Minute Man Cleaners

NASSAU COUNTY

EAST ROCKAWAY, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C130157

Prepared for:

Dennis Manly

Minute Man Cleaners

89 Ocean Avenue

East Rockaway, NY 11518

Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

DECEMBER 2015

CERTIFICATION STATEMENT

I J. ROBERT HOLZMACHER certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375] and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

J. ROBERT HOLZMACHER P.E.,

DATE: DECEMBER 15, 2015

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AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization

SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: Site Number C130157, Minute Man Cleaners, 89 Ocean Avenue, East Rockaway, New York

Institutional Controls:	1. The property may be used for commercial and industrial use.
	Imposition of an institutional control in the form of an environmental easement for the controlled property that: A. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3); B. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws; C. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and D. requires compliance with the Department-approved Site Management Plan..
Engineering Controls:	1. Cover system consisting of asphalt, soil cover, and building;
	2. Soil Vapor Extraction System; and.
	3. In-Situ Chemical Oxidation.

Inspections:	Frequency
1. Cover inspection	Annually

Site Identification: Site Number C130157, Minute Man Cleaners, 89 Ocean Avenue, East Rockaway, New York

Monitoring:	
1. Groundwater Monitoring Wells MW-1S, MW-1D, MW-2S, MW-2D, MW-3S, MW-3D, MW-4S, MW-4D, MW-5S, MW-5D, MW-9, MW-12, MW-14WT, MW-14S, MW-14D, DB-1	6 months
Maintenance:	
2. Blower maintenance	Monthly
Reporting:	
1. SVE/SSD System Operation	Annually
2. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 Introduction

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Minute man Cleaners located in East Rockaway, Nassau County, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) Site No. C130157 which is administered by New York State Department of Environmental Conservation (NYSDEC).

Ben Ley Enterprises Inc. entered into a Brownfield Cleanup Agreement (BCA) on March 22, 2006 with the NYSDEC to remediate the site. A figure showing the site location and boundaries of this site is provided in Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix D.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Nassau County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA (Index #W1-1085-06-01; Site # C130157) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix A of this SMP.

This SMP was prepared by J.R. Holzmacher P.E. LLC (JRH), on behalf of Ben Ley Enterprises Inc., in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Brownfield Cleanup Agreement (BCA) and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table 1: Notifications*

Name	**Contact Information**
Girish Desai P.E.	(631) 444-0243 girish.desai@dec.ny.gov
Walter Parish P.E.	631-444-0241 walter.parish@dec.ny.gov
Kelly Lewandowski	518-402-9553 Kelly lewandowski@dec.ny.gov
Dennis Manly	516-599-1344 dennis242@optonline.net
Robert Holzmacher P.E.	631-234-2220 bob@holzmacher.com

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in Village of East Rockaway, Town of Hempstead, Nassau County, New York and is identified as Section 42 Block 69 and Lot 214 (formerly Lot 201) on the Nassau County Tax Map (see Figure 1). The site is an approximately 0.1774-acre area and is bounded by Atlantic Avenue with an automobile service repair shop to the north, a restaurant to the south, Mill River with a boat storage yard to the east, and Ocean Avenue with a restaurant to the west (see Figure 2 – Site Layout Map). The boundaries of the site are more fully described in Appendix D –Environmental Easement. The owner of the site parcel at the time of issuance of this SMP is:

Ben Ley Enterprises Inc.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a building, asphalt parking area, bulkhead, concrete sidewalks, bushes, and an open area on the eastern portion along Mill River. The Site is zoned commercial and is currently utilized for commercial uses. The Site occupant includes a dry cleaner.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include commercial and residential properties. The properties immediately south of the Site include commercial properties; the properties immediately north of the Site include commercial properties; the properties immediately east of the Site include commercial properties; and the properties to the west of the Site include commercial properties.

2.2.2 Geology

The site soil is primarily fill material to a depth of approximately 13 feet below grade surface (bgs) underlain by sand and gravel. A geologic cross section is shown in Figure 3. Site specific boring logs, prepared by URS and JRH are provided in Appendix E.

2.2.3 Hydrogeology

The water table is encountered approximately 3.5 feet to 5.5 feet bgs depending on the tidal stage. Groundwater flow direction changes through the complete tidal cycle, indicating significant tidal influence. During the low tide, groundwater flows east towards the Mill River. While during the high tide, groundwater flows in a westerly direction (away from the Mill River). Groundwater contour maps are shown in Figures 4A, 4B, 5A, and 5B. Groundwater elevation data is provided in Tables 2 and 3.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

The site was developed in 1968 for a pizzeria and restaurant and later used as a retail-clothing store. The property was purchased by Ben Ley Enterprises in 1982 and has been used as a dry cleaning facility since.

According to the proprietor of Minute Man Cleaners, approximately half a dozen “acute” leaks of PCE occurred between 1983 and 1987 due to broken gaskets within the machine. At these times, spillage was observed underneath and behind the dry cleaning machine moving eastward towards the joint between the floor and the eastern wall of the facility, approximately three feet east of the dry cleaning machine. In 1987 all of the gaskets and cartridge tubes within the machine were replaced. In March 2000, the dry cleaning machine was replaced with a new state-of-the-art unit and placed in the same location as the previous machine.

Based upon investigations conducted to date, the primary contaminant of concern at the site is tetrachloroethylene (PCE), which is a compound used in dry cleaning operations. It is still used at the facility. PCE was detected in on-site soils, and on-site and off-site groundwater exceeded PCE standards, criteria and guidance (SCGs). Elevated levels of PCE were detected in the sediments of the adjacent river and in soil vapor. The RI delineated the contamination surrounding the dry cleaning machine. The maximum level found was 27 ppm. A major portion of the PCE source area was removed during the excavation activities although residual contamination exists at the site.

An IRM was completed at the site in 2008 and consisted of removal of shallow soils (0 to 5 feet bgs) around the dry cleaning machine in accessible areas inside the building and outside the building; a single application consisting of the placing of potassium permanganate into excavation pits for In-Situ Chemical Oxidation (ISCO) treatment of impacted soil and groundwater; and installation of a soil vapor extraction (SVE) system for the remaining impacted unsaturated soils and to provide soil vapor mitigation. In total, approximately 56.5 tons of impacted soils were removed for off-site disposal from both the interior and exterior excavations and approximately 2,900 pounds of potassium permanganate were utilized for the ISCO application.

Additional ISCOs injections took place in 2015, February and July, in which 165 pounds of potassium permanganate was injected into the subsurface in each of five locations across the site for a total of 825 pounds injected during each round.

The SVES operating at the site will remain active which will remove any vapors that might otherwise build up below the concrete slab.

One sediment sample detected up to 9,000 ppb of PCE and 1,100 ppb of TCE, which are below the sediment screening levels of 16,000 ppb and 1,800 ppb respectively, identified in the June 2014 DEC Guidance Screening and Assessment of Contaminated Sediment.

The sampling of shallow groundwater conducted in October 2015 showed maximum concentrations of PCE, TCE, and cis 1, 2 DCE detected at 150 ppb, 6.3 ppb, and 15 ppb. The SCGs for PCE, TCE, and cis 1, 2 DCE are each 5 ppb.

In deeper groundwater the maximum PCE and TCE concentrations were 180 ppb and 6.1 ppb. Other site contaminants did not significantly exceed SCGs. Concentrations of PCE and TCE were 46 ppb and 5.7 ppb in well DB-1.

Offsite monitoring wells did not detect PCE in deep groundwater. However, PCE was detected at a maximum concentration of 7.3 ppb in shallow groundwater.

During 2010, PCE was detected at 374 ug/m^3 in a soil vapor sample collected from a temporary soil vapor probe north west of the site. The concentrations of petroleum constituents (benzene, hexane, and cyclohexane) were also elevated in this soil vapor sample. Three separate offers of subslab vapor and indoor air sampling were made to a nearby apartment building; however, no response was received.

Surface water and sediment samples were collected from the adjacent Mill River. One surface water sample detected PCE at one ppb, which is equal to the guidance value for surface water.

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

TETRACHLOROETHYLENE (PCE)	TRICHLOROETHENE (TCE)
CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE

The contaminants of concern exceed the applicable SCGs for: soil, groundwater and soil vapor.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated January 9, 2015 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.5 Remaining Contamination

2.5.1 Soil

Some remaining soil contamination remains underneath the building.

The SVES operating at the site will remain active which will remediate any soil contaminates and remove any soil vapors that might otherwise build up below the concrete slab.

2.5.2 Sediment

One sediment sample detected up to 9,000 ppb of PCE and 1,100 ppb of TCE, which are below the sediment screening levels of 16,000 ppb and 1,800 ppb respectively, identified in the June 2014 DEC Guidance Screening and Assessment of Contaminated Sediment.

2.5.3 Groundwater

The sampling of shallow groundwater conducted in October 2015 showed maximum concentrations of PCE, TCE, and cis 1, 2 DCE detected at 150 ppb, 6.3 ppb, and 15 ppb. The SCGs for PCE, TCE, and cis 1, 2 DCE are each 5 ppb.

In deeper groundwater the maximum PCE and TCE concentrations were 180 ppb and 6.1 ppb. Other site contaminants did not significantly exceed SCGs. Concentrations of PCE and TCE were 46 ppb and 5.7 ppb in well DB-1.

Offsite monitoring wells did not detect PCE in deep groundwater. However, PCE was detected at a maximum concentration of 7.3 ppb in shallow groundwater.

Table 4 and Figure 6 summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action.

2.5.4 Surface Water

Surface water and sediment samples were collected from the adjacent Mill River. One surface water sample detected PCE at one ppb, which is equal to the guidance value for surface water.

2.5.5 Soil Vapor

During 2010, PCE was detected at 374 ug/m^3 in a soil vapor sample collected from a temporary soil vapor probe north west of the site. The concentrations of petroleum constituents (benzene, hexane, and cyclohexane) were also elevated in this soil vapor sample. Three separate offers of subslab vapor and indoor air sampling were made to a nearby apartment building; however, no response was received.

3.0 Institutional and Engineering Control Plan

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix B) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the Decision Document issued January 2015, to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to commercial and industrial uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 7. These ICs are:

- The property may be used for: commercial and industrial use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- A provision for the consideration of sampling upon request from the property owner in offsite locations where access was previously refused. If appropriate, soil vapor intrusion sampling will be completed and actions recommended to address exposures related to soil vapor intrusion will be implemented;

- A provision for evaluation of the potential for on-site soil vapor intrusion if use of PCE in the onsite building is discontinued and for any buildings developed on the site within the IC boundaries shown on Figure 7, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- Vegetable gardens and farming on the site are prohibited.

3.3 Engineering Controls

3.3.1 Cover (or Cap)

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of twelve inches of clean soil, asphalt pavement, concrete covered sidewalk, and concrete building slabs. Figure 8 presents the location of the cover system. The Excavation Work Plan (EWP) provided in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix F.

3.3.2 Sub-Slab Depressurization System/Soil Vapor Extraction Systems

Procedures for operating and maintaining the SSDS/SVE system are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). As built drawings, signed and sealed by a professional engineer, are included in Appendix J – Operations and Maintenance Manual. Figure 9 shows the location of the ECs for the site.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.3.1 - Cover (or Cap)

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3.3.2 – Sub-Slab Depressurization System; Soil Vapor Extraction Systems

The SSDS/SVE system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSDS/SVE system may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Conditions that may warrant discontinuing the SSDS/SVE system include contaminant concentrations in groundwater and/or soil that: (1) reach levels that are consistently below ambient water quality standards or the site SCGs, as appropriate; (2) have become asymptotic to a low level over an extended period of time, as accepted by the NYSDEC; or (3) the NYSDEC has determined that the SSDS/SVE system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

4.0 Monitoring and Sampling Plan

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in Appendix G.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and

- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site–wide Inspection

Site-wide inspections will be performed once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix H – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and

- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Treatment System Monitoring and Sampling (for Active ECs)

4.3.1 Remedial System Monitoring

Monitoring of the SSDS/SVE system will be performed on a routine basis, as identified in Table 5 Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SVE system components to be monitored include, but are not limited to, the components included in Table 5 below.

Table 5 – Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Blower	Flow rate	10-20 CFM	Monthly
General System Piping	Exposed Piping	No leakage	Annually

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix H - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.2 Remedial System Sampling

Samples shall be collected from the SVE/SSDS on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table 6 – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 6 – Remedial System Sampling Requirements and Schedule

Sampling Location	Analytical Parameters	Schedule
	VOC (EPA Method TO-15)	
Effluent	X	Annually

Detailed sample collection and analytical procedures and protocols are provided in Appendix I – Field Activities Plan and Appendix G – Quality Assurance Project Plan.

4.4 Post-Remediation Media Monitoring and Sampling

Samples shall be collected from the monitoring well on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table 7 – Post Remediation Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 7 – Post Remediation Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**	**Schedule**
	VOCs (EPA Method 624)	
Monitoring Wells	X	Semi-Annually for the 1st year then reduced to annually.

Detailed sample collection and analytical procedures and protocols are provided in Appendix I – Field Activities Plan and Appendix G – Quality Assurance Project Plan.

Prior to sampling the well, a water level indicator with accuracy of 0.01 feet will be used to measure the depth to the water table. Groundwater will be sampled using per well dedicated tubing and purge water will be analyzed using field indicator parameters pH, Conductivity, and temperature. Upon three consecutive consistent readings a groundwater sample will be collected.

Fill each 40 ml VOA vial with groundwater taking care not to let it over flow and lose preservative. Place cap with Teflon septum on each vial as filled. Turn the VOA vial upside down and check for air bubbles. Tap the bottom of the VOA vials to dislodge any bubbles that may have formed around the cap or sides. If bubbles are present, remove cap and fill VOA vial with additional sample water to completely vial. Reconfirm that there are no bubbles in vial.

4.4.1 Soil Sampling

Soil sampling will be performed to assess the quality of the soil following completion of the remedial actions. Soil sampling will not be performed as part of routine monitoring.

4.4.2 Sediment Sampling

Sediment sampling will not be performed as part of routine monitoring.

4.4.3 Groundwater Sampling

Groundwater monitoring will be performed semi-annually to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC. If significant rebound in contaminant levels is detected at the 6 month post treatment monitoring round then an additional ISCO treatment event will be implemented with NYSDEC approval. Groundwater sampling will occur quarterly during the first year following the final ISCO treatment event unless an alternate schedule is approved by NYSDEC.

The network of monitoring wells has been installed to monitor upgradient, on-site and downgradient groundwater conditions at the site. The network of on-site and off-site wells has been designed based on the following criteria:

Table 8 summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, 12 on-site wells and 3 offsite wells are sampled to evaluate the effectiveness of the remedial system.

Table 8 – Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude)	Well Diameter (inches)	Elevation (Feet above mean sea level)		
				Surface	Screen Top	Screen Bottom
MW-1S	On-site	40.64066° N, 73.6596° W	1.65	6.52	-10.48	-15.48
MW-1D	On-site	40.64065° N, 73.6596° W	1.65	5.62	-16.38	-21.38
MW-2S	On-site	40.64046° N, 73.6596° W	1.65	6.84	-10.16	-15.16
MW-2D	On-site	40.64048° N, 73.6596° W	1.65	6.68	-18.32	-23.32
MW-3S	On-site	40.64043° N, 73.6595° W	1.65	5.68	-12.32	-17.32
MW-3D	On-site	40.64044° N, 73.6595° W	1.65	5.84	-18.16	-23.16
MW-4S	On-site	40.64054° N, 73.6594° W	1.65	5.60	-11.40	-16.40
MW-4D	On-site	40.64056° N, 73.6594° W	1.65	5.68	-17.32	-22.32
MW-5S	On-site	40.64068° N, 73.6594° W	1.65	6.22	-10.78	-15.78
MW-5D	On-site	40.64065° N, 73.6594° W	1.65	5.94	-16.06	-21.06
MW-9	On-site	40.64061° N, 73.6595° W	1.00	6.52	-3.52	-6.48
MW-12	On-site	40.64049° N, 73.6595° W	1.65	6.84	3.84	-6.16
MW-14WT	Off-site	40.64093° N, 73.6595° W	1.00	6.36	3.36	-6.64
MW-14S	Off-site	40.65955° N, 73.6595° W	1.00	6.28	2.28	-2.72
MW-14D	Off-site	40.65955° N, 73.6409° W	1.00	6.18	-18.82	-28.82
DB-1	On-site	40.64061° N, 73.5696° W	1.00	6.58	-48.42	-58.42

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.4.4 Surface Water Sampling

Surface Water sampling will not be performed as part of routine monitoring.

4.4.5 Soil Vapor Sampling

Soil vapor sampling will be performed to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The network of on-site soil vapor sample locations has been designed based on the following criteria:

A provision for implementing actions is recommended to address exposures related to soil vapor intrusion.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the soil vapor sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.6 Soil Vapor Intrusion Sampling

A provision for evaluation of the potential for on-site soil vapor intrusion if use of PCE in the onsite building is discontinued and for any buildings developed on the site..

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.7 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix I - Field Activities Plan. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the site to operate and maintain the SVE system;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SVE system are operated and maintained.

Further detail regarding the Operation and Maintenance of the SVE system is provided in Appendix J - Operation and Maintenance Manual. A copy of this Operation and Maintenance Manual, along with the complete SMP, is to be maintained at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Remedial System (or other Engineering Control) Performance Criteria

The remedial SVE system performance will be deemed adequate if it is able to accomplish two goals:

- Prevent the accumulation of soil vapors that might otherwise leak into the building; and
- Remove latent contamination from soils which might otherwise reach groundwater and contribute to increasing concentrations of contaminants in the monitoring wells.

5.3 Operation and Maintenance of Soil Vapor Extraction System

The following sections provide a description of the operations and maintenance of the SVE system. Cut-sheets and as-built drawings for SVE system are provided in Appendix J - Operations and Maintenance Manual.

5.3.1 System Start-Up and Testing

The SVE system consists of slotted piping which is buried in coarse, granular soil beneath the building floor slab. This network is connected to solid piping which exits below grade through the east foundation wall and is then routed to the mechanical room at the south end of the building. This piping rises up vertically and passes through the wall of the mechanical room above grade where it then connects to a vacuum blower. The blower draws air from beneath the building and discharges it above the roof line where it is diluted with ambient air.

Starting the system is accomplished by turning the blower switch to the "on" position and listening to confirm that the blower is running. The suction line of the blower contains a vacuum range pressure switch which will verify if a sufficient suction is achieved. This switch is connected to and "auto-dialer" which will dial out if the blower fails to draw sufficient suction. Once running the blower should make a smooth sound. If a very high pitch is heard the suction pipes should be checked to verify that they are not blocked or filled with water.

The system testing described above will be conducted if, in the course of the SVE system lifetime, the system goes down or significant changes are made to the system and the system must be restarted.

5.3.2 Routine System Operation and Maintenance

General procedures for the routine operation include:

- Adjustment and repairs are to be made on an as needed basis;
- The SVES must be operational for 24 hours per day and seven days per week.
- The equipment will be inspected and monitored on a Monthly basis unless an event precludes a more expedited inspection.

5.3.3 Non-Routine Operation and Maintenance

- If damage to the system is encountered during a scheduled inspection or during routine work within the space, attempts to repair the system will be initiated by the Owner.

5.3.4 System Monitoring Devices and Alarms

The SVE system has an alarm panel with a remote modem dialer which will automatically call selected contacts in the event of a system shut-down or indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SVE system will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

The SVE system was originally constructed without a moisture "knock out" drum and has proven able to run properly with this configuration. Therefore, the only alarm configured with the system is a vacuum range pressure switch on the vacuum blower suction pipe. This switch is connected to an auto-dialer which indicates an operational failure whenever adequate suction is lost.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

This site is located on a portion of the coast line which was flooded during Super Storm Sandy during October 29, 2012. The building and surrounding area were under several feet of salt water and were without electricity for an extended period. Once debris was removed and the site cleanup it was determined that none of the monitoring wells were damaged but that the SSDS/SVE vacuum blower was ruined. The suction piping was verified to have drained and the blower and motor were replaced and returned to operation.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2. Remedial Systems

Remedial systems will be operated properly considering the current site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

The SSDS/SVE system draws air only from the area beneath the building and operates with a single blower. A reduction in air flow rate, and a corresponding reduction in electrical usage, could be achieved through the installation of an inlet damper. However, such a reduction might reduce the effectiveness of the SSDS system. When residual contaminant concentrations are reduced sufficiently and the occurrence of soil vapors ceases than a request will be made to NYSDEC to cease operation of the SSDS/SVE system.

6.2.3 Building Operations

Structures including buildings and sheds will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation and water consumption.

This site does not contain any buildings or sheds dedicated only to the remedial system. The SVE system is located within the mechanical room of the occupied structure. The operation of the building is related to the needs of the dry cleaning business and there are few opportunities for savings related to the SSDS/SVE system.

6.2.4 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

The SVE system is configured with an auto-dialer to allow remote indication of operational problems without the need for frequent site visits. Scheduled site visits will be combined with other trips to nearby sites, to the extent practical. Sampling events will also be scheduled to include site and system inspections in order to reduce the total number of trips required.

6.2.5 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix H – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix H. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 9 and summarized in the Periodic Review Report.

Table 9: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Monthly
Periodic Review Report	Annually

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);

- Sampling results in comparison to appropriate standards/criteria;

- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);

- Any observations, conclusions, or recommendations; and

- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;

- Name, company, and position of person(s) conducting maintenance activities;

- Description of maintenance activities performed;

- Any modifications to the system;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,

- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;

- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;

- Description of non-routine activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix D - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.

- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A site evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  - Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.

  - The overall performance and effectiveness of the remedy.

- A performance summary for all treatment systems at the site during the calendar year, including information such as:

  - The number of days the system operated for the reporting period;

  - The average, high, and low flows per day;

  - The contaminant mass removed;

  - A description of breakdowns and/or repairs along with an explanation for any significant downtime;

- A description of the resolution of performance problems;
- Alarm conditions;
- Trends in equipment failure;
- A summary of the performance, effluent and/or effectiveness monitoring; and
- Comments, conclusions, and recommendations based on data evaluation.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] for the site."

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*

For this site, as a BCP project, every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the Periodic Review Report.

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

Sampling 6 months. If a significant rebound is determined then chem-ox will need to be conducted.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3, upon completion of an RSO, an RSO report must be submitted to the Department for approval. A general outline for the RSO report is provided in Appendix K. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

Remedial Investigation Report – Prepared by URS Corporation - January 15, 2007;

Supplemental Remedial Investigation Report – Prepared by URS Corporation - August 1, 2007;

Excavation and in Situ Chemical Oxidation Interim Remedial Measure Work Plan – Prepared by URS Corporation – November 8, 2007;

Excavation and In Situ Chemical Oxidation Interim Remedial Measure Report - Prepared by URS Corporation – July 1, 2008;

Post IRM Groundwater Monitoring Report – Initial Sampling - Prepared by URS Corporation – August 14, 2008;

Soil Vapor Investigation Work Plan Off-Site Wendy's Restaurant – Prepared by URS Corporation – October 30, 2008;

Soil Vapor Investigation Off-Site Wendy's Restaurant - Prepared by URS Corporation – January 14, 2009;

Alternatives Analysis Report (AAR) Remedial Plan (RP) – Prepared by J.R. Holzmacher P.E. LLC – October 31, 2014;

Decision Document – Prepared by New York State Department of Environmental Conservation – January 2015.

Remedial Action Report - Prepared by J.R. Holzmacher P.E. LLC – December 2015.

TABLES

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C13057

Ground Water Elevations
Shallow Wells
Table 2

Shallow Wells - Low Tide — Readings taken between 10:05 - 10:21

WELL No.	MW-1S		MW-2S		MW-3S		MW-4S		MW-5S		MW-14S	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.56	6.84	5.72	5.68	5.525	5.60	4.90	6.22	4.84	6.28
Depth to Water	4.93		5.33		4.63		4.69		4.99		4.64	
Water Elev		1.59		1.51		1.05		0.91		1.23		1.64

Shallow Wells - Mid Tide — Readings taken between 13:08 - 13:23

WELL No.	MW-1S		MW-2S		MW-3S		MW-4S		MW-5S		MW-14S	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.56	6.84	5.72	5.68	5.525	5.60	4.90	6.22	4.84	6.28
Depth to Water	4.52		4.83		3.69		3.61		4.24		4.35	
Water Elev		2.00		2.01		1.99		1.99		1.98		1.93

Shallow Wells - High Tide — Readings taken between 16:09 - 16:22

WELL No.	MW-1S		MW-2S		MW-3S		MW-4S		MW-5S		MW-14S	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.56	6.84	5.72	5.68	5.525	5.60	4.90	6.22	4.84	6.28
Depth to Water	4.09		4.35		3.05		2.90		3.63		3.96	
Water Elev		2.43		2.49		2.63		2.70		2.59		2.32

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C13057

Ground Water Elevations
Deep Wells
Table 3

Deep Wells - Low Tide Readings taken between 10:05 - 10:21

WELL No.	MW-1D		MW-2D		MW-3D		MW-4D		MW-5D		MW-14D	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.725	6.68	5.56	5.84	5.44	5.68	5.18	5.94	4.94	6.18
Depth to Water	4.97		5.01		4.60		4.22		4.73		4.43	
Water Elev		1.55		1.67		1.24		1.46		1.21		1.75

Deep Wells - Mid Tide Readings taken between 13:08 - 13:23

WELL No.	MW-1D		MW-2D		MW-3D		MW-4D		MW-5D		MW-14D	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.725	6.68	5.56	5.84	5.44	5.68	5.18	5.94	4.94	6.18
Depth to Water	4.54		Flooded		3.81		3.61		3.93		4.03	
Water Elev		1.98		#VALUE!		2.03		2.07		2.01		2.15

Deep Wells - High Tide Readings taken between 16:09 - 16:22

WELL No.	MW-1D		MW-2D		MW-3D		MW-4D		MW-5D		MW-14D	
	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev	Survey	Elev
Top of Well PVC	4.88	6.52	4.725	6.68	5.56	5.84	5.44	5.68	5.18	5.94	4.94	6.18
Depth to Water	4.10		4.15		3.24		3.16		3.35		3.60	
Water Elev		2.42		2.53		2.60		2.52		2.59		2.58

J.R. Holzmacher P.E., LLC
Consulting Engineers

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1DDL**
Screen Intervals		Groundwater	**25-30'**	**25-30'**	**25-30'**	**25-30'**	**25-30'**	**25-30'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**03/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**50**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	0.62J	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.7BJ	4.9	ND	2.0BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
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Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1D**	**MW-1DDL**
Screen Intervals		Groundwater	**25-30'**	**25-30'**	**25-30'**	**25-30'**	**25-30'**	**25-30'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**03/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**50**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.45J	ND
cis-1,2-Dichloroethene	PPB	5	2.5	ND	0.93J	1.0J	**15**	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.6J	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	0.55J	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	0.76J	0.97J	ND	ND	2.6	1.5
Methylene chloride	PPB	5	4.7B	4.5	3.6B	**5.8B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**180D**	**89**	**210D**	**190D**	**1900E**	**1900D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**6.1**	ND	**5.2**	4.4	**50**	**54D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	1.4	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**03/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.0BJ	1.2BJ	1.4J	1.9BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**03/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.6J	ND
cis-1,2-Dichloroethene	PPB	5	2.3	1.8J	1.0J	1.2J	**7.3**	**12JD**
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	ND	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	3.4	2.4	ND	0.68J	**5.3**	ND
Methylene chloride	PPB	5	4.6B	4.6B	3.6B	**5.1B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**150**	**140**	**210D**	**190D**	**1700E**	**1900D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**6.3**	**5.8**	**5.5**	4.9	**32**	**43D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2DDL**
Screen Intervals		Groundwater	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.1BJ	2.2BJ	ND	2.0BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
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Site #C130157

Volatile Organic Chemicals
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Table 4

Client Sample ID:		NYSDEC	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2D**	**MW-2DDL**
Screen Intervals		Groundwater	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.59J	ND
cis-1,2-Dichloroethene	PPB	5	0.86J	ND	0.88J	1.3J	1.8	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.8J	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	0.55J	0.56J	0.87J	ND
Methylene chloride	PPB	5	4.5B	4.6B	3.9B	**5.5B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**140**	**130**	**160**	**110**	**500E**	**480D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	2.2	2.2	2.5	2.0	**12**	**12D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-2S**	**MW-2S**	**MW-2S**	**MW-2S**	**MW-2S**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.6BJ	2.2BJ	1.3J	2.1BJ	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	0.61J	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-2S**	**MW-2S**	**MW-2S**	**MW-2S**	**MW-2S**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.45J
cis-1,2-Dichloroethene	PPB	5	ND	0.90J	0.81J	0.99J	1.5
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	2.5	ND
Dibromochloromethane	PPB	5	0.67J	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	0.57J
Methylene chloride	PPB	5	4.6B	4.9B	3.6B	**5.4B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**28**	**73**	**73**	**51**	**110**
Toluene	PPB	5	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**0.90J**	1.8J	1.5J	1.2J	2.8
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
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** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
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Table 4

Client Sample ID:		NYSDEC	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3DDL**
Screen Intervals		Groundwater	**24-29'**	**24-29'**	**24-29'**	**24-29'**	**24-29'**	**24-29'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.0BJ	1.4BJ	2.3J	2.2BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

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East Rockaway, NY
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Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3D**	**MW-3DDL**
Screen Intervals		Groundwater	**24-29'**	**24-29'**	**24-29'**	**24-29'**	**24-29'**	**24-29'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.48J	ND
cis-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	3	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.9J	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	0.87J	ND
Methylene chloride	PPB	5	4.5B	4.7B	4.0B	**5.1B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**94**	**90**	**78**	**100**	**860E**	**840D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	1.5J	1.8	1.2J	1.9J	**22**	**22D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
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** Guidance Value*

Minute Man Cleaners
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East Rockaway, NY
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Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-3S**	**MW-3S**	**MW-3S**	**MW-3S**	**MW-3S**
Screen Intervals		Groundwater	**18-23'**	**18-23'**	**18-23'**	**18-23'**	**18-23'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.6BJ	1.7BJ	1.3J	1.8BJ	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Client Sample ID:		NYSDEC	**MW-3S**	**MW-3S**	**MW-3S**	**MW-3S**	**MW-3S**
Screen Intervals		Groundwater	**18-23'**	**18-23'**	**18-23'**	**18-23'**	**18-23'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PPB	5	0.73J	0.66J	1.0J	1.4J	1.7
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	2.4	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	0.52J	0.56J	0.65J	0.79J
Methylene chloride	PPB	5	4.6B	4.5B	3.6B	**5.6B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**110**	**120**	**120**	**91**	**170**
Toluene	PPB	5	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	2.1	2.0J	2.3	1.9J	4.4
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4DDL**
Screen Intervals		Groundwater	**23-28'**	**23-28'**	**23-28'**	**23-28'**	**23-28'**	**23-28'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.9BJ	1.5BJ	1.4J	1.9BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
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Volatile Organic Chemicals
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Table 4

Client Sample ID:		NYSDEC	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4D**	**MW-4DDL**
Screen Intervals		Groundwater	**23-28'**	**23-28'**	**23-28'**	**23-28'**	**23-28'**	**23-28'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.59J	ND
cis-1,2-Dichloroethene	PPB	5	1.0J	0.54J	0.71J	0.63J	4.4	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	ND	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	1J	ND
Methylene chloride	PPB	5	4.8B	4.6B	4.1B	**6.1B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	2.9J	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**130**	**110**	**140**	**150**	**1900E**	**1800D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	4.1	3.0	3.6	4.0	**45**	**42D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	0.61J	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**20**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.3BJ	2.6BJ	ND	1.7BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
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Volatile Organic Chemicals
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Table 4

Client Sample ID:		NYSDEC	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4S**	**MW-4SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**20**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PPB	5	0.79J	1.1J	ND	ND	1.4	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	ND	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	0.54J	ND
Methylene chloride	PPB	5	4.8B	4.5B	3.9B	**5.0B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**100**	**88**	**94**	**88**	**450E**	**500D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	2.9	2.4	1.7J	1.7J	**12**	**13JD**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

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Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-5D**	**MW-5D**	**MW-5D**	**MW-5D**	**MW-5D**
Screen Intervals		Groundwater	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	0.55J	0.96J	2.6
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	0.52J
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.2BJ	3.1BJ	ND	3.3BJ	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	3.1
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Table 4

Client Sample ID:		NYSDEC	**MW-5D**	**MW-5D**	**MW-5D**	**MW-5D**	**MW-5D**
Screen Intervals		Groundwater	**22-27'**	**22-27'**	**22-27'**	**22-27'**	**22-27'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.47J
cis-1,2-Dichloroethene	PPB	5	0.52J	ND	ND	ND	**8**
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.0J	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	1.8J	7.1	1.8J	3.6	**30**
Methylene chloride	PPB	5	4.9B	4.7B	3.8B	**6.2B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**11**	**12**	2.8	**6.4**	**170**
Toluene	PPB	5	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**1.1J**	1.4J	0.51J	0.87J	**11**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	0.92J	1.0J	2.2	ND
1,1-Dichloroethene	PPB	5	ND	ND	0.68J	0.78J	0.7J	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.9BJ	2.7BJ	ND	2.0BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	1	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5S**	**MW-5SDL**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.42J	ND
cis-1,2-Dichloroethene	PPB	5	2.4	3.5	4.8	**5.8**	**12**	**12D**
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	0.85J	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	5.3	**23**	**30**	**32**	**33**	**28D**
Methylene chloride	PPB	5	**5.0B**	4.8B	4.0B	**5.0B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**69**	**63**	**150D**	**190D**	**430E**	**450D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**3.7**	**6.4**	**13**	**14**	**25**	**27D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	0.68J	1.2J	1.6J	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
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** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-9**	**MW-9**	**MW-9**	**MW-9**	**MW-9**	**MW-9DL**
Screen Intervals		Groundwater	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.5BJ	1.7BJ	1.5J	2.9BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	0.78J	ND	ND	ND	ND
Bromoform	PPB	50*	ND	1.0J	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND	ND

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-9**	**MW-9**	**MW-9**	**MW-9**	**MW-9**	**MW-9DL**
Screen Intervals		Groundwater	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**10**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	0.99J	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.49J	ND
cis-1,2-Dichloroethene	PPB	5	**15**	ND	**12**	**14**	**39**	**35D**
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.2J	ND	ND
Dibromochloromethane	PPB	5	ND	1.2J	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	0.50	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	0.47J	0.79J
Methylene chloride	PPB	5	4.7B	4.7B	3.7B	**5.0B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**12**	3.6	**91**	**93**	**730E**	**680D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**2.1**	0.50J	4.8	**6.9**	**20**	**18D**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-12**	**MW-12**	**MW-12**	**MW-12**	**MW-12**
Screen Intervals		Groundwater	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.6BJ	1.7BJ	1.6J	3.0BJ	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	0.60J	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Client Sample ID:		NYSDEC	**MW-12**	**MW-12**	**MW-12**	**MW-12**	**MW-12**
Screen Intervals		Groundwater	**3-13'**	**3-13'**	**3-13'**	**3-13'**	**3-13'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	0.86J	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.6J
cis-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	0.99J	ND
Dibromochloromethane	PPB	5	ND	ND	ND	0.59J	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	ND
Methylene chloride	PPB	5	4.5B	4.6B	3.8B	**5.5B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**21**	**15**	**17**	**15**	**27**
Toluene	PPB	5	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	0.61J	0.51J	ND	ND	0.51J
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
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EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**MW-14 D**	**MW-14 D**	**MW-14 D**	**MW-14 D**	**MW-14 D**
Screen Intervals		Groundwater	**25-35'**	**25-35'**	**25-35'**	**25-35'**	**25-35'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	3.6	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	2.0BJ	2.8BJ	ND	5.6B	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

Minute Man Cleaners
89 Ocean Ave
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Site #C130157

Volatile Organic Chemicals
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Table 4

Client Sample ID:		NYSDEC	**MW-14 D**	**MW-14 D**	**MW-14 D**	**MW-14 D**	**MW-14 D**
Screen Intervals		Groundwater	**25-35'**	**25-35'**	**25-35'**	**25-35'**	**25-35'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	0.70J	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	ND	7.7	ND	ND	1.7
Methylene chloride	PPB	5	4.9B	4.8B	4.3B	**5.9B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	ND	3.6	ND	ND	ND
Toluene	PPB	5	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	ND	0.54J	ND	ND	ND
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

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Volatile Organic Chemicals
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Client Sample ID:		NYSDEC	**MW-14 S**	**MW-14 S**	**MW-14 S**	**MW-14 S**	**MW-14 S**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	NA
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	NA
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	4.2	ND	1.8J	3.4	**24**
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	1.5
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	NA
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	NA
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	NA
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	NA
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	NA
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	NA
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	NA
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	NA
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	NA
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	NA
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	NA
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	NA
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	ND	2.3BJ	ND	5.2B	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	NA
Bromochloromethane	PPB	5	ND	ND	ND	ND	NA
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Client Sample ID:		NYSDEC	**MW-14 S**	**MW-14 S**	**MW-14 S**	**MW-14 S**	**MW-14 S**
Screen Intervals		Groundwater	**17-22'**	**17-22'**	**17-22'**	**17-22'**	**17-22'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.8J	NA
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	NA
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	NA
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	NA
Isopropylbenzene	PPB	5	ND	ND	ND	ND	NA
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	NA
Methyl tert-butyl ether	PPB	10	7.5	ND	5.1	**12**	**19**
Methylene chloride	PPB	5	**5.0B**	**5.2B**	4.0B	**5.7B**	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	NA
n-Propylbenzene	PPB	5	ND	ND	ND	ND	NA
Naphthalene	PPB	5	ND	ND	ND	ND	NA
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	NA
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	NA
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	NA
Tetrachloroethene	PPB	5	3.2	ND	**5.7**	**7.5**	**10**
Toluene	PPB	5	ND	ND	ND	ND	0.47J
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	ND	ND	ND	0.88J	0.93J
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	NA
Vinyl acetate	PPB	50*	ND	ND	ND	ND	NA
Vinyl chloride	PPB	2	ND	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

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Volatile Organic Chemicals
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Client Sample ID:		NYSDEC	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**
Screen Intervals		Groundwater	**4-9'**	**4-9'**	**4-9'**	**4-9'**	**4-9'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**08/02/2011**
Dilution Factor							
Analyte:	**Units:**						
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	NA
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	NA
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	NA
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	NA
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	NA
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	NA
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	NA
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	NA
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	NA
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	NA
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	NA
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	NA
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	NA
2-Butanone	PPB	50*	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	NA
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	NA
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	NA
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	NA
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.9BJ	1.7BJ	1.5J	5.3B	ND
Acrolein	PPB		ND	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	NA
Bromochloromethane	PPB	5	ND	ND	ND	ND	NA
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	ND

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Client Sample ID:		NYSDEC	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**	**MW-14 WT**
Screen Intervals		Groundwater	**4-9'**	**4-9'**	**4-9'**	**4-9'**	**4-9'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**08/02/2011**
Dilution Factor							
Analyte:	**Units:**						
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	ND
Chloroethane	PPB	5	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	ND	NA
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	NA
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	NA
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	NA
Isopropylbenzene	PPB	5	ND	ND	ND	ND	NA
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	NA
Methyl tert-butyl ether	PPB	10	ND	ND	ND	ND	ND
Methylene chloride	PPB	5	**5.0B**	4.7B	3.8B	**5.8B**	**15B**
n-Butylbenzene	PPB	10	ND	ND	ND	ND	NA
n-Propylbenzene	PPB	5	ND	ND	ND	ND	NA
Naphthalene	PPB	5	ND	ND	ND	ND	NA
o-Xylene	PPB	5	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	NA
Styrene	PPB	5	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	NA
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	NA
Tetrachloroethene	PPB	5	**7.3**	**16**	**12**	**5.2**	**19**
Toluene	PPB	5	NU	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	NU	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	NU	ND	ND	ND	ND
Trichloroethene	PPB	5	NU	ND	ND	ND	ND
Trichlorofluoromethane	PPB	5	NU	ND	ND	ND	NA
Vinyl acetate	PPB	50*	NU	ND	ND	ND	NA
Vinyl chloride	PPB	2	NU	ND	ND	ND	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

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Table 4

Client Sample ID:		NYSDEC	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well DL**
Screen Intervals		Groundwater	**55-65'**	**55-65'**	**55-65'**	**55-65'**	**55-65'**	**55-65'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
1,1,1,2-Tetrachloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	PPB	0.2	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	PPB	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	PPB	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	PPB	5	ND	ND	ND	ND	3.5	ND
1,1-Dichloroethene	PPB	5	ND	ND	ND	ND	2.6	ND
1,1-Dichloropropene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	PPB	5	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	PPB	0.04	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	PPB	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	PPB	0.6	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,3-dichloropropane	PPB	0.4	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	PPB	3	ND	ND	ND	ND	ND	ND
1,4-Dioxane	PPB	50*	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	PPB	5	ND	ND	ND	ND	ND	ND
2-Butanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	PPB	50*	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
2-Hexanone	PPB	50*	ND	ND	ND	ND	ND	ND
2-Propanol	PPB	7	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	PPB	5	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	PPB	50*	ND	ND	ND	ND	ND	ND
Acetone	PPB	50*	1.9BJ	2.6BJ	ND	4.5BJ	ND	ND
Acrolein	PPB		ND	NA	NA	NA	NA	NA
Acrylonitrile	PPB		ND	NA	NA	NA	NA	NA
Benzene	PPB	1	ND	ND	ND	ND	ND	ND
Bromobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Bromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Bromodichloromethane	PPB	50*	ND	ND	ND	ND	ND	ND
Bromoform	PPB	50*	ND	ND	ND	ND	ND	ND
Bromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Carbon disulfide	PPB	50*	ND	ND	ND	ND	0.65J	ND

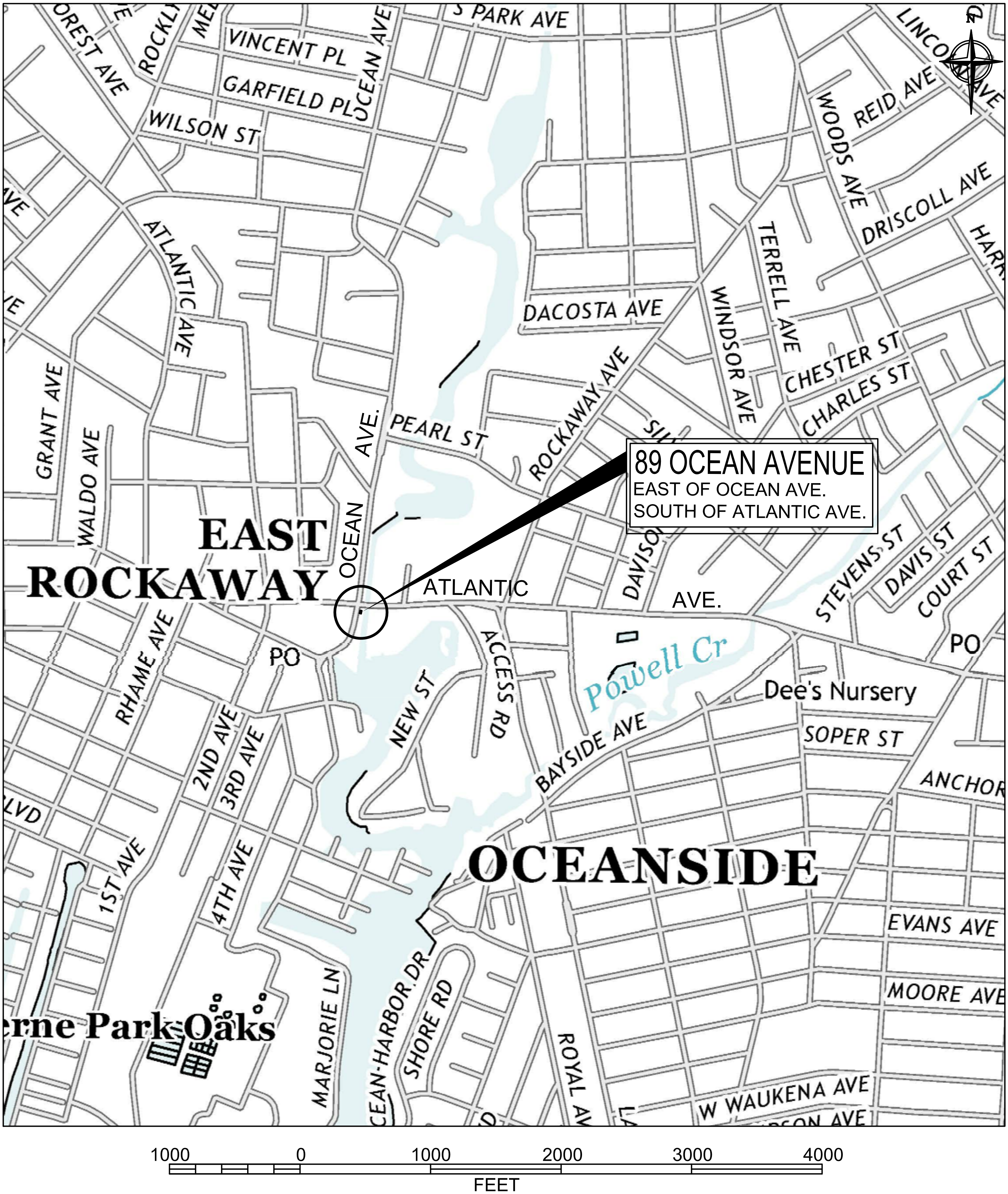
Minute Man Cleaners
89 Ocean Ave
East Rockaway, NY
Site #C130157

Volatile Organic Chemicals
EPA Method 8260
Table 4

Client Sample ID:		NYSDEC	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well**	**DB-1 Well DL**
Screen Intervals		Groundwater	**55-65'**	**55-65'**	**55-65'**	**55-65'**	**55-65'**	**55-65'**
Sampling Date:		Standards	**10/21/2015**	**9/9/2015**	**5/4/2015**	**3/23/2015**	**9/25/2012**	**9/25/2012**
Dilution Factor								**25**
Analyte:	**Units:**							
Carbon tetrachloride	PPB	5	ND	ND	ND	ND	ND	ND
Chlorobenzene	PPB	5	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	PPB	50*	ND	ND	ND	ND	NA	NA
Chloroethane	PPB	5	ND	ND	ND	ND	ND	ND
Chloroform	PPB	7	ND	ND	ND	ND	ND	ND
Chloromethane	PPB	5	ND	ND	ND	ND	0.6J	ND
cis-1,2-Dichloroethene	PPB	5	1.7J	**18**	3.5	4.3	**6.3**	ND
cis-1,3-Dichloropropene	PPB	0.4**	ND	ND	ND	ND	ND	ND
Cyclohexane	PPB	50*	ND	ND	ND	1.6J	ND	ND
Dibromochloromethane	PPB	5	ND	ND	ND	ND	ND	ND
Dibromomethane	PPB	5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Diisopropyl ether	PPB	50*	ND	ND	ND	ND	NA	NA
Ethanol	PPB	50*	ND	ND	ND	ND	NA	NA
Ethylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Freon-114	PPB	50*	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	PPB	0.5	ND	ND	ND	ND	ND	ND
Isopropylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
m,p-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
Methyl Acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	PPB	10	5.3	ND	3.6	0.54J	**130**	**99D**
Methylene chloride	PPB	5	**5.1B**	4.6B	4.0B	**6.0B**	ND	ND
n-Butylbenzene	PPB	10	ND	ND	ND	ND	ND	ND
n-Propylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Naphthalene	PPB	5	ND	ND	ND	ND	ND	ND
o-Xylene	PPB	5	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	PPB	50*	ND	ND	ND	ND	NA	NA
p-Ethyltoluene	PPB	50*	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Styrene	PPB	5	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	PPB	50*	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	PPB	5	ND	ND	ND	ND	ND	ND
Tetrachloroethene	PPB	5	**46**	**16**	**170D**	**180D**	**210E**	**250D**
Toluene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	PPB	5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	PPB	0.4	ND	ND	ND	ND	ND	ND
Trichloroethene	PPB	5	**5.7**	2.9	**13**	**10**	**31**	**27**
Trichlorofluoromethane	PPB	5	ND	ND	ND	ND	ND	ND
Vinyl acetate	PPB	50*	ND	ND	ND	ND	ND	ND
Vinyl chloride	PPB	2	ND	ND	0.93J	1.1J	1.9	ND

Notes:
All results in ppb
ND - Not detected
NS-No Standard
NA- Not Analyzed
B- Analyte detected in blank
Bold-Exceeds NYS Standards
** Guidance Value*

FIGURES



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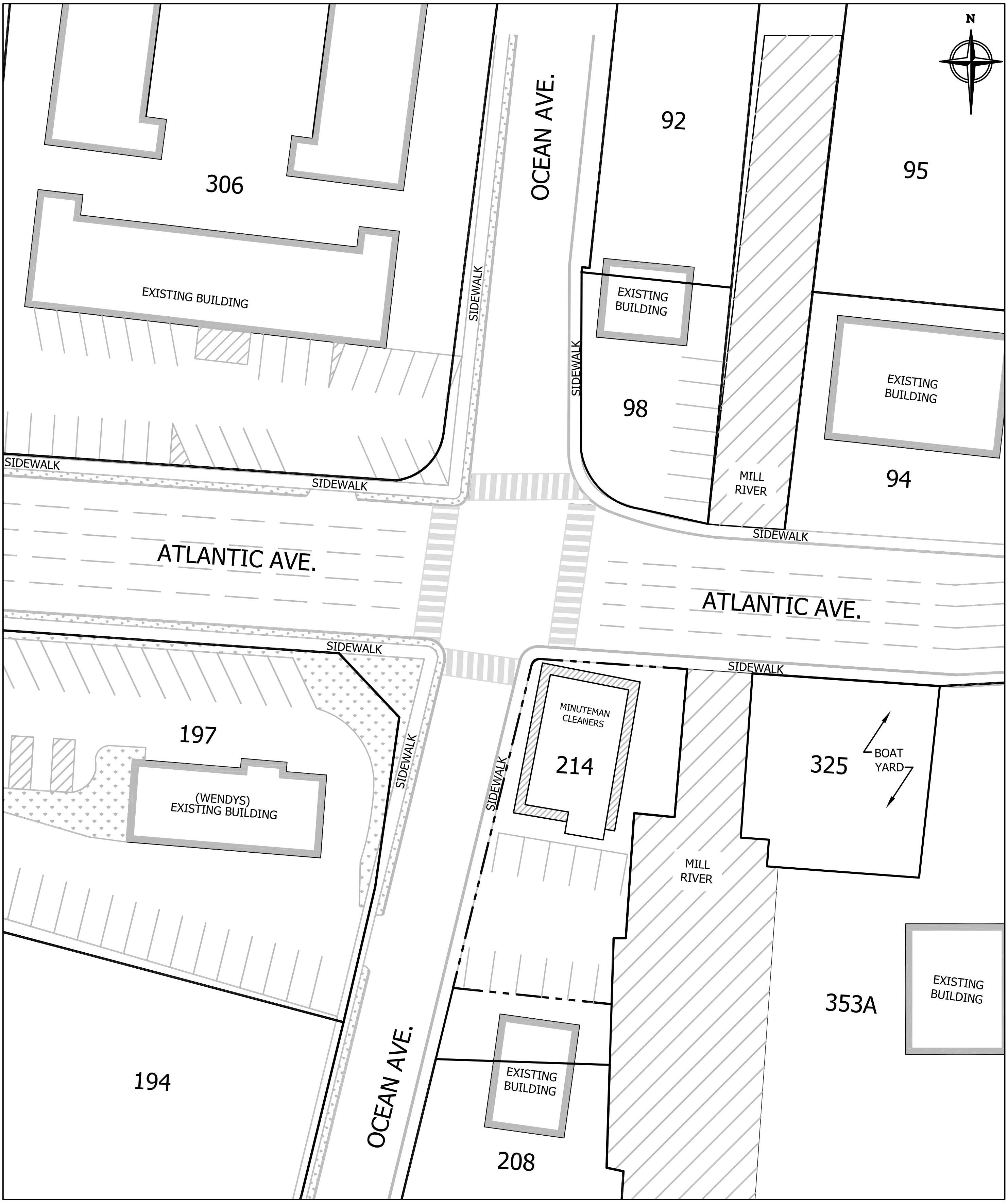
3555 VETERANS MEMORIAL HWY
SUITE A
RONKONKOMA, NEW YORK 11779

PHONE # (631) 234-2220
FAX # (631) 234-2221
E-MAIL: info@holzmacher.com

TITLE: **SITE LOCATION MAP**
MINUTEMAN CLEANERS
SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
KTO	1"=1000'	07/29/14	ManlD 13-01
CHKD:	APPD:	REV.:	NOTES:
PJH	PJH	-	-
FIGURE NO.:	1		



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FAX # (631) 234-2221
E-MAIL: info@holzmacher.com

TITLE:

Site Layout Map

SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1:50	11-16-15	ManlD1301
CHKD:	APPD:	REV.:	NOTES:
PJH	PJH	-	-
FIGURE NO.:			
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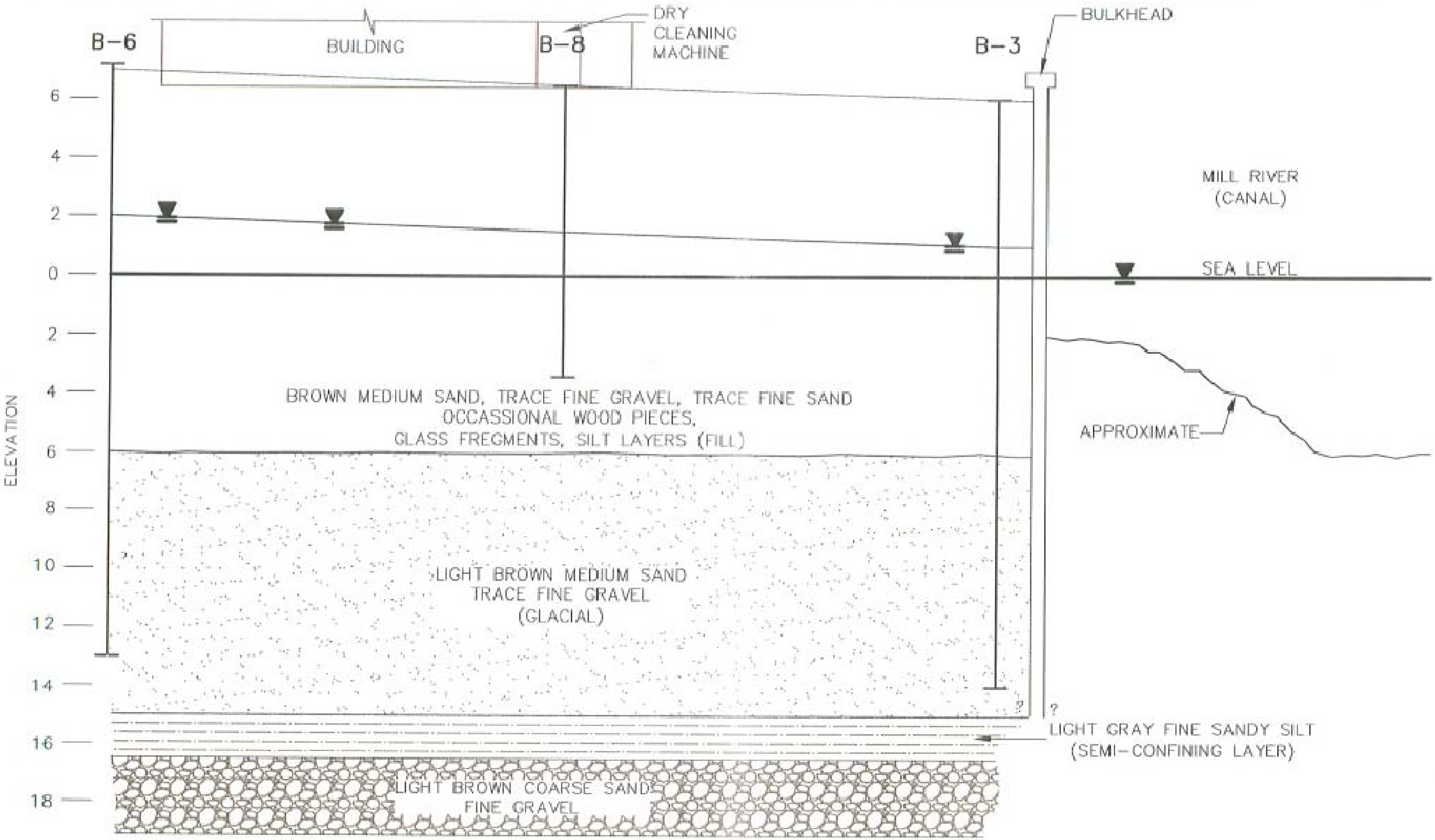

NOTE:

WATER TABLE LOCATION IS
APPROXIMATED AND VARIES TIDALLY.

BASE DATA BY U.R.S. CORPORATION
NY, NY JANUARY 15, 2007

P:\2013\ManID13-01 Minute Man Cleaners\Task 7 - Site Management Plan\SMP\Figures

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PHONE # (631) 234-2220 FAX # (631) 234-2221
E-MAIL: info@holzmacher.com

TITLE:

Geologic Cross Section

SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	N.T.S.	07-30-2015	ManID13-01
CHKD:	APPD:	REV.:	NOTES:
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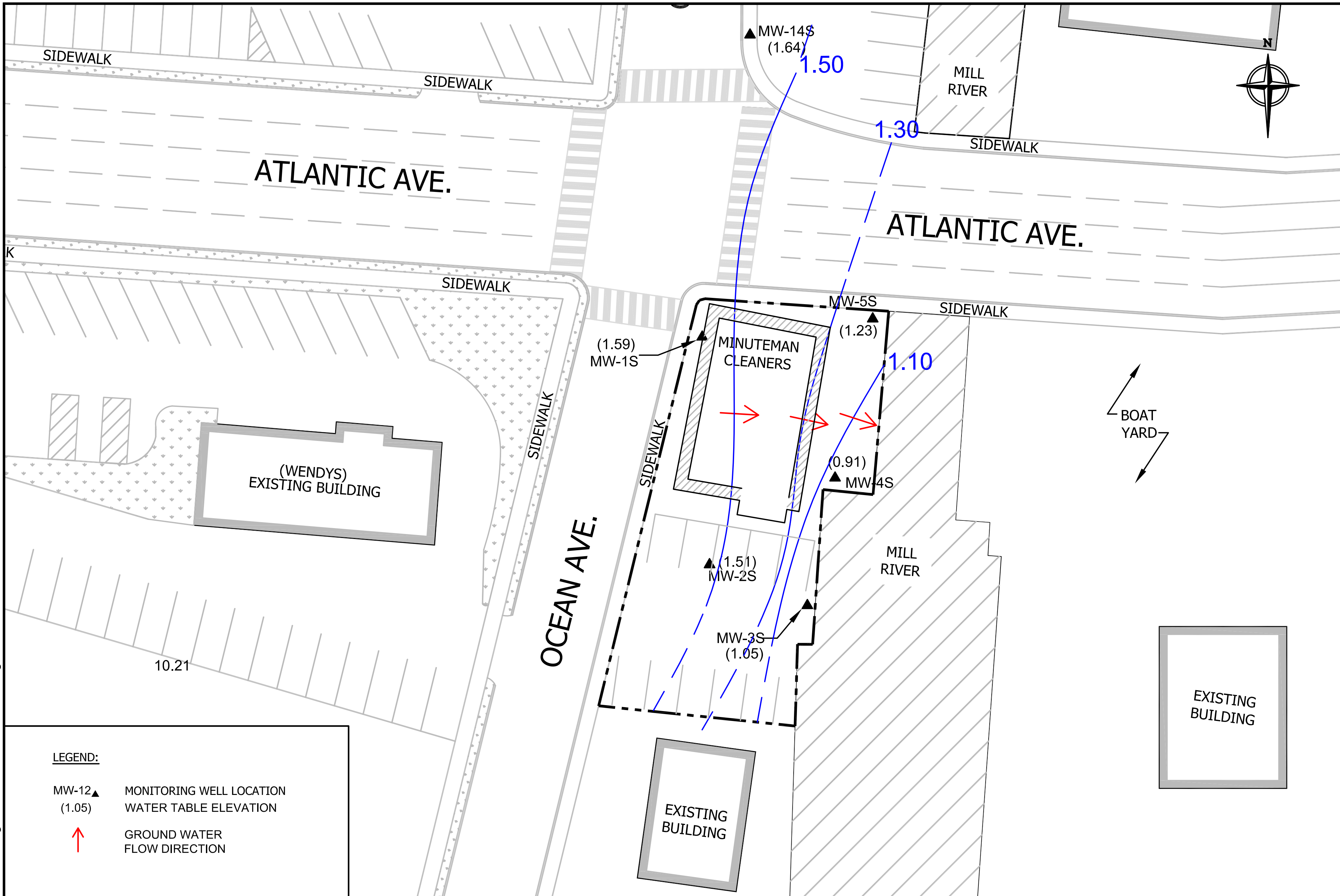
FIGURE NO.:			
3			



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J.R. HOLZMACHER P.E., LLC	**SHALLOW WELLS - LOW TIDE**	CHKD: PJH	APPD: PJH	REV.: -	NOTES: -
	JULY 1, 2013 - TAKEN BETWEEN 10:05-10:21	FIGURE NO.: 4A			
	89 OCEAN AVE				
	EAST ROCKAWAY, NEW YORK 11518				

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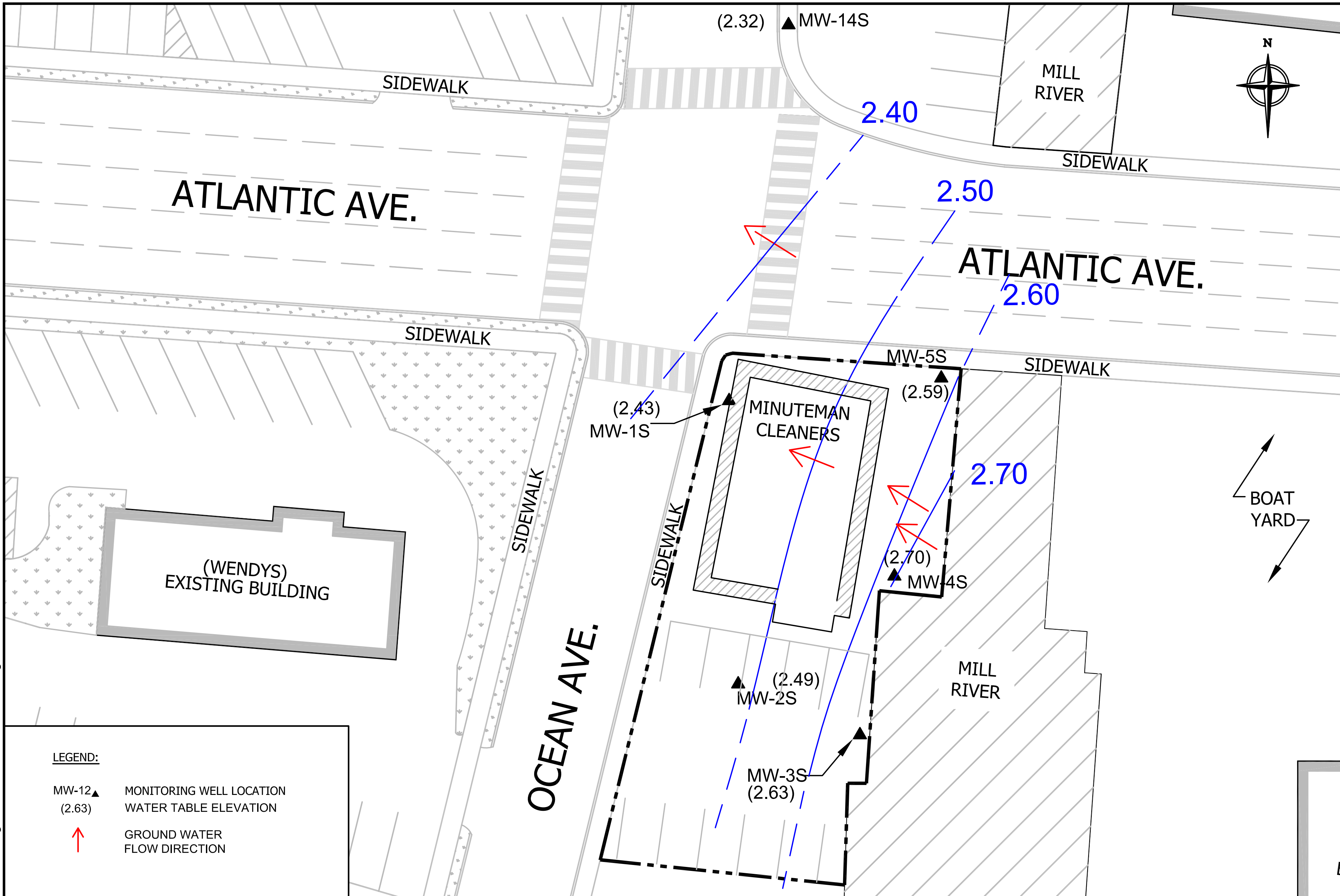
E-MAIL: info@holzmacher.com



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E-MAIL: info@holzmacher.com

TITLE:

SHALLOW WELLS - HIGH TIDE

JULY 1, 2013 - TAKEN BETWEEN 16:09-16:22
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
DRN	1'=50'	08-28-2013	ManlD13-01
CHKD:	APPD:	REV.:	NOTES:
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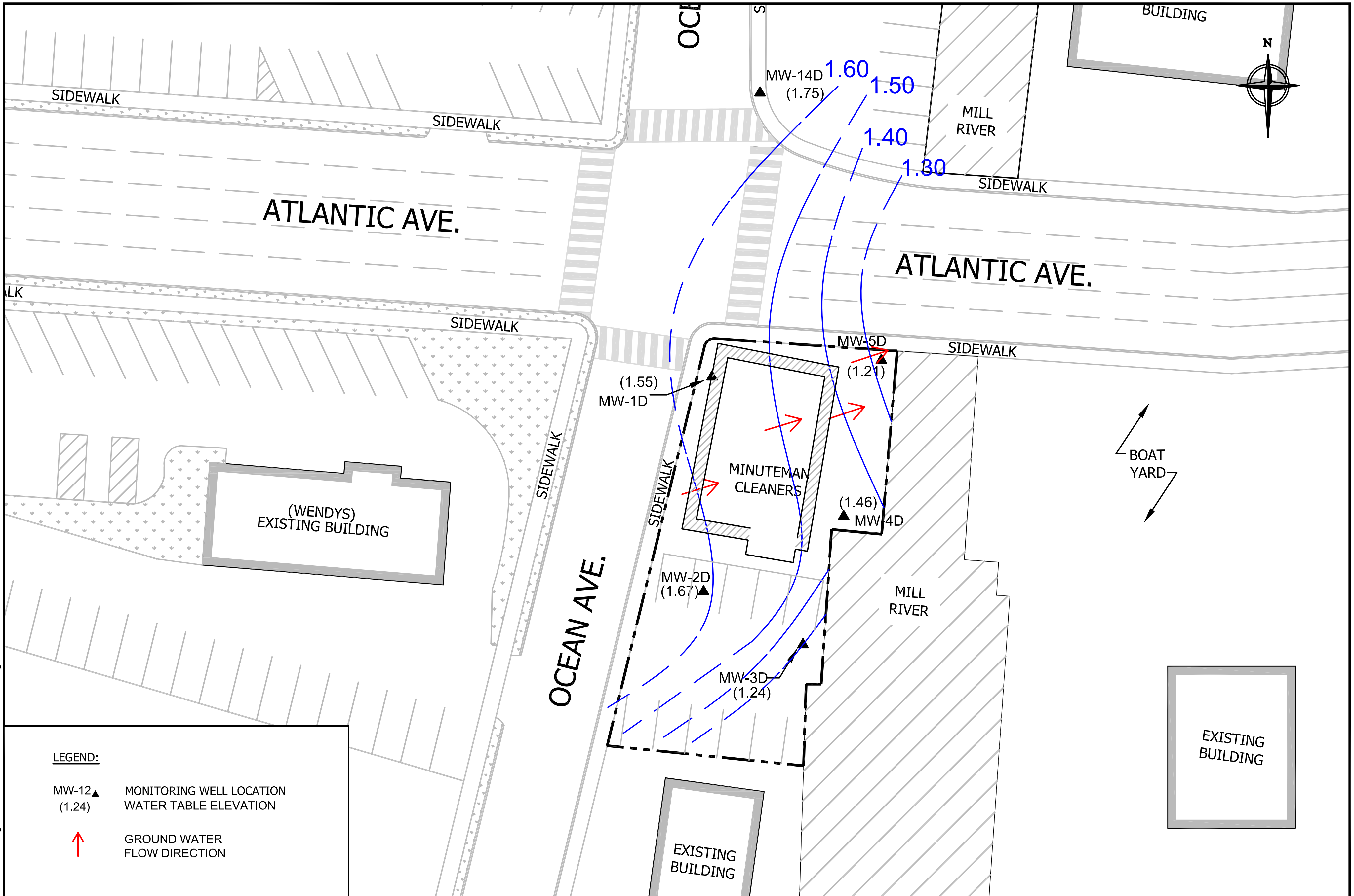
FIGURE NO.:			
4B			



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E-MAIL: info@holzmacher.com

TITLE:

DEEP WELLS - LOW TIDE

JULY 1, 2013 - TAKEN BETWEEN 10:05-10:21
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1'=40'	07-30-2015	ManlD13-01
CHKD:	APPD:	REV.:	NOTES:
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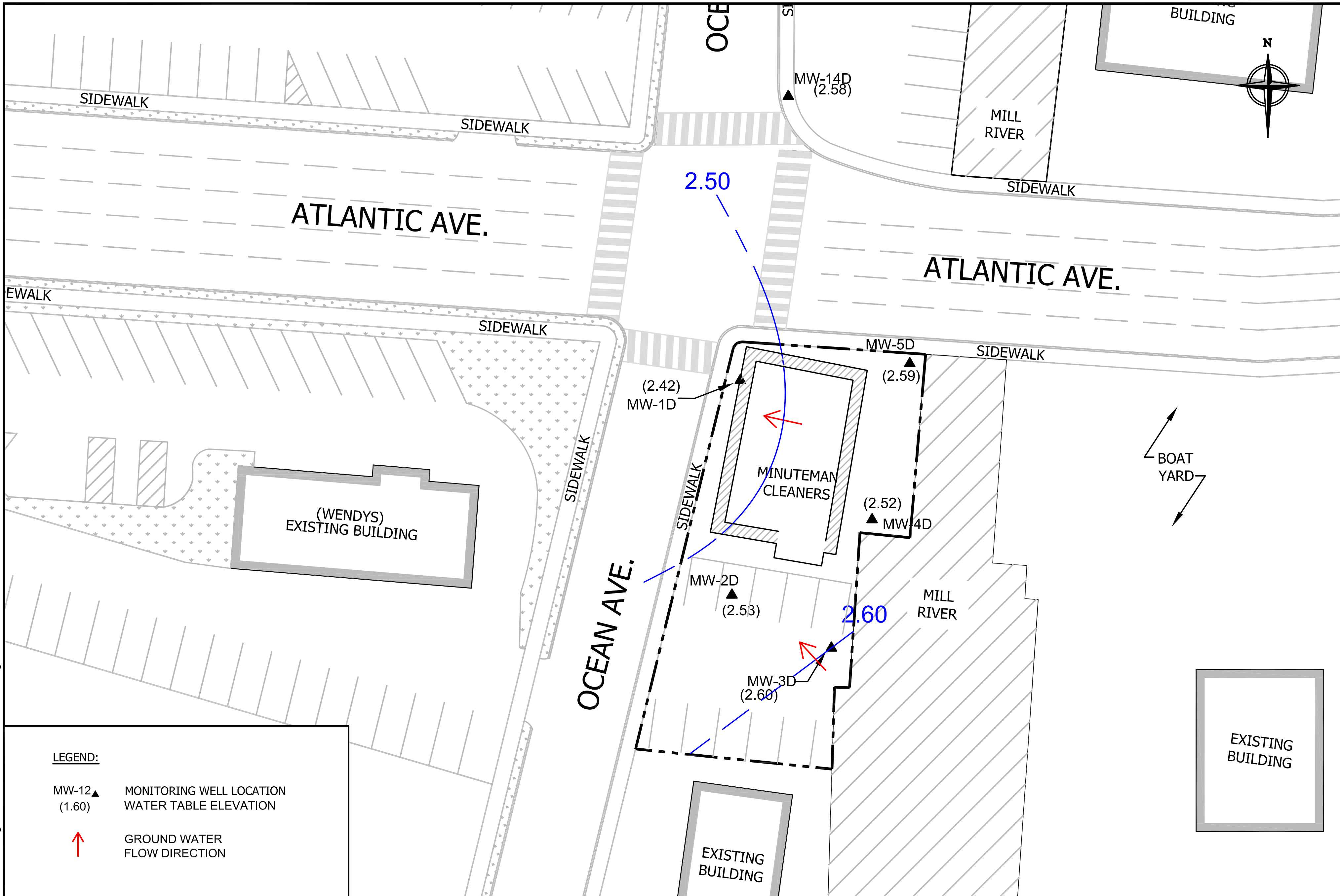
FIGURE NO.:	5A		



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TITLE:

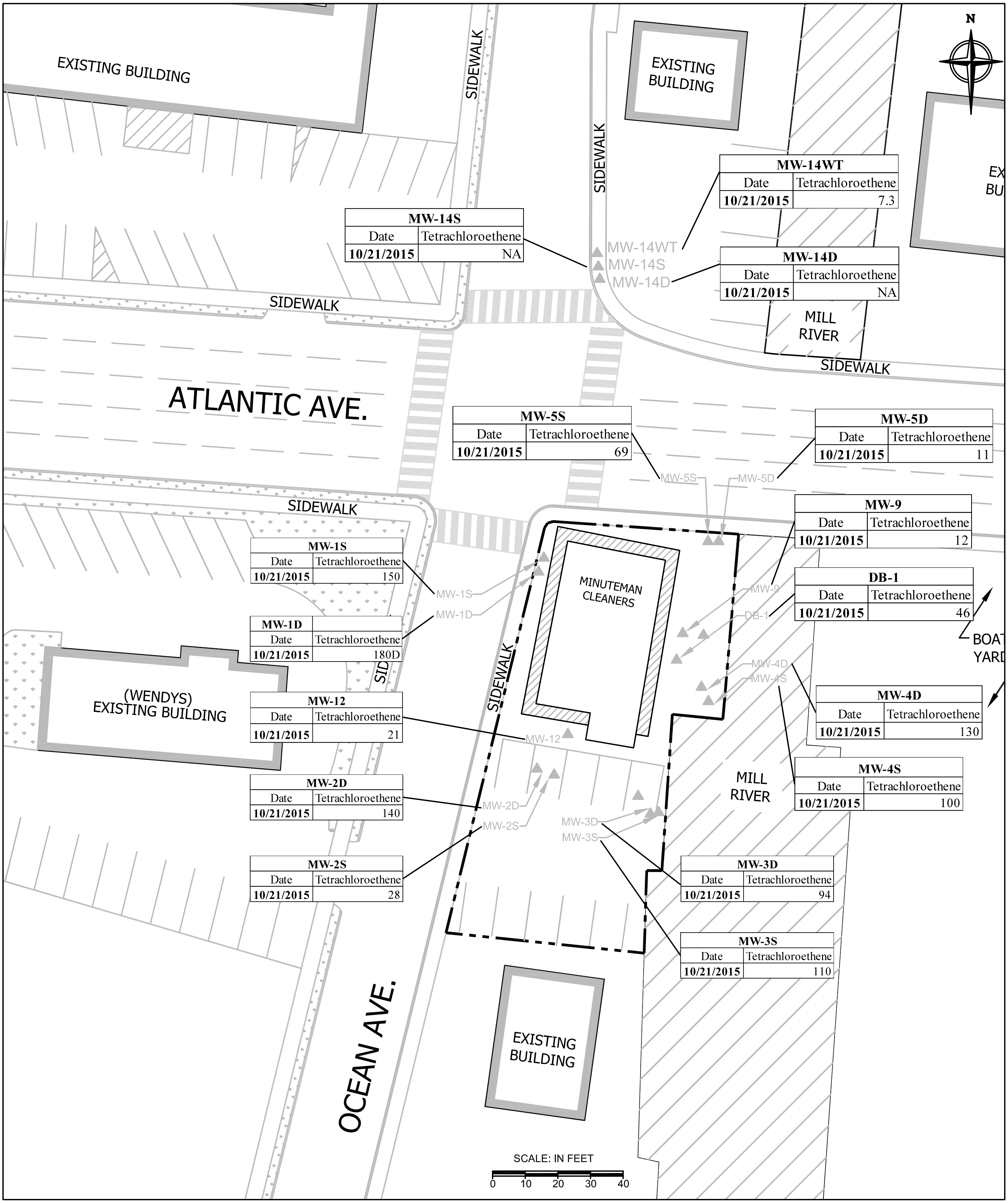
DEEP WELLS - HIGH TIDE

JULY 1, 2013 - TAKEN BETWEEN 16:09-16:22

89 OCEAN AVE

EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1'=40'	07-30-2015	ManlD13-01
CHKD:	APPD:	REV.:	NOTES:
PJH	PJH	-	-
FIGURE NO.:	5B		



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E-MAIL: info@holzmacher.com

TITLE:

REMAINING GROUNDWATER EXCEEDANCES

SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1:40	07-30-15	ManlD1301
CHKD:	APPD:	REV.:	NOTES:
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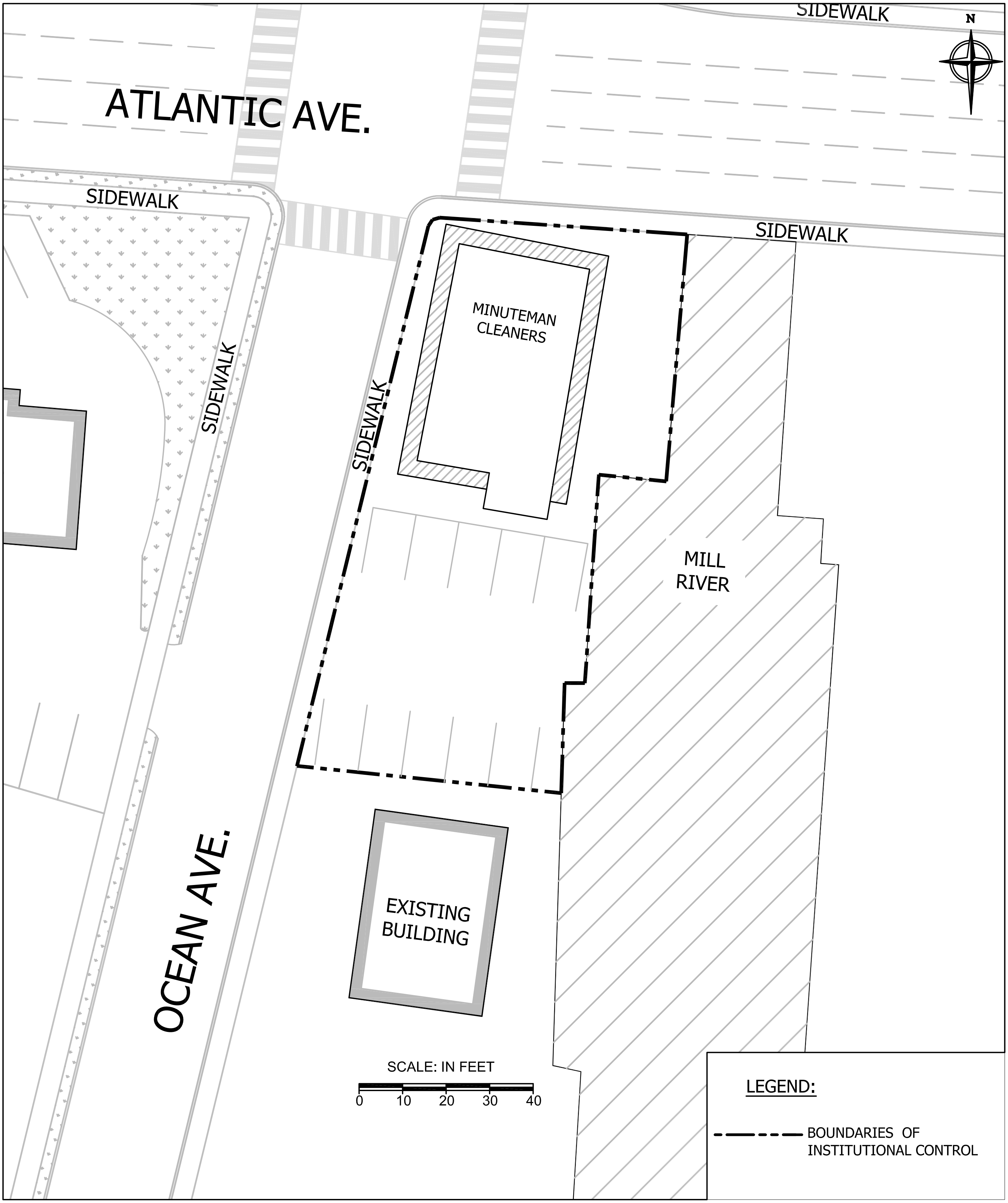

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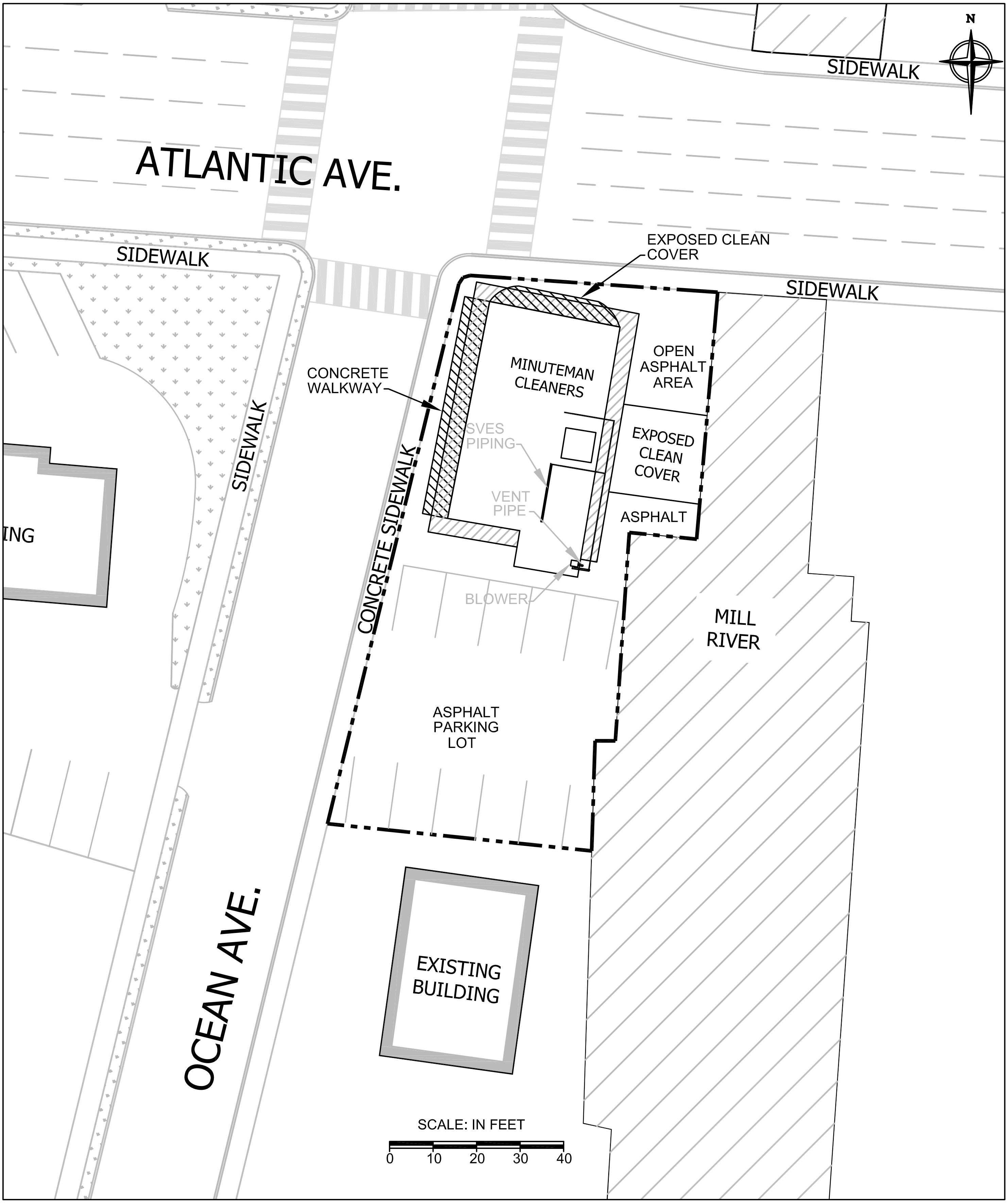
PHONE # (631) 234-2220
FAX # (631) 234-2221
E-MAIL: info@holzmacher.com

BOUNDARIES OF INSTITUTIONAL CONTROL

SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1:16	07-31-15	ManID1301
CHKD:	APPD:	REV.:	NOTES:
PJH	PJH	-	-
FIGURE NO.: 7			



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PHONE # (631) 234-2220 FAX # (631) 234-2221 E-MAIL: info@holzmacher.com

TITLE:

COVER SYSTEMS
SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
LJF	1:30	07-31-15	ManID1301
CHKD:	APPD:	REV.:	NOTES:
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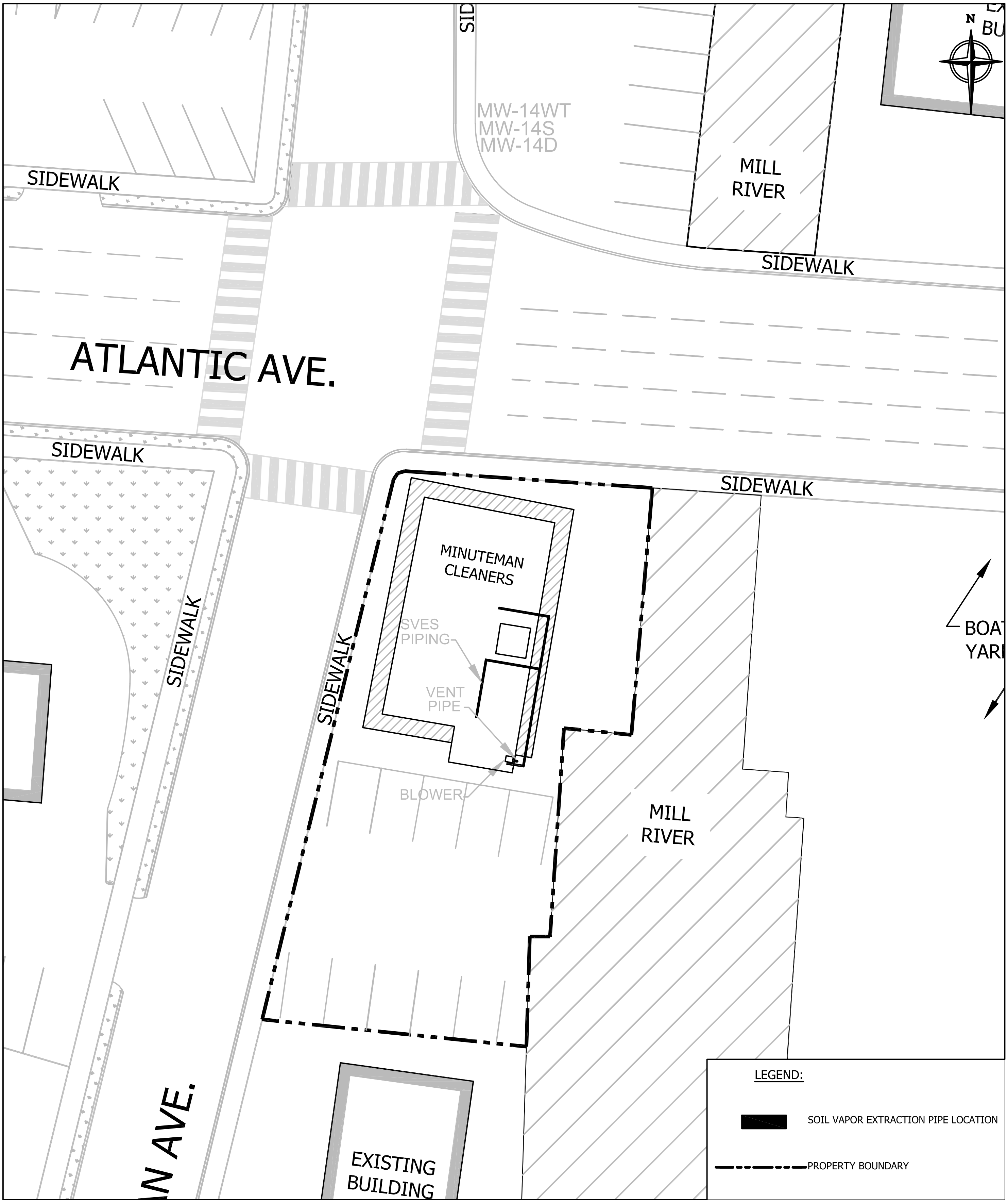
FIGURE NO.: 8			



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FAX # (631) 234-2221
E-MAIL: info@holzmacher.com

ENGINEERING CONTROLS LOCATION

SITE #C 130157
89 OCEAN AVE
EAST ROCKAWAY, NEW YORK 11518

DWN:	SCALE:	DATE:	PROJECT NO.:
DAH	1:16	11-14-14	ManID1301
CHKD:	APPD:	REV.:	NOTES:
JRH	JRH	-	-
FIGURE NO.:	9		

APPENDIX A – LIST OF SITE CONTACTS

Name	**Phone/Email Address**
Site Owner –Dennis Manly	516-599-1344 dennis242@optonline.net
Remedial Party –Dennis Manly	516-599-1344 dennis242@optonline.net
Qualified Environmental Professional - Robert Holzmacher P.E.	631-234-2220 bob@holzmacher.com
NYSDEC DER Project Manager - Girish	(631) 444-0243 girish.desai@dec.ny.gov
NYSDEC Regional HW Engineer - Walter Parish	631-444-0241 walter.parish@dec.ny.gov
NYSDEC Site Control - Kelly Lewandowski	518-402-9553 Kelly.lewandowski@dec.ny.gov

APPENDIX B – EXCAVATION WORK PLAN (EWP)

B-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table B-1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table B-1: Notifications*

Regional Office NYSDEC Representative - Girish Desai	(631) 444-0243 girish.desai@dec.ny.gov
NYSDEC Site Control - Kelly Lewandowski	518-402-9553 kelly.lewandowski@dec.ny.gov
Apartment Complex	David and Lauren Moss East Crest Rental Associates 134 Wright Road Rockville Centre, NY 11570

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of

concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix G of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections B-5 and B-6 of this Appendix.

B-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes are as follows: the route selected for future trucking of materials will depend upon the location of the disposal facility to be selected. The route will be described in detail and a map will be created prior to commencing any such trucking activities. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport;

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

B-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic

Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

Materials anticipated for reuse on site include soils which may have been impacted by past releases of solvents and which have been either totally or partially remediated by operation of the SVE system and the addition of potassium permanganate for chemical oxidation. Initial soil screening will be accomplished through use of a Photo Ionization Detector (PID) to screen each bucket of soil excavated. Select samples will also be placed into glass jars and covered with foil. The PID will be used to sample the head space in these jars after the soil is allowed to warm.

Soils having no PID detection above background readings will be segregated from those having higher readings. Soil Stockpile locations will vary depending upon the location of any future excavation. Favored locations include the east side of the building and the east side of the parking area. The size of stockpiles will depend upon the location of any future excavation. Representative soil samples will be collected from each stockpile and analyzed for the volatile organic contaminants of concern. These soils will be reused or disposed offsite based on the results of this characterization.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Decision Document. The existing cover system is comprised of a minimum of forty-eight inches of exposed clean soil, asphalt pavement, concrete covered sidewalks and concrete building. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

B-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

B-13 COMMUNITY AIR MONITORING PLAN

In the event that future excavation on site is required then air monitoring will be performed. This will include use of Dust-Trac particle counters positioned at the property boundaries. This will generally include the public sidewalks on the north and west sides of the property, as well as the south or east boundaries on the property depending upon daily wind direction. The stationary particle counters will be supplemented with handheld PID walked along the downwind property boundary every 2 hours or more frequently based on olfactory detection of possible contaminant spikes.

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in Figure B-1. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

B-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX C

RESPONSIBILITIES of

OWNER and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Minute Man Cleaners site (the "site"), number C130157, are divided between the site owner(s) and a Remedial Party, as defined below. The owner(s) is/are currently listed as:

Ben Ley, c/o Minute Man Cleaners, 89 Ocean Avenue, East Rockaway, NY, 516-599-1344, dennis242@optonline.net (the "owner").

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:

Ben Ley, c/o Minute Man Cleaners, 89 Ocean Avenue, East Rockaway, NY, 516-599-1344, dennis242@optonline.net.

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner's Responsibilities:

1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.

2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the site's Periodic Review Report (PRR) certification to the NYSDEC.

3) In the event the site is delisted, the owner remains bound by the Environmental Easement, and shall submit, upon request by the NYSDEC, a written certification that the Environmental Easement, is still in place and has been complied with.

4) The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3 - Notifications.

6) In the event some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in Section 1.3- Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

7) The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) The owner will maintain the SSDS/SVE system in operation on behalf of the RP. The RP remains ultimately responsible for maintaining the engineering controls.

9) Until such time as the NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.

10) The owner shall maintain access to a public water connection for drinking water.

11) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data, that is produced with respect to

structures and that exceeds NYSDOH or OSHA guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.

2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.

4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).

5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html .

6) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3- Notifications of the SMP.

7) The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the site, as required in Section 5.3 or Appendix J (Operation, Monitoring and Maintenance Manual) of the SMP.

8) The RP is responsible to maintain access to public drinking water for all tenants.

9) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.

10) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX D – ENVIRONMENTAL EASEMENT

NASSAU COUNTY CLERK'S OFFICE

ENDORSEMENT COVER PAGE

Recorded Date: 10-06-2014
Recorded Time: 10:29:11 a

Liber Book: D 13129
Pages From: 756
To: 765

Control
Number: 422
Ref #: RE 004537
Doc Type: D02 EASEMENT

Location:	Section	Block	Lot	Unit
HEMPSTEAD (2820)	0042	00069-00	00214	

Taxes Total	.00
Recording Totals	240.00
Total Payment	240.00

AAR001

THIS PAGE IS NOW PART OF THE INSTRUMENT AND SHOULD NOT BE REMOVED.
MAUREEN O'CONNELL
County Clerk

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 23rd day of September, 2014 between Owner(s) Dennis Manley, having an office at 89 Ocean Avenue, East Rockaway, County of Nassau, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 89 Ocean Avenue in the Village of East Rockaway, County of Nassau and State of New York, known and designated on the tax map of the County Clerk of Nassau as tax map parcel numbers: Section 42 Block 69 Lot 214 (formerly 201), being the same as that property conveyed to Grantor by deed dated December 29, 1995 and recorded in the Nassau County Clerk's Office in Liber and Page 10613 . The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.1774 +/- acres, and is hereinafter more fully described in the Land Title Survey dated April 19, 2014 prepared by Ferrantello Land Surveying P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C130157, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C130157
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Dennis Manley:

By: ____________________

Print Name: Dennis Manley

Title: Owner Date: 6/10/14

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF Nassau)

On the 10th day of June, in the year 20 14 before me, the undersigned, personally appeared Dennis Manley, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public - State of New York

MARSHA L LAMOUR
NOTARY PUBLIC STATE OF NEW YORK
NASSAU COUNTY
LIC. #01LA6263216
COMM. EXP. June 11, 2016

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ______________________
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 23rd day of September, in the year 2014, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

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David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

SCHEDULE "A" PROPERTY DESCRIPTION

BEGINNING at a point on the southerly side of Atlantic Avenue, where the same is intersected by the easterly end of a curve having a radius of 17 feet which curve connects to the southerly side of Atlantic Avenue and the easterly side of Ocean Avenue,

RUNNING THENCE, along the southerly side of Atlantic Avenue South 75 degrees 31 minutes East 43.76 feet to the channel,

RUNNING THENCE, along the same the following four courses and distances; (1) South 13 degree 51 minutes, west 56.93 feet (2) North 71 degrees 16 minutes West 16.50 feet (3) South 14 degrees 45 minutes West 50.35 feet (4) South 14 degrees 50 minutes West 28.95 feet;

RUNNING THENCE North 75 degrees 31 minutes west 60.76 feet to the present easterly side of Ocean Avenue;

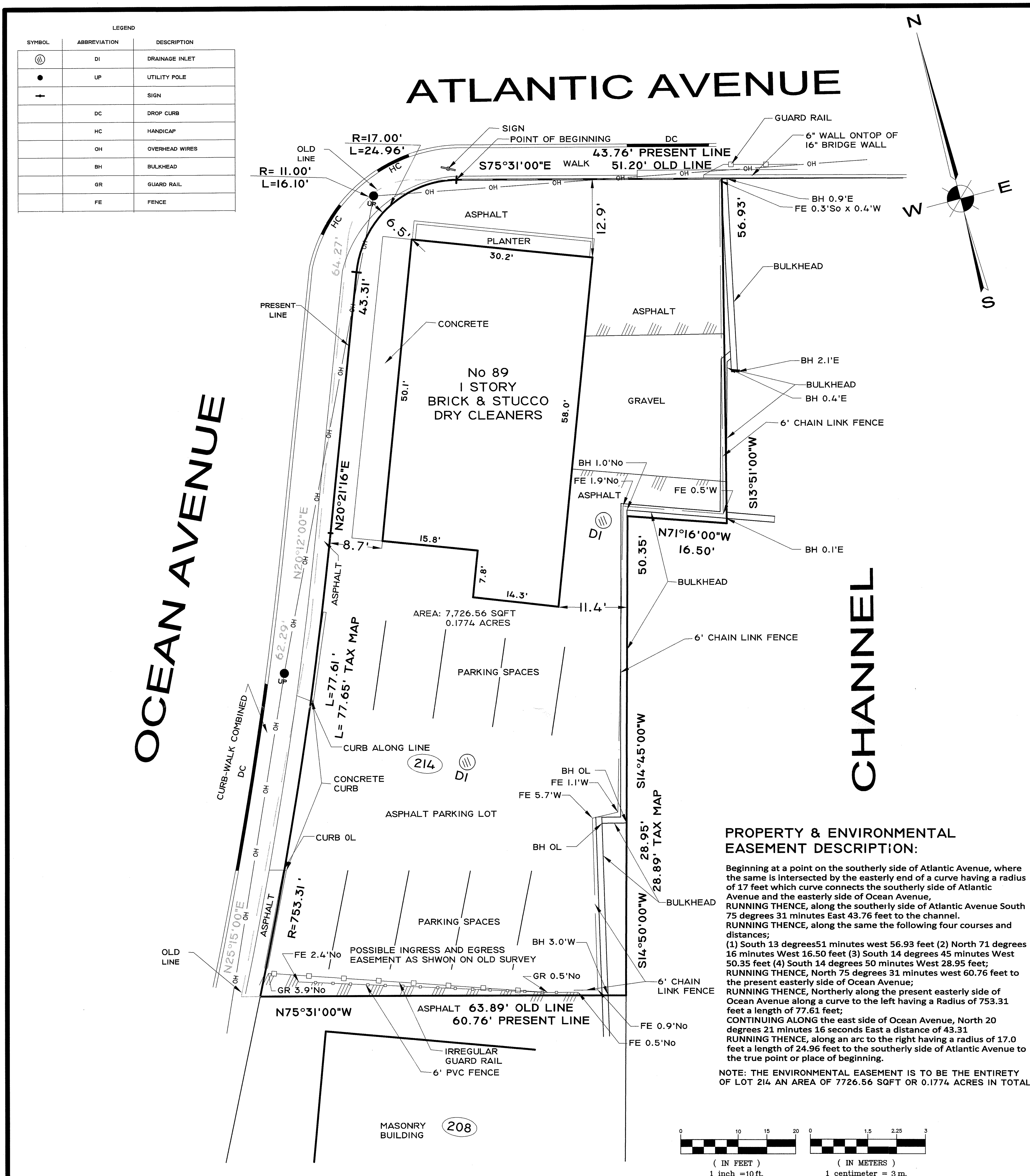
RUNNING THENCE, Northerly along the present along the easterly side of Ocean Avenue along a curve to the left having a Radius of 753.31 feet a length of 77.61 feet;

CONTINUING ALONG the east side of Ocean Avenue, North 20 degrees 21 minutes 16 seconds East a distance of 43.31

RUNNING THENCE along an arc to the right having a radius of 17.0 feet a length of 24.96 feet to the southerly side of Atlantic Avenue to the true point or place of beginning.

LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
(symbol)	DI	DRAINAGE INLET
●	UP	UTILITY POLE
(symbol)		SIGN
	DC	DROP CURB
	HC	HANDICAP
	OH	OVERHEAD WIRES
	BH	BULKHEAD
	GR	GUARD RAIL
	FE	FENCE



PROPERTY & ENVIRONMENTAL EASEMENT DESCRIPTION:

Beginning at a point on the southerly side of Atlantic Avenue, where the same is intersected by the easterly end of a curve having a radius of 17 feet which curve connects the southerly side of Atlantic Avenue and the easterly side of Ocean Avenue,
RUNNING THENCE, along the southerly side of Atlantic Avenue South 75 degrees 31 minutes East 43.76 feet to the channel.
RUNNING THENCE, along the same the following four courses and distances;
(1) South 13 degrees51 minutes west 56.93 feet (2) North 71 degrees 16 minutes West 16.50 feet (3) South 14 degrees 45 minutes West 50.35 feet (4) South 14 degrees 50 minutes West 28.95 feet;
RUNNING THENCE, North 75 degrees 31 minutes west 60.76 feet to the present easterly side of Ocean Avenue;
RUNNING THENCE, Northerly along the present easterly side of Ocean Avenue along a curve to the left having a Radius of 753.31 feet a length of 77.61 feet;
CONTINUING ALONG the east side of Ocean Avenue, North 20 degrees 21 minutes 16 seconds East a distance of 43.31
RUNNING THENCE, along an arc to the right having a radius of 17.0 feet a length of 24.96 feet to the southerly side of Atlantic Avenue to the true point or place of beginning.

NOTE: THE ENVIRONMENTAL EASEMENT IS TO BE THE ENTIRETY OF LOT 214 AN AREA OF 7726.56 SQFT OR 0.1774 ACRES IN TOTAL.

0 10 15 20
(IN FEET)
1 inch =10 ft.

0 1.5 2.25 3
(IN METERS)
1 centimeter = 3 m.

NOTE: SURVEY PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT

CERTIFIED TO: DENNIS MANLEY
PEOPLE OF THE STATE OF NY ACTING THROUGH ITS COMMISSIONER OF THE DEPT. OF ENVIRONMENTAL CONSERVATION

PROPERTY SURVEY

IT IS HEREBY CERTIFIED THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE CODE OF PRACTICE AND MINIMUM STANDARDS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS
MEMBER OF THE NEW YORK STATE LAND TITLE ASSOCIATION
MEMBER OF THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL SURVEYORS
MEMBER OF THE NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS
MEMBER OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS
UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF NEW YORK STATE EDUCATION LAW.
COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYOR'S ORIGINAL SEAL AND SIGNATURE SHALL NOT BE CONSIDERED TO BE A TRUE AND VALID COPY.
NOT RESPONSIBLE FOR SUB-SURFACE CONDITIONS OR ANY EASEMENTS OTHER THAN SHOWN

STATE OF NEW YORK · FRANK FERRANTELLO · LICENSED PROFESSIONAL SURVEYOR · Lic. # 50762

seal here

No.	REVISION DESCRIPTION	DATE	BY
6			
5			
4			
3			
2			
1	-	-	-

SITE DATA:
AREA OF PLOT = 7,726.56 SQ. FT. / 0.1774 ACRES

MAP OF: PROPERTY (NYSDEC BROWNFIELDS SITE NO.C130157)
LOT AS SHOWN

LOCATED AT: INC VILLAGE OF EAST ROCKAWAY
NASSAU COUNTY, NEW YORK

TAX MAP ID: SECTION 42, BLOCK 69, LOT 214, FORMERLY LOT 201

FERRANTELLO LAND SURVEYING P.C.
NEW YORK STATE LICENSED LAND SURVEYORS
SITE PLANNING & SUBDIVISION CONSULTANTS
BUILDING & CONSTRUCTION LAYOUT PROFESSIONALS
12 WEST MALL
PLAINVIEW, NY 11803
PHONE 516-248-2766
WEBSITE : WWW.NYLANDSURVEYING.COM
EMAIL: INFO@JPFPC.COM
FAX 516-294-8570

SCALE: 1"=10'	DATE: 4/19/2014	DATUM: -	SURVEYED BY: DD & AL	DRAFTED BY: CW	CHECKED BY: FF	SHEET: 1 OF 1

APPENDIX E – SOIL BORING LOGS

URS Corporation	TEST BORING LOG	
	BORING NO:	B-1
PROJECT: Minuteman Cleaners	SHEET:	1
CLIENT: Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR: Zebra Environmental	DRILLING METHOD:	Geoprobe 6610DT-direct push

GROUNDWATER: ~5'					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

GROUND ELEVATION:		
DATE STARTED:	09/05/06	933
DATE FINISHED:	09/05/06	1045
DRILLER:	E. Maraitis	
GEOLOGIST:	M. Murphy & J. Scherer	
REVIEWED BY:		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	6" asphalt	---		
		1	MC		60%	Brown	Medium Dense	Medium sand, trace fine sand, trace gravel	Fill	2.1	Dry
								Soil sample collected			
5											
6		2	MC		80%	Brown	Medium Dense	Medium sand and gravel, trace fine sand	Fill	2.5	Wet
								Groundwater at @ 5'			
8								Soil sample collected			
								Groundwater sample collected			
10											
		3	MC		80%			Same to 13'	Fill	1.3	Wet
12								Fill/native soil break at 14'			
14						Lt. Brown		Medium sand, trace gravel	SP		
15											
16		4	MC		100%				SP	5.1	Wet
18											
20											
		5	MC		100%			Same to 21.5' bgs	SP	4.6	Wet
						Lt. Gray	Hard	Fine sand, some silt 21.5' to 23' bgs	ML		
23											
						Lt. Brown	Dense	Coarse sand and gravel	GP	3.0	
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 25' bgs.	PROJECT NO.	38580332
Soil samples collected 0'-5', 5'-10' and 23'-25'. Groundwater samples at 5'-10' and 20'-25'	BORING NO.	B-1
Water sample collected from 1" temporary well point with poly tubing and check valve		

APPENDIX C
COMMUNITY AIR MONITORING PLAN

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions,

and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.
3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners	BORING NO:	B-2
CLIENT:	Ben Ley Enterprises, Inc.	SHEET:	1
BORING CONTRACTOR:	Zebra Environmental	JOB NO.:	38580332
GROUNDWATER:	~6'	DRILLING METHOD:	Geoprobe 6610DT-direct push

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE			
									GROUND ELEVATION:		
				TYPE		Macrocore	5'		DATE STARTED:	09/05/06	1105
				DIA.					DATE FINISHED:	09/05/06	1150
				WT.		---			DRILLER:	E. Maraitis	
				FALL		---			GEOLOGIST:	M. Murphy & J. Scherer	
									REVIEWED BY:		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	6" asphalt	---		
0.5–5		1	MC		50%	Brown	Medium Dense	Medium sand, trace fine sand, trace gravel Soil sample and duplicate sample collected	Fill	5.7	Dry
6–10		2	MC		80%	Brown	Medium Dense	Medium sand and gravel, trace fine sand Groundwater @ 6' Soil sample and duplicate sample collected Groundwater sample and duplicate collected	Fill	4.8	Wet
10–15		3	MC		100%	Lt. Brown		Same to 13' Fill/native soil break at 14' Medium sand, trace gravel	Fill SP	3.8	Wet
15–20		4	MC		80%				SP	3.1	Wet
20–23		5	MC		100%	Lt. Gray	Hard	Same to 22.5' bgs Fine sand, some silt 22.5' to 23' bgs	SP ML	1.6	Wet
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 23' bgs.
Soil samples collected 0'-5' and 5'-10'. Groundwater sample at 5'-10'.
Water sample collected from 1" temporary well point with poly tubing and check valve

PROJECT NO.	38580332
BORING NO.	B-2

URS Corporation	TEST BORING LOG	
	BORING NO:	B-3
PROJECT: Minuteman Cleaners	SHEET:	1
CLIENT: Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR: Zebra Environmental	DRILLING METHOD:	Geoprobe 6610DT-direct push

GROUNDWATER: ~6'					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:		
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	5'		DATE STARTED:	09/05/06	1200
				DIA.					DATE FINISHED:	09/05/06	1225
				WT.		---			DRILLER:	E. Maraitis	
				FALL		---			GEOLOGIST:	M. Murphy & J. Scherer	
									REVIEWED BY:		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	6" asphalt	---		
5		1	MC		80%	Brown	Medium Dense	Medium sand, trace fine sand, trace gravel, trace wood and glass fragments Soil sample collected	Fill	2.5	Dry
6, 8, 10		2	MC		100%	Brown	Medium Dense	Medium sand and gravel, trace fine sand, Clayey silt at 5.5' and 6.5' bgs Black tar-like substance at 9' bgs Soil sample collected Groundwater sample collected	Fill	20.8	Wet
12, 14, 15		3	MC		100%	Lt. Brown		Medium sand and gravel, trace fine sand Fill/native soil break at 14' Medium sand, trace gravel	Fill SP	20.0	Wet
16, 18, 20		4	MC		80%				SP	1.9	Wet
23, 25											
28, 30											
33, 35											
38, 40											

Comments: Boring completed at 20' bgs.	PROJECT NO.	38580332
Soil samples collected 0'-5' and 5'-10'. Groundwater sample at 5'-10'.	BORING NO.	B-3
Water sample collected from 1" temporary well point with poly tubing and check valve		

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners	BORING NO:	B-4
CLIENT:	Ben Ley Enterprises, Inc.	SHEET:	1
BORING CONTRACTOR:	Zebra Environmental	JOB NO.:	38580332
GROUNDWATER:	~5'	DRILLING METHOD:	Geoprobe 6610DT-direct push
		GROUND ELEVATION:	
		DATE STARTED:	09/05/06 1305
		DATE FINISHED:	09/05/06 1340
		DRILLER:	E. Maraitis
		GEOLOGIST:	M. Murphy & J. Scherer
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	6" asphalt	---		
0.5–5		1	MC		80%	Brown	Medium Dense	Medium sand, trace fine sand, trace gravel, trace brick fragments. Soil sample collected	Fill	1.5	Dry
5–6		2	MC		60%	Brown	Med. Dense	Medium sand and fine sand to 6' bgs	Fill	16.9	Wet
6–8						Dk. Gray	Very Soft	Silt - strong organic odor to 8' bgs	PT		
8–10						Brown	Med. Dense	Medium sand, some gravel	SP		
10–15		3	MC		60%	Lt. Brown	Med. Dense	Medium sand, trace gravel	SP	12.2	Wet
15–20		4	MC		80%	↓		↓	SP	2.0	Wet
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 20' bgs.
Soil samples collected 0'-5' and 5'-10'. Groundwater sample at 5'-10'.
Water sample collected from 1" temporary well point with poly tubing and check valve

PROJECT NO.	38580332
BORING NO.	B-4

URS Corporation

TEST BORING LOG

BORING NO:	B-5
SHEET:	1
JOB NO.:	38580332
DRILLING METHOD:	Geoprobe 6610DT-direct push
GROUND ELEVATION:	
DATE STARTED:	09/05/06 1345
DATE FINISHED:	09/05/06 1415
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy & J. Scherer
REVIEWED BY:	

PROJECT: Minuteman Cleaners

CLIENT: Ben Ley Enterprises, Inc.

BORING CONTRACTOR: Zebra Environmental

GROUNDWATER: ~5'

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	6" asphalt	---		
5		1	MC		60%	Brown	Medium Dense	Medium sand, trace fine sand, trace gravel, trace shell fragments Soil sample collected	Fill	4.2	Dry
6		2	MC		100%	Dk Gray	Very Stiff	Silt - strong organic odor to 7' bgs	Fill	2.1	Wet
8–10						Brown	Med. Dense	Medium sand, trace fine sand, trace gravel Groundwater sample collected Soil sample collected	SP		
12–15		3	MC		80%	Lt. Brown	Med. Dense	Medium sand and gravel, trace fine sand	SP	2.1	Wet
16–20		4	MC		100%	↓	↓	↓	SP	2.0	Wet
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 20' bgs.
Soil samples collected 0'-5' and 5'-10'. Groundwater sample at 5'-10'.
Water sample collected from 1" temporary well point with poly tubing and check valve

PROJECT NO. 38580332

BORING NO. B-5

URS Corporation	TEST BORING LOG	
	BORING NO:	B-6
PROJECT: Minuteman Cleaners	SHEET:	1
CLIENT: Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR: Zebra Environmental	DRILLING METHOD:	Geoprobe 6610DT-direct push
GROUNDWATER: ~6'	GROUND ELEVATION:	
	DATE STARTED:	09/07/06 855
	DATE FINISHED:	09/07/06 925
	DRILLER:	E. Maraitis
	GEOLOGIST:	M. Murphy & J. Scherer
	REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	SAMPLE: STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	DESCRIPTION: COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS: PID	Moist
0.5						---	---	6" asphalt	---		
0.5–5		1	MC		80%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel, Soil sample collected	Fill	1.7	Dry
6–10		2	MC		100%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel, Groundwater sample collected Soil sample collected	Fill	2.8	Wet
12–15		3	MC		80%	Lt. Brown	Med. Dense	Medium sand and gravel, trace fine sand	SP	3.4	Wet
16–20		4	MC		100%	↓	↓	↓	SP	1.6	Wet
23											
25											
28											
30											
33											
35											
38											
40											

Comments		
Comments: Boring completed at 20' bgs.	PROJECT NO.	38580332
Soil samples collected 0'-5' and 5'-10'. Groundwater sample at 5'-10'.	BORING NO.	B-6
Water sample collected from 1" temporary well point with poly tubing and check valve		

URS Corporation		TEST BORING LOG	
		BORING NO:	B-7 (Inside Building)
PROJECT:	Minuteman Cleaners	SHEET:	1
CLIENT:	Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR:	Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit
GROUNDWATER: ~6'		GROUND ELEVATION:	
		DATE STARTED:	09/06/06 1145
		DATE FINISHED:	09/06/06 1215
		DRILLER:	E. Maraitis
		GEOLOGIST:	M. Murphy & J. Scherer
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	3'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	4" concrete	---		
		1	MC		80%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel,	Fill	9.7	Dry
5		2	MC		100%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel, Medium sand, some fine sand, trace gravel,	Fill	7.6	Wet
6											
8		3	MC		100%	Brown Black Brown	Medium Dense	Medium sand, some fine sand, trace gravel, Strong petroleum odor from 7' to 8' bgs	Fill	1425	Wet
10											
12											
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 9' bgs.	PROJECT NO.	38580332
Soil samples collected 3'-6' and 6'-9'. Groundwater sample at 6'-9'.	BORING NO.	B-7
Water sample collected from 1" temporary well point with poly tubing and check valve		

URS Corporation		TEST BORING LOG	
		BORING NO:	B-8 (Inside Building)
PROJECT:	Minuteman Cleaners	SHEET:	1
CLIENT:	Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR:	Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit

GROUNDWATER: ~6'					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:		
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	3'		DATE STARTED:	09/06/06	1251
				DIA.					DATE FINISHED:	09/06/06	1320
				WT.		---			DRILLER:	E. Maraitis	
				FALL		---			GEOLOGIST:	M. Murphy & J. Scherer	
									REVIEWED BY:		

DEPTH FEET	SAMPLE: STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	DESCRIPTION: COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS: PID	Moist
0.5						---	---	4" concrete	---		
		1	MC		67%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel,	Fill	49.8	Dry
5		2	MC		100%				Fill	75.4	Wet
6											
8		3	MC		100%				Fill	4.0	Wet
10											
12								Duplicate soil samples collected at 3'-6' and 6'-9'			
14								Strong organic odor noted in water sample			
15								No sheen observed on surface of purge water			
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments:		
Comments: Boring completed at 9' bgs.	PROJECT NO.	38580332
Soil samples collected 3'-6' and 6'-9'. Groundwater sample at 6'-9'.	BORING NO.	B-8
Water sample collected from 1" temporary well point with poly tubing and check valve		

URS Corporation

TEST BORING LOG

BORING NO:	B-9 (Inside Building)
SHEET:	1
JOB NO.:	38580332
DRILLING METHOD:	Geoprobe remote direct push unit
GROUND ELEVATION:	
DATE STARTED:	09/06/06 1400
DATE FINISHED:	09/06/06 1415
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy & J. Scherer
REVIEWED BY:	

PROJECT: Minuteman Cleaners
CLIENT: Ben Ley Enterprises, Inc.
BORING CONTRACTOR: Zebra Environmental
GROUNDWATER: ~6'

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	3'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---	4" concrete	---		
		1	MC		67%	Brown	Medium Dense	Medium sand, some fine sand, trace clayey silt	Fill	14.0	Dry
5		2	MC		100%	Brown	Medium Dense	Medium sand, some fine sand, trace gravel, trace shells	Fill	6.8	Wet
6											
8		3	MC		100%	Light Gray	Medium Dense	Meduim sand, some fine sand, trace gravel	Fill	2.8	Wet
10											
12											
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 9' bgs.
Soil samples collected 3'-6' and 6'-9'. Groundwater sample at 6'-9'.
Water sample collected from 1" temporary well point with poly tubing and check valve

PROJECT NO.	38580332
BORING NO.	B-9

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners	BORING NO:	B-10
CLIENT:	Ben Ley Enterprises, Inc.	SHEET:	1
		JOB NO.:	38580332
BORING CONTRACTOR:	Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit

GROUNDWATER: ~5'					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

GROUND ELEVATION:		
DATE STARTED:	05/03/07	9:55
DATE FINISHED:		
DRILLER:	E. Maraitis	
GEOLOGIST:	M. Murphy	
REVIEWED BY:		

DEPTH FEET	SAMPLE: STRATA	NO.	TYPE	BLOWS PER 6"		REC% RQD%	DESCRIPTION: COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS: PID	Moist
0.5							---	---	6 inchs concrete	---		
		1	MC					Medium Dense	Brown sand, trace gravel, trace silt Lab Sample 2-4	Fill	1.3	
5												
6		2	MC					Medium Dense	Brown sand, trace gravel, trace silt	Fill	4.8	
8												
10												
12												
14												
15												
16												
18												
20												
23												
25												
28												
30												
33												
35												
38												
40												

Comments: Boring completed at 15' bgs.
Soil samples collected 2'-4'.

PROJECT NO.	38580332
BORING NO.	B-10

URS Corporation	TEST BORING LOG	
	BORING NO:	B-11 (Inside Building)
PROJECT: Minuteman Cleaners	SHEET:	1
CLIENT: Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR: Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit

GROUNDWATER: ~5'					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	3'		DATE STARTED:	05/02/07 10:55
				DIA.					DATE FINISHED:	
				WT.		---			DRILLER:	E. Maraitis
				FALL		---			GEOLOGIST:	M. Murphy
									REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS Moist
0.5						---	---	6" concrete	---		
		1	MC		75%	Brown	Medium Dense	Brown fine to medium sand, trace gravel, trace silt. Lab Sample 3-5	Fill	24.2	
5		2	MC			Brown	Medium Dense	Fine to medium sand, trace ~~clayey~~ silt	Fill	26.0	
6											
8		3	MC			Brown	Medium Dense	Fine to medium sand, trace ~~clayey~~ silt	Fill	1.1	Wet
10											
12											
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 9' bgs.	PROJECT NO.	38580332
Soil sample collected 3'-5'	BORING NO.	B-11

J/35822.01/excel/Minuteman Boring Logs

URS Corporation		TEST BORING LOG	
		BORING NO:	B-12 (Inside Building)
PROJECT:	Minuteman Cleaners	SHEET:	1
CLIENT:	Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR:	Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit

GROUNDWATER: ~5'					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	3'		DATE STARTED:	05/02/07 11:25
				DIA.					DATE FINISHED:	
				WT.		---			DRILLER:	E. Maraitis
				FALL		---			GEOLOGIST:	M. Murphy
									REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS Moist
0.5						---	---	6" concrete	---		
		1	MC			Brown	Medium Dense	Limited recovery (cobble in sampler) brown sand	Fill	2.6	
5		2	MC			Brown	Medium Dense	Brown sand, trace gravel, trace silt Lab Sample 3-5	Fill	21.7	
6											
8		3	MC			Brown	Medium Dense	Brown sand, trace gravel, trace silt	Fill		
10											
12											
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 9' bgs.	PROJECT NO.	38580332
Soil sample collected 3'-5'.	BORING NO.	B-12

J/35822.01/excel/Minuteman Boring Logs

URS Corporation

TEST BORING LOG

BORING NO:	B-13 (Inside Building)
SHEET:	1
JOB NO.:	38580332
DRILLING METHOD:	Geoprobe remote direct push unit
GROUND ELEVATION:	
DATE STARTED:	05/02/07 1230
DATE FINISHED:	
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy
REVIEWED BY:	

PROJECT: Minuteman Cleaners
CLIENT: Ben Ley Enterprises, Inc.
BORING CONTRACTOR: Zebra Environmental

GROUNDWATER: ~5'					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore	3'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS PID	Moist
0.5						---	---	6" Concrete	---		
		1	MC			Brown	Medium Dense	Brown sand, trace grael, trace silt	fill	35.1	
5		2	MC			Brown	Medium Dense	Brown sand, trace grael, trace silt Lab Sample 3-5	fill		
6											
8		3	MC			Brown	Medium Dense	Brown sand, trace grael, trace silt	fill		
10											
12											
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 9' bgs.
Soil sample collected 3'-5'.

PROJECT NO.	38580332
BORING NO.	B-13

J/35822.01/excel/Minuteman Boring Logs

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners	BORING NO:	MW-8
CLIENT:	Ben Ley Enterprises, Inc.	SHEET:	1
BORING CONTRACTOR:	Zebra Environmental	JOB NO.:	38580332
GROUNDWATER:	~5'	DRILLING METHOD:	Geoprobe remote direct push unit

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

GROUND ELEVATION:	
DATE STARTED:	05/03/07 1010
DATE FINISHED:	
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy
REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---		---		
5		1	MC			Brown	Medium Dense	Sand, Trace gravel Trace silt Lab Sample 2-4	fill	1.0	
6–10		2	MC			Brown	Medium Dense	Sand, Trace gravel Trace silt Lab Sample 5-6	fill	0.7	
12–15		3	MC			Brown	Medium Dense	Sand, Trace gravel Trace silt			
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 15' bgs.
Soil samples collected 2'-4' and 5'-6'.

PROJECT NO.	38580332
BORING NO.	MW-8

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners
CLIENT:	Ben Ley Enterprises, Inc.
BORING CONTRACTOR:	Zebra Environmental
GROUNDWATER:	~5'

BORING NO:	MW-9
SHEET:	1
JOB NO.:	38580332
DRILLING METHOD:	Geoprobe remote direct push unit
GROUND ELEVATION:	
DATE STARTED:	05/03/07 910
DATE FINISHED:	
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS Moist
0.5						---	---		---		
5		1	MC			Brown	Medium Dense	Trace brick Medium Sand, trace gravel Lab Sample 2-4	fill	0.1	
6, 8, 10		2	MC			Brown	Medium Dense	Black clayey silt from 5 to 8 strong organic odor	fill	~~75.0~~ 75.4	Wet
12, 14, 15		3				Brown	Medium Dense	Black clayey silt from 5 to 8 strong organic odor			
16, 18, 20											
23, 25											
28, 30											
33, 35											
38, 40											

Black w white dots

Comments: Boring completed at 15' bgs.	PROJECT NO.	38580332	
Soil samples collected 2'-4'.	BORING NO.	MW-9	

URS Corporation	TEST BORING LOG	
	BORING NO:	MW-10
PROJECT: Minuteman Cleaners	SHEET:	1
CLIENT: Ben Ley Enterprises, Inc.	JOB NO.:	38580332
BORING CONTRACTOR: Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit
GROUNDWATER: ~5'	GROUND ELEVATION:	
	DATE STARTED:	05/03/07 935
	DATE FINISHED:	
	DRILLER:	E. Maraitis
	GEOLOGIST:	M. Murphy
	REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---		---		
5		1	MC			Brown	Medium Dense	Brown and, gravel and trace silt Lab Sample 2-4	fill	1.5	
6, 8, 10		2	MC			Brown	Medium Dense	Brown sand, gravel and trace silt	fill	1.2	
12, 14, 15		3				Brown	Medium Dense	Brown sand, gravel and trace silt			
16, 18, 20											
23, 25											
28, 30											
33, 35											
38, 40											

Comments: Boring completed at 15' bgs.	PROJECT NO.	38580332
Soil sample collected 2' - 4'.	BORING NO.	MW-10

J/35822.01/excel/Minuteman Boring Logs

URS Corporation

TEST BORING LOG

PROJECT:	Minuteman Cleaners	BORING NO:	MW-11
CLIENT:	Ben Ley Enterprises, Inc.	SHEET:	1
		JOB NO.:	38580332
BORING CONTRACTOR:	Zebra Environmental	DRILLING METHOD:	Geoprobe remote direct push unit
GROUNDWATER: ~5'		GROUND ELEVATION:	
		DATE STARTED:	05/03/07
		DATE FINISHED:	
		DRILLER:	E. Maraitis
		GEOLOGIST:	M. Murphy
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS Moist
0.5						---	---		---		
		1	MC			Brown	Medium Dense	Brown and, trace gravel and trace silt Lab Sample 2-4	fill	0.0	
5											
6		2	MC			Brown	Medium Dense	Brown sand, trace gravel and trace silt	fill	0.0	Wet
8											
10											
12		3				Brown	Medium Dense	Brown sand, trace gravel and trace silt			
14											
15											
16											
18											
20											
23											
25											
28											
30											
33											
35											
38											
40											

Comments: Boring completed at 15' bgs.	PROJECT NO.	38580332
Soil samples collected 2'-4'.	BORING NO.	MW-11

URS Corporation

TEST BORING LOG

BORING NO:	MW-12
SHEET:	1
JOB NO.:	38580332
DRILLING METHOD:	Geoprobe remote direct push unit
GROUND ELEVATION:	
DATE STARTED:	05/03/07 1015
DATE FINISHED:	
DRILLER:	E. Maraitis
GEOLOGIST:	M. Murphy
REVIEWED BY:	

PROJECT: Minuteman Cleaners

CLIENT: Ben Ley Enterprises, Inc.

BORING CONTRACTOR: Zebra Environmental

GROUNDWATER: ~5'

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore	5'	
				DIA.				
				WT.		---		
				FALL		---		

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSIST HARD	MATERIAL DESCRIPTION	USCS	PID	Moist
0.5						---	---		---		
5		1	MC				Medium Dense	Brown sand, trace gravel, trace silt Lab sample 2-4	fill	0.7	
6, 8, 10		2	MC				Medium Dense	Sand, gravel and trace silt No Peat Layer	fill	2.7	
12, 14, 15		3						Sand, gravel and trace silt No Peat Layer			
16, 18, 20											
23, 25											
28, 30											
33, 35											
38, 40											

Comments: Boring completed at 15' bgs.
Soil samples collected 2'-4'.

PROJECT NO.	38580332
BORING NO.	MW-12

J/35822.01/excel/Minuteman Boring Logs

GEOLOGIC LOG

BORING #: DB-1

DATE: 2/18/2011 **CLIENT: Dennis Manley**

SITE: Minuteman Cleaners, East Rockaway

CONTRACTOR: Zebra Environmental Corp. (Evan and Luke)
DEPTH DRILLED: 55 Feet
DEPTH TO WATER: 4 Feet (High Tide)
DRILLING METHOD: Geoprobe ™

Depth (feet)	*RECOVERY*	*PID Readings*	*Sample Description*
0-5	32-inches	0.0 ppm	Top 4" – Asphalt, sand, and brick fill. Remainder – Orange-brown medium to coarse grained sand with sub-rounded quartz pebbles. Wet bottom 6 inches.
5-10	Full	0.0 ppm	Wet, dark-brown coarse grained sand with disseminated quartz pebbles. Weakly stratified in places. No odor. No sheen.
10-15	Full	0.0 ppm	Top 42 inches- wet, dark, brown coarse grained sand and quartz pebbles –in sharp contact with light brown fine to medium grained sand. No odor. No sheen.
15-20	48-inches	0.0 ppm	Wet, finely laminated fine to medium grained sand. Micaceous in places. Disseminated sub-rounded quartz pebbles. No odor. No sheen.
20-25	Full	0.0 ppm	Wet, fine to medium grained sand grading into medium to coarse sand with sub-rounded quartz pebbles. Orange-brown color. No odor. No sheen.
25-30	Full	0.0 ppm	Top 28" – Wet, orange-brown, medium to coarse grained sand with quartz pebbles. Next 9" - Grayish brown silty sand. Bottom – Light brown medium to coarse grained sand. No odor. No sheen.
30-35	46-inches	0.0 ppm	Wet, light-brown dense (!) fine to medium grained sand. Scattered quartz pebbles. No odor. No sheen. Soil sample collected for analysis at 34-35 feet.

J.R. Holzmacher P.E., LLC 300 Wheeler Road, Suite 402, Hauppauge, New York 11788-4300
Tel: (631) 234-2220 Fax: (631) 234-2221 e-mail: info@holzmacher.com

GEOLOGIC LOG

BORING #: DB-1 **PAGE # 2 0F 2**

DATE: 02/18/2011 **CLIENT: Dennis Manley**

SITE: Minuteman Cleaners

Depth (feet)	*RECOVERY*	*PID Readings*	*Sample Description*
35-40	28-inches	0.0 ppm	Wet, light brown dense (!) medium grained sand with large quartz pebbles. No odor. No sheen.
40-45	13-inches	0.0 ppm	Same as above. Abundant gravel. Dense. No odor. No sheen.
45-50	No Recovery	N/A	Same as above based on behavior of rods. Gravelly and dense sand!
50-55	No Recovery	N/A	Same as above based on behavior of rods. Gravelly and dense sand.
Note 10:13 AM			Groundwater sample collected at 51 to 55 feet below grade. Purged 3 gallons. Purge water PID reading- 0.0 ppm. No odor. No sheen. Turbid.
Note 10:20 AM			Groundwater sample collected at 41 to 45 feet below grade. Purged 2.5 gallons. PID reading of purge water- 0.0 ppm. No odor. No sheen. Turbid.
Notes 10:25 AM			Groundwater sample collected at 31 to 35 feet below grade. Purged 3 gallons. PID reading of purge water- 0.0 ppm. No odor. No sheen. Clear.

J.R. Holzmacher P.E., LLC 300 Wheeler Road, Suite 303, Hauppauge, New York 11788-4300
Tel: (631) 234-2220 Fax: (631) 234-2221 e-mail: info@holzmacher.com

APPENDIX F – HEALTH AND SAFETY PLAN (HASP) WITH COMMUNITY AIR MONITORING PLAN (CAMP)

Construction Health and Safety Plan
For
Property Located at

Minute Man Cleaners
89 Ocean Avenue
East Rockaway, NY 11518

NYSDEC Site Number: C130157
July 2015

Prepared by
J.R. Holzmacher P.E., LLC
Consulting Engineers
3555 Veterans memorial Highway, Suite A,
Ronkonkoma, NY 11779-7636
631-234-2220

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1.0 INTRODUCTION

This section of the Health and Safety Plan (HASP) document defines general applicability and general responsibilities with respect to compliance with Health and Safety programs. This plan has been prepared for excavation/remediation activities to be conducted to determine if subsurface contamination is present. Soil sampling activities are estimated to occur during the excavation period for the proposed new building and sub-grade parking structures at the site.

1.1 Scope and Applicability of the Site Health and Safety Plan

The purpose of this HASP is to define the requirements and designate protocols to be followed during the investigation/remediation activities at the site. Applicability extends to all government employees, contractors, subcontractors, and visitors.

All personnel on site, contractors and subcontractors included, shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This HASP summarizes those hazards in Table 3.1 and defines protective measures planned for the site.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the exclusion zone or contamination reduction zone.

During development of this plan, consideration was given to current safety standards as defined by the Environmental Protection Agency (EPA)/Occupational Health and Safety Administration (OSHA)/National Institute of Occupational Safety and Health (NIOSH), health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- USEPA, Office of Emergency and Remedial Response, Emergency Response Team, Standard Operating Safety Guides
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values

1.2 Visitors

There will be no outside visitors allowed on the site during site investigation/remediation activities. Outside visitors are defined as those not directly involved with drilling and sampling activities.

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY

2.1 Key Personnel

The following personnel and organizations are critical to the excavation/remediation efforts at the site estimated to occur during the excavation activities identified in Figure 1.1 – Construction Activities Schedule. The organizational structure will be reviewed and updated periodically by the site supervisor.

Site Characterization Team Representatives:

1. J.R. Holzmacher P.E., LLC
2. Remediation Contractor – Zebra Environmental Inc.

2.2 Site Specific Health and Safety Personnel

The Site Health & Safety Officer (SHSO) is responsible for ensuring that the provisions of this HASP are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs. The SHSO is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan.

The SHSO at the site with respect to investigation/remediation activities is:

J.R. Holzmacher P.E., LLC
Philip Hoffken Jr.
Project Manager/Sr. Scientist

2.3 Organizational Responsibility

1. The SHSO of the site will conduct site inspections throughout the project making sure the Health and Safety Plan is followed. His main concern is the personal protection of the workers.

3.0 TASK SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

The current and intended use of the property is commercial. The Volunteer, Minute Man Cleaners is an active dry cleaning facility. The property is located at 89 Ocean Avenue, East Rockaway, Nassau County, New York and is approximately 0.19 acres in size. It is occupied by a single-story building that has operated as a dry cleaner since 1982. The site is bordered by Atlantic Avenue on the north, Ocean Avenue to the west, Mill River on the east and a seafood restaurant to the south. Perchloroethylene (PCE), the contaminant of concern, is used in the dry cleaning process. In 2005, an investigation indicated a significant release of PCE to soil and groundwater from the dry cleaning machine. It was estimated that this release occurred from 1983 to 1987 due to seal leaks in a storage tank at the base of the machine.

3.2 Task-by-Task Risk Analysis

The evaluation of hazards is based upon the knowledge of the site background presented in Section 3.1 above, and anticipated risks posed by the specific tasks to be performed.

The following subsections describe each task/operation in terms of the specific hazards associated with it. In addition, the protective measures to be implemented during completion of those tasks are also identified.

Table 3.1 provides a summary of task analysis and chemical hazards potentially encountered at the Site.

TABLE 3.1
TASK ANALYSIS
POTENTIAL CHEMICAL HAZARDS OF CONCERN

Contaminant	PEL/TLV	LEL (%)	IDLH
VOCs			
Perchloroethylene	100 ppm	N/A	150 ppm
MTBE	NE/50ppm	NE	NE
Gasoline	NE/300	1.4	Ca

NE – not established
N/A-not appropriate
Ca – Cancer

Notes: 1. TLV = Threshold Limit Value
2. IDLH = Immediately Dangerous to Life and Health

3.3 Chemical Hazards

A. Hazard Identification and Prevention

- Safety related work practices would be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts. Overhead power lines, buried cables and electrical equipment used on site all pose a danger of shock or electrocution if workers contact or sever them during field operations.

- New York State law requires that a utility mark out to be performed at a site at least 72 hours prior to starting any subsurface work. The tank removal contractor will contact New York City One Call (1-800-272-4480) to request a mark out of underground utilities in the proposed excavation and drilling areas. Work will not begin until the required utility clearances have been completed.

- Public utilities typically do not mark-out utility lines that are located on private property. Therefore, JRH will exercise due diligence and try to identify the location of any private utilities at the site. A private utility contractor will clear on-site subsurface disturbance locations for utilities prior to the commencement of any such work. JRH will also use as-built drawings for the area being investigated, perform a line locating survey, and identify a no-dig/drill zone and hand dig if there is insufficient data to determine the location of utility lines.

- Care must be taken to ensure loose clothing does not get tangled in any moving equipment while borings are being drilled.

- There may be slip or trip hazards associated with rough, slippery or elevated work surfaces at the site. The sampling sites could contain a number of slip, trip and fall hazards for site workers, such as: holes, pits, or ditches; excavation faces and slippery surfaces (steep grades, uneven grades, snow and ice and sharp objects).

- Drilling or excavating is dangerous during electrical storms. All field activity must terminate when thunderstorms are evident. Extreme heat and cold, ice and heavy rain can produce unsafe conditions for drilling work. Such conditions, when present, will be evaluated on a case-by-case basis to determine if work shall terminate.

- The use of an excavator and other equipment that are gasoline or fuel powered presents the possibility of encountering fire and explosion hazards.

- Plants and animals that are known to be hazardous to humans may affect work that takes place. Spiders, bees, wasps, hornets, ticks, poison oak and poison ivy are only some of the hazards that may be encountered. Individuals who may potentially be exposed to these hazards should be made aware of their existence and instructed in their identification. Emergencies resulting from contact with a natural hazard should be handled through the normal medical emergency channels. Individuals who are sensitive to these types of "natural" hazards should indicate their susceptibility to the SHSO.

- Work on-site will involve the use of heavy construction equipment such as an excavator. The unprotected exposure of site workers to this noise during field activities can result in noise induced hearing loss. The SHSO will monitor the noise exposure for the initial trip and determine whether noise protection is warranted for each of the team members. The SHSO will ensure that either ear muffs or disposable foam earplugs are made available to all personnel and are used by the personnel in the immediate vicinity of the field operation as required.

3.3.1 General Description

There is potential high-level VOC contamination because there was a spill of perchloroethylene.

Potential chemical hazards in the subsurface are evaluated below. It is anticipated that dry cleaning compounds and dust could be of concern. The potential for exposure to vapors, contaminated dusts, and contaminated soil/groundwater is of utmost concern.

3.3.2 Potential Chemical Health Hazards-Perchloroethylene

Perchloroethylene (also called perc) is a colorless, nonflammable liquid. It does not occur naturally but is produced in large amounts (310 million pounds in 1991) in the United States. Demand for perc declined about 35% from 1989 to 1991, and is likely to continue to fall. Solvent recycling and reduced demand for chlorofluorocarbons are major reasons for this trend. The largest user of perc is the dry cleaning industry.

Perc enters the body when breathed in with contaminated air or when consumed with contaminated food or water. It is less likely to be absorbed through skin contact. Once in the body perc can remain, stored in fat tissue. Effects of perchloroethylene on human health and the environment depend on the amount present and the length and frequency of exposure. Effects also depend on the health of a person or the condition of the environment when exposure occurs. Breathing perc for short periods of time can adversely affect the human nervous system. Effects range from dizziness, fatigue, headaches and sweating to loss of coordination and unconsciousness. Contact with perc liquid or vapor irritates the skin, the eyes, the nose, and the throat.

3.3.3 First Aid

If soil comes in contact with the eyes immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Contact lenses should not be worn but can be protected by safety glasses/goggles. If lead contaminated soil comes in contact with the skin, wash the skin with soap and water prior to leaving the site. If a person breathes in large amounts of dust, move the exposed person to fresh air at once. If contaminated soil has been swallowed, get medical attention immediately (NIOSH, 1987).

4.0 PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel are required to be trained in accordance with the standard. At a minimum, all personnel are required to be trained to recognize the hazards on-site, the provisions of this HASP, and the responsible personnel. The SHSO at the site pre-entry briefing(s) or periodic site briefings will discuss this plan.

5.0 PERSONNEL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA designated Levels of Protection (A through D), and the specific levels of protection required for each task at the Site.

5.1 Levels of Protection

Personnel will wear the appropriate protective equipment when response activities involve known or suspected atmospheric contamination, vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full facepiece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact.

The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.

- Potential for exposure to substances in air, liquids, or other direct contact with material due to work being done.
- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgment until the hazards can be better identified.

5.2 Level D Personnel Protective Equipment:

- Disposable Tyvek^{R} coveralls (as needed)
- Disposable Nitrile Exam gloves (as needed)
- Disposable Tyvek^{R} booties (as needed)
- Steel-tipped work boots
- Safety glasses
- Hard hat
- 3M N95 Dust Masks with Exhalation Valves (if needed)

5.3 Reassessment of Protection Program

The Level of Protection provided by PPE selection shall be upgraded or downgraded based upon changes in site conditions or investigation findings. When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase.
- Change in job tasks during a work phase.
- Change of season/weather
- When temperature extremes or individual medical considerations limit the effectiveness of PPE.
- Change in work scope, which affects the degree of contact with contaminants.

5.4 Work Mission Duration

Before the workers actually begin work in their PPE ensembles, the anticipated duration of the work mission will be established. Several factors limit mission length, including:

- Air supply consumption (SCBA use)-**Not Applicable.**

- Suit/Ensemble permeation and penetration rates for chemicals-**Not Applicable.**
- Ambient temperature and weather conditions (heat stress/cold stress).
- Capacity of personnel to work in PPE.

5.5 Personal Protective Equipment Recommended for Site

The following specific clothing materials are recommended for the site:

A. GroundwaterSampling – Level D

Site activities will require PPE as follows: hardhat, disposable Tyvek[R] coveralls (if needed), disposable Tyvek[R] booties (if needed), safety glasses and chemical resistant gloves. Particulate respirator-3M N95 Dust Masks with exhalation valves will be available.

5.6 SOP for Personal Protective Equipment

Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and it's frequency of use. The different levels of inspection are as follows:

- Inspection and operation testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use or training and prior to maintenance.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.
- The primary inspection of the PPE in use for activities at the Site will occur prior to immediate use and will be conducted by the user. This ensures that the specific device or article has been checked-out by the user and that the user is familiar with its use.

TABLE 5.1
SAMPLE PPE INSPECTION CHECKLIST

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - Imperfect seams
  - Non-uniform coatings

- Tears
- Malfunctioning closures

- Hold up to light and check for pinholes.
- Flex product:
  - Observe for cracks
  - Observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - Discoloration
  - Swelling
  - Stiffness

During the work task:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure.
- Tears.
- Punctures.
- Seam Discontinuities.

GLOVES

Before use:

- Visually inspect for:
  - Imperfect seams
  - Tears
  - Non-uniform coating
  - Pressurize glove with air; listen for pinhole leaks.

5.7 Specific Levels of Protection Planned for the Site

The following levels of protection will be utilized during activities at the Site:

- Level D

6.0 FREQUENCY AND TYPES OF AIR MONITORING/SAMPLING

This section explains the general concepts of an air-monitoring program and specifies the surveillance activities that will take place during project completion at the Site.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to verify and determine the level of worker protection needed. Initial screening for identification is often qualitative, i.e., the contaminant, or the class to which it belongs, is demonstrated to be present, but the determination of its concentration (quantification) must await subsequent testing. Two principal approaches are available for identifying and/or quantifying airborne contaminants:

- The on-site use of direct-reading instruments.
- Laboratory analysis of air samples obtained by a gas-sampling bag, collection media (i.e., filter, sorbent) and/or wet-contaminant collection methods.

6.1 Direct-Reading Monitoring Instruments

Unlike air sampling devices, which are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision-making. Data obtained from the real-time monitors are used to assure proper selection of personnel protection equipment, engineering controls, and work practices. Overall, the instruments provide the user the capability to determine if site personnel are being exposed to concentrations that exceed exposure limits or action levels for specific hazardous materials.

Of significant importance, especially during initial entries, is the potential for IDLH conditions or oxygen deficient atmospheres. Real-time monitors can be useful in identifying any IDLH conditions, toxic levels of airborne contaminants, flammable atmospheres, or radioactive hazards. Periodic monitoring of conditions is critical, especially, as exposures may have increased since initial monitoring or if new site activities have commenced.

6.2 Site Air Monitoring and Sampling Program

A. Air Monitoring Instruments

- **Organic Vapor Monitoring**

Instrument :Photoionization Detector (PID) with for use during all intrusive activities (10.6 Ev lamp).

Instrument: Detector Tubes – for measuring benzene and vinyl chloride concentrations.

Monitoring for organic vapors will be conducted in the breathing zone of employees using a PID during intrusive activities. Refer to Table 6.1 for total volatile organic vapor and benzene action levels.

- **Combustible Gas Monitoring**

Instrument: Combustible Gas Indicator (CGI)/ Oxygen Meter

Continuous air monitoring with a CGI/Oxygen meter will be conducted in areas where flammable vapors or gases are suspected. All work activities must stop where the monitor indicates the concentration of flammable vapors exceeds ten percent of the lower flammable limit (LEL) at a location with a potential ignition source. The area must be ventilated to reduce the concentration to below ten percent of the LEL.

- Dust Monitoring

Instrument: TSI DustTrak Model 8520 (or equivalent)

Continuous dust monitoring during all site activities will be conducted. Dust mitigation must be employed should readings exceed 10 mg/m^3.

- **Calibration and Record keeping**

Equipment used will be calibrated in accordance with the manufacturers' specifications. The PID and CGI will be calibration checked before and after use under approximately the same conditions at which the instrument will be used. Calibration information will be kept in the field notebook or instrument log. The date, time, location, instrument serial number, calibration gas and concentration, will be noted.

B. Action Levels

TABLE 6.1

SITE AIR MONITORING AND SAMPLING PROGRAM SUMMARY

Instrument	Action Level	Action
PID (10.6 ev)	Continuous readings to 9ppm	Remain in level D PPE.
PID	Continuous reading of 10 to 100 ppm above background	Level D PPE but screen with Drager detection tube for benzene. If benzene detected >1 ppm upgrade to Level C and wear an organic vapor (OV) cartridge/air-purifying respirator (APR). Investigate source.
PID	Continuous reading over 100 ppm background	Stop Work. Reevaluate work conditions and procedures, Contact SHSO prior to continuing for authorization.

Drager Tubes: Benzene	1- 10 ppm	Upgrade PPE to level C with OV/APR.
Drager Tubes: Benzene	>10 ppm	Stop Work . Reevaluate work conditions and procedures. Contact SHSO prior to continuing for authorization.
Combustible Gas Indicator	Continuous reading of 0% to 1% lower explosive level (LEL).	Remain in level D PPE. If no benzene present, assume source is methane. Continuously monitoring LEL.
Combustible Gas Indicator	Continuous reading of 1% to 10% LEL	Level D unless benzene is present. Investigate source and ventilate, if possible. SHSO may require upgrade to Level C PPE.
Combustible Gas Indicator	Continuous reading > 10% LEL	Stop Work. Evacuate work area and ventilate source of combustible gas, if possible, Contact SHSO prior to continuing for authorization.
Dust Monitor	Continuous reading >10.0 mg/m^3	Suppress by spraying the dusty area with water.

Notes: PEL = Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit
REL = National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limit
TLV = American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value

C. Reporting Format

- Air Monitoring Log

6.3 Site Ambient Air Sampling

A. Sampling Criteria

A site ambient air sampling program will be considered if the following criteria are met:

1. Meteorological conditions
2. Health and safety observations
3. Particulate levels are two to three times above background.
4. Site specific activities
5. Site activity increases airborne contaminant(s) exposure potential.

7.0 SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

7.1 Buddy System

During all Level B, C or D activities or when some conditions present a risk to personnel, the implementation of a buddy system is recommended if not mandatory. A buddy system requires at least two (2) people to work as a team, each looking out for each other. Table 8.1 lists those tasks, which require a buddy system and any additional site control requirements.

TABLE 7.1	
PERSONNEL REQUIREMENTS	
Task	**Control Measures**
Soil Sampling	Line of sight, buddy system

7.2 Site Communications Plan

Successful communications between field teams and personnel in the support zone is essential. The following communications systems will be available during activities at the Site.

- Hand Signals
- Direct Vocal Communication
- For hand signal communications, the following definitions will apply during activities at the Site:

TABLE 7.2	
HAND SIGNAL DEFINITIONS	
Signal	**Definition**
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance
Thumbs up	OK/I am all right/I understand
Thumbs down	No/Negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

7.3 Work Zone Definition

The three general work zones established at the Site are the Exclusion Zone, Contamination Reduction Zone, and Support Zone. One of the basic elements of effective site soil remediation activities is the delineation of work zones. The purpose of establishing work zones is to:

- Reduce the accidental spread of hazardous substances by workers or equipment from the contaminated areas to the clean areas;
- Confine work activities to the appropriate areas, thereby minimizing the likelihood of accidental exposures;
- Facilitate the location and evacuation of personnel in case of an emergency; and
- Prevent unauthorized personnel from entering controlled areas.

Although a site may be divided into as many zones as necessary to ensure minimal employee exposure to hazardous substances, this plan uses the three most frequently identified zones in similar projects. These zones are the Exclusion Zone, the Decontamination Zone, and the Support Zone (sometimes referred to by others as the "clean zone"). Movement of personnel and equipment between these zones should be minimized and restricted to specific access control points to minimize the spreading of contamination, if encountered.

7.3.1 Exclusion Zone

The Exclusion Zone is the area where contamination is either known or expected to occur and where the greatest potential for exposure exists. No contamination is actually known to exist on this site. Therefore, the following protective measures will be taken in the Exclusion Zone.

Unprotected onlookers will be restricted from suspicious pre-screened soils requiring sampling such that they are 25 feet upwind or 50 feet downwind of excavation or drilling activities.

Those conducting activities and sampling in the Exclusion Zone will wear the applicable Personal Protective Equipment (PPE). The actions to be taken and PPE to be worn in the Exclusion Zone if VOCs are determined with the PID to be above background are described in Section 6 and Table 6.1.

7.3.2 Decontamination Zone

A Decontamination Zone will be established between the Exclusion Zone and the Support Zone, and will include the personnel, equipment and supplies that are needed to decontaminate equipment and personnel. The size will be selected by the SHSO to be sufficient to conduct the necessary decontamination activities. Personnel and equipment in the Exclusion Zone must pass through this zone before leaving or entering the Support Zone. This zone should always be established and maintained upwind of the Exclusion Zone.

7.3.3 Support Zone

The Support Zone will surround the Decontamination Zone and the Exclusion Zone. Break areas, operational direction and support facilities will be located in this area. Eating, smoking and drinking will be allowed only in this area.

7.4 Nearest Medical Assistance

Figure 7.1 shows a map of the route to the South Nassau Community Hospital, (516) 632-3000 which is the nearest hospital that can provide emergency care for individuals who may experience an injury or exposure on site. The route to the hospital will be verified by the SHSO, and will be familiar to all site personnel.

FIGURE 7.1

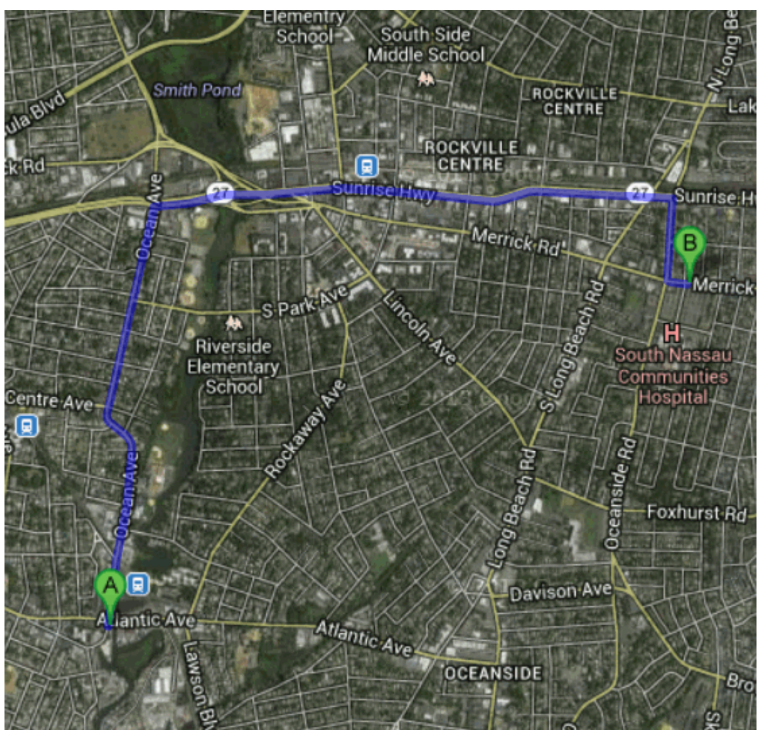
Directions	Distance
1. Start at 89 Ocean Ave, East Rockaway, NY 11518.	
2. Turn **RIGHT** onto **NY-27 E**	go 1.2 mi
3. Turn **RIGHT** onto **N Oceanside Rd**.	go 0.2 mi
4. Take the 2nd **LEFT** onto **Merrick Rd** Destination will be on the right.	go 295 ft

Total Travel Estimate : 3.50 miles - about 12 minutes

Start:

Start at 89 Ocean Ave, East Rockaway, NY 11518

End:
South Nassau Community Hospital
(516) 632-3000
1 Healthy Way, Oceanside, NY 11572



7.5 Safe Work Practices

Table 7.3 provides a list of standing orders for the Exclusion Zone.
Table 7.4 provides a list of standing orders for the Decontamination Zone.

7.6 Emergency Alarm Procedures

The warning signals described in Section 9.4 “Evacuation Routes and Procedures,” will be deployed in the event of an emergency. Communication signals will also be used according to Section 7.2.

TABLE 7.3
STANDING ORDERS FOR EXCLUSION ZONE

- No smoking, eating, or drinking in this zone.
- No horseplay.
- No matches or lighters in this zone.
- Check-in on entrance to this zone.
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position.
- Wear the appropriate level of protection as defined in the HASP.

TABLE 7.4
STANDING ORDERS FOR CONTAMINATION REDUCTION ZONE

- No smoking, eating, or drinking in this zone.
- No horseplay.
- No matches or lighters in this zone.
- Wear the appropriate level of protection.

8.0 DECONTAMINATION PLAN

Consistent with the levels of protection required, the decontamination table(s) provides a step-by-step representation of the personnel decontamination process. These procedures should be modified to suit site conditions and protective ensembles in use.

8.1 Standard Operating Procedures

Decontamination involves the orderly controlled removal of contaminants. Standard decontamination sequences are presented in Table 8.1. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination. Personnel shall clean on-site as much gross contamination from clothing and equipment, as possible.

8.2 Levels of Decontamination Protection Required for Personnel

The levels of protection required for personnel assisting with decontamination will be Level D. The SHSO is responsible for monitoring decontamination procedures and determining their effectiveness.

8.3 Equipment Decontamination

Sampling equipment will be dedicated to each sample as practicable. Appendix A is the decontamination protocol for equipment. After on-site decontamination, non-disposable materials, such as gloves and booties, will be placed in plastic bags and for proper disposal off site.

8.4 Disposition of Decontamination Wastes

Contaminated disposable materials will be left in a secured condition on-site.

TABLE 8.1	
LEVEL D DECONTAMINATION STEPS	
Step 1	Remove outer garments (i.e., coveralls) and boots
Step 2	Remove gloves
Step 3	Wash hands and face

9.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This plan is compatible with local, state and federal disaster and emergency management plans, as appropriate.

9.1 Pre-Emergency Planning

During the site briefing held periodically/daily, all employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation routes. Table 9.1 identifies potential hazards associated with site activities, along with the available emergency prevention/control equipment and its location. The plan will be reviewed and revised, if necessary, on a regular basis by the SHSO. This will ensure that the plan is adequate and consistent with prevailing site conditions.

TABLE 9.1
EMERGENCY RECOGNITION/CONTROL MEASURES

HAZARD	PREVENTION/CONTROL	LOCATION
Fire/Explosion	Fire Extinguisher	Site Trailer and Heavy Equipt. mounted
Spill	Sorbent Materials	Not Applicable
Air Release	Evacuation Routes	Not Applicable

9.2 Personnel Roles and Lines of Authority

The Site Supervisor has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area, and evacuation of adjacent residents. He/she is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified and follow-up reports completed. The SHSO may be called upon to act on the behalf of the site supervisor, and will direct responses to any medical emergency. The individual contractor organizations are responsible for assisting the

The Site Supervisor is: To be determined.

9.3 Emergency Recognition/Prevention

Table 3.1 provides a listing of chemical and physical hazards on-site. Additional potential hazards associated with site activities are listed in Table 9.1, along with the available emergency prevention/control equipment and its location. Personnel will be familiar with techniques of hazard recognition from preassignment training and site-specific briefings. The SHSO is responsible for ensuring that prevention devices and equipment are available to personnel.

9.4 Evacuation Routes/Procedures

In the event of an emergency which necessitates an evacuation of the site, the following alarm procedures will be implemented:

- Insure that a predetermined location is identified off-site in case of an emergency, so that all personnel can be accounted for.

- Personnel will be expected to proceed to the closest site exit with their buddy, and mobilize to the safe distance area associated with the evacuation route. Personnel will remain at that area until the re-entry alarm is sounded or an authorized individual provides further instructions.

9.5 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the SHSO and notify the appropriate emergency organization(s). In the event of a fire or spill, the site supervisor will notify the appropriate local, state and federal agencies.

TABLE 9.2
List of Emergency Contacts

Organization	Contact	Telephone
Police	NYPD	911
Fire	NYFD	911
Hospital	South Nassau Community Hospital.	(516) 632-3000
EPA Emergency Response Team		800-424-8802
NYSDEC	Spill Hotline	800-457-7362
National Response Center		800-424-8802
Center for Disease Control		404-488-4100
Chemtrec		800-424-9555

9.6 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the Exclusion Zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket.) First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Site Supervisor.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included in Table 3.1.

Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

9.7 Fires or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site.

If it is safe to do so, site personnel may:

- Use fire fighting equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials, which may contribute to the fire.

9.8 Spill or Leaks

In the event of a spill or a leak from excavation or drilling equipment, including containers, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin containment and recovery of the spilled materials.

9.9 Emergency Equipment/Facilities

The following emergency equipment/facilities will be utilized on-site.

TABLE 9.3
LIST OF EMERGENCY EQUIPMENT/FACILITIES

List of Emergency Equipment/Facilities	Storage Location
First Aid Kit	Support Zone
Fire Extinguisher	Support Zone
Spill Kits	Support Zone
Berm Materials	Support Zone
Eye Wash	Support Zone
Real Time Air Equipment	Exclusion Zone

10.0 REFERENCES

1. *Aldrich Chemical Book*, RTECS
2. *American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values*
3. *Chemical Protective Clothing Performance Index Book*, Forsburg
4. *Dangerous Properties of Industrial Materials*, SAX and Lewis
5. *Emergency Response Guide Book*, DOT P 5800.5, 1990
6. *EPA 40 CFR 311 Health and Safety Regulations*
7. *EPA/Office of Emergency and Remedial Response/Environmental Response Team Standard Operating Safety Guide*
8. *Extremely Hazardous Substances*, EPA, Noyes
9. *Guide to Occupational Exposure Values* – 1992
10. *Guidelines for the Selection of Chemical Protective Clothing*, Little
11. *Handbook of Toxic and Hazardous Chemicals and Carcinogens*, Sittig, np (Noyes)
12. *Hazardous Chemicals Data Book*, G. Weiss, ndc (Noyes)
13. *Hazardous Chemicals Desk Reference*
14. *NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines*
15. *OHMTADS Database*
16. *OSHA 29 CFR 1910.120 Health and Safety Regulations*
17. *The Merck Index, an Encyclopedia of Chemicals, Drugs, and Biologicals*, Merck & Co., Inc.
18. *Threshold Limit Values and Biological Exposure Indices, ACGIH*, 1991-1992
19. *V.S.L.G. Chris Man*

APPENDIX A

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

APPENDIX A

STANDARD OPERATING PROCEDURES

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

Summary

Equipment, tools, materials, etc. used in the excavation/remediation and collection of samples at the site must be properly prepared and cleaned/decontaminated during and after each sampling event. The degree of cleaning/decontamination will be dependent upon site conditions and the nature and type of contamination, if present, the intent and goal(s) of the remediation, and data quality objectives, as well as other site-specific requirements. The importance of this action must be impressed upon the sampling team and those assisting the team, such as a backhoe or drill rig operator.

Procedure

1. Heavy Equipment Decontamination

All equipment, tools and materials associated with sampling events must be cleaned or decontaminated prior to usage. Items such as drill rigs, auger flights, trackhoes, and backhoes all present potential sources of contamination to environmental samples. Therefore, all heavy equipment utilized at a site must undergo the following decontamination procedures:

- the equipment will first be high pressure, hot washed or steam-cleaned with potable water; and,
- the equipment will be rinsed thoroughly with potable water.

Contain, collect and dispose of all decontamination fluids in accordance with site/project- specific requirements. The bucket of trackhoes and backhoes may be cleaned over the excavation allowing high pressure decontamination washwater to return to the excavation.

2. Cleaning of Field Sampling Equipment

All equipment and tools used to collect samples for chemical analyses, including spatulas, spoons, scoops, trowels, split-spoons, augers, etc. will be decontaminated using the following procedures:

- non-phosphate detergent wash;
- potable water or distilled/deionized water rinse; and
- air or oven-dry.

If the equipment, listed above, is to be stored for future use, allow to dry and then wrap in aluminum foil (shiny-side out) or seal in plastic bags. Collect or dispose of all decontamination fluids in accordance with site/project-specific requirements.

3. Personal Clothing Decontamination

All footwear worn in and around a contamination area will be washed down using soap and water to remove any soil or oily residue remnants. If disposable gloves, booties or suits (such as Tyvek® suits) are worn, these suits or booties are to be removed and disposed of in a designated 55-gallon drum on site for future disposal. Any other clothing that comes in contact with contaminated soil should not be worn more than 24-hours and should be washed prior to wearing again.

APPENDIX B
MSDSs

MSDS Number: **T0767** * * * * * *Effective Date:* ***05/19/08*** * * * * * *Supercedes:* ***08/16/05***

MSDS Material Safety Data Sheet

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

Mallinckrodt CHEMICALS

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.

TETRACHLOROETHYLENE

1. Product Identification

Synonyms: ethylene tetrachloride; tetrachloroethene; perchloroethylene; carbon bichloride; carbon dichloride
CAS No.: 127-18-4
Molecular Weight: 165.83
Chemical Formula: Cl2C:CCl2
Product Codes:
J.T. Baker: 9218, 9360, 9453, 9465, 9469
Mallinckrodt: 1933, 8058

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Tetrachloroethylene	127-18-4	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

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

Health Rating: 2 - Moderate (Poison)

Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate (Life)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Irritating to the upper respiratory tract. Giddiness, headache, intoxication, nausea and vomiting may follow the inhalation of large amounts while massive amounts can cause breathing arrest, liver and kidney damage, and death. Concentrations of 600 ppm and more can affect the central nervous system after a few minutes.
Ingestion:
Not highly toxic by this route because of low water solubility. Used as an oral dosage for hookworm (1 to 4 ml). Causes abdominal pain, nausea, diarrhea, headache, and dizziness.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
May cause liver, kidney or central nervous system damage after repeated or prolonged exposures. Suspected cancer risk from animal studies.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance. The use of alcoholic beverages enhances the toxic effects.

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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:
Aspiration hazard. 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:
Wash skin with soap or mild detergent 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.

Note to Physician:
Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard but becomes hazardous in a fire situation because of vapor generation and possible degradation to phosgene (highly toxic) and hydrogen chloride (corrosive). Vapors are heavier than air

and collect in low-lying areas.
Explosion:
Not considered to be an explosion hazard. Containers may explode when involved in a fire.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.
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.

6. Accidental Release Measures

Ventilate area of leak or spill. 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. Neutralize with alkaline material (soda ash, lime), then 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! 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

Store in a cool, dry, ventilated area away from sources of heat or ignition. Isolate from flammable materials. Protect from direct sunlight. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. 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.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA), 200 ppm (ceiling),
300 ppm/5min/3-hour (max)

-ACGIH Threshold Limit Value (TLV):
25 ppm (TWA), 100 ppm (STEL); listed as A3, animal carcinogen
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, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.
Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Ethereal odor.
Solubility:
0.015 g in 100 g of water.
Specific Gravity:
1.62 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
121C (250F)
Melting Point:
-19C (-2F)
Vapor Density (Air=1):
5.7
Vapor Pressure (mm Hg):
18 @ 25C (77F)
Evaporation Rate (BuAc=1):
0.33 (trichloroethylene = 1)

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Slowly decomposed by light. Deteriorates rapidly in warm, moist climates.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition. Hydrogen chloride gas and phosgene gas may be formed upon heating. Decomposes with moisture to yield trichloroacetic acid and hydrochloric acid.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong acids, strong oxidizers, strong alkalis, especially NaOH, KOH; finely divided metals, especially zinc, barium, lithium. Slowly corrodes aluminum, iron and zinc.
Conditions to Avoid:
Moisture, light, heat and incompatibles.

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11. Toxicological Information

Oral rat LD50: 2629 mg/kg; inhalation rat LC50: 4100 ppm/6H; investigated as a tumorigen, mutagen, reproductive effector.

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

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Tetrachloroethylene (127-18-4)	No	Yes	2A

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into water, this material is not expected to biodegrade. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals.
Environmental Toxicity:
The LC50/96-hour values for fish are between 1 and 10 mg/l. The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be toxic to aquatic life.

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: TETRACHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1897
Packing Group: III
Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: TETRACHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1897
Packing Group: III
Information reported for product/size: 4L

International (Air, I.C.A.O.)

Proper Shipping Name: TETRACHLOROETHYLENE

Hazard Class: 6.1
UN/NA: UN1897
Packing Group: III
Information reported for product/size: 4L

15. Regulatory Information

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

Ingredient	TSCA	EC	Japan	Australia
Tetrachloroethylene (127-18-4)	Yes	Yes	Yes	Yes

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

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Tetrachloroethylene (127-18-4)	Yes	Yes	No	Yes

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

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Tetrachloroethylene (127-18-4)	No	No	Yes	No

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

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Tetrachloroethylene (127-18-4)	100	U210	No

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

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

Australian Hazchem Code: 2[Z]
Poison Schedule: None allocated.
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: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. 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:

No Changes.

Disclaimer:

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

SAFETY DATA SHEET

Creation Date 22-Sep-2009 **Revision Date** 10-Feb-2015 **Revision Number** 1

1. Identification

Product Name cis-1,2-Dichloroethylene

Cat No. : AC113380000; AC113380025; AC113380100; AC113380500

Synonyms cis-Acetylene dichloride.

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Entity / Business Name
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled
Causes serious eye irritation
Causes skin irritation
May cause respiratory irritation

Precautionary Statements
Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Avoid breathing dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Take precautionary measures against static discharge
Do not eat, drink or smoke when using this product
Response
Call a POISON CENTER or doctor/physician if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
Rinse mouth
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Fire
Explosion risk in case of fire
Fight fire with normal precautions from a reasonable distance
Evacuate area
Storage
Store in a well-ventilated place. Keep cool
Store in a closed container
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

Component	CAS-No	Weight %
cis-1,2-Dichloroethylene	156-59-2	97

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation	Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.
Ingestion	Do not induce vomiting. Obtain medical attention.
Most important symptoms/effects	Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Water spray. Carbon dioxide (CO_2). Dry chemical. Use water spray to cool unopened containers. chemical foam.
Unsuitable Extinguishing Media	No information available
Flash Point	6 °C / 42.8 °F
Method -	No information available
Autoignition Temperature	440 °C / 824 °F
Explosion Limits	
Upper	12.80%
Lower	9.70%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Flammable. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products
Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO_2)
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.
Environmental Precautions	See Section 12 for additional ecological information.
Methods for Containment and Clean Up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Ensure adequate ventilation. Wear personal protective equipment. Use explosion-proof equipment. Use only non-sparking tools. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges.
Storage	Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
cis-1,2-Dichloroethylene	TWA: 200 ppm		

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
cis-1,2-Dichloroethylene			TWA: 200 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-80 °C / -112 °F
Boiling Point/Range	60 °C / 140 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	201 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Relative Density	1.280
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C2 H2 Cl2
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to light. Incompatible products. Exposure to moist air or water.

Incompatible Materials Bases

Hazardous Decomposition Products Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
cis-1,2-Dichloroethylene	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
cis-1,2-Dichloroethylene	Not listed	Not listed	EC50 = 721 mg/L 5 min EC50 = 905 mg/L 30 min	Not listed

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

TDG

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IATA

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IMDG/IMO

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
cis-1,2-Dichloroethylene	X	-	X	205-859-7	-		-	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	Yes

Sudden Release of Pressure Hazard No
Reactive Hazard No

Clean Water Act Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

Component	Hazardous Substances RQs	CERCLA EHS RQs
cis-1,2-Dichloroethylene	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
cis-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class B2 Flammable liquid
D1B Toxic materials
D2B Toxic materials

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 22-Sep-2009
Revision Date 10-Feb-2015
Print Date 10-Feb-2015
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally

Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of SDS

Material Safety Data Sheet
Trichloroethylene

ACC# 23850

Section 1 - Chemical Product and Company Identification

MSDS Name: Trichloroethylene
Catalog Numbers: AC158310000, AC158310025, AC421520000, AC421520040, AC421520200, AC421525000, 15831-0010, S80327ACS-1, S80327ACS-2, T340-4, T341-20, T341-4, T341-500, T341J4, T403-4
Synonyms: Ethylene trichloride; 1,1,2-Trichloroethylene; TCE.
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
79-01-6	Trichloroethylene	99+	201-167-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 15 max liquid.
Warning! Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Breathing vapors may cause drowsiness and dizziness. Possible risks of irreversible effects. Cancer hazard. Causes eye and skin irritation. May cause respiratory tract irritation. May cause liver and kidney damage. May cause central nervous system effects.
Target Organs: Kidneys, central nervous system, liver, spleen, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Contact with trichloroethylene causes pain but no permanent injury to the eyes. (Doc of TLV)
Skin: Causes skin irritation. May be harmful if absorbed through the skin.
Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed. May cause central nervous system effects.
Inhalation: May cause respiratory tract irritation. May cause liver and kidney damage. May be harmful if inhaled. May cause central nervous system effects. The chief symptoms of TCE exposure were found to be abnormal fatigue, irritability, headache, gastric disturbances, and intolerance to alcohol. (Doc to TLV)
Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver

and kidney damage. May cause cancer in humans. Repeated exposure may cause damage to the spleen. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do not induce vomiting. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not applicable.
Autoignition Temperature: 410 deg C (770.00 deg F)
Explosion Limits, Lower:7.9 Vol %
Upper: 90 Vol %
NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.
Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Trichloroethylene	10 ppm TWA; 25 ppm STEL	1000 ppm IDLH	100 ppm TWA; 200 ppm Ceiling

OSHA Vacated PELs: Trichloroethylene: 50 ppm TWA; 270 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless - APHA: 15 max
Odor: chloroform-like
pH: Not available.
Vapor Pressure: 77.3 mbar @ 20 deg C
Vapor Density: 4.5 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 87 deg C @ 760 mmHg
Freezing/Melting Point:-86 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:1.460
Molecular Formula:C_2HCl_3
Molecular Weight:131.39

Section 10 - Stability and Reactivity

Chemical Stability: Moisture sensitive. Light sensitive.
Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, bases, active metals, metals and metal compounds (toxic, e.g. beryllium, lead acetate, nickel carbonyl, tetraethyl lead).
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 79-01-6: KX4550000

LD50/LC50:
CAS# 79-01-6:
Draize test, rabbit, eye: 20 mg/24H Moderate;
Draize test, rabbit, skin: 2 mg/24H Severe;
Inhalation, mouse: LC50 = 8450 ppm/4H;
Inhalation, mouse: LC50 = 220000 mg/m3/20M;
Inhalation, mouse: LC50 = 262000 mg/m3/30M;
Inhalation, mouse: LC50 = 40000 mg/m3/4H;
Inhalation, rat: LC50 = 140700 mg/m3/1H;
Oral, mouse: LD50 = 2402 mg/kg;
Oral, mouse: LD50 = 2400 mg/kg;
Oral, rat: LD50 = 4920 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;
Skin, rabbit: LD50 = 20 mL/kg;
.

Carcinogenicity:
CAS# 79-01-6:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 4/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

Epidemiology: Tumorigenic effects have been reported in experimental animals.
Teratogenicity: Teratogenic effects have occurred in experimental animals.
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in humans.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 41-67 mg/L; 96 hrs.; LC50Daphnia: Daphnia: 2.2-100 mg/L; 48 hrs.; LC50Mollusk Shrimp: 2 mg/L; 96 hrs.; LC50 Bluegill sunfish, LD50= 44,700 ug/L/96Hr. Fathead minnow, LC50=40.7 mg/L/96Hr.
Environmental: In air, substance is photooxidized and is reported to form phosgene, dichloroacetyl chloride, and formyl chloride. In water, it evaporates rapidly. Potential for mobility in soil is high.
Physical: No information available.
Other: Bioconcentration potential is low (BCF less than 100).

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 79-01-6: waste number U228.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TRICHLOROETHYLENE	TRICHLOROETHYLENE
Hazard Class:	6.1	6.1
UN Number:	UN1710	UN1710
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 79-01-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 79-01-6: 100 lb final RQ; 45.4 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 79-01-6: immediate, delayed, reactive.
Section 313
This material contains Trichloroethylene (CAS# 79-01-6, 99+%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR
Clean Air Act:
CAS# 79-01-6 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 79-01-6 is listed as a Hazardous Substance under the CWA. CAS# 79-01-6 is listed as a Priority Pollutant under the Clean Water Act. CAS# 79-01-6 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 79-01-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
WARNING: This product contains Trichloroethylene, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: CAS# 79-01-6: 50 æg/day NSRL (oral); 80 æg/day NSRL (inhalation)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 36/38 Irritating to eyes and skin.
R 45 May cause cancer.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 67 Vapours may cause drowsiness and dizziness.
R 68 Possible risk of irreversible effects.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 79-01-6: 3

Canada - DSL/NDSL

CAS# 79-01-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 79-01-6 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 2/01/1999
Revision #9 Date: 6/03/2008

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: VINYL CHLORIDE

TRADE NAMES/SYNONYMS:
MTG MSDS 97; 1-CHLOROETHYLENE; 1-CHLOROETHENE; CHLOROETHYLENE; CHLOROETHENE; CHLORETHENE; CHLORETHYLENE; ETHYLENE MONOCHLORIDE; MONOCHLOROETHYLENE; MONOCHLORO ETHENE; MONOCHLOROETHENE; VINYL CHLORIDE MONOMER; VINYL CHLORIDE, INHIBITED; VINYL C MONOMER; RCRA U043; UN 1086; C2H3Cl; MAT24940; RTECS KU9625000

CHEMICAL FAMILY: halogenated, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

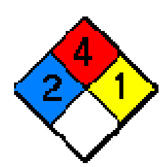
COMPONENT: VINYL CHLORIDE
CAS NUMBER: 75-01-4
PERCENTAGE: >99.9

COMPONENT: PHENOL
CAS NUMBER: 108-95-2
PERCENTAGE: <0.1

COMPONENT: INHIBITORS
CAS NUMBER: Not assigned.
PERCENTAGE: <0.1

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=4 REACTIVITY=1



EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: gas
ODOR: faint odor, sweet odor
MAJOR HEALTH HAZARDS: harmful if swallowed, skin irritation, eye irritation, central nervous system depression, cancer hazard (in humans)
PHYSICAL HAZARDS: Flammable gas. May cause flash fire. May polymerize. Containers may rupture or explode.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, nausea, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, joint pain, loss of coordination, hearing loss, lung congestion
LONG TERM EXPOSURE: impotence, bluish skin color, blood disorders, liver damage, cancer
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation, blisters
LONG TERM EXPOSURE: irritation, blisters
EYE CONTACT:
SHORT TERM EXPOSURE: irritation, eye damage
LONG TERM EXPOSURE: irritation, eye damage
INGESTION:
SHORT TERM EXPOSURE: frostbite
LONG TERM EXPOSURE: cancer

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

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

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. 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: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. 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. 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. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking.

FLASH POINT: -108 F (-78 C) (CC)
LOWER FLAMMABLE LIMIT: 3.6%
UPPER FLAMMABLE LIMIT: 33%
AUTOIGNITION: 882 F (472 C)

6. ACCIDENTAL RELEASE MEASURES

WATER RELEASE:
Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. 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

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Inside storage: Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
VINYL CHLORIDE:
1.0 ppm OSHA TWA
5 ppm OSHA STEL 15 minute(s)
0.5 ppm OSHA action level 8 hour(s)
1 ppm ACGIH TWA
NIOSH TWA (lowest feasible concentration)

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

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

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: For the gas: Wear appropriate chemical resistant gloves. For the liquid: Wear insulated gloves.
OSHA REGULATED SUBSTANCES: U.S. OSHA 29 CFR 1910.1017.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
OSHA Standard:
Respirator selection should comply with 29 CFR 1910.134, 29 CFR 1910.1017, and the final rule published in the Federal Register on August 24, 2006.
NIOSH Recommendations:
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 a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: colorless
ODOR: faint odor, sweet odor
MOLECULAR WEIGHT: 62.50
MOLECULAR FORMULA: C-H2-C-H-Cl
BOILING POINT: 9 F (-13 C)
FREEZING POINT: -245 F (-154 C)
VAPOR PRESSURE: 2515.6 mmHg @ 21.1 C
VAPOR DENSITY (air=1): 2.2
SPECIFIC GRAVITY (water=1): 0.9106
WATER SOLUBILITY: 0.25%
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: 260 ppm
EVAPORATION RATE: Not applicable
VISCOSITY: 0.01072 cP @ 20 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alcohol, ether, carbon tetrachloride, benzene

10. STABILITY AND REACTIVITY

REACTIVITY: May polymerize. Avoid contact with light or storage and use above room temperature.

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

INCOMPATIBILITIES: metal carbide, metals, oxidizing materials, peroxides

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

POLYMERIZATION: May polymerize. Avoid contact with heat, light, air, water or incompatible materials. Closed containers may rupture violently.

11. TOXICOLOGICAL INFORMATION

VINYL CHLORIDE:
TOXICITY DATA: 18 pph/15 minute(s) inhalation-rat LC50; 500 mg/kg oral-rat LD50
CARCINOGEN STATUS: OSHA: Carcinogen; NTP: Known Human Carcinogen; IARC: Human Sufficient Evidence, Animal Sufficient Evidence, Group 1; ACGIH: A1 -Confirmed Human Carcinogen;

EC: Category 1
LOCAL EFFECTS:
Irritant: skin, eye
ACUTE TOXICITY LEVEL:
Toxic: ingestion
Relatively Non-toxic: inhalation
TARGET ORGANS: central nervous system
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.
ADDITIONAL DATA: Stimulants such as epinephrine may induce ventricular fibrillation. May cause birth defects.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 388000 ug/L 10 month(s) LETH (Mortality) Northern pike (Esox lucius)

INVERTEBRATE TOXICITY: 41.74 ug/L 72 day(s) (Residue) Mosquito (Culex pipiens quinquefasciata)

ALGAL TOXICITY: 41.74 ug/L 72 day(s) (Residue) Green algae (Oedogonium cardiacum)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Hazardous Waste Number(s): D043. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.2 mg/L. U043.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Vinyl chloride, stabilized
ID NUMBER: UN1086
HAZARD CLASS OR DIVISION: 2.1
LABELING REQUIREMENTS: 2.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: 150 kg

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Vinyl chloride, stabilized
UN NUMBER: UN1086
CLASS: 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
Vinyl chloride: 1 LBS RQ
PHENOL: 1000 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: Yes
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
Vinyl chloride

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated.

STATE REGULATIONS:
California Proposition 65:
Known to the state of California to cause the following:
Vinyl chloride
Cancer (Feb 27, 1987)

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ABD2

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

MATHESON TRI-GAS, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION HEREIN.

APPENDIX C
COMMUNITY AIR MONITORING PLAN

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions,

and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.
3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

APPENDIX G – QUALITY ASSURANCE PROJECT PLAN (QAPP)

QUALITY ASSURANCE PLAN FOR

AMERICAN ANALYTICAL LABORATORIES, LLC

56 Toledo Street
Farmingdale, NY 11735
(631) 454-6100, fax (631)454-8027

Approved by: Lori Beyer **Date:** 04/29/14
Lori Beyer, Technical/Laboratory Director

Approved by: Karen Kelly **Date:** 04/28/14
Karen Kelly, QA Manager

Controlled copy on Ivory Paper

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

American Analytical Laboratories, LLC. is a full service analytical testing laboratory that provides to its clients comprehensive solutions to their analytical needs. These services include a wide range of analytical testing in the four major categories; Potable Water, Non Potable Water, Solid/Hazardous Waste and Air/Emissions, along with Technical Support, Regulatory Compliance & Site Assessment and Emergency Response Services. Legal identification numbers, Tax ID; Certification ID numbers are available upon request.

In the pursuit of accomplishing its objectives, American Analytical Laboratories, LLC recognizes that Quality Assurance is absolutely necessary in order to ensure that the samples it handles for its clients are analyzed within the guidelines set by NYSDOH, EPA SW-846, NIOSH, NJDEP, PADEP,and CTDOH.

Accordingly, **American Analytical Laboratories, LLC (AAL), has established a Quality Assurance Plan, the objectives are:**

- To ensure the performance reliability of American Analytical Laboratories (AAL)
- To provide the highest quality analytical service possible.
- To ensure that all turn around times are met.
- To ensure compliance with all applicable local, state and federal regulations and to meet the requirements of The TNI Standard- The NELAC Institute Standard 2003, 2009.

The laboratory Work Areas are adequate for their use, and appropriately clean to support environmental testing. Laboratory space is arranged to minimize cross-contamination between incompatible areas of the laboratory, volatile lab is in it's own room with separate sample refrigerator. The building is kept **secure** during off hours with locked doors and an alarm. Laboratory work areas include:

- Sample receipt/storage

- Laboratory sample preparation and separate instrument-analysis rooms
- Chemical and waste storage
- Office – data handling, data storage

1.2 Quality Assurance Policy Statements

Quality Assurance at American Analytical Laboratories, LLC. is:

The total activities performed by all its employees in accordance and in compliance with the system requirements as set forth in its QA Plan/Manual and related documentation, (SOPs), in the quality system, such that **the objective of the management system is to consistently provide our customers with data of known and documented quality that meets their requirements, and to uphold the highest quality of service**.

American Analytical Laboratories, LLC is committed to Continuous Quality Improvement and, as such insists that all personnel and staff be aware of and practice those good principles that will assure the successful implementation of the quality polices on an ongoing basis, and to comply with the TNI Standard. All employees are required to read and implement the quality documentation/procedures pertaining to their work and are trained annually on ethical principles and procedures surrounding the data that is generated. Every employee must ensure that the generation and reporting of quality analytical data is fundamental priority. **Ethics and Data Integrity Procedures**, see SOP 113, and Section 22 of this Quality Manual are reviewed annually.

1.2.1 Policy on how personnel are free from pressures that affect the quality of work:

The laboratory ensures that personnel are free from any commercial, financial, and other undue pressures, which might adversely affect the quality of work. This policy is implemented and enforced through the commitment of management, at all levels, to the QA principles outlined in this manual. All employees are trained annually on the ethical principles surrounding the data that is generated, and that the laboratory maintains a strict policy of client confidentiality.

The quality policy at AAL requires that all tests and calibrations shall always be carried out in accordane with stated methods, regulatory agency and customer's requirements. It is AAL's policy that quality must be stressed prior to production and it is our belief that without quality there can be no production. AAL's management staff oversees and reviews all raw data and logbooks to ensure that method requirements have been met. Both the Laboratory Director and QA Manager have the authority to "stop work" in any or all areas if an out of control event has been discovered, see Section 15.2.7 for more detail on control of non-conforming testing. The Technical Director/QAO evaluate the significance of the non-conforming work, corrective action is established and when completed and approved the Technical Director authorizes the resumption of work.

1.2.2 Policy on Client confidentiality and proprietary rights:

It is AAL's policy to ensure confidentiality of our customer's by only submitting lab results to the organization that ordered the work and relinquished the samples to the lab. If a third party requests a copy of any specific lab report, AAL will not release any records/documentation without authorization (written or verbal) from the party ordering the work. There are no exceptions to this policy.

The laboratory shall, where clients require transmission of test results by telephone, telex, facsimile, email or other electronic means, follow documented procedures that ensure that the above requirements are met and that the confidentiality is preserved. AAL includes a confidentiality disclosure statement in their faxed and emailed reports.

Client support – communication is maintained to provide proper instruction and modification for testing. Technical staff is available to discuss any questions or concerns. Delays or major deviations to the testing are communicated to the client immediately by the lab director by email or phone. The laboratory will provide the client with all requested information pertaining to their samples agreed upon prior to sample analysis or approved by the laboratory director (see SOP 109).

Client feedback – both positive and negative (Complaints,see Section 24) is encouraged. Feedback provides acknowledgement, corrective actions where needed, and opportunities for improvement, generally received by the lab director by email or letter.

1.3 **Corporate Responsibility**

The officers of American Analytical Laboratories, LLC. have committed the company to provide and maintain high levels of quality in all aspects of its analytical concern and management of all samples. It is the responsibility of management working directly with, and with contributions from, its Laboratory managers to:

- Establish policy and procedures relative to the successful achievement of the quality levels established for its operations.

- Establish the proper mechanisms and systems that will ensure the translation of these policies to its departments in such a manner that they are integrated into the day-to-day operation.

- Provide consistent guidance and resources to the departments for its management to ensure compliance with all applicable regulatory requirements.

- Ensure that all procedures are properly documented, updated, revised, and distributed accordingly to all appropriate personnel.

- Have final oversight responsibility for the quality assurance program of the corporation. The oversight responsibilities can include periodic audits, general quality meetings, and informational seminars.

1.4 **Facility Management Responsibility**

It is the responsibility of American Analytical Laboratories' facility management to carry out the established corporate policies documented in the Quality Assurance Plan. These responsibilities can include the appointment of specific site quality teams, local audit activities, dissemination of and instruction in all quality related procedures and documents, and the appointment of a separate quality officer. Accordingly, it is the responsibility of each department supervisor, either directly or through proper delegation, to:

- Plan all data collection activities
- Implement all sampling, analysis, and Quality Control (QC) protocols
- Document and approve all sampling, analysis, and QC protocols
- Assess the effectiveness of the QA/QC activities and to implement appropriate corrective action responses
- Review Data and determine the limits on use

1.5 Data Quality Objectives

Data Quality Objectives (DQO) are:

Statements of the level of uncertainty that a decision maker is willing to accept in results derived from environmental data, when the results are going to be used in a regulatory compliance setting.

Customarily, DQO's are accompanied by statements of:

- The decision to be made
- Why environmental data is needed and how they will be used
- Descriptions of the environmental data to be collected
- Specifications with regard to the domain of the decisions

- Calculations, statistical or otherwise, that will be performed on the data

1.5.1 Minimization of Risk

The objective of DQO's is to minimize risk in an environmental decision. Generally, but not always, these decisions are based on data that is provided by the technical staff, or materials and methods used for the laboratory analysis. The data provided by a laboratory is customarily a statement of a certain constituent concentration level on a material sample that is understood to represent some area of concern.

It is incumbent upon all individuals responsible for the collection of the material to ensure that proper procedures have been followed in order to avoid false negatives (a material is non-hazardous when, in reality, it is) or false positives (a material is judged hazardous when, in reality, it is not).

It is incumbent on the laboratory to perform the required analysis utilizing all proper and prescribed procedures that will ensure that the data provided on the material is accurate and precise within the established uncertainty acceptable, for the analytical results. The performance of an analytical laboratory is monitored by analyzing defined control samples in accordance with established laboratory QC protocols.

The laboratory attests to the integrity of the number provided to the decision maker on the specific sample analyzed. The quality officer, or the appropriately designated staff member will attest to the integrity of the entire process that went into obtaining the analytical result of the material. The maintenance of all of the quality assurance characteristics of the process constitutes compliance with the DQO's and ensures that the risk in an environmental decision is minimized.

1.6 **Quality Assurance Plan (QAP)/Quality Manual**

A documented compendium of guidance, instructions and protocols that must be followed to ensure that the expected quality levels of environmental decisions can be achieved with predictability and regularity.

American Analytical Laboratories has modeled it's plan along EPA guidelines as presented in Guidelines and Specifications for Preparing Quality Assurance Program

Plans, QAMS-004/80, EPA-600/8-83-024, June, 1983. These documents have been published by EPA's Office of Monitoring Systems and Quality Assurance, and the Office of Research and Development. Additional quality control (QC) elements come from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition, NYSDOH-ELAP Certification Manual, **and the 2003 NELAC Standard/2009 TNI Standard**.

American Analytical Laboratories Quality Assurance Plan (QAP)/Quality Manual contains guidance, instructions and protocols for the following areas:

- Organizational Structure and Personnel Responsibilities
- Scope of Activities
- Sample Custody and Documentation Procedures
- Calibration Procedures and Frequency
- Data Reduction, Validation and Reporting
- Internal Quality Control Procedures
- Performance and System Audits
- Document Control
- Preventive Maintenance, Corrective Action Procedures
- Data Integrity, Complaints
- Quality Assurance Reports to Management

2.0 Organizational Structure And Personnel Responsibilities

2.1 General Introduction

The purpose of this section is to clearly define the functions and responsibilities each person is expected to carry out under the QAP. In addition, this section delineates ***(see Organizational Chart-AppendixI)*** the specific lines of authority and communication which are essential to ensuring that the goals and objectives of the QAP are achieved.

The organizational structure for American Analytical Laboratories, LLC., as it relates to the QAP, is clear and decisive. Each individual will be held accountable for properly executing his or her assigned tasks in accordance with the QAP. American Analytical Laboratories is committed to taking a strong role to provide proper oversight, support, and policy direction to ensure its analytical operations are conducted in accordance with the QAP.

2.2 General Responsibilities For Each Job Function

Provided below is a list of the functions and responsibilities that are assigned to individuals by job position. In addition, individual company SOP's may assign specific duties and responsibilities other than is provided here. **Generally, managers and supervisors are required to ensure that each individual has the knowledge, capability, and qualifications to perform their assigned tasks. This includes assuring that assigned personnel have completed the training requirements specified in Section 2.3 of this program.**

2.2.1 **President/ Vice-President**

The Facility's President/VP has the primary responsibility to ensure that the objectives of the QAP are carried out at every level of the operation. The specific duties of the President/VP are as follows:

- Overall functional responsibility for program implementation
- Direct the activities of responsible personnel
- Allocate necessary resources to carry out the goals of the QAP

2.2.2 **Laboratory/Technical Director**

The Laboratory Director/Technical Director must ensure that responsibilities listed below are carried out in accordance with the QAP. The Laboratory Manager may choose to assign certain functions to other laboratory personnel as appropriate. These responsibilities include:

- Developing, documenting, and implementing standard analytical and sampling procedures
- Ensuring that day to day support of operations is properly carried out in a timely manner
- Ensuring that laboratory Quality Control procedures are properly performed
- Providing the necessary training and resources for laboratory analysts
- Performing Data Validation (as appropriate), review and approve all laboratory reports
- Reviewing all new work to ensure that the lab has the appropriate facilities and resources before accepting such work
- Handling Project Planning and Contract Review, coordinating with clients their needs, our capabilities, resolve differences; need for subcontracting before sample arrival
- Oversees support services, including purchasing of equipment/supplies, service contracts for maintenance of instrumentation.

2.2.3 Quality Assurance Officer(QAO)/QA Manager

The QA Manager is primarily responsible for ensuring that the laboratory personnel are conducting their daily operations in accordance with the QAP and laboratory specific SOP's. The QA Manager is responsible for:

- Oversight and review quality control/laboratory data
- Focal point for and monitoring QC activities; corrective actions
- Implement and monitor American Analytical Laboratories performance evaluation program
- Maintain Quality Assurance training records
- Conducting Internal Audits annually
- Ensure that a **Demonstration of Capability** be made prior to using any test method and any time there is significant change in instrumentation or personnel. This shall be documented with the signed Certification Statement and kept on file in the personnel records of the affected employee.
- Responsible for review/revision of Quality Manual/SOP's
- Provide Quality Assurance reports to Management (as assigned), notify of any deficiencies, ensure quality system is implemented at all times
- Monitor and maintain laboratory certifications

2.2.4 Laboratory Analysts/Technicians

Laboratory analysts are responsible for the items listed below.

- Performing laboratory analysis based on documented procedures (SOPs).

- Performing appropriate QC in accordance with the QAP or documented laboratory SOP's

- Identifying when corrective actions are necessary under the supervision of management.

- Performing data reduction calculations as required.

2.3 Training and Review of Personnel Qualifications

The laboratory management shall be responsible for defining minimum qualification levels for all laboratory personnel, as well as ensuring that all lab staff have demonstrated capability in the activities for which they are responsible. New staff members are given training under the supervision of a qualified analyst or the department manager, and after performing the demonstration of capability successfully, can work independently.

Ensuring that the training of the technical staff is kept up-to-date and on-going by the following:

1. A signed statement must be on file that demonstrates that each employee has read, and is using the latest version of the Lab's Quality Manual and SOP's which relates to their job responsibilities.
2. Training courses or wokshops on specific equipment or analytical techniques shall all be documented and any certificates received are to be placed in the employee's file.
3. Documentation of demonstration of capability/continued proficiency of each test method once a year by one of the following:
   a. acceptable performance of a blind sample (PT's).
   b. At least four consecutive LCS's with acceptable levels of precision and accuracy.
4. A statement, signed and dated, from each employee that they have read, acknoweledged and understood their personal ethical and legal responsibilities including the potential punishments and penalties for improper, unethical, or illegal actions. This is documented by the signed attendance sheet at the annual refresher data integtrity training.

5. All documentation is entered into the employee training file

2.4 Policy on how personnel are free from pressures that affect the quality of work:

The quality policy at AAL requires that all tests and calibrations shall always be carried out in accordance with stated methods and regulatory agency and customer's requirements. It is AAL's policy that quality must be stressed prior to production and it is our belief that without quality there can be no production. AAL's management staff oversees and reviews all raw data and logbooks to ensure that method requirements have been met. Both the Laboratory Director and QA Manager have the authority to "stop work" in any or all areas if an out of control event has been discovered, see Section 15.2.7 for more detail on control of non-conforming testing. The Technical Director/QAO evaluate the significance of the non-conforming work, corrective action is established and when completed and approved the Technical Director authorizes the resumption of work.

3.0 Scope of Services/Methods

3.1 A copy of all the Test Methods under which the laboratory performs its certified testing under NYSDOH LAB ID # 11418 is in Appendix II.

3.1.1 AAL also maintains the following certifications with state entities:
NJDEP – Cert# NY050
CTDOH – Cert# PH-0205
PADEP – Cert# 68-00573
The certificates and parameter lists are on file with the QA Manager. If accreditation is terminated or suspended, the laboratory will immediately cease to use the certificate number reference in any way and inform clients impacted by the change.

3.2 Method Selection: Methods are available for all activities associated with the analysis of the sample including preparation & testing. When the laboratory is required to analyze a parameter by a specified method due to a regulatory requirement, the parameter/method combination is recognized as a reference method. The laboratory will use methods that meet the needs of the client, and when mandated by a regulatory authority, only those methods will be used. If a method is not specified by the client, an appropriate method will be selected by the Laboratory Director, the client informed and approved.

3.3 Method Validation: is a confirmation that the requirements for a specific intended use are fulfilled. Test methods are validated by performing an initial demonstration of capability, see Appendix VI.

3.4 Analytical Uncertainty: A subset of measurement uncertainty that includes all laboratory activities performed as part of the analysis. When requested, the laboratory will provide an estimate of analytical uncertainty as determined by SOP 120.

3.5 Data Qualifiers are listed on a separate page included with the Analytical Report (Cerificate of Results).

3.6 Review of all Requests, Tenders, and Contracts

All new work is initiated by the Technical Director and/or the **Account Executive/Manager** who delegates responsibilities for new work according to available resources. Staff members are informed prior to initiation of new work in order to determine if appropriate facilities and resources are available. The plan for any new testing shall be reviewed and approved by the technical director before commencing such work. If the review uncovers any potential conflicts, deficiencies, inappropriate accreditation status, and/or inability to perform the work, the laboratory shall notify the client. In cases where differences exist between the request/tender and contract they shall be resolved prior to starting work.

The review shall document that facilities and resources are organized to efficiently perform the work, including subcontracted work. The record of contract review includes pertinent discussions with the client regarding their requirements and results submitted during the contract period. For routine reviews of ongoing work a date and signature of the laborarory official responsible for the contract is sufficient. For any new testing requirements, the designated official shall ensure that standard operating procedures and demonstration of capability (DOC) to perform those tests prior to reporting results are available. The SOP(s) shall be under document control and DOC statements shall be on file.

Clients are notified immediately in situations where the laboratory cannot conform to the contract and if there is a change in laboratory accreditation status.

4.0 Laboratory Equipment

American Analytical Laboratories operates a fully equipped laboratory with the ability to conduct analysis for wet chemistry, metals, volatile organic compounds, semi-volatile organic compounds, TPH, TCLP, pesticide/PCB/herbicide compounds

4.1 **Analytical Instruments** include: see Omega/LIMS for more detailed information

ICP: Varian-720-ES Inductively Coupled Plasma Spectrophotometer (Metals)
TOC Analyzer: Tekmar/Phoenix 8000 – 9/25/12 – working to get this online, approved
CETAC Quick Trace Hg Analyzer M-6100 (Mercury)
GC/MS: (2)Agilent 5977, with Purge & Trap-Tekmar-Atomx,(Volatiles-SystemsV1,V2)
GC/MS:(2)Agilent 5977 (Semivolatiles-Systems SV1,SV2)
GC: Hewlett Packard 5890, FID (Systems O & **R-TPH-DRO)**
GC: Hewlett Packard 5890, FID, ELCD(Volatiles/GRO System L)
GC: Hewlett Packard 5890, Dual Column ECD(3SystemsXY,QU,KB) (Pest/PCB/Herb)
GC:Hewlett Packarr 6890, Dual Column ECD (System MN – Pest/PCB/Herb)
Lachat Quick Chem 8000Series (Inorganics – Nutrients)
HACH – DR 4000 UV-VIS Spectrophotometer (Inorganics-Minerals)
Dohrmann – DX2000 – Organic Halide Analyzer (TOX)

4.2 Support Equipment: see Logbooks for more detailed information

Balances: Analytical – Mettler #7
Top-load Pan Balances #1-6,8

Ovens: Inorganic Prep #1, #2
Login #3

Refrigerators: Login – Walk-in
Organic Prep - Freezer, Refrig#3
Inorganic (WC) Prep – Refrig #1,2
Vol Lab – Refrig #4,6
BNA Extracts – Refrig #7

Thermometers: see spreadsheet on file with Inorganic Manager

pH Meter: see lab notebook – Inorganic Prep Lab

- **pH – Liquid – Sartorius Model PP-20**
- pH – Soil – Orion Model 301
- **field pH meter-Milwaukee MW102**

Volumetric dispensing devises(except Class A glassware and glass microliter syringes) are checked for accuracy quarterly.

- No equipment is used outside of the permanent control of the laboratory
- Calibration, maintenance records for instruments is kept in Omega/LIMS

5.0 Subcontracting of Tests/Support Services & Supplies

5.1 The laboratory director shall advise the client in writing and include in its written report the certified subcontracted Lab ID No. used for any portion of the testing required.

5.2 The subcontracted work shall be placed with an accredited laboratory, transfer of sample is done with a signed chain of custody which is included in the final report.

5.3 The laboratory shall retain records that the above requirements have been met.

5.4 The laboratory shall use only those outside support services and supplies that are of adequate quality to sustain confidence in the lab's tests. The laboratory director reviews and approves all suppliers/supplies prior to purchasing.

5.5 The laboratory shall maintain records of all suppliers/supplies and support services (service calls for equipment) it uses in the Omega/LIMS. Supplies/chemicals are inspected by the department manager and supplies are stored according to manufacturers recommendations, lab SOPs, or test method specifications. Supplies including certificates of analysis are kept on file in the lab by either the department manager or QAO.

5.6 Where no independent assurance of the quality of supplies or support services is available, the lab shall have these items verified as complying with any standard specifications required for the tests concerned.

5.7 The Quality Manager maintains a list of subcontractors with a copy of their certificate of accreditation/ analyte list.

5.8 The laboratory performing the subcontracted work is identified in the final report with it's report being included in the lab's final report to the client. The laboratory assumes responsibility to the client for subcontractors work, except where the client specified which subcontractor is to be used.

6.0 Sampling Procedures

6.1 When sampling is done by AAL personnel, **sample collection procedures shall include the following:**

6.1.2 Ensure that the sample taken is a truly representative sample using proper sampling techniques, sample containers, and preservation as required in ELAP Manual, Item No. 241, 242, 243, & 244. See Appendix III.

6.1.3 Properly identify the collected sample(s) and document their collection on the chain of custody (COC).

6.1.4 Relinquish sample custody to the Sample Custodian at the lab, who now will sign the chain of custody at the time of receipt, including date and time. The sample log-in procedure will begin here , and the sample in-house chain of custody will be prepared.

6.1.5 SOPs relevant to the sampling program are: SOP 116, 101, 102, 103

6.2 Sample Containers

6.2.1 Preparing container orders: containers are provided to the client upon request by phone or email and referred to the Sample Custodian in Login and/or the Laboratory Director , see SOP 102

6.2.2 Sample container preservation and holding time requirements are found in Appendix III of the QAP.

6.3 Sampling Plan

6.3.1 The laboratory uses sampling plans provided by the client or prepared in consultation with the client, or by following the procedures in SOP 116. The plan includes any factors that must be controlled to ensure the validity of the test.

6.3.2 Sampling Records: relevant sampling data: date/time, location, sampler ID, is recorded on the chain of custody.

6.3.3 If preservation or holding time requirements are not met, the procedures in Section 18 – Control of Nonconforming Environmental Testing are followed as well as procedures in SOP 103 – Sample Acceptance Policies.

7.0 Sample Acceptance Policy : see SOP 103

7.1 The External Chain of Custody(COC): For every sample submitted by the client, the chain of custody form is initiated by the sampling personnel. This form shall include client name; address; contact, sample identification, the location, date and time of collection, collector's name, preservation type, sample type, analyses required and any other remarks concerning the sample.

7.2 Sample labels are to include a unique Sample Identification No. on durable labels, such as water resistant and the use of indelible ink.

7.3 Appropriate sample containers must be used, and adherence to specified holding times as stated in the ELAP Manual referenced in the above Section 6.0 and in Appendix III.

7.4 There must be sufficient sample volume to perform the required tests.

7.5 Samples which show sign of damage or contamination, missing labels, disagreement with COC, will be documented on the chain of custody, and at sample login using Omega/LIMS Sample Receipt Checklist, sample custodian shall then inform the Lab Director of the situation who will then contact the client in order to resolve the discrepancy.

8.0 Sample Receipt Protocols

8.1 Upon receipt of all samples, the sample custodian shall inspect the condition of the samples, document that they were received in good condition, properly preserved for the type of analysis required, and record on the Sample Receipt Checklist that the arrival temperature of those samples which require ≤6°C was compliant. **Samples hand delivered after collection shall be considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice. Record on COC received samples on ice and the temperature.** All items specified in Section 7 shall also be checked and followed.

8.2 The results of all checks/disrepancies shall be recorded on the COC and at sample login using the Omega/LIMS Sample Receipt Checklist.

8.3 Incoming samples which require checking for chemical preservation such as pH, shall be done by the Sample Custodian and recorded in the Omega/LIMS Checklist or on COC at login or upon initiation of analysis.

8.4 All sample discrepancies will be reported to the laboratory director, and documented using the Omega/LIMS Checklist, lab director will consult with the client for further instruction before proceeding with sample analysis.

8.5 If the sample does not meet the sample receipt acceptance criteria listed above, the laboratory shall: retain correspondence and/or records of conversations concerning the final disposition of the rejected sample(s); or fully document in Omega(comments) any decision to proceed with the analysis of samples not meeting acceptance criteria.

8.6 The analysis data shall be appropriately qualified in the case narrative in the final report.

8.7 **The laboratory utilizes the Omega/LIMS to document receipt of all samples.** The sample login and **External COC** records the following: Client/Project Name, date and time of receipt, a unique Lab ID code (detailed in Section 9), analysis required, date and time of collection, sampler, client contact, matrix, number of containers, sample receipt comments,Storage Status, after which there is a log review, to check for errors, by someone other than the person who did the login and is recorded on the Sample Login Checklist. See Appendix IV for sample COC/Checklist.

8.8 The Lab ID number is linked to the Sample# on the COC and the Client SampID in the work order login.

8.9 Any comments resulting from inspection for sample rejection are linked to the Lab ID at the time of login on the Omega/LIMS Checklist, see Appendix IV.

8.10 All documentation, such as memos; fax's, that are sent to the laboratory by the client shall be retained in the work order folder with the COC, then filed later with the client folder.

8.11 A complete chain of custody record shall be maintained. External, as described above, and at a future date if needed, Internal. The **Internal Chain of Custody** is utilized for transfer of samples throughout the laboratory and can be documented in Omega-LIMS(Coordination)– Sample ContainerTracking, but at the present time is done with the use of a form sheet requesting samples from sample custodian by lab personnel, see Appendix IV.

8.12 **Legal Chain of Custody** – If requested by the client, the laboratory has procedures for legal chain of custody services. If samples are noted as being used for legal/evidentiary purposes, special chain of custody procedures are put into place by the laboratory. Custody seals can be sent by the lab if sampling containers are ordered from the lab, shipping records are maintained with the COC, and an internal COC is initiated that provides additional documentation of internal handling by analysts and disposal record is provided (internal COC in Appendix IV).

9.0 Sample Tracking

9.1 In order to maintain sample identity, the laboratory (sample custodian) shall assign a unique identification number to each sample received. Using the Omega/LIMS, a work order number is assigned to each new COC, the seven digit work order number is followed by a **sample ID #001A; (A,B,C...)** is the sample fraction ID used for different tests to be run on that sample, i.e. WO#1401003-001A,001B,002A,002B,003A,003B...2 tests to be run on 3 samples, sample numbers run sequentially, this identifies the sample with all lab activities such as sample preparation; extraction, and analysis.

9.2 Sample containers are labeled with this Lab ID number using a durable label prior to being stored in the refrigerators. **Walk-in Refrigerator** (in sample log-in room) stores all samples after log-in except the volatiles which are stored in Refrigerator #6 (in VOA Lab).

9.3 The Lab ID number is also written on the chain of custody and linked to the field/client ID assigned to each sample container.

9.4 **Sample extracts** are labeled with the sample Lab ID number and are stored in numbered refrigerators segregated by classfication and analysis (i.e. Base neutrals, acid extractables, pesticides, herbicides, and PCB's).

9.5 The **Internal Chain of Custody** form is an integral part of sample tracking and follows the sample movement in and out of the sample storage area during preparation and analyis. Any transfer of samples can be recorded on the Internal COC with the date, time, name of the person relinquishing the sample(s); namely the sample custodian, the name of the person receiving the sample(s); namely the analyst, and the purpose of the exchange.Presently, lab personnel are using a form sheet (see Appendix IV) to request samples from the sample custodian.

9.6 After the sample has been analyzed, the unused portion will be returned to Login to the assigned sample Refrig./shelf for storage until disposal, this is documented in Omega-LIMS-Sample Disposal.

9.7 **Digest/Extraction Transfer** – Digestions and Extractions are documented in the Omega/LIMS Prep Log and Prep logbooks. Upon completion of the digestion/extraction the sample is given to the analyst. **BNA, Pest/PCB/Herb extracts** are then stored in Refrigerator #7 until ready for disposal.

9.8 **Sample Aiquots/Subsampling** – In order for the analysis results to be representative of the sample collected in the field, the laboratory supplies bottles/jars for sampling to clients when possible, so that the testing requested will have the required bottle/preservative for analysis. If the client has not received bottles from the lab and supplies it's own which need subsampling, subsamples are separated from the field sample in order to prioritize preservation/volume requirements, volatiles will be run first before any subsampling.

10.0 Sample Storage

10.1 **Samples which require thermal preservation shall be stored under refrigeration at ≤6°C, unless otherwise stated in the method.** Incoming samples for inorganics, semivolatiles and pesticides/herbicides/PCB's are stored in **Walk-in Refrigerator** on their respective shelves according to Lab ID No., in the Sample Log-in room. Incoming samples for volatiles are stored in Refrigerator #6 in the VOA Lab. Samples shall be stored away from all standards, reagents, food and any other potentially contaminating sources and in such a way as to prevent cross contamination. Samples are held secure and accessible only to lab personnel.

10.2 **Sample fractions, extracts, leachates and other sample preparation products shall be stored separately and in accordance with the above conditions or according to specifications in the test method.** BNA extracts are stored in Refrigerator #7. Volatile standards are stored in Refrigerator #4, Semivolatile; PCB; Pest./Herb. standards are stored in Freezer #1. Inorganic standards are stored in Refrigerators #1 & 2.

10.3 It is the policy of this laboratory to hold all samples; sample extracts in accordance with the protocols stated above and for a period of one month.

11.0 Sample Disposal : see SOP 108

11.1 All sample extracts, digestates, remnants are maintained by AAL for a period of 30 days from reporting of the sample results to the client unless otherwise requested by the customer.

11.2 Once the 30 day period has expired the following procedures are followed:

11.2.1 Sample Extracts – are held in each of the organic labs an then consolidated into a container labeled "Hazardous Waste" in the prep lab

11.2.1.1 It is the Extraction Manager's responsibility to notify the Hazardous Waste Technician that the sample extract container in the prep lab is ready for disposal

11.2.1.2 The Hazardous Waste Technician collects all analyzed sample extracts and places the vials in the 55 gallon drum located in the waste shed labeled "Haz Waste-Flammable Liquid-Vials."

11.2.1.3 Each drum is labeled with the start/accumulation date.

11.2.1.4 Once the drum is filled, the Hazardous Waste Technician seals the drum and documents on the label the date of completion(end date).

11.2.2 Sample Digestates

11.2.2.1 It is the Inorganic Manager's responsibility to notify the Hazardous Waste Technician that sample digestates are ready for disposal.

11.2.2.2 The Hazardous Waste Technician collects all analyzed sample digestates and pours the metals digestates into the 55 gallon drum located in the waste shed labeled "Haz Waste-Corrosive Liquid-Acid Waste."

11.2.2.3 Each drum is labeled with the start/accumulation date.

11.2.2.4 Once the drum is filled, the Hazardous Waste Technician seals the drum and documents on the label the date of completion(end date).

11.2.3 Sample Remnants

11.2.3.1 It is the Hazardous Waste Technician's responsibility to monitor the sample volume stored in the incoming sample walk-in refrigerator.

11.2.3.2 Once the incoming refrigerator shelves are visually full, the Hazardous Waste Technician shall verify the laboratory identifiers which are greater than 30 days old(from receipt date), working with the Sample Custodian.

11.2.3.3 Unused soil sample remnants greater than 30 days old are collected by the Hazardous Waste Technician and brought to the waste shed in the back of the laboratory facility.

11.2.3.4 Unused soil sample remnants are placed in the 55 gallon drum labeled "Non-Regulated Waste Solid." Ten days before a waste pickup, a composite soil sample will be collected from all filled drums and analyzed for: TCLP complete, Reactivity, Ignitability, Corrosivity; Sample ID will be Soil Waste Composite & Date collected.

11.2.3.5 Unused liquid sample remnants are poured into the 55 gallon drum labeled "Haz Waste-Acid Waste."

11.2.3.6 Each drum is labeled with the start/accumulation date.

11.2.3.7 Once the drum is filled, the Hazardous Waste Technician seals the drum and documents on the label the date of completion(end date).

11.2.3.8 Customers that specifically request or the contract dictates that samples be stored by the laboratory greater than 30 days are maintained on the bottom shelf of the incoming sample walk-in refrigerator located in sample login.

11.2.3.9 These samples designated for long term storage may not be disposed of until the Laboratory Director receives authorization from the customer.

11.2.3.10Generally, all sample containers designated for long term storage are placed in a plastic Ziploc bag and the bag is clearly labeled "Do not dispose."

11.2.3.11 All sample containers are clearly labeled as to the customer, laboratory identification and sample collection date.

11.2.3.12 Document Disposal date in Omega/LIMS under "coordination/sample disposal" option.

11.3 Laboratory Waste

11.3.1 Extraction Laboratory

11.3.1.1 Solvent waste generated from the organic extraction laboratory is stored in the extraction laboratory in the Cans labeled **"HazWaste-Flammable Liquid-Solvent Waste."**

11.3.1.2 It is the responsibility of the Hazardous Waste Technician to empty the Cans each morning or as needed.

11.3.1.3 The solvent waste is placed in a 55 gallon drum labeled **"Flammable Waste Liquid."**

11.3.1.4 Place acid waste from the PCB extraction in the white can labeled **Hazardous Waste-Corrosive Liquid – "Acid Waste"** in the hood in the Extraction Lab. Contact Haz Waste Tech to empty as needed.

11.3.2 Inorganic Digestion Laboratory

11.3.2.1 Nitric Acid waste generated from the metals digestion is stored prior to disposal in the digestion laboratory in the White Cans labeled "Haz Waste-Corrective Liquid."

11.3.2.2 It is the responsibility of the Hazardous Waste Technician to empty the Cans each morning or weekly as needed.

11.3.2.3 The acid waste is placed in a 55 gallon drum labeled **"Haz Waste-Corrosive Liquid"**

11.3.3 VOA Laboratory

11.3.3.1 **At the point of generation, any samples that are determined to have any concentrations greater than the regulatory levels for TCLP based on laboratory testing, those samples shall be segregated and manifested separately with the appropriate waste codes and either:**

1.3.2.1.1 Mixed with the appropriate waste stream or

1.3.2.1.2 Lab packed by our waste transporter.

11.3.3.2 After 30 days all VOA liquid samples are brought to the hazardous waste shed by the waste technician and emptied into the Hazardous Waste-Corrosive Liquid – Acid Waste Drum (since pH <2 for aqueous waste).

11.3.3.3 After 30 days all non segregated VOA soil samples are brought to the hazardous waste shed by the waste technician and hand emptied into the Non-regulated Waste – Solid 55 gallon Drum.

11.3.4 Segregation: Soil Drums and Discarded Soil Samples

11.3.4.1 If any soil is determined to exceed the regulatory levels at the point of generation based on laboratory testing, those samples will be segregated and manifested as hazardous waste soil with the appropriate "D" codes listed in Table 1(SOP108).

Those samples are not to be mixed with the non-regulated soil and shall be transported in separate containers.
11.3.4.2 Based on review of the lab results, the Laboratory Director will advise the sample custodian to segregate any discarded soil samples that will require to be manifested separately and/or lab packed prior to off-site disposal.
11.3.4.3 All soil drums with unused sample remnants are composited and tested for: TCLP: VOA, SVOA, Pesticides, Herbicides and Metals prior to disposal. Providing all results are less than the regulatory levels in 40CFR Chapter 1, then the soil is profiled as "non-hazardous/non-regulated soil."
11.3.4.4 The testing in 1.3.4.3 above is a confirmatory analysis of the individual testing that is conducted as part of the laboratory analysis.

11.3.5 Segregation: Liquid Waste and Discarded Liquid Samples

11.3.5.1 Any liquid sample that exceeds the concentration in Table 1(SOP108) based on laboratory testing, shall be segregated as the point of generation and added to either the corrosive or flammable drum and the Laboratory Director will ensure the appropriate codes are listed on the disposal manifest.

Sample Disposal/Transport

Once there are five (5) full labeled 55 gallon drums in the waste shed, the Hazardous Waste Technician notifies the Laboratory Director that the laboratory is ready for final waste disposal.

It is the responsibility of the Laboratory Director to generate a purchase order and contact the disposal facility to schedule a waste pickup.

All waste is disposed of in accordance with local and federal regulations and all waste disposal is documented under manifests.

American Analytical Laboratories, LLC. (AAL) transports all waste under our EPA ID Number "NYD001360101."

Annually the Laboratory Director completes the NYS Department of Environmental Conservation Hazardous Waste Report for all waste generated and transported by the laboratory from the preceding year, if greater than 2,000 Kg/yr. **Currently AAL is classified as a small quantity generator and therefore not currently required to file.**

Annually the Laboratory Director completes the County of Suffolk, Department of Public Works "Objectionable/Prohibited Waste Removal" reporting form for all waste generated and transported by the laboratory from the preceding year.

12.0 Reagents and Standards/Purchasing

12.1 Analytical standards and reagents used by the laboratory are of the grade or quality specified in the methods and guaranteed by the manufacturer with a certificate of analysis for the standard reference material purchased. **Procedures for purchasing, storage of reagents, lab materials, are found in SOP 118. The lab director approves all purchase orders and when materials are received matches the packing slip with the purchase order placed. Purchasing documents and a list of approved suppliers are recorded in the laboratory Omega-LIMS.**

12.2 When reagents are received in the lab they are documented in a notebook(Inorganics), and in Omega/LIMS for Organics showing the date of receipt, description of material; manufacturer; recommended storage conditions. Date of receipt is also written on the label of the reagent bottle. The certificate of analysis is kept on file by the laboratory section manager/analyst. **COAs are also scanned and attached to the logged in reagent files in Omega-LIMS.**

12.3 **Expiration dates of primary standards provided by the manufacturer shall be recorded on the container, if not provided by the manufacturer it is not required.**

Secondary Standard expiration dates are assigned (documented in Omega/LIMS) by the analyst who prepared them according to the method instructions and are not used beyond these dates unless tested. **Expiration dates for prepared reagents and standards must be on container.**

12.4 **Standards/Reagents are stored in cabinets or refrigerators in the laboratories designated for that purpose and separated from samples.**

12.5 **All containers of prepared standards, reference materials, and reagents shall bear a unique identifier and expiration date.**

12.6 **Prepared reagents are verified to meet the requirements of the test method through the use of QC required in the test method.**

12.7 **The laboratory director maintains in the Omeg-LIMS a list of approved suppliers, and evaluates it routinely by ensuring that the supplier meets the requirements of quality and service, see SOP 118.**

13.0 Calibration Procedures And Frequency

American Analytical Laboratories, LLC shall create and maintain the applicable methods of calibration for each analytical method and/or procedure used in its analytical laboratories. The following sections describe the general calibration procedures used in the laboratory; details of specific instrument and method calibration/verification procedures and acceptance criteria are provided in the manufacturers literature or individual laboratory SOP's respectively.

- Sufficient raw data are retained to reconstruct the calibration used to calculate the sample result.
- All calibrations are verified with a second source standard/uniquely independent lot# which is traceable to a national standard.
- Calibration standards include a concentration at or below the regulatory/reporting limit but above the laboratory's detection limit.
- Results of samples must be within the calibration/linear range (bracketed by standards) or the results must be flagged as having less certainty, or diluted to a concentration within the calibration/linear range.
- No data associated with a calibration that is out of control will be reported.

13.1 Standard Preparation & Calibration Logbook

A record of any calibration standards and instrument calibration must be maintained in accordance with this QAP. At a minimum, the following information shall be recorded together in the bound notebook for Inorganics. Metals standard prep is recorded in the Sample Prep Logbook, and calibration data is kept with the raw data file. Organic standard prep is recorded in Omega/LIMS(no signatures), instrument calibrations and raw data files are imported into Omega-LIMS to be included with the Analytical Report when required.

Standard Preparation:

- Date the standard was prepared
- Title of the solution
- Concentration of the standard
- Manufacturer Std.cert. and lot number & also of reagent grade chemical(s) used
- Quantity prepared
- Expiration date
- Preparer's identification

Instrument Calibration:

- Date of calibration
- Method description
- Calibrants
- Standard value (e.g., std. concentration, pH units, std. weights,etc.)
- Technician signature (in Logbooks), Analyst ID in Omega
- Comments (as appropriate)

In addition, other information may be required; examples are listed below:

- Drying time and temperatures
- Gross, tare and net weights
- Volume used
- Citation of preparation or primary standard (i.e.,“standardized against 0.025N Potassium”)
- Dates which standards are prepared (Mo/Da/Yr)
- Calculations to adjust solution to nominal concentrations
- Final standardization titers and calculations

13.2 Labeling of Standards/Reagents

A label must be placed on the inorganic calibration standard/reagent container that records: the unique ID by year and sequential nuimbers and an expiration date.

Records must include:

- Traceability to purchased stock
- Concentration
- Title of the solution, reference to method of preparation
- Dates of preparation and expiration
- Preparer's initials/ID

- Organic standard info. is in Omega/LIMS

13.3 Standard Calibration Curves

13.3.1 Calibration Standards

Refer to the method SOP for any specific calibration instructions, analytical instrumentation shall be calibrated in accordance with requirements which are specific to the instrumentation and procedures used. Generally, instruments are calibrated by analyzing a minimum of three standards and a blank at the beginning of each shift or with each batch. Initial calibration standards are run and QC criteria are met before analyzing samples. Continuing calibration standards are run with each batch and at the end of the run, results are to agree within the accepted method QC criteria.

Purchased standards shall have a lot specific certificate of analysis. The laboratory shall use only standards of high purity. According to the method requirements, solvents or reagents must be of equal or higher quality.

13.3.2 Frequency of Re-Calibration

The frequency of re-calibration will depend on a number of factors. If it is found that the response of the calibration verification sample exceeds the acceptance limits established for the analysis, then the instrument must be re-calibrated. An instrument must be re-calibrated after it has undergone any special repair. In addition, an examination of the Control Charts for the analyses may indicate an "out of control" situation which could be traceable to a calibration problem.

13.3.3 Generation of Standards Curves

Concentration values reported between the limit of detection (LOD/MDL)) and the low standard in the calibration curve, limit of quantitation (LOQ/PQL), are considered to be estimates and reported as “J” values.

13.3.3.1 Computer Generated

In many instances, the computer software of a specific instrument will generate the appropriate calibration curves. Refer to the individual instrument instruction manual for the proper guidance and appropriate computer settings for calibration. A hard copy of the calibration curve and response factors shall be generated and filed for reference or imported on a pdf file into Omega.

13.3.3.2 Manually Generated

In many methods, particularly the colorimetric methods, a manual calibration curve needs to be prepared that will be used to determine the parameter’s concentration. Refer to the SOP for specific instructions.

All standard curves should be dated and labeled with the method, analyte, standard concentrations, and instrument responses. Using the appropriate response units (e.g. - absorbance) and the corresponding concentrations, calculate the least squares equation for the line and the correlation coefficient. An acceptable correlation coefficient is 0.995 or greater. Draw a linear calibration curve from the excel program. The concentration of an unknown sample can be calculated directly off the calibration curve. The working range of the curve is considered to be within the range of the standards used. Samples whose response exceeds the response of the highest standard must be diluted to be within the linear range.

13.4 <u>Calibration of Support Equipment/Measurement Traceability</u>

The calibration procedures for the support equipment available in the laboratory is provided below. Again, specific calibration requirements for the other analytical instrumentation found in the lab (i.e., AA, GFAA, ICP, GC, GC/MS, etc.) are provided in the manufacturer's literature or individual laboratory SOP's.

13.4.1 <u>Analytical Balances/Weights</u>

All analytical balances shall be serviced/calibrated by a qualified organization annually, Class "S" weights shall also be calibrated annually, Certificate of Calibration Report for balances and a letter stating Class "S" weights are calibrated with wts. traceable to NIST are kept on file with the QA Manager .

<u>Record</u> : *Service Organization Sticker With Date Of Service and certificate of weight traceability*

All analytical balances calibration shall be checked, each day the balance is used, in three ranges with NIST traceable Class "S" weights, two in the gram range (5-100g) and one in the milligram range (10-500 mg).
<u>Record</u>: Date, Target And Actual Readings And Analyst's Initials in a Lab Notebook.

13.4.2 <u>Top-Load or Pan Balances</u>

All Top-loading balances should be serviced annually by a qualified service organization, Cert. Of Calibration Report and a letter stating weights are traceable to NIST are kept on file with the QA Manager .
<u>Record</u>: *Service Organization Sticker With Date Of Service and certificate of weight traceability*

Top-loading or pan balances calibration shall be checked each day the balance is used using NIST traceable Class "S" reference weights in at least three weight ranges representative of routine use.
Record: Date, Target And Actual Readings with Analyst's Initials in a Lab Notebook.

13.4.3 **pH/Conductivity Meter**

All pH Meter calibration is to be checked using standard buffers each day of use. Conductivity meter- calibrate daily with 0.01M KCl

DI Water – check conductivity daily and record in lab notebook

Two Point Calibration. For pH Meters with a slope adjustment, the slope is created using standard pH Buffers at the extremes of the working range (e.g. pH 4.0 and pH 10.0). The slope is then checked using a standard buffer at the middle of the working range (e.g. pH 7.0). An acceptable actual reading is target value ±0.05 pH Units. When the meter is in use for longer than a 3 hour period, the pH of the third buffer shall be checked once every 3 hours. If the pH differs by more than ± 0.2 units from the standard buffer, the meter shall be recalibrated.

Record: Date, pH Buffer Target Values, Set Points (S), Actual Readings (S), And Analyst's Initials in a Lab Notebook.

13.4.4 **Thermometers**

The laboratory shall have access to an NBS traceable, factory certified thermometer, graduated in at least 0.2 °C increments, covering the complete range for all analyses for which the lab is certified and shall be calibrated at appropriate points at or near the range for the temperature being measured. After the first year of service and annually thereafter, the certified thermometer should be checked at the ice-point and the correction factors adjusted accordingly.

Record: Date, Ice-Point Reading, Adjustment to Be Made To the Correction Factors, New Correction Factors and Analyst's Initials in a Notebook/Spreadsheet.

The laboratory should have a sufficient number of working thermometers so that each may have a dedicated use. Each working thermometer must be uniquely identified by number and calibrated at the temperature(s) of interest by comparing the readings with those of a NIST or NBS certified thermometer prior to being placed into service and annually thereafter. Metal thermometers or infrared measuring devises shall be verified

quarterly. Mercury in glass thermometers that have separated columns should be removed from service.
Record: Date, Thermometer, Calibration, Temperatures, Correction Factors, and Analyst's Signature in a Notebook/Spreadsheet.

- **Water baths- (Inorganics)- temperature monitoring daily when used , water replaced monthly or as needed. (Organics)- water baths are adjusted by the technician according to the extraction being performed: Hexane - 92°C, Methylene Chloride - 90°C, hydrolysis/ether - 65°C.**

13.4.5 **Refrigerators**
Laboratory refrigerators should maintain a temperature of 1 to 6°C **Refrigerator temperatures should be checked each day prior to use**. Temperature readings are to be taken using a dedicated and calibrated thermometer, having its bulb immersed in a liquid and kept in the refrigerator. The thermometer should have graduations of no greater than 1 degree centigrade.
Record: Date, Times, Temperature Readings and Analyst's Initials in a Lab Notebook.

13.4.6 **Ovens**
Ovens used for drying and/or sterilization should be maintained at the target temperature of interest during use. **Oven temperatures should be checked each day prior to use.** Temperatures should be measured using a calibrated dedicated thermometer. The thermometer should have graduations no greater than 1 degree centigrade. If the oven door must be opened to read the thermometer, the thermometer's bulb should be immersed in a sand bath.
Record: Date, Target Temperature, Time And Temperature At The Start And At The End Of The Cycle, Oven Use (e.g. "Dried Total Suspended Solids Nos. ... or Sterilized Pipettes") And Analyst's Initials in a Lab Notebook.

- The oven in the extraction lab has no thermometer, technician records the digital number on the oven.

13.4.7 **Barometer**
Aneroid Barometers should be calibrated with a mercury barometer before initial use and every three months thereafter.
Record: Date, Calibration Readings, Correction Factor And Analyst's Initials in a Notebook.

13.4.8 **Pipets (Eppendorf):** Calibrate at least quarterly, check accuracy with specific gravity (wt.) of water. *Record*: reading and analyst's signature in a bound notebook.

13.4.9 **Glass microliter syringes:** Are to be considered in the same manner as Class A glassware, but must come with a certificate attesting to established accuracy or the accuracy must be initially demonstrated and documented by the lab- Organic Analyst keeps record of syringe accuracy, see SOP 419.

13.5 Traceability of Measurements

13.5.1 Verification and/or validation of equipment, such as balances, thermometers, spectrophotometers shall be performed with NIST traceable standards annually. Calibration certificates must indicate NIST traceability along with measurement results and the associated uncertainty and/or statement of compliance with an identified metrological specification, such as tolerance. Reference standards, such as Class S weights and NIST traceable thermometers, are used for calibration only and shall be calibrated by an organization that can provide traceability to NIST. Volumetric glassware, if not serialized and calibrated by the manufacturer or Class A, is checked quarterly in house using documented gravimetric technique.

13.5.2 Reference standards are of the highest quality, Troemner Class "S" weights, located in the Inorganic Lab, are used for daily calibration of the balances. These weights are calibrated annually by a company that can provide traceability to NIST.

13.5.3 Reference Materials are also traceable to NIST or certified reference materials, by a Certificate of Analysis.

13.5.4 Purchased reference materials come with a Certificate of Analysis, where available, if not, it is verified by analysis and comparison to a certified reference material.

13.5.5 Internal reference materials, such as working standards or intermediate stock solutions, are checked against a second source at first time of use, or a **vendor** certified different lot by the analysis of an Initial Calibration Verification (ICV), or a Laboratory Control Sample (LCS). Working standards and intermediate stock solutions are given expiration dates when prepared based on method or regulatory requirements and used up or disposed of by the expiration date.

14.0 Data Reduction, Validation, & Reporting

The following procedures shall be utilized by American Analytical Laboratories for data reduction, validation, & reporting. See also SOP 119.

14.1 Calculations

All calculations being performed shall be recorded using the International System of Units (IS). All chemical results for liquids shall be expressed in milligrams per liter (mg/L) for inorganics, micrograms per liter (ug/L) for organics, all results for solids;sediments; and non-aqueous matrices shall be reported on a wt. per wt. basis, milligrams per kilogram (mg/kg) for inorganics, micrograms per kilogram (ug/kg) for organics. If the concentrations are generally less than 0.1 mg/L it may be more convenient to report results in micrograms per liter (ug/L). Conversely, all results greater than 10,000 mg/L should be expressed in percent (ex. 1% equals 10,000 mg/L when the specific gravity is 1.00).

All analytical results will be reported with regard to the proper **significant figures.** Generally a minimum of two significant figures is required for organics and three significant figures for inorganics. EPA rounding rules will also be used in reporting results, whereby the number preceeding a five after the decimal place will be rounded up if it is an odd number, and down if it is an even number; for example: 1.35 mg/L becomes 1.4 mg/L, and 1.45 mg/L becomes 1.4 mg/L. All digits of a reported result are expected to be known definitely, with the exception of the last digit, for which there may be a degree of uncertainty. Report only the number of digits which are justified by the accuracy (i.e. detection limits) of the test and instrument being utilized.

14.2 Data Reduction/Review

Data reduction is the process of converting raw data to a usable format beginning with data processing and continuing through data review and reporting of results. Data reduction can be performed by the analyst who obtained the data or by another designated analyst. **Data review** is done by the laboratory manager who verifies that data reduction has been properly performed and that all forms and log books have been completely and accurately compiled. Data shall generally be reduced in the following ways:

- The department manager will assign the work of the dept. to the individual analyst and will review the data to see that the project requirements are met.

- Manual calculation of results if necessary is done directly onto the data sheet/quantitation report, or in the lab notebook

    - Manual integration procedures must be followed when integrating peaks during data reduction, see SOP112.

- Direct acquisition and processing of raw data is done by the computer gathering system – Omega/LIMS

- It is the responsibility of the analyst/Dept. Mgr. to check his/her data for errors prior to submission to the Lab Director.

- If the sample does not meet the requirements of the method, the department manager must inform the Lab Director and both must review the non-conforming item to determine its effect on the sample results. The dept. manager must correct the discrepancy and the lab director must document the appropriate corrective action in a case narrative or have the sample re-extracted/re-analyzed.

14.2.1 Data Reduction: Final Data Packages

Raw instrument data from all sources shall be reduced to a final data package or report for a given sample by the following steps:

- Generate data for a sample using specific analytical instruments or methods. Analysts perform data reduction for each individual analyte tested to produce the final results.

- Raw data is imported from the instruments into the Omega/LIMS for organics and metals, then calculated using the imported prepfactors, dilutions…and a final result is reviewed and a QA check is done by the dept manager.
  Inorganics– results are manually entered into Omega/LIMS. Results are reviewed by the dept. manager and a QA check is done to finalize results for reporting. Inorganic

raw data is kept in lab notebooks/files, organic and metals raw data is imported into Omega-LIMS with the associated workorder to be reviewed by the Lab Director.

- In Omega/LIMS, test codes provide the required concentration units and other information required to obtain final analytical results.

- Results for all areas (organics, inorganics, wet chemistry) are compiled into an organized report form. Review of the final report and supporting documentation (COC) is done by the Lab Director after which, the report is signed off. Reports are then either emailed or hard copy mailed to the client. There is a QC review of 10% of all data packages.

- Test results derived from any sample that did not meet sample acceptance criteria such as holding time, temperature, or improper container shall be written up in the Sample Receipt Checklist or in a case narrative and included with the final report. Any deviations from the test method that may have affected the quality of results shall also be explained in the final report.

- When required by project regulations or results did not meet acceptance criteria, results will be reported with defined data qualifers.

14.2.2 **Data Control**

- After issuance of the final report, that report shall remain unchanged. Amendments to the report shall be approved by the Laboratory Director, the **report version** shall indicate that the report was changed: revised/updated or if additional information was requested and added, a supplemental report is issued.

    - All raw data will be in a linked file with the workorder as well as the report (pdf file) available for inspection. Client folders will also be filed by client name containing any other documents pertaining to the data package. These records will be retained for a period of at least 5 years, at the request of the client this time frame may be extended. See also Section 21 – Record Keeping
    - Records that are stored or generated by computers can have a hard copy as well as backup pdf copies. In Organics – GC/MS and GC computers backup data.

- To ensure that data are protected from inadvertent changes or unintentional destruction, the laboratory is protected for integrity of data processing/validation by password.

14.3 Data Validation

Data validation involves the ability of the laboratory procedures and methods to withstand external scrutiny. Data must be defensible in regard to precision and accuracy. Documentation must be maintained verifying the accuracy of testing procedures, instrument calibrations, and sample preparation, through appropriate use of QC samples. In order to validate individual samples they must be tracked from sampling through laboratory receipt, through analytical testing, to the final disposition of the sample and analytical results. This information will be maintained through sample logs, chain of custody forms, daily logs, and laboratory notebooks.

14.3.1 Data Validation Criteria

Criteria for validating chemical analyses shall be developed. The criteria should include, but not be limited to, the following items:

- holding times
- sample representatives
- instrument tuning/maintenance
- calibration
- method blanks/reagent blanks
- precision/accuracy
- percent surrogate recovery
- matrix spike/matrix spike duplicates
- internal standards
- dilution analysis
- graphs and chromatograms

It is the responsibility of the laboratory section manager to assure the validity of all laboratory procedures and to ensure the accuracy of all results reported from their laboratory section.

14.4 **Data Reporting Format/Reporting Analytical Results**

All laboratory raw data for a given sample must be traceable and trackable throughout all laboratory testing. The laboratory record keeping system/report of laboratory analysis must include all of the following information:

- **Title**
- **Name and address of laboratory, phone no./contact person**
- **Unique ID of report on each page, including the total number of pages**
- **Name and address of client**
- unique sample number
- analysis required
- sampling location/project name
- sample description/client ID
- date/time of sample collection
- name of sample collector
- date/time received by laboratory
- method of analysis
- date of analysis, **time of analysis if required holding time is ≤ 72hrs.**
- raw analytical data when requested or on file
- results/reporting units on dry wt. basis
- defined data qualifiers
- **Signature and title of person accepting responsibility of report; date of issue**
- **Clear indication of data provided by outside sources; subcontracted lab's report is included in our report.**

- **All test results are faxed/emailed to comply with the requirements of the TNI Std, with hard copy to follow when requested. The lab's Omega/LIMS also provides an EDD spreadsheet of the results.**

If errors are detected in the report, a subsequent revised report will be issued. The updated report will be identified as a revision, new report version number, with signature, date of issue and reason for revision stated in the comments section of the workorder in Omega-LIMS. Additional report data/information requested such as, narrative or QC Summary, will be issued as a Supplement to Workorder, with signature and date of issue.

If the laboratory discovers equipment used to derive results in any report casts doubts on the validity of the result it shall notify the client(s) in writing.

The test results could be expressed in terms of measurement uncertainty, if requested. To take into account all components of variability, the standard deviation (SD) from the LCS control chart will be used. To express a result for a 95% confidence interval, use two times the SD, for a 99% confidence interval, use three times the SD. The confidence interval for suspended solids will be taken from the duplicate control chart , the working (95%) or upper (99%) control limit. The sample result could be reported: result ± 2x SD (95% confidence interval).

15.0 Internal Quality Control And Quality Assurance Procedures

15.1 Precision, Accuracy and Consistency are achieved through:

- proper operation of instruments as per manufacturer/method used
- selection and use of reagents and stds of appropriate quality
- monitor & control environmental conditions – temp, proximity to contaminants
- glassware cleaning to level required by analysis as shown in method blank
- following SOPs, assess deviations, treat data appropriately
- Precision- repeatability of lab results, shown through sample duplicate runs
- Accuracy of test method – use continuing calibrations, certified reference stds, PT samples
- Method Validation/ Capablility - establish LOD, LOQ, linear range
- Data Reduction – select appropriate method to reduce raw data to final results, i.e. regression, manual integration
- periodic review of data reduction processes to assure applicability

15.2 QC Requirements

An internal quality control (QC) system is a set of routine internal procedures for assuring that the data generated by a measurement system meets prescribed acceptance criteria. These acceptance limits are usually related to data precision, accuracy and completeness. Inherent and implied in this control function is a parallel objective of measuring and defining the quality of the data generated. The procedures associated with this objective are designed to provide a quantitative assessment of data quality again in terms of precision, accuracy and completeness. An additional objective of an internal QC system is to assess the impact of the sample matrix on the data being generated.

The control function is accomplished through laboratory performance QC. The daily laboratory performance QC is comprised of:

- Method and Reagent Blanks
- Calibration Verification Samples (ICV, CCV)
- Laboratory Control Samples (LCS)
- GC/MS tuning criteria (where applicable), surrogate spikes

The information obtained from these activities is used to assess daily laboratory performance. Each department will empirically establish their own laboratory's performance.

The effect of sample matrix on data quality is addressed through matrix-spike QC. Matrix-spike QC is based on the use of an actual environmental sample for precision and accuracy determinations and relies on the analysis of matrix spikes and matrix spike duplicates (MS/MSD) or sample duplicates. In addition, surrogate recoveries are used to monitor the effect of sample matrix on analytical data for organic compounds.

Control charts may be used to monitor the systems performance over time and to compare daily results against the Lab's established QC Acceptance Criteria (limits).

15.2.1 Frequency of Running Control Samples

Laboratory QC samples (LCS/LCSD), or Matrix Spike/Matrix Spike Duplicate or sample duplicates and surrogate samples will be run with every analytical batch. A batch is considered to be a group of twenty samples or less which behave similarly with respect to the method. An analytical procedure may specify an analytical batch (20 samples). Volatiles run QC samples with every 12 hour sequence.

15.2.2 Control Charts, Construction & Use

Control Charts are devices/tools of Statistical Process Control that provides a visual picture of the performance of a process. Typically in a laboratory setting, the process of primary concern is the analytical method and the sub-process associated with the method is the measurement, that is the instrumentation. The results on appropriate QC samples and as shown on the control charts provide the process capability profiles for the analytical methods. In any process there are two kinds of variables that can affect the output. These are commonly referred to as - determinate and indeterminate effects. A determinate effect is usually associated with a bias while the indeterminate effects are those inputs that occur randomly and are "normally" present as a natural part of the process. The combination of the two effects represent what is customarily associated with the variation of the process. If a process is capable and in-control then it is usually assumed that only indeterminate variations are operating.

A comparison of the result obtained on the respective QC samples against the accepted performance standard or specification allows American Analytical Laboratories to determine if their analytical processes are:

- Centered, and meeting the capability requirements of the methods
- Stable and consistent over time.
- Capability is determined by empirically establishing the performance of the method for a given laboratory. Acceptable capability is judged against available performance standards established by the EPA and against the performance achievements of other laboratories.

Stability and consistency can be monitored by the use of the control charts.

15.2.2.1 **Steps in Constructing Control Charts/Limits:**

The steps in establishing and constructing control charts are as follows:

- Determine and obtain the appropriate QC samples that will be used to monitor the process.

- Obtain typically, twenty (20) data points by measuring the analyte concentration in the QC samples by the analytical method. Generally, the results on the QC samples are expressed as % Recovery.

- Calculate the average (Xavg.) and standard deviation (SD) of the measurements.

- Calculate the upper and lower **control limits** for the process.

The upper and lower control limits for the analytical processes will be taken to +/- 3(SD). The upper and lower warning limits will be taken to ± 2(SD). These limits are consistent with the EPA guidelines and represent the region in which 99.9% of the QC results are expected to be found if the method is in control.

- Construct a control chart by drawing a center line at the concentration given by Xavg. and an upper and lower control limit lines at the concentration levels given by Xavg. ±3(SD), upper and lower warning limits at the concentration level given by Xavg.± 2(SD). Plot the twenty points on the chart and examine for any unfavorable trends (see 8.2.2.2, below).

- Continue to collect and plot data points until it is determined that sufficient time has passed to have encountered all of the indeterminate events. Generally, three (3) months is sufficient.

- Recalculate Xavg. , o, (Xavg. ± 3SD) and (Xavg. ± 2SD). Reconstruct the control chart.

The Control Chart can now be used to monitor the on-going capability of the analytical method.

- **Control Charts** can be constructed (when needed) for the performance monitoring of all analytes of concern in the environmental decision process. QC spike recovery limits are calculated using the lab's Omega/LIMS:Option:Control Charting category, for LCS, MS/MSD, and surrogates. A record of the control charts is kept on file by the QA Manager.

15.2.2.2 Evaluating Trends and Corrective Action

From time to time, results will fall out of the acceptable control limits and corrective action will have to be taken. Periodically certain patterns will be observed that will indicate that the process is changing and is "out of control". It should be noted that an "out of control" situation is not necessarily unfavorable: the change could be in a direction of improved capability.

The following describes when a process is changing and is considered to be "out of control":

- When one value or plot is outside of the control limits
- When seven values in a row plot above or below the center line on the control chart
- When ten out of eleven successive values are either all above or below the center line
- When seven or more successive values are near either the upper or lower control limit

Control charts help to find defects in the process and should flag those situations where some form of corrective action is required. The specific corrective action will depend on a number of factors and should be carried out with input from the laboratory supervisor.

15.2.3 **Laboratory Quality Control Samples**

15.2.3.1 **Blanks**

Method Blanks Method blanks are analyzed to assess the level of background contamination which may exist in the analytical system and which might lead to the reporting of elevated concentrations or false positive data. A method blank consists of reagents specific to the methods which are processed through all aspects of the procedure including preparation, sample clean up and analysis, are evaluated in conjunction with other QC information to determine the acceptability of the data generated for that batch of samples. One method blank for each group of up to 20 samples, or per 12 hour sequence, is prepared at the same time as sample preparation and by the same procedures. The method blank may be analyzed after the calibration verification standard to ensure that there is no carryover from the standard.

Ideally, the concentration of target analytes in the blank should be well below the reporting limit for that analyte. In practice, however, some common laboratory solvents and metals are difficult to eliminate to the parts-per-billion levels commonly reported in environmental analyses. As a result, criteria for determining blank acceptability must be based on consideration of the analytical methods used, analytes reported, reporting limits and regulatory limits. *American Analytical Laboratories has adopted the EPA recommended criteria for determining blank concentration levels (SW-846, Chapter 1, November, 1990 and using Methods 6010, 8000).*

Metals Analysis Method/Cal. Blanks: **Following Method 6010, 7470/7471**, analyze one method/cal. blank per batch of up to 20 samples and a continuing cal. blank at the end of sample run, the concentration of target analytes in the blank must be no greater than three times the Instrument Detection Limit or less than 10% of the action level or less than 10% of the lowest sample result for each analyte, whichever is greater. If not, repeat the analysis twice and average the results, if blank is still outside the limits, take corrective action to identify the source of the contamination, recalibrate and reanalyze the previous 10 samples.

Organic Analysis Method Blanks: **Following Method 8000**, analyze one method blank per 12 hour shift or with each batch of up to 20 samples, the concentration of target analytes in the blank must be no greater than two times the Method Detection Limit or five times the MDL for common lab contaminants (ie. acetone, methylene chloride, phthalates), or less than 5% of the regulatory limit or less than 5% of the sample result, whichever is greater. If not, then lab shall take corrective action to locate and reduce the source of contamination and reextract and reanalyze all associated samples.

15.2.3.2 **Calibration Verification Criteria**

Organic Analysis: Instruments are calibrated by analyzing calibration standards and a blank as per the EPA method. At the beginning of each 12 hr. sequence, before samples are analyzed , operation of the GC/MS must be verified by tuning to compliance, BFB; for Volatile Organics, and DFTPP; for Semivolatile Organics. *All QC acceptance criteria used is taken from the appropriate Organic EPA Methods (8260,8270,8081,8082,8151).*The response for any analyte in the Initial Calibration Verification Standard must agree within the requirements of the response for that analyte calculated from the calibration curve as per method criteria. If this criterion is not met, a new calibration curve must be prepared for that analyte before sample analysis can begin. In addition, the response for the continuing Calibration Verification Standard for GC and GC/MS must also agree within the limits of the response set for that analyte in the analytical method. If this criterion is not met, the system is judged to be out of control, and the problem must be identified and corrected. Any GC samples analyzed since the last in-control standard must be re-analyzed. For GC, CCV's must be analyzed every 12 hours and QC criteria met before analyzing samples. For GC/MS, use the response factor criteria listed in the EPA methods to check the validity of the initial calibration every 12 hours and QC criteria must also be met before analyzing samples.

Metals Analysis: Instruments must be calibrated daily or once every 24 hours according to manufacturer's instructions and following the procedures specified in the Method SOP's. *The QC acceptance criteria is taken from EPA Methods 6010,7470/7471*. Results for the calibration verification standard (ICV) must agree within +/- 10% of the true value. If this criterion is not met, the instrument must be re-calibrated and the ICV must be re-analyzed before sample analysis can begin. The results obtained from continuing calibration verification standard (CCV), run after every 10 samples and at the end of the run, must agree within +/- 10% of the true value. If this criterion is not met, the instrument must be re-calibrated and the verification standards must be re-analyzed. In addition, all samples analyzed since the last in-control standard must be re-analyzed. Verify the interelement and background correction factors at the beginning of the analytical run by analyzing an interference check standard. Results shall be within ± 20% of the true value.

All Standards used in Chemical Testing: Initial Calibration Verification(ICV) standards and QC check standards shall be obtained or prepared from lots of materials different from those used to prepare the calibration standards.

15.2.4 **Matrix Spikes and Matrix Spike Duplicates**

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are two aliquots of the same environmental sample to which known amounts of analytes have been added and are subjected to the entire analytical procedure.
The results of the MS/MSD analysis are used to evaluate the effect of the sample matrix and the method on the accuracy and precision (reproducibility) of the analysis. The analysis of at least one matrix spike and one duplicate unspiked sample or one matrix spike/matrix spike duplicate pair with each batch of up to 20 samples is required. The results, expressed as % Recovery and Relative Percent Difference (RPD), are calculated as follows:

$$\% \text{ Recovery} = \frac{Cs-Cu}{Cn} * 100$$

Where:

Cs = measured concentration of spiked sample
Cu = measured concentration of unspiked sample (use 0 for LCS)
Cn = actual concentration of spike

The Matrix Spike results are evaluated relative to the control limits either stated in the analytical method or calculated in-house limits. Method 6010 for Metals, % Recovery is to be within 80-120% of the actual value. Method 8000 for Organics, % Recovery is to be within 70-130% of the actual value, or within in-house control limits determined from historical data. If matrix spike sample recoveries are found to be outside control limits, the samples will be flagged/qualified in the QC Summary Report.
Precision is estimated from the relative percent difference (RPD) of the concentrations measured for the MS/MSD pairs and calculated as:

$$RPD = \frac{C1-C2}{\left(\frac{C1+C2}{2}\right)} * 100$$

The RPD = the difference between samples 1 & 2, divided by the average, times 100
Where:

C1 = measured concentration of the first sample
C2 = measured concentration of the second sample
A control limit of ± 20% RPD is used in all SW-846 Methods.

15.2.5 **Organic Surrogate Recoveries**

Surrogates are organic compounds which are similar to the analytes of interest in chemical behavior but which are not normally found in environmental samples. Surrogates are added to samples to monitor the effect of the matrix on the accuracy of the organic analysis. Results are reported in terms of percent recovery and calculated by dividing the concentration found by the concentration added times 100. *If surrogate recoveries fall outside the in-house limits determined in the laboratory, the following procedures are necessary:* 1. Check to be sure there are no errors found in the calculations, surrogate solutions or internal standards. 2. Check instrument performance, correct if necessary and reanalyze the extract/sample. 3. On diluted samples where recoveries are not within limits, use results of undiluted sample to show that the recoveries were within QC limits if there is no matrix interference. 4. If no instrument problem has been found and recoveries are outside the limits, the sample should be re-extracted and re-analyzed. 5. If after re-analysis the recovery is still not within limits, report the data with a qualifier. If recovery is within limits in the re-analysis, report this data.

15.2.6 **Laboratory Control Samples (LCS)**

A Laboratory Control Sample shall be included with each analytical batch, not to exceed 20 samples, or one LCS per 12 hour shift/sequence. It consists of an aliquot of a clean matrix similar to the sample matrix and of the same weight or volume. The LCS is spiked with the same analytes of known concentration as the matrix spike for the purpose of determining precision or bias measurements. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix. *Use spike recoveries as stated in the specific EPA Method or the calculated in-house limits (3 standard deviations from mean) as the QC limits for the LCS. Exceptions for LCS analysis would be for those analytes where no spiking solution is available, such as TSS, TDS, TVS, TS,Total Solids, pH, Turbidity.*

15.2.6.1 **Evaluation criteria and Corrective Actions**

An LCS that is determined to be within the acceptance criteria establishes that the analytical system is in control and validates system performance for the samples in the associated batch.

Any matrix spike, surrogate or LCS results that fall outside of the control limits require evaluation by the laboratory. Compare results from samples or spikes with the LCS. If recoveries of analytes in the LCS are outside of the control limits, then the problem may lie with the extraction and/or cleanup procedures applied to the sample matrix, or with the chromatographic procedures. Once the problem has been identified, corrective action includes correcting any instrument problem found and then the re-analysis of the samples, or the re-extraction and analysis of new sample aliquots, including new matrix spike samples and LCS. In the case of a sample matrix interference for MS/MSD analysis the data would be reported with the appropriate data qualifier.

If a large number of analytes are in the LCS, it becomes statistically likely that a few will be outside control limits. This may not indicate that the system is out of control, therefore corrective action may not be necessary. Upper and lower marginal exceedance (ME) limits can be established to determine when corrective action is necessary. A ME is defined as being beyond the LCS control limit of 3 standard deviations (SD), but within the ME limits. ME limits are between 3 and 4 SD around the mean.

The number of allowable marginal exceedances is based on the number of analytes in the LCS. If more analytes exceed the LCS control limits than is allowed, or if any one analyte exceeds the ME limits, the LCS fails and corrective action is necessary. This ME approach is relevant for methods with long lists of analytes. It will not apply to target analyte lists with fewer than 11 analytes.

The number of allowable ME's is as follows:

1.0 >90 analytes in LCS, 5 analytes allowed in ME of LCS control limit
2.0 71-90 analytes in LCS, 4 analytes allowed in ME of LCS control limit
3.0 51-70 analytes in LCS, 3 analytes allowed in ME of LCS control limit
4.0 31-50 analytes in LCS, 2 analytes allowed in ME of LCS control limit
5.0 11-30 analytes in LCS, 1 analyte allowed in ME of LCS control limit
6.0 <11 analytes in LCS, no analytes allowed in ME of LCS control limit

If the same analyte exceeds the LCS control limits consecutively, it is an indication of a systemic problem. The source of the problem/error shall be located and corrective action taken. Analysts monitor acceptance criteria of the LCS from each analytical batch and report any analytes outside the acceptance limits by using the Corrective Action Report (CAR) in Omega LIMS. Generally, the number of analytes in the LCS is under 30 which would allow 0-1 ME, AAL goal is to have no LCS analytes outside QC limits and no Marginal Exceedances. Only Volatile and Semi-Volatile LCS analyte lists are large enough to warrant ME limits, these have been calculated and are on file with the QA Manager or appropriate SOP.

15.3 Method Detection Limit Determination

Generally, a measured value becomes acceptable when it is larger than the uncertainty associated with the measurement. The reporting of a result will be influenced by many factors and must be corrected for when determining the detection limit. These factors include:

- Instrument detection limits- This is the smallest signal above background noise that an instrument can detect reliably. These detection limits are instrument/matrix specific.
- Sample Matrix-The effect of sample matrix will be reflected in the method detection limit for that matrix.
- Sample Dilution-The effect of sample dilution determines the limit of detection in a complex matrix where it is impossible due to interference to analyze the sample to given protocols.
- Sample Interferences- Correction must be made for any spectral interferences.
- Data objectives-The use of the data which has to be reported influences the limit of detection reported.

All of these factors must be accounted for when **MDLs** are generated. Thus MDLs will be generated for specific analytical methods (**600 series- 608,624,625**), matrices, and data objectives. At a minimum MDLs will be generated and documented upon adoption of a method, and **once a year** for all analytes of applicable methods. Also the frequency of MDLs generated has been set forth as whenever a change has been made to an instrument or methodology, MDLs will be re-generated.

The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
For operational purposes, when it is necessary to determine the MDL in the matrix, the MDL shall be determined by multiplying the appropriate one-sided 99% t-statistic by the standard deviation obtained from a minimum of three to five times the estimated MDL, where the t-statistic is obtained from standard references or the table below.

No. of samples	t-statistic
7	3.143
8	2.998
9	2.9896
10	2.821

Estimate the MDL as follows:

It is essential that all sample processing steps of the analytical method be included in the determination of the method detection limit.

Obtain the concentration value that corresponds to:

a) an instrument signal/noise ratio within the range of 2.5 or 5.0, or

b) the region of the standard curve where there is a significant change in sensitivity (i.e., a break in the slope of the standard curve).

This concentration is then spiked into the specific matrix the MDL is to be determined. A minimum of seven aliquots each is processed through the entire analytical method. Make all computations according to the defined method with final results in the method reporting units. If a blank measurement is required to calculate the measured level of analyte, obtain a separate blank measurement for each sample aliquot analyzed. The average blank measurement is subtracted from the respective sample measurements.
Determine the variance (S^2) for each analyte as follows:

$$S^2 = {}^1/_{n-1} \left[{}^{n}{}_{i=1} (x_1 - x)^2 \right]$$

where x_i = the mean measurement of the variable x and x = the average value of x,

$$x = {}^1/_n \; {}^{n}{}_{i=1} x_1$$

Determine the standard deviation (s) for each analyte as follows:

$$s = (S^2)^{1/2}$$

Determine the MDL for each analyte as follows:

MDL = t (n-1, a=.99)(s)

where t (n-1, a=.99) is the one sided t-statistic appropriate for the number of samples used to determine (s), at the 99 percent level.
It is quite possible that an inflated MDL will be calculated from data obtained at many times the real MDL even though the level of analyte is less than five times the calculated method detection limit. To ensure that the estimate of the method detection limit is a good estimate, it is necessary to determine that a lower concentration of analyte will not result in a significantly lower method detection limit.

REPORTING

The analytical method used must be specifically identified by number and title and the MDL for each analyte expressed in the appropriate method reporting units. If the analytical method permits options which affect the method detection limit, these conditions must be specified with the MDL value. The sample matrix used to determine the MDL must also be identified with the MDL/reporting value.

15.4 Limit of Detection (LOD)

For all other but the 600 series organic methods, the laboratory shall determine the LOD for the method for each target analyte of concern in the quality system matrices. All sample-processing steps of the analytical method shall be included in the determination of the LOD. The validity of the LOD shall be confirmed by qualitative indentification of the analyte(s) in a QC sample in each quality system matrix containing the analyte at no more than 2-3 times the LOD for single analyte tests and 1-4 times the LOD for multiple analyte tests. This verification must be done on every instrument that is to be used for analysis of samples and reporting of data. An LOD study is not required for any component for which spiking solutions or QC samples are not available, such as temperature, or when test results are not to be reported to the LOD. Where an LOD study is not performed, the laboratory may not report a value below the Limit of Quantitation.

15.5 Limit of Quantitation (LOQ)

The laboratory shall determine the LOQ for each analyte of concern according to a defined, documented procedure. The LOQ study is not required for any analyte for which spiking solutions or QC samples are not available, such as pH. The validity of the LOQ shall be confirmed by successful analysis of a QC sample containing the analytes of concern in each quality system matrix 1-2 times the claimed LOQ. A successful analysis is one where the recovery of each analyte is within the established test method acceptance criteria or client data objectives for accuracy. The LOQ is the low point of the calibration curve when adjusted for sample preparation factors, and the LOQ is always greater than the LOD.

16.0 Audits

This section provides a description of the activities associated with the conducting of Internal, External, System and Performance Audits. Audits provide management with an assessment of the management system, identifying areas where improvement in the management/quality system will increase the reliability of the data.

The Internal Audit is an annual review, done by the QA Manager, of laboratory operations to verify compliance with the management/quality system – including analytical methods, SOPs, the Quality Manual, ethics/data integrity, and the **TNI Standard.** This is done in portions throughout the year.

The System Audit reviews the management system through the annual Management Review, done by the QA Manager, see Section 19.

The External Audit is done by the accrediting body bi-annually, management ensures that all areas of the lab are accessible to auditors and appropriate personnel are available to assist in conducting the audit.

A Performance Audit verifies the ability of the analyst/method to correctly identify and quantify analytes in Performance Evaluation/Proficiency Testing Samples. As part of the Internal Audit, the QA Manager reviews past PT performance and any corrective action procedures that followed due to unsatisfactory results.

16.1 Internal Audit – See Appendix V for report form checklist

An Internal Audit is an on-site qualitative review of the operating procedures involved in all components of field and lab management/quality system. They determine if the systems are being used appropriately. The audit provides an evaluation of the adequacy of the overall management/quality system to provide data of known quality which are sufficient to meet the objectives of the QA program and involve a comparison of activities in the QA Plan with those actually performed.

The Internal Audit also consists of observations and documentation of all aspects of the sampling, data generation/reporting processes and data integrity. In addition to evaluating analytical procedures and techniques, the Audit will emphasize review of all record keeping and data handling systems. The record keeping will include, but not necessarily be restricted to, the following:

- Calibration documentation for both instruments and apparatus
- Completeness of data forms
- Data review and validation procedures
- Data archival procedures
- Sample log-in procedures
- Quality control documentation
- Preventative/instrument maintenance documentation
- Corrective action reports

16.1.1 Audit Guidance

The following guidance describes some of the characteristics that will be looked for when the QA Officer performs the Internal Audit to ensure that the laboratory activities are being performed in accordance with the QAP and the SOPs. Any discovery found during the course of the Audit (unless otherwise noted) will be brought to the attention by documented internal correspondence to the Laboratory Director and Organic and Inorganic Managers to discuss appropriate correction action.

Checklist Items for: See Appendix V
Annual Internal Audit Report:

1. Review of Log Books: Each logbook will be examined for legibility, completeness and to determine if any deviation from standard practices have been noted in the comment column, where appropriate. Lab managers are expected to review the log books. Deviations from acceptance limits, where applicable, will be noted by the QA Auditor.

2. Expiration Dates of Standards: The expiration date on all bottles (vials, etc.) containing primary, secondary, stock and working standards will be examined by the QA Auditor. Labels on the standard are expected to be legible and complete. Any standard found expired will be noted and brought to the immediate attention of the and Laboratory Manager.

3. Sample Receiving Procedures: Login, date/time, Sample Acceptance Checklist

4. Refrigerators/Ovens: A logbook of refrig/oven temp will be kept daily.

5. TCLP Extractor: The TCLP extractor will be checked that the rotation rate has been verified annually, a logbook of extraction fluid prep and pH will be kept.

6. Lab Hygiene and Safety: All lab areas will be examined for general hygiene and safety. All analysts and people in the laboratory are expected to be wearing safety glasses. Samples shall be stored in their proper place. Any situations of uncleanliness will be noted by the QA Auditor and brought to the immediate attention of the Laboratory Director.

7. SOP/Method Review: SOP's shall be reviewed annually, revisions shall be documented and new SOP's distributed with changes.

8. Measurement Traceability & Calibration: Lab balances logbook checked, volumetric pipets checked for accuracy quarterly recorded in log book.

9. Chemical Storage: All chemical and reagent storage space will be examined to ensure that the solvents, solutions, and reagents are being stored in their proper container, are in storage cabinets approved for the storage of materials, and any secondary containment is in its place. Any deviations will be noted by the QA Auditor. Meets Safety Regs/Flammables are separate

10. Glassware Cleaning: Glassware shall be cleaned to meet the sensitivity of the test method, any changes are to be documented in the lab records/SOP's. For metals analysis, in accordance with SW-846 Sample Prep. (3000)Methods, glassware shall be prewashed with detergent, acid washed in 10% HNO3/10% HCL and rinsed with DI water prior to use. For organic analysis, glassware shall be cleaned with a detergent cleaner (Citranox), rinsed with DI water and air dried prior to use.

11. Training Records: The training records of laboratory staff will be examined and updated by the QA Manager to ensure that all the records are complete and consistent with the assigned responsibilities of the given analyst. Technicians performing certain analysis will have a signed statement in their training files that they have been trained in the analytical method being used (**Demonstration of Capability**) and have read the latest revision of the method SOP as well as the QA Manual. A signed statement from each employee, that they have read, acknowledged and understood their personal ethical responsibilities as stated in SOP 113 on ethics and data integrity, will be kept in their training files.

12. Review results/corrective actions from PT's, last NYDOH inspection: include comments in annual management review.

13. Review Testing Activities: Test Results – any audit finding that casts doubt on the validity of test results, the lab shall take timely corrective action, and should notify clients promptly if after investigating it shows that the lab results may have been affected. Notify clients after resolution of the problem with an updated/revised test report. Record audit findings/corrective actions. Follow-up audit activities shall verify and record implementation and effectiveness of the corrective action taken.

14. Review any data integrity issues/policies

16.2 System Audit – see Section 19.5 Management Review

Annually the QA Manager Audits the laborory's management system using the topics covered in the Management Review.

16.3 <u>Performance Audits/PT Samples</u>

The performance audit represents a quantitative assessment of the measurement of data quality. It provides a direct, point-in-time evaluation of the accuracy of the various measurement systems and procedures. This will be accomplished by challenging each system with a certified QC reference standard for the analyte(s) of interest or by using Performance Evaluation/Testing (PT) Samples.

Performance evaluation/testing (PT) samples are submitted to each operational area of the laboratory on a scheduled basis by the facility's QA Officer. Performance Evaluation samples are to be obtained from a third party vendor of certified samples. **PT samples are submitted to American Analytical Labs on a routine basis, at least 5 but no more than 7 months apart, by an outside regulatory agency, NY State Dept. of Health-ELAP, which certifies the lab for various analytes and evaluates the quality of data produced. The laboratory does not share PT samples or results with other laboratories , and samples are treated as typical samples in the production process, including same analysts, preparation, calibration, and QC criteria. If the PT sample falls below the range of the routine method, consult with the Department Manager on how to proceed. AAL has not encountered this, our methods have all been able to meet the required PT reporting limits.**

The precision and accuracy of the data generated are evaluated against the certified concentration values of the analytes and the prescribed QC performance limits. An evaluation report is issued to the Laboratory Director by the regulatory agency involved in certification and kept on file.

The results of the evaluation are subsequently reviewed with the participating areas of the laboratory, the Laboratory Director and the QA Officer. The **Corrective Action Process** (see Section 18) can also be initiated as the result of Performance Evaluation Audits where needed. **Corrective action PT samples must be 15 days apart from the analysis/completion date.**

The QA Officer is responsible for submitting these PT samples, a record of on-line submission is retained in a file, along with the resulting evaluation reports.

16.4 Audit Reporting, Review and Remediation

Internal or external audit findings are responded to within the time frame agreed to at the time of the audit. The response may include action plans that could not be completed within the response time frame. A completion date is established by management for each action item an included in the response.

Subsequent to any Audit the QA Officer will discuss any findings with the appropriate Laboratory Section Managers to ensure implementation of the corrective action steps (see Section 18) and to establish a corresponding timetable for remediation.

A formal Audit Report will be reviewed by the QA Officer and the Laboratory Director. A report that details the findings of the Internal and Performance audits is documented in the Management Review.

Audit findings that cast doubt on the effective of the laboratory operation to produce data of known and documented quality or question the validity of sample results must be investigated. Corrective action must be followed. Clients must be notified in writing if the investigation shows the laboratory results have been negatively affected and the client requirements have not been met. The client must be notified within 24-48 hours after the laboratory discovers the issue, after which a

time frame will be decided upon for corrective action; reanalysis; report revisions. All investigations that result in findings of inappropriate activity will be documented as stated in the Data Integrity procedures in Section 22.

17.0 Preventive Instrument Maintenance

A Preventive Maintenance schedule must be planned and kept current with respect to the type of instrumentation in the laboratory. Separate maintenance logs shall be kept for all **analytical instruments**; i.e. ICP, Hg Analyzer, Lachat, GC,GC/MS logs are kept in Omega/LIMS. See also SOP 106.

17.1 Items To Be Checked

Each instrument should be checked for general wear and tear, with special attention given to consumable parts such as tubing, lamps, filaments, etc. The manufactures literature will also recommend certain routine maintenance steps to be taken. These should be incorporated into the maintenance schedule.

17.2 Frequency and Schedule

The frequency in which the routine maintenance procedures should be conducted will depend on several parameters such as:

1. Instrument Type
2. Amount of Use
3. Type/Quality of Samples

The frequency should be determined after evaluating the performance of the given instrument for a period of time. For example, if the performance criteria is not met, a routine source cleaning may be required.

17.3 Responsibility

The responsibility of maintaining laboratory instruments starts with the individual operating the instrument at any given time. Before an individual starts working, the instrument should be put through a general performance check to determine the working status of the instrument. As problems are detected, they should be addressed immediately and all repairs and alterations to the instrument - regardless of how minor - should be documented in the ***Maintenance Log – in Omega/LIMS*** . The information recorded should contain the following information:

1. Nature of problem or routine maintenance service
2. Date of problem/service
3. Source of problem
4. Date of correction/service
5. Brief description of repair/service
6. Name of Analyst(s)
7. Copies of Service Report if available

17.4 Documentation And Review

All Maintenance Logs shall be reviewed by the QA Officer on a quarterly basis to ensure that the repairs and adjustments to the laboratory's instruments are complete and the instruments are always in a state of readiness. All repairs and adjustments shall be reviewed in depth to ensure that the repair has not altered the instrument sufficiently enough to jeopardize the integrity of the analysis. All major repairs by service technicians which supply service reports shall be kept on file, and recorded in Omega-LIMS with the general maintenance logs.

17.5 Training

A certain amount of training is required prior to an individual performing accurate analysis on any instrument. The amount of training is dependent on the individuals background and education. However, all laboratory personnel must be able to demonstrate the ability to run analyses accurately. A record of this employee evaluation should be kept on file for future reference (**Demonstration of Capability Statement**).

17.6 Contingency Plans For Down Time Minimization

All laboratories must be prepared for instrument down time, and alternate analytical options must be available, which is the foundation to any good contingency plan. In the event that a mechanical failure occurs which will result in prolonged down time, contingency plans must be implemented.

17.6.1 Alternative Laboratories

All laboratories should make arrangements with other labs to run samples in the event of instrument down time.

17.6.2 Alternative Methods

All Laboratories should have alternative methods available. Should the method of choice not be available, it becomes the Laboratory Director's decision to determine if the alternative method should be used or if the sample should be sent to another laboratory.

18.0 Corrective Action Policy/Procedures- see also SOP 107

Corrective action is a process of identifying, investigating, approving, implementing and validating measures to counter unacceptable departures from policies and procedures or out-of-control QC performance which can affect data quality. The laboratory uses the Corrective Action Report Form in it's Omega/LIMS to document corrective actions, see also SOP 107. Deficiencies cited in external assessments, internal audits, data reviews, customer complaints, managerial reviews are documented and require corrective action.

Deficiencies cited in the external assessment (ELAP inspection), internal quality audits, complaints, and managerial reviews are documented and responses are reported and reviewed by appropriate Managers: the Technical/Laboratory Director and/or QAO. Records(Corrective Action Reports, CAR) in the Laboratory Database-Omega-LIMS shall be available to show that the Root Cause(s) of the deficiencies are investigated by the QAO/Dept Manager/Analyst , and the results of the investigation recorded. Records(CAR) shall be available to document the intended corrective action, to show that the implemented corrective action is monitored for effectiveness. The QAO reviews/maintains these records. The Technical/Laboratory Director will ensure that the corrective actions are discharged within the agreed upon time frame. When non-conformances and departures from SOP's cause doubt about the lab's operations, affected areas are promptly audited. Where there may be non-systematic errors, such as initial cause is readily

identifiable or expected random failures (failed QC), a formal root cause analysis is not performed and the process begins with selection and implementation of corrective action – see Sec. 18.1 Technical Corrective Action.

18.1 Corrective Action procedures for the Analyst: Technical Corrective Action

Method SOP's provide QC acceptance criteria and specific protocols for corrective actions. Any QC measure result that falls outside of acceptance limits must be evaluated for the need to b reanalyzed or qualified . When testing discrepancies are found such as out-of-control QC, the analyst will follow the specific protocol for corrective action as stated in the method SOP located in the SOP Manual in your analytical area. Analysts routinely implement corrective actions for data with unacceptable QC, non-systematic errors or random failures. First level correction may include re-analysis without further assessment. Any discrepancies are documented, and if evaluation requires cause analysis, the cause and solution are recorded in the Corrective Action Report found in Omega/LIMS, see also Section 18.5 Control of non-conforming testing. The discrepancy will be identified, and the sample data associated with the discrepancy will be flagged/qualified. The Dept.Mgr/QAO will recommend/approve corrective actions to be initiated by the analyst and ensure implementation and documentation of the corrective action. Each corrective action log entry is reviewed, signed, and dated by the QAO/Technical Director. Corrective actions are performed prior to the reporting of the affected data.

18.2 **Types Of Corrective Actions**
Corrective Actions are categorized into five types:

18.2.1 Corrective Actions Resulting From Analyst/Bench Level

Corrective action procedures are often handled at the bench level by the analyst or Section Manager who reviews the preparation or extraction procedure for possible errors, checks the instrument calibration, spike and calibration mixes, etc.. Follow procedures listed in SOP 107 on Corrective Actions, Section 3.3, 3.4. If the problem persists or cannot be identified, the matter is referred to the Laboratory Director, or QA Officer for further investigation of the root cause of the problem. Complete the Corretive Action Log/Report to document the problem and corrective action taken, QAO shall keep this on

file. The QAO will then monitor the results to ensure that the corrective action taken has been effective.
Sample data associated with failed QC are evaluated for the need to be reanalyzed or qualified. If cause analysis is required, record in CAR

18.2.2 Corrective Actions Resulting from the Evaluation of Control Charts

Corrective actions can be generated from an evaluation of the various Control Charts, if used to monitor a method. These types of evaluations many times result in the recognition of the beginning of an unfavorable trend or shift in the performance of the analytical method over time. These observed changes, if left unattended, could cause problems at a later time. Normally, these types of corrective actions are initiated by either the QA Officer or Analyst. A Corrective Action Report is to be issued and completed.

18.2.3 Corrective Actions Resulting from a Systems Audit/Management Review

An Internal Systems Audit is performed by the QA Officer on a annual basis. Many times a System Audit will identify a practice or condition that is not being followed according to the QAP or Method SOPs. In addition, lack of Good Laboratory Practices and Safety concerns could be identified in the System Audit. Management will be verbally/email notified by the QA Officer, and a Corrective Action Summary Report will be issued.

18.2.4 Corrective Actions Resulting from Performance Capability Audits

American Analytical Laboratory analyzes Performance Evaluation Samples to evaluate their ability to accurately analyze the certified analytes. As a result of these activities biases can be identified. When a bias is identified, the QA Officer notifies the laboratory Section Manager/Analyst. The lab Section Manager/Analyst is then asked to investigate the bias, and take appropriate corrective action to remediate the problem.The QA Officer does a follow-up on the corrective actions taken in the lab and also reports corrective actions for failed analytes to the requesting government agency. An External Audit is also performed bi-annually by the government agency (NYSDOH) that certifies the laboratory for services in the environmental analysis of water, solid waste, and air. An inspection report is issued which then must be responded to with corrective actions taken by the laboratory.

18.2.5 Corrective Actions taken during Sample Log-in

Sample Custodian is to -
Document any discrepancy incurred by the lab during the course of sample log-in on the chain of custody and notify the Section Manager and/or Lab Director who will then contact the client inorder to resolve the discrepancy. Examples of such discrepancies are: holding time exceeded, sample labels differ from what is on COC, insufficient sample for requested analysis, bi-layer samples – how to handle before analysis, and broken sample container.

18.3 Documentation of Corrective Actions

Unacceptable conditions that are identified as the result of Systems, or Performance Capability Audits require that the Corrective Action Process be initiated and documented in a Corrective Action (CA) Report . This report shall contain all pertinant information needed about the problem/discrepancy and the corrective action taken.

A CA report is normally initiated by the QA Officer along with an estimated completion date of the corrective action process. Generally, this time period is one month or less. If this completion time is not possible then a reasonable completion time must be agreed upon. A copy of all initiated and completed CA reports are to be sent to the Section Manager, and Lab Director, and a copy kept on file in the laboratory.

18.4 Preventive Action/Improvements

Preventive action is a pro-active process to identify opportunities for improvement rather than a reaction to the identification of problems or complaints. All employees have the authority to recommend preventive action; needed improvements; potential sources of nonconformances either technical or in the quality system, and might involve analysis of data, including trend analysis and proficiency test results. Recommendations are made to the department manager and passed on to the Laboratory Director and QAO. If warranted, the Lab Director or QAO develops an action plan to develop, implement, and monitor the action. The plan must include controls that will enable objective evaluation of its suitability. The Preventive Action is audited under the direction of the QAO. Preventive action may also include: review of QC to identify trends, review of PT data to look for analytes that were nearly missed. Investigate analytes that were missed and to prevent repeat failures,

the QAO will then order blind QC to test that area and confirm that corrective action procedures were effective. Other Preventive action: review of client feedback for improvement opportunities, scheduled instrument maintenance, managerial reviews.

18.5 Control of Non-Conforming Environmental Testing

Specific corrective action protocols for handling out-of-control QC are in each method SOP. In addition, general procedures are followed to determine when departures from quality control have occurred. Provision is made for such deviations and documentation is determined by the Corrective Action Procedure. Because of the sampling schedule and the time frame of the analysis, it is not always possible to repeat the analysis if all quality control measures are not found acceptable. Therefore, if a quality control measure is found to be out-of-control, and the data is to be reported, all samples associated with the failed quality control measure are to be reported with the appropriate qualifier, i.e. holding time not met, "H" qualifier reported with data.

All employees have the authority to stop work on samples when any aspect of the testing and reporting process does not conform to the laboratory's SOP's or client's requirements. The employee who stopped work shall immediately notify the section manager, Laboratory/Technical Director, or QAO.

The Technical Director/QAO evaluates the significance of the non-conforming work. Corrective action is established for the non-conforming work. If necessary, such as when the data has been impacted, the client is notified and defective reports are recalled and/or reissued. The laboratory/Technical Director is responsible for authorizing the resumption of work.

19.0 Quality Assurance Reports To Management

On a annual basis, the QA Officer will file a written report (Internal Audit) documenting the QA process and deficiencies. Such deficiencies will have corrective action measures suggested and management will act upon corrections where necessary. These reports will be distributed to:

- the Laboratory Manager
- the Inorganic/Organic Section Managers

The proposed format of the reports shall consist of the following sections:

19.1 Results of Systems Audits

Comments on the findings made during the reporting period and corrective actions generated.

19.2 Results on Performance Audits

Comments on performance by the laboratory during period and corrective actions generated.

19.3 Corrective Action Status

Comments on the progress of corrective action remediation accomplished and any other corrective actions still pending.

19.4 Continuous Quality Improvement Activities

Comments on any activities that resulted in quality improvement or that maintained quality with cost reductions. This will include a review of any improvements demonstrated by continuing results of System and Performance Audits.

19.5 Management Review Topics:

The Laboratory Director/QAO shall review the laboratory quality system and its testing and calibration activities annually to introduce any necessary changes or improvements. The review will take into account:

- **the outcome of recent internal audits**
- **reports from managerial/supervisory personnel**
- **suitability of policies and procedures**
- **assessments by external bodies**
- **results of ELAP proficiency tests**
- **changes in the volume/type of work undertaken**
- **feedback from clients**
- **corrective/preventive actions**
- **recommendations for improvement**
- **complaints**
- **other factors such a quality control activites, resources and staff training**

19.6 The findings and any corrective actions from this review will be documented, either in a corrective action report(Section18) or managerial report(Section 19), and any corrective actions taken will be carried out within an appropriate and agreed upon time frame and management will determine appropriate completion dates for action items and ensure they are completed within the agreed upon time frame.

19.7 Data Integrity review – As part of the internal audit program, the lab shall review data integrity issues. Issues shall be handled in a confidential manner until a follow-up investigation is completed and issues clarified. All investigations that result in the finding of inappropriate activity shall be documented to include any disciplinary actions, corrective actions taken, notification of clients. Documentation shall be maintained for at least five years.

20.0 Document Control

This section describes the procedures used to initiate, write, revise, review, and distribute the laboratory's Standard Operating Procedures (SOPs) , QA Manual or any other lab documents. The laboratory manages 3 types of documents: 1.controlled-uniquely identified, issued, tracked and kept current in the management system, 2. approved-reviewed and signed/dated by issuing authorities, 3. obsolete- have been superseded by more recent versions or are no longer needed. Two types of SOPs are used in the laboratory,1.Test method, 2. general use procedural.

20.1 SOPs are initiated by the following means:

20.1.1 A new protocol or method is adopted for routine use by the laboratory.
20.1.2 A change or revision of an existing protocol is made.
20.1.3 A change in protocol is mandated by one or more of the regulatory agencies that certify the lab.
20.1.4 A client requires a method or protocol not routinely performed by the lab.
20.1.5 A need is identified by the QA Officer, Lab Director, or Section Manager to change an existing procedure.

20.2 Writing SOPs/ Lab Documents (QA Manual)

20.2.1 SOP's are generally written by the Section Manager, or QA Officer and the particular individuals currently performing the tasks. The SOPs are then reviewed by the QA Officer and Lab Director to determine their conformance to the required EPA or approved methods. The changes, if any, are then discussed with the person who prepared the SOP. After the changes have been made , the finalized SOP is reviewed again and signed by the QA Officer and Lab Director before their distribution in the lab. It is the responsibility of the QA Officer and the Lab Director to assure that the SOPs are implemented and are in routine use in the lab. The QA Manual is written and maintained by the QA Officer with final approval given by the Lab Director.

20.2.2 The format of the SOP Cover page will include the SOP name/number, Preparation date, Revision number, Revision date, number of pages. A heading – Method Title and Method Reference No., the names of the persons who prepared and approved (QA Officer, Lab Director) the SOP, and the dates prepared and approved. The QA Manual includes a Title Page with Preparation date, Revision number, Revision date, and the names and dates of the persons who approved it, Signatures of the approving authorities and the Effective date of the document.

20.2.3 Test method SOPs include the following topics:

i. identification of method
ii. applicable matrix/matrices
iii. limits of detection/quantitation
iv. scope and application
v. summary of method
vi. definitions
vii. interferences
viii. safety
ix. equipment and supplies
x. reagents and standards
xi. sample collection,preservation,shipment,storage
xii. quality control
xiii. calibration and standardization
xiv. procedure
xv. data analysis and calculations
xvi. method performance
xvii. pollution prevention
xviii. data assessment and acceptance criteria for QC
xix. corrective action for out-of-control data
xx. waste management
xxi. references
xxii. tables,diagrams,flow charts,validation data

20.2.4 Order of Precedence
In the event of a conflict or discrepancy between policies, the order of precedence is as follows: Quality Manual, SOPs, Other-work instructions, memos.

20.3 Reviewing SOP's/ Lab Documents (QA Manual)

20.3.1 It is the responsibility of the QA Officer to review current SOP's/Lab Documents annually to assure compliance with current methods. The findings are then discussed with the Lab Director, Section Manager and technicians and revisions are made if needed. Implementation of the revision process is described below.

20.4 **Revision of SOP's/ Lab Documents (QA Manual)**

20.4.1 SOP's/Lab Documents are revised/amended by either the QA Officer and/or Section Manager and technicians. **Amendment of documents maybe done by hand pending re-issue, amendments will be clearly marked, initialed and dated**.The changes are discussed, after which the revised SOP/Lab Document is reviewed and approved by the QA Officer and the Lab Director to be reissued as soon as possible. Revise the SOP/Lab Document Cover page with the Revision number, date revised and approved by dates and signatures of those responsible. It is the responsibility of the QA Officer to see that the revised SOP's/Lab Documents are distributed and implemented and are in routine use in the lab. Keep on file(archived) copies of the outdated revisions and/or a revision record with description of changes, and master copies of the latest revision SOP's and QA Plan.

20.5 **Distribution of SOP's/Lab Documents**

20.5.1 The QA Officer is responsible for distributing new and revised SOP's to the laboratory and for collecting and/or destroying out of date (obsolete) SOP's. Current SOP's are kept in a looseleaf notebook in the laboratory available to all analysts. When revisions are made, obsolete SOP's will be replaced in the notebook and Section Managers and technicians will be informed of the revisions, obsolete SOPs will be either collected and archived or destroyed. A copy of the latest revision of the QA Manual will also be kept in the lab available to all personnel.

20.5.2 Copies of documents to distribute to lab personnel are listed on the Revision record page of the SOP and the date is recorded on the Distribution List; obsolete documents are retrieved and either destroyed or one copy is kept on file as an obsolete document.

20.5.3 **Archived obsolete SOPs –** are boxed- labeled with a number and description of contents (i.e. box#1 – SOPs:Old Revisions-Obsolete)and then stored in the attic, retained for 5 years.

20.6 QC Documents

20.6.1 Audit Reports; Responses, CARs, PT results/raw data, Mgmt. review, are all kept on file in the front office area by the QA Officer.

20.6.2 A master list of controlled documents is maintained by the QAO in the database file, updated when changes/revisions are made to documents

21.0 Documentation and Record Keeping

21.1 The laboratory shall retain records of chemical analyses which include raw data; quality control data; chain of custody forms; lab reports, for a period of **five years** after the date of analysis or completed report, **except for potable water analysis; data records must be kept for a period of ten years.**

21.2 The laboratory shall file and maintain data records and lab reports in an accessible location in the lab for five years after the date of analysis to be available for review during on- site audits.

21.3 **Analytical Records - the laboratory shall retain the following information as part of the records of analysis: needed for historical reconstruction, see also SOP 104**

1. Lab ID/ Sample Number
2. Date/time of sample preparation and analysis: time is required if holding time is 72 hrs. or less. Sample receiving/storage records.
3. Name and signature of person who performed analysis on raw data or electonic identification
4. Type of analysis performed-reference method used, prep/cleanup logs, std./reagent prep, calibration criteria, instrument identification
5. Results of analysis with raw data, including correction/dilution factors, manual calculations, integrations
6. Results of initial calibrations, calibration check stds, and QC requirements/report/acceptance criteria
7. Correspondence relating to lab activities for a project
8. Copies of final reports are filed in Front office, and every six months boxed up labeled by client and stored in the attic as archived information.
9. Standard and reagent origin, receipt, prep and use
10. quality control protocols and assessment
11. electronic data security, backups, changes to automated data entries
12. method performance criteria including qc requirements
13. proficiency test results
14. records of DOC for each analyst

15. record of names, initials and signatures for all individuals responsible for signing any lab record
16. correspondence relating to lab activities for a project, kept in client folder or with lab report
17. corrective/preventive action reports
18. copies of internal and external audits with responses
19. copies of SOPs,QA Manual, current and historical
20. sample receiving, storage records, filed with work order
21. personnel qualification, training records
22. data review, management review records – QAO maintains

Analytical records – all information necessary for historical reconstruction of data, include all raw data, chromatograms, strip charts, printouts, calculations, forms and logbooks. All records are retained for five years.

21.3.1 Records Management – for control of lab/instruments/standards, notebooks

When mistakes occur in records, each mistake shall be crossed out, not erased, and the correct value entered alongside. These corrections shall be signed/initialed by the person making the correction and dated. Records stored electronically, equivalent measures shall be taken to avoid loss or change of original data. Data is imported directly from the instruments into Omega/LIMS, and then is password protected once it is QA checked by a Department Manager.

21.4 Records that are stored or generated by computers have hard copy and/or write protected backup copy/pdf file as stated in **SOP 110** and are also available to accrediting bodies for five years.

21.5 The laboratory notebooks shall indicate the effective date(s) that they are being used on the outside cover. Additionally, the sample analysis/preparation dates shall be listed for each analytical procedure performed throughout the text of each logbook.

21.6 **Access to archived information** shall be documented with an access log, located outside the doorway to the attic storage area.

21.7 Administrative Records: the following shall be maintained: a) Personnel qualifications and training records b) DOC for each analyst c) log of names, initials, signatures for all individuals responsible for signing any lab record d) proficiency test results e) internal and external audits and audit responses f)managerial reviews

21.8 Review of Requests and Contracts – The review of all new work is done by the Laboratory Director,such that oversight is provided so that requirements are defined (methods, reporting limits, QC), the lab has adequate capability, and test methods are applicable to the customers needs. Contracts for new work may be formal bids, signed documents, verbal, or electronic. The review will also cover any work that will be subcontracted by the lab.

21.8.1 The Laboratory Director informs the client of the results of the review, if it indicates any potential conflict or inability of the lab to complete the work satisfactorily. Any differences are resolved and recorded , related notes/ emails are saved in the project folder.

21.8.3 Records are maintained for every contract or work request in the project folder. This includes all related communication with the client, including emails, faxes, telephone conversation notes.

21.9 In the event that the laboratory transfers ownership or goes out of business, records are maintained or transferred according to client instructions. Appropriate regulatory and state legal requirements concerning laboratory records shall be followed, see SOP 111.

22.0 Data Integrity Training/Procedures

22.1 **Data integrity training** shall be provided as a formal part of new employee orientation and will also be provided on an annual basis(refresher) for all current employees. Training shall include discussion regarding all data integrity procedures reviewed in **SOP 113**, data integrity training documentation, in depth data monitoring: to include review of raw data and QC standards check of reported data on a quarterly basis. Key topics to be covered are the organizational mission and it's relationship to the critical need for honesty and full disclosure in all analytical reporting, how and when to report data integrity issues and record keeping. Specific examples of breaches of ethical behavior shall be discussed, including improper data manipulations, adjustments of instrument time clocks, and on the importance of proper written narration on the part of the analyst with respect to procedures/criteria that impact the integrity of analytical data; analyst comments will be included in the sample work order in Omega/LIMS – seen in case narrative section.

Monitoring Data Integrity procedures, issues is done during the annual Internal Audit by the QA Manager, updates are done as needed.

22.2 Initial data integrity training and the annual refresher training shall have a **signature attendance sheet** that demonstrates all staff have participated and understand their obligations related to data integrity. The data integrity attendance sheets are to be kept on file by the QAO. Trainees are required to understand that any infractions will result in a detailed investigation that could lead to very serious consequences including immediate termination, civil/criminal prosecution.

22.3 Data Integrity Training Topics to be covered:

- **Organizational mission**
- **How and when to report data integrity issues**
- **Record keeping**
- **Training procedures**
- **Data integrity training documentation**
- **In-depth data monitoring**
- **Specific examples of breaches of ethical behavior – improper data manipulations, adjustment of time clocks, inappropriate changes in concentration of standards**

22.4 Data integrity procedures include a written ethics agreement signed by all staff which details their agreement with AALs data integrity policies. These signed sheets shall be placed in each employees record file. **Other procedures/QC documents that are part of the data integrity program are:**

- **Ethics and Data Integrity policy, training, investigations, SOP113**
- **Manual Integration procedures, SOP112**
- **Corrective Action procedures, SOP107, QAP Section 18**

22.5 Managers acknowledge their support of these procedures by upholding the spirit and intent of the lab's data integrity procedures and effectively implement the specific requirements of the procedures. Confidential reporting of alleged data integrity issues can be done by email through the Department Manager/QAO/Laboratory Director. To report data integrity issues anonymously, this can be done by leaving a written note in the manager's in-box. See SOP 113 for more detail on the process.

22.6 All investigations resulting from data integrity issues are conducted confidentially. They are documented and notifications are made to clients who received any negatively affected data that did not meet the client's data quality requirements. See SOP 113 for more detail.

23.0 Exceptionally Permitted Departures from Documented Policies and Procedures or from Standard Specifications

23.1 The Laboratory Director maintains responsibility for ensuring that documented policies and procedures are adhered to. Arrangements for known and controlled departures from documented policies and procedures are allowed in certain circumstances. Any departure must be documented with the following information:

Signature/date of individual responsible for requesting the departure
Reason for the departure
Effected SOP(s)/Analysis
Intended results of the departure
Actual results

The corrective action report must be used for documenting this process and can be generated at the analyst/department supervisor/manager level. The QA Officer and Laboratory Director are responsible for signing corrective action reports.

23.2 SOPs:

The purpose of an SOP is to standardize how a particular task, process, method or situation is handed to ensure compliance and consistency while still allowing flexibility to apply common sense and logic to meet immediate needs. Some circumstances cannot be foreseen, so exceptions may be necessary.

SOPs help ensure that actions are conducted safely, and that data are analyzed consistently. SOPs also provide project and individual accountability.
The primary purpose of an SOP is to describe what to do and the order in which to do it, with pertinent background on why it must be done.

Exceptions:
Exceptions to documented procedures (SOPs) may be allowed in certain circumstances: Some examples are listed below but are not meant to be all inclusive

- QC result that falls outside acceptance limits and client requests rush results (this must be clearly documented as "preliminary" and the impact to the data with subsequent notation that final results to follow upon completion of reanalysis/verification, etc.)

- Any deviation from a documented procedure due to sample matrix effects

- Pre-logging samples when chain of custody has short holding time parameters and balance of information pertaining to project is incomplete.

- Accepting samples that do not meet AAL's sample acceptance policy

24.0 Complaints

All complaints/issues about the lab's activities, requests to verify results or analytical data, received from clients or other parties will be documented in a complaint file/logbook maintained in the front office of the laboratory. Complaints provide the laboratory an opportunity to improve laboratory operation and client satisfaction.The complaint file will contain the date and name of the person receiving the complaint, source of the complaint , the resolution, and any written material accompanying the complaint, generally these will be in the form of emails. The Lab Director or QAO investigates complaints to determine that it has merit and promptly audits all areas of activity and responsibility involved if needed. The written results of the investigation including corrective actions taken by the lab are reviewed, signed, and dated by the Lab Director and/or QAOand the client is informed by either email or phone.

24.1 Improvement

Improvement in the overall effectiveness of the laboratory management system is a result of the implementation of the various aspects of the management system, which includes: Quality Policy and Objectives, Internal Audits, Data review and analysis, Corrective/Preventive Action, and Management Reviews.

25.0 Demonstration of Capability

I. **Demonstration of Capability (DOC): A procedure to establish the ability of the analyst to generate analytical results of acceptable accuracy and precision.**

Before reporting any data with a given method, a satisfactory DOC is performed. Thereafter, each analyst demonstrates continuing proficiency through the procedures outlined below in Ongoing DOC.

A. **Initial Demonstration of Capability (IDOC)**

An IDOC is performed:

- before using any method
- each time there is a change in instrument type, personnel or method
- if the lab or analyst has not performed the method in a twelve-month period

The IDOC for each analyst is documented in their employee file; it identifies the analyst involved with preparation and/or analysis; matrix; analyte(s); method (s); SOP/Rev used; date of analysis; summary results-mean recovery, standard deviation.

All raw data, prep records, calculations for each DOC are retained and available for review.

When methods specify a procedure to be followed, only those procedures will be used. If no procedures are specified the lab uses its own procedure, which is documented in the method SOP.

1. The analyte shall be diluted in a volume of clean quality system matrix, that which is used for the LCS, sufficient to prepare four aliquots.
2. At least four (4) aliquots shall be prepared, (4) LCS at a concentration 1-4 times the concentration of the LOQ, and analyzed according to the method either concurrently or over a period of days.
3. Using all the results, calculate the mean recovery in the appropriate reporting units and standard deviations for each parameter of interest. When this is not possible, the lab shall assess performance against established and documented criteria.
4. Compare the information from (3) above to corresponding criteria for precision and sccuracy in the method or lab generated criteria. If all parameters meet the acceptance criteria, the analysis of actual samples may begin.If any one of the parameters does not meet the acceptance criteria, the performance is unacceptable for that parameter.
5. When one or more of the tested parameters fail at least one of the acceptance criteria, the analyst shall proceed as follows:
    a) locate and correct the souce of the problem and repeat the test for all parameters of interest
    b) or repeat the test for all parameters that failed to meet criteria

Repeate failure however confirms a general problem with the measurement system. If this occurs, locate and correct the problem and repeat the test for all compounds of interest.

B. On-going DOC

After the IDOC is completed, the analyst shall demonstrate on-going capability annually by meeting one of the following:

1. acceptable performance of a blind sample (single blind to analyst); blind performance sample (PT)
2. another initial DOC
3. four (4) consecutive LCS runs with acceptable levels of precision and accuracy

On-going DOC records are retained in the employee file.

APPENDIX H

SITE MANAGEMENT FORMS

Summary of Green Remediation Metrics for Site Management

Site Name: ______________________________ Site Code: ____________________
Address: _________________________________ City: _______________________
State: ____________ Zip Code: _________ County: _____________________

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: ____________________

Current Reporting Period
Reporting Period From: _____________________ To: ________________________

Contact Information
Preparer's Name: __________________________ Phone No.: ___________________
Preparer's Affiliation: __________________________________

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		

Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR
I, ___________________________ (**Name**) do hereby certify that I am ______________________ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application. ____ **Date** **Contractor**

APPENDIX I

FIELD ACTIVITIES PLAN

CHAPTER 2 SAMPLING, ANALYSIS and QUALITY ASSURANCE

2.1 Sampling and Analysis Requirements

(a) Selection of analytical parameters.

1. All initial investigations must analyze and report on:

i. for organic contaminants the full target compound list plus the 30 (10 volatile organic compounds and 20 semi-volatile organic compounds) highest concentration tentatively identified compounds (TICs). The full target compound list plus the 30 (TCL+30), as defined in paragraph 2.4(d)15; and

ii. for inorganic compounds, the full target analyte list (TAL), as defined in paragraph 2.4(d)13.

2. Samples from an area of concern or a site may be analyzed for a limited contaminant list as approved by DER once the nature of the contamination is fully characterized.

3. For investigations of known petroleum releases, sample analysis must be for the suite of contaminants shown in the fuel oil and gasoline tables (tables 2 and 3) contained in the Commissioner Policy on *Soil Cleanup Guidance* (CP-Soil).

4. For investigation of non-petroleum storage and discharge areas, sample analysis must use the methods appropriate for the stored or discharged material.

5. Analysis must be conducted by a laboratory that is accredited pursuant to the NYSDOH Environmental Laboratory Accreditation Program (ELAP) for the category of parameters analyzed.

(b) Laboratory analytical methods. Except as provided in paragraph 1 below, samples collected by the remedial party will be analyzed by an analytical method included in the most current DEC Analytical Services Protocol (ASP), available on DEC's website identified in the table of contents.

1. An alternative to the ASP may be proposed if an analytical method, as described in the most current ASP:

i. does not exist for a specific contaminant or parameter (e.g., pH, dissolved oxygen) within a specific matrix;

ii. is demonstrated to be inappropriate for the matrix analyzed; or

iii. cannot achieve an acceptable detection limit or minimum reporting limit as provided in a DER-approved work plan.

2. Where one of the exceptions in paragraph 1 exists, the remedial party will:

i. select an appropriate method from another source;

ii. document the rationale for selecting the method;

iii. develop a standard operating procedure for the method, including a quality control section; and

iv. propose the method and standard operating procedure for such method to DEC for its consideration and approval.

3. The method selected must achieve a detection limit or minimum reporting limit that is below the applicable cleanup level for all contaminants that may be present in the medium being sampled and analyzed.

4. Unless otherwise provided in a DER-approved work plan, the Lloyd Kahn method must be used for the determination of total organic carbon in soil and sediment. This method is available on DEC's website identified in the table of contents.

5. Except for tissue samples (see subdivision 2.1 (d) below), gas chromatography methods with a mass spectrometer detector system must be used for analysis of semi-volatile contaminants (exclusive of herbicides, pesticides and PCBs). Other chromatography methods (e.g., high-performance liquid chromatography) with appropriate detector systems must be used for the analysis of organic analytes amenable only to non-gas chromatographic methods. A mass spectrometer detector system is preferable but not required if the site has already been characterized to the extent that all contaminants are known.

6. The procedures (including quality control and quality assurance) specified in the ASP analytical method must be followed unless an alternate procedure is included in the approved work plan.

(c) Field-testing technologies and methods.

1. DER accepts the use of field-testing technologies (e.g., immunoassay test kits, x-ray fluorescence devices, direct-sensing down-hole tools) when supported by ELAP approved analytical methods, provided the data are not used to make final determinations relative to impacts of contamination on public health. The role of field testing technologies for programs for which this guidance applies is described in Appendix 2A.

2. Field-testing technologies are encouraged in the following circumstances:

i. for contaminant delineation if contaminant identity is known or if there is reasonable certainty that a specific contaminant may be present (e.g., benzene, toluene, ethyl benzene, xylene in the case of sampling for a gasoline release);

ii. to bias sample location to the specific location of greatest suspected contamination;

iii. for testing or analysis of intermediate samples;

iv. to collect data in support of engineering design or remedy optimization; or

v. for segregating wastes for off-site disposal or treatment.

3. Where a field-testing technology is proposed to be used:

i. a standard operating procedure must be provided for DER approval that includes:

(1) a detailed step-by-step procedure for the analysis method;
(2) qualifications of the technician responsible for performing the field testing; and
(3) quality assurance procedures (e.g., calibration standards, blanks) as specified by the method;

ii. laboratory analysis of split samples must be performed to evaluate the correlation between the field testing technology and the ELAP-certified laboratory results. A minimum of 10% of the samples must be analyzed by the ELAP-certified laboratory using a standard ASP method. In general, sufficient correlation occurs if the field testing and laboratory results are within 30 relative percent difference;

iii. 10% of sample analyses using the field-testing technology must be performed in duplicate;

iv. there should be no bias in the selection of duplicate or correlation samples, such as selecting only positive detections for duplicate or correlation sampling. The duplicate or correlation analysis should be done on every tenth sample, selected in the order they are collected and presented for analysis; and

v. the field testing must be performed by a field technician with the following minimum qualifications:

(1) completion of a certification course or training by an experienced technician who has demonstrated proficiency in the method; or
(2) demonstration of proficiency by correlation of the technician's field-testing technology results with fixed laboratory analysis results collected from a previous site.

(d) Tissue analysis. Where the analysis of tissue samples is required, the sampling and analysis included in any work plan must be in accordance with this subdivision.

1. For tissue analysis. Methods and sampling plans must be specified in the work plan and approved prior to implementation. EPA SW-846 methods are not appropriate for biological tissue as these methods, for example, often underestimate PCB/organochlorine concentrations.

2. Analysis of lipid content is required for all organochlorine compounds using EPA3540C Soxhlet extraction with 1:1 hexane/acetone ratio or other approved method. The percent lipids should be determined from the same aliquot as that used to determine the organochlorine concentration.

3. Tissue sampling should follow the current procedures set forth in the most current DEC guidance documents for biota collection, preparation and analysis.

(e) Soil vapor intrusion sampling. When soil vapor, sub-slab vapor, crawl space air, indoor air or outdoor air sampling is required the NYSDOH document, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006) or the most current version with appropriate updates, must be used.

(f) Determination of the presence of non-aqueous-phase liquid (NAPL).

1. Methods acceptable to DER must be used to determine the presence of NAPL in soil or water. Such methods include, without limitation, visual identification of sheens or other visible product, measurable thickness of product on the water table, the use of field instruments, ultraviolet fluorescence, soil-water agitation, centrifuging and hydrophobic dye testing.

2. NAPL is suspected to be present in groundwater where:

i. concentration is equal to or greater than 1% of the water solubility of the contaminant; or

ii. a mixture of such contaminants in (i) above is present, then the effective water solubility of the contaminant should be estimated for this determination.

3. NAPL is suspected to be present in soil where a single contaminant is present at concentrations greater than 10,000 mg/kg.

(g) Alteration of groundwater samples collected for metals analysis.

1. Provision for the alteration of groundwater samples (filtration as defined in section 2.4) for metals analysis is only acceptable when the rationale for any proposed filtration is prepared in accordance with this subdivision and, if a field decision, must be reviewed and approved in accordance with subdivision 1.6(d) by the DER project manager prior to any filtration of samples.

2. Alteration of groundwater samples will not be approved unless the following conditions can be documented:

i. the target turbidity level of 50 NTUs for development and sampling of groundwater monitoring well is or will be exceeded;

ii. the well(s) being sampled was (were) properly designed, installed, constructed, developed, maintained and sampled;

iii. attempts have been made to repurge and/or redevelop the well; and

iv. replacement of the well(s) with documentation of proper well construction and installation where necessary, has been considered and is not justified.

3. Any request to filter groundwater samples must include a justification which addresses the conditions listed in paragraph 2 above and include a filtering protocol which:

i. is consistent with the methods in the November 1986 Environmental Protection Agency document entitled Test Methods for Evaluating Solid Waste (EPA-SW846);

ii. is a filtration methodology which minimizes changes in the water chemistry of the sample;

iii. provides that any precipitates which may form upon removal of the sample from the well (e.g., iron floc) must not be filtered out but dissolved by acid/preservation; and

iv. provides that a filtered sample would not be collected without an accompanying unfiltered sample.

4. When collecting filtered groundwater samples:

i. the sample must be collected using a minimally disturbing method (e.g., low-rate bladder or peristaltic pumping, bailing);

ii. the turbidity of the samples must be recorded at the time of collection;

iii. two samples must be collected:

(1) one of which must be preserved immediately in an unaltered state; and
(2) the second must be filtered and preserved; and

iv. if split samples are required, then both the filtered and unfiltered samples must be split.

5. When analyzing the samples:

i. if the unfiltered sample does not exceed SCGs, there is no need to analyze the filtered sample; and

ii. if there is a question whether metal contaminants are naturally occurring or were introduced through human-made activities, upgradient and background wells may be sampled using the same procedure, with best efforts made to obtain an uncontaminated sample of the horizon which is being screened, to allow a comparison of contaminant data to naturally occurring metal ion concentrations in the aquifer matrix.

2.2 Reporting Requirements

(a) Unless otherwise approved in advance by DER, laboratory data deliverables must be as defined in this subdivision.

1. Category B laboratory data deliverables. Category B data deliverables which are defined in the ASP and summarized in Appendix 2B:

i. must be submitted for the following types of samples, except for sites subject to section 5.5 (UST closure):

(1) samples representing the final delineation of the nature and extent of contamination for a SC or RI completed pursuant to Chapter 3;
(2) correlation samples as defined in section 2.4;
(3) confirmation and documentation samples as defined in paragraphs 1.3(b)3 and 11 and collected pursuant to section 5.4; and/or

(4) samples to determine closure of a system pursuant to sections 6.4 and/or 6.5; and

ii. must include the preparation of a Data Usability Summary Report (DUSR) prepared by a party independent from the laboratory performing the analysis for all samples when Category B data deliverables are provided. This party must also be independent from any direct involvement with the project, e.g. Project Manager or property owner. The required content of a DUSR and qualifications for the person preparing the DUSR are detailed in Appendix 2B.

2. Category A and Category Spills laboratory data deliverables. Category A or Category Spills data deliverables, which are defined in the ASP and summarized in Appendix 2B must be submitted for all analyses not identified in paragraph 1 above.

3. Analytical cleanup. Any analytical cleanup methods required must be:

i. in accordance with subdivision 2.3(c);

ii. identified in the work plan; and

iii. if employed, identified in the data deliverable package.

4. Tentatively identified compounds (TICs). TICs identified by the analysis of a sample in accordance with subparagraph 2.1(a)1.ii must be reported in the data deliverables in the following cases:

i. all samples analyzed as part of a SC, RI or pre-design sampling effort undertaken to delineate the nature and extent of contamination;

ii. all samples in all phases of a project when (a) TIC(s) has/have been identified as a contaminant of concern; or

iii. if TICs are present and included on the discharge limits for a treatment system.

(b) Submission of data. Final/validated analytical data, with applicable data qualifiers are to be summarized in tables for all reports prepared in accordance with this guidance.

1. When reporting analytical results below the method detection limit (MDL) or method reporting limit (MRL), the result will be shown as non-detect (ND) along with the appropriate MDL or MRL.

2. The data from individual samples, QA information (e.g., chromatograms) and other supporting documentation identified by this section are not to be included in appendices or otherwise included in the reports or work plans. This information and other supporting data identified in subdivision 3.13(c) are to be included in a separate electronic data submission provided at the time of the submission of the report/work plan.

(c) Electronic submissions. All required documentation identified by this Chapter must be provided in an electronic format in accordance with section 1.15.

2.3 Quality Assurance Requirements

(a) The remedial party must ensure that suitable and verifiable data result from sampling and analysis. To achieve this objective the quality assurance procedures detailed in this section must be followed for all sampling and laboratory analysis activities.

1. Determination of need for a quality assurance officer (QAO). The remedial party shall consult with DER during the development of the work plan, pursuant to section 3.3, to determine whether a QAO will be required. A QAO will generally be necessary for large or complex projects, such as those requiring non-routine analytical methods or sampling techniques (e.g., field testing technologies).

2. Role of the QAO. Where required, the QAO:

i. will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures;

ii. shall not be directly involved in the collection and analysis of samples from the site for which they are the QAO.; and

iii. acts in conjunction with the project manager in the development of the sampling and analytical portion of a site-specific quality assurance project plan (QAPP);

3. QAO qualifications. The QAO:

i. must not have another position on the project, such as a project or task manager, that involves project productivity or profitability as a job performance criteria;

ii. must, at a minimum, hold a bachelors degree:

(1) in a relevant natural or physical science; or
(2) engineering; and

iii. must be familiar with analytical methods, data interpretation and validation, the development of sampling plans, quality control procedures and auditing requirements and techniques.

3. As required by the approved work plan, during the course of the sampling and analytical portion of the project the QAO or a designee may:

i. conduct periodic field and sampling audits;

ii. interface with the analytical laboratory to resolve problems; and

iii. interface with the data validator and/or the preparer of the DUSR to resolve problems.

(b) Data acceptance.

1. DER will reject analytical data from any laboratory which does not have a current and

appropriate certification for the parameters analyzed.

2. Laboratories performing the analysis of tissue samples must provide documentation of the demonstration of capability (e.g., analysis of reference samples) for approval by DER prior to conducting any tissue analysis.

3. DER may reject data that do not meet the data quality objectives (e.g., if minimum reporting limits specified in the approved work plan are not achieved, if the pressure in an air canister is outside of the acceptable ranges, if holding times or temperature ranges are not met, etc.).

(c) Specific sampling and analytical requirements.

1. Laboratories will follow all quality assurance/quality control procedures specified in the approved analytical methods.

2. Sampling methods, sample preservation requirements, sample holding times, decontamination procedure for field equipment and frequency for field blanks, field duplicates and trip blanks for aqueous samples should conform to the ASP, unless an alternate method/procedure has been approved in the work plan. Duplicate and matrix/matrix-spike duplicates are required at a frequency of 1 per 20 samples. Aqueous trip blanks are required at the same frequency for samples that are to be analyzed for volatiles. Field and/or rinsate blanks may also be required at the same frequency.

3. Sample matrix cleanup. Sample matrix cleanup (in laboratory) must occur when chemical interferences may be causing elevated reporting limits or inadequate contaminant identification or quantitation. Sample matrix cleanup must conform to the procedures specified in the ASP.

4. Results from analysis of soils and sediments will be reported on a dry-weight basis, except for those results required by the method to be otherwise reported. Analysis of vegetation tissue shall be on a dry-weight basis. All other tissue analysis shall be reported on a wet-weight basis.

5. Samples must be sent to the laboratory as soon as practicable. Generally, samples should be received by the laboratory within 48 hours of sampling.

(d) Soil vapor or air sampling and analysis. Where soil vapor, sub-slab vapor, crawl space air, indoor air or outdoor air sampling is required, the work plan is to be prepared using the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006) or the most current version must be used.

(e) A glossary of quality assurance terms is provided in subdivision 2.4(d).

2.4 Quality Assurance Project Plan

(a) All work plans must include quality assurance procedures to be followed for sampling and analysis. All work plans and the QAPP, undertaken pursuant to an oversight document in accordance with subdivision 1.2(d), must be submitted and approved in advance of sampling.

1. These procedures will be incorporated into the work plan or be supplied as a separate stand alone document. If a separate QAPP is submitted, a summary of the sample information identified in subparagraph 2.v below must also be included in the work plan.

2. The following should be included in either the work plan QAPP section or a standalone QAPP:

i. the project scope and project goals as well as how the project relates to the overall site investigation or remediation strategy;

ii. project organization, including the designation of a project manager, QAO and field analyst, (if field analysis is planned). Resumes of these individuals must be included;

iii. sampling procedures, data quality usability objectives and equipment decontamination procedures;

iv. site map showing sample locations;

v. an "Analytical Methods/Quality Assurance Summary Table" which must include the following information for all environmental, performance evaluation and quality control samples:

(1) matrix type;
(2) number or frequency of samples to be collected per matrix;
(3) number of field and trip blanks per matrix;
(4) analytical parameters to be measured per matrix;
(5) analytical methods to be used per matrix with minimum reporting requirements;
(6) number and type of matrix spike and matrix spike duplicate samples to be collected;
(7) number and type of duplicate samples to be collected;
(8) sample preservation to be used per analytical method and sample matrix;
(9) sample container volume and type to be used per analytical method and sample matrix; and
(10) sample holding time to be used per analytical method and sample matrix; and

vi. a detailed description of sampling methods to be used and sample storage in the field.

(b) If tissue samples are being collected, the QAPP for tissue analysis should follow the outline in the USEPA publication *Preparation Aids for the Development of Category I Quality Assurance Project Plans* (EPA/600/8-91/003).

(c) Analytical data must be provided in an electronic format in accordance with section 1.15.

(d) Quality assurance glossary. Quality assurance terms and definitions presented in this subdivision must be used in preparing all documents related to quality assurance or control.

1. "Alteration" means altering a sample collected for analysis in any way other than by adding a preservative, such as nitric acid to lower pH. Examples of alteration include, but are not limited to: filtering, settling and decanting, centrifuging and decanting and acid extracting.

2. "Analytical Services Protocol" or "ASP" means DEC's compilation of approved EPA laboratory methods for sample preparation, analysis and data handling procedures.

3. "Correlation sample" means a sample taken, when using a field-testing technology, to be analyzed by an ELAP-certified laboratory to determine the correlation between the laboratory and field analytical results.

4. "Effective solubility" means the theoretical aqueous solubility of an organic constituent in groundwater that is in chemical equilibrium with a separate-phase (NAPL) mixed product (product containing several organic chemicals). The effective solubility of a particular organic chemical can be estimated by multiplying its mole fraction in the product mixture by its pure-phase solubility.

5. "Environmental Laboratory Accreditation Program" or "ELAP" means a program conducted by the NYSDOH which certifies environmental laboratories through on-site inspections and evaluation of principles of credentials and proficiency testing. Information regarding ELAP is available at the NYSDOH Wadsworth Laboratory website .

6. "Filtration" means the filtering of a groundwater or surface water sample, collected for metals analysis, at the time of collection and prior to preservation. Filtering includes but is not limited to the use of any membrane, fabric, paper or other filter medium, irrespective of pore size, to remove particulates from suspension.

7. "Final delineation sample" means a sample taken to make a decision regarding the extent of contamination at a site during the investigation and the design of the remedy or confirmation/documentation sampling during remedial construction, which is to be analyzed by an ELAP-certified laboratory.

8. "Intermediate sample" means a sample taken during the investigation or remediation process that will be followed by another sampling event to confirm that remediation was successful or to confirm that the extent of contamination has been defined to below a level of concern.

9. "Method detection limit" or "MDL" means the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte.

10. "Minimum reporting limit" means the lowest concentration at which an analyte can be detected and which can be reported with a reasonable degree of accuracy. It is the lowest concentration that can be measured, a lab-specific number, developed from minimum detection limits, and is also referred to as the practical quantitation limit (PQL).

11. "Nephelometric Turbidity Unit" or "NTU" is the unit by which turbidity in a sample is measured.

12. "Preservation" means preventing the degradation of a sample due to precipitation, biological action, or other physical/chemical processes between the time of sample collection and analysis. The most common examples involve refrigeration at 4 degrees Celsius and lowering sample pH by the addition of acid to keep dissolved metals in solution or to reduce the biodegradation of dissolved organic analytes.

13. "Target analyte list" or "TAL" means the list of inorganic compounds/elements designated for analysis as contained in the version of the *EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration* in effect as of the date on which the laboratory is performing the analysis. For the purpose of this chapter, a Target Analyte List scan means the analysis of a sample for Target Analyte List compounds/elements.

14. "Targeted compound" means a contaminant for which a specific analytical method is designed to detect that potential contaminant both qualitatively and quantitatively.

15. "Target compound list plus 30" or "TCL+30" means the list of organic compounds designated for analysis (TCL) as contained in the version of the EPA *Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration* in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis.

16. "Tentatively identified compound or TIC" means a chemical compound that is not on the target compound list but is detected in a sample analyzed by a GC/MS analytical method. TICs are only possible with methods using mass spectrometry as the detection technique. The compound is tentatively identified using a mass spectral instrumental electronic library search and the concentration of the compound estimated.

17. "Well development" means the application of energy to a newly installed well to establish a good hydraulic connection between the well and the surrounding formation. During development, fine-grained formation material that may have infiltrated the sand pack and/or well during installation is removed, allowing water from the formation to enter the well without becoming turbid and unrepresentative of groundwater in the formation.

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GROUNDWATER SAMPLING LOG
Minute Man Cleaners
89 Ocean Ave, East Rockaway, New York

Well ID: ______________________
Date: ______________________
Sampling Personnel: ______________________
Weather: ______________________

WELL INFORMATION

Well Depth (ft): ______________________
Water Level Depth (ft): ______________________
Well Diameter (in): ______________________

WELL WATER INFORMATION

Length of Water Column (ft): ______________________
Volume of Water in Well (gal): ______________________
Total Volume Purged (gal): ______________________
Duration of Pumping (min): ______________________

EVACUATION INFORMATION

Pump On: ______________________ Pump Off: ______________________

Time: *Parameter*								
Temperature (°C)								
pH								
Cond (umho's/cm)								

APPENDIX J

O&M MANUAL (FOR EACH ACTIVE EC)

IPF Colasit Plastic Fans

• Corrosion Resistant • No Metal in the Air Stream • Fire Retardant PPs

Direct Drive/Belt-Drive Medium-Pressure Radial Fans

Advantages of IPF Fans

- Solid polypropylene impeller
- Quality Swiss craftsmanship and proven technology
- Reliability and long life
- Highly efficient means lower operation costs
- ISO 9001
- Low noise level

Specifications *CMV125 to CMV400*

Size range	Intake/exhaust diameter 5″ to 16″
Performance	Flow rate to 7,500 CFM 10 in. w.g. maximum fan static pressure 75% efficiency
Radial impeller	Single-width centrifugal fan Clockwise or counterclockwise rotation 20 forward-curved streamlined blades Injection-molded in fire-retardant polypropylene or PVDF No metal in the air stream Dynamic and statically balanced
Fan housing	Self-supporting thermoformed and mechanically welded PVC, PPs (fire-retardant) and PVDF No exposed metal parts
Bearings and shaft	Two permanently lubricated flange bearings and a rubberized sleeve enclosed in an injection-molded fiberglass case Carbon-steel shaft
Other features	Sleeved inlet and outlet Housing drain Weather cover Optional hub seals available for specific applications
Support frame	Powder-coated sheet metal or optional stainless-steel fan support and motorplate
Belt drive	Nonstatic and oil resistant V-belt Cast-iron pulleys, adjustable pulleys available Adjustment for tensioning and belt replacement Drives factory set to specified RPM
Motor	Three phase or single phase Totally enclosed and fan cooled NEMA mounting Other motors available

IPF COLASIT PLASTIC FANS

• Corrosion Resistant • No Metal in the Air Stream • Fire Retardant PPs

To select the appropriate fan for your application, use the performance tables to locate the model that provides the CFM required at the static pressure specified. For highest efficiency, select the fan size that will handle the required capacity and pressure with the lowest horsepower motor. *Please note that BHP is the fan horsepower and does not include an approximate 15% loss for drives systems.*

Model CMV 125 Performance Table

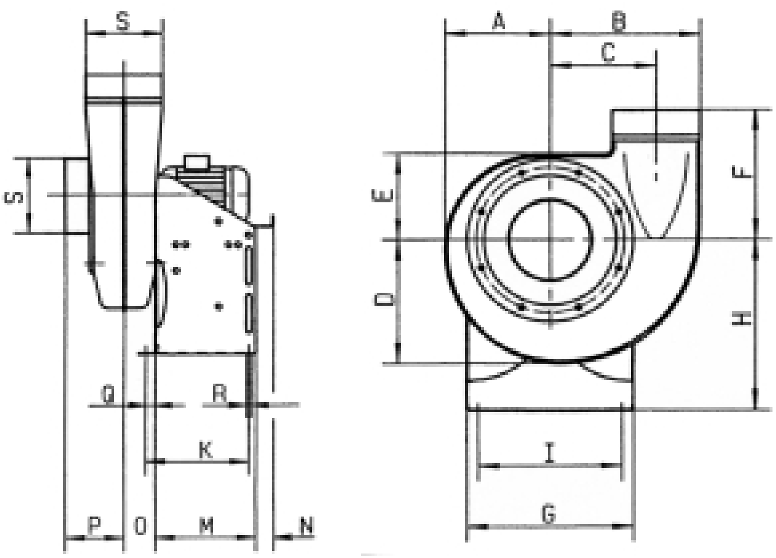
FAN STATIC PRESSURE (inches water gauge)

Volume	Outlet	.25		.5		.75		1		1.5		2		2.5		3	
CFM	Velocity	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
50	375	1035	0.005	1416	0.011	1712	0.019	1963	0.027	2387	0.046	2746	0.068				
100	755	1210	0.010	1553	0.019	1831	0.028	2071	0.039	2481	0.062	2832	0.089	3142	0.117	3424	0.148
150	1130	1448	0.020	1748	0.031	2002	0.043	2226	0.056	2616	0.084	2953	0.114	3254	0.147	3530	0.183
200	1510	1724	0.037	1985	0.051	2214	0.066	2421	0.081	2786	0.113	3107	0.148	3397	0.186		
250	1890			2252	0.081	2457	0.098	2646	0.116	2986	0.153	3290	0.193	3566	0.234		
300	2270			2539	0.121	2724	0.142	2896	0.163	3211	0.205	3497	0.250				
350	2645			2841	0.176	3008	0.199	3165	0.223	3457	0.272						

MODEL CMV 125

Mechanical Specifications

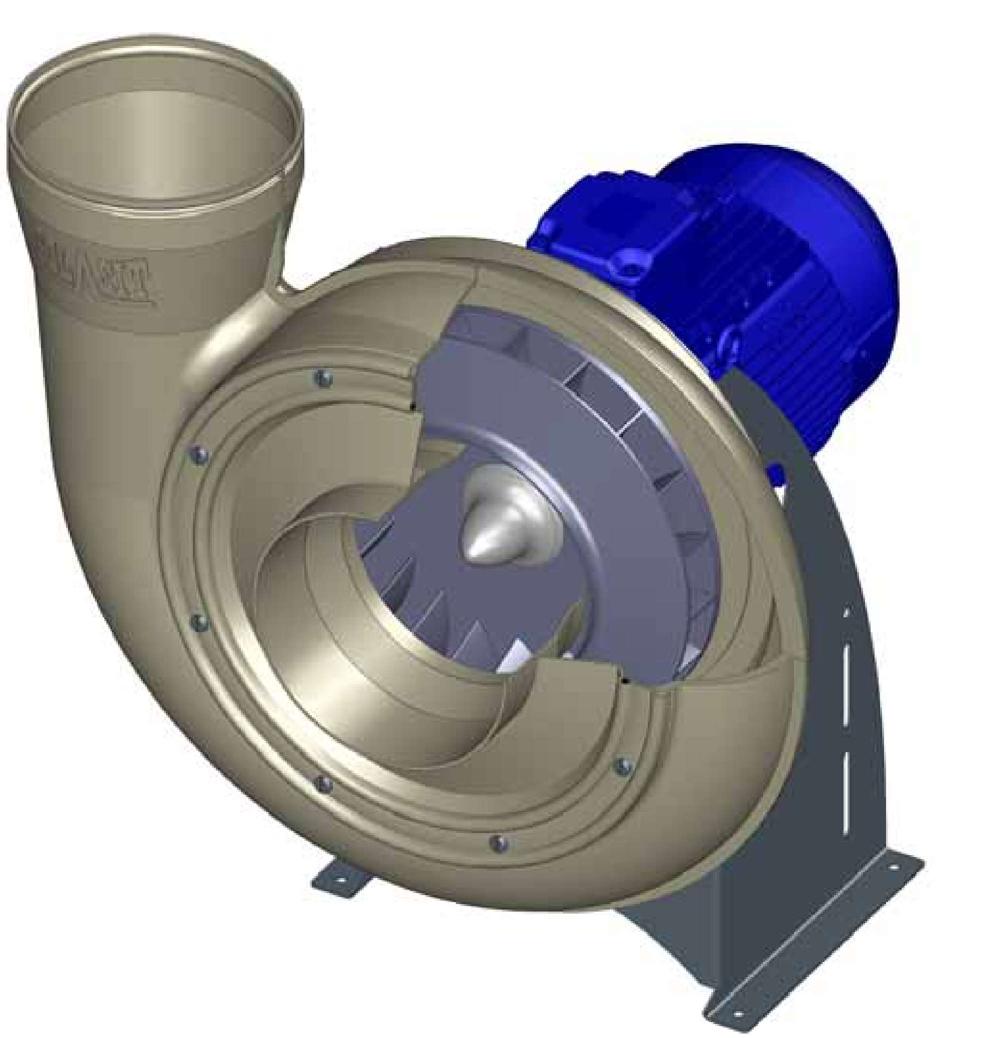
Wheel diameter	7.87"
Tip speed	rpm x 2.061 = ft/min.
Maximum rpm	3600
Inlet/outlet diameter	4.92" I.D.
Inlet/outlet area	0.132 ft^2
Fan weight (w/o motor)	11 lb.



Dimensions (inches) Direct Drive/Belt Driven

CMV	A	B	C	D	E	F	G	H	I	K	L	M	O	P	Q	R	S
125	6.75	9.5	6.5	8	6	9	10.75	11	9	8.25	18	8	2.13	4.38	.75	.31	5
140	7.5	10.5	7.13	8.75	6.5	9.63	11.5	11.88	10	8.5	18.25	8.25	2.25	4.63	.75	.31	5.5
160	8.38	11.75	8.13	10	7	10.25	12.75	13.13	11	8.88	18.63	8.25	2.25	4.88	.75	.38	6.25
180	9.25	13.25	9	11	7.88	11.25	14	14.75	12.5	8.88	19.75	8.625	2.875	5.5	.75	.38	7
200	10.75	14.5	10	12.25	8.63	12.38	15.63	15.75	13.75	10.5	21.75	10.25	3.25	6.25	.75	.38	7.88
225	11.38	16.25	11.25	13.63	9.5	13.38	17.63	17.75	15.38	11.5	25.13	10.75	3.63	7.13	1.25	.5	8.88
250	12.5	17.88	12.5	15	10.5	14.5	19.5	19.63	17.13	11.5	29	10.75	4.13	7.88	1.25	.5	9.88
280	13.75	19.75	13.63	16.5	11.5	16	21.5	22	19	11.63	26	11.25	4.5	8.88	1.25	.5	11
315	15.5	22.25	15.63	18.63	13	17.75	24.13	24.88	21.5	13.25	26.5	12.75	5.25	9.88	1.25	.5	12.5
400	17.5	25.75	17.38	21.25	14.5	18.5	27	28	24.38	14.5	31.38	14.25	6.38	12.38	1.25	.5	15.75

Plastic industrial fan



Agent:	COLASIT AG – Faulenbachweg 63 – CH-3700 Spiez Phone: +41 33 655 61 61 – Fax: +41 33 654 81 61 e-mail: info@colasit.ch
COLASIT Order No.:	
Fan type:	
Year of manufacture:	
☐ For use in Ex zones	☐ Not for use in Ex zones

TD-000 674-E

Edition 2011 / Subject to alteration

COLASIT AG
Plastic construction
CH-3700 Spiez
Phone +41 (0)33 655 61 61 Fax +41 (0)33 654 81 61
www.colasit.com

1.8 General risk matrix

Operation
The safety regulations prevailing at the operator’s location are mandatory and must be observed at all times. Before making an intervention, the process must be stopped, i.e. all mechanical movement must be stopped and it must be ensured that no automatic motion can occur.

Missing safety devices
If the fan is equipped with safety devices, they may neither be modified nor removed. Further safety devices of suitable design must be fitted by the operator and are subject to his control.

Disregard of safety precautions
Please implement all safety measures so that the fan, together with its associated equipment, can operate properly and any danger to persons, materials and products can be excluded.

Putting the fan out of operation
In the case of damage to or failure of safety devices, the fan must be stopped and put out of operation. It may only be put into operation again when the safety devices are fully functional again.

Overpressure
If the fan is operated in overpressure conditions with normal seals, there is a danger of gas escaping.
For operation in overpressure conditions, special seals must be fitted.

Electricity
When any work is carried out on the fan, the electric motor must be deenergised and secured to prevent it from switching on. The main power switch must be secured against operation by third parties using a lockable device (e.g. padlock) by the persons working on the fan. **Full disconnection of the motor is only permissible in case of complete removal!**
The safety regulations for work on electrical equipment prevailing at the place of operation must be observed at all times and be available for reference at the place of operation.

Electrostatic charge
Media flowing through the plastic components may cause the buildup of electrostatic charge. These are harmless to persons who do not react to electrical impulses in the body

Unsuitable materials
Through the use of inappropriate materials, the fan and/or parts may be damaged or become non-functional. Please always use original spare parts and contact the manufacturer in any case of doubt.

COLASIT AG
Plastic construction
CH-3700 Spiez
Phone +41 (0)33 655 61 61 Fax +41 (0)33 654 81 61

Dangerous media

Depending on the mode of operation, fan parts may come in contact with dangerous media.
Work on the fan or carrying out maintenance work is not allowed during operation. Before carrying out any work, any dangerous media must be removed from the system and, when required, must be neutralized and secured in such a way that an inflow of dangerous media is prevented.

1.9 EC conformity of the COLASIT fan

The fan was designed, built and tested to Directive 2006/42 EC.
In addition to this EC Directive and EN standards which have the equivalent status of a Swiss standard, Swiss safety and accident-prevention regulations have also been taken into account.
An EC Declaration of Conformity in terms of the EC guidelines 2006/42 EC on machines will be issued along with the fan.

1.10 Restrictions when commissioning

We stipulate that putting into operation is prohibited as long as the fan, including all parts belonging to it or equipment connected to it, has not been installed and checked out and until the operating manual has been read completely before commissioning.

We stipulate that the fan may only be put into operation when the safety inspector has given his approval. He is obliged to record this approval in a protocol.

The disregard of these stipulations constitutes negligence.

1.11 General operation conditions

The permissible operating conditions are indicated on the manufacturer's plate.

The fan is not suitable for the transport of solids in the air flow. This operating mode will lead to the destruction of the fan.

The ducts on the intake and delivery sides must always be open. A closed duct will lead to a rise in temperature which could cause the destruction of the fan.

The minimum air speed through the fan is 3 meters per second.

The maximum air speed may not exceed 30 meters per second through the fan.

The standard motors are designed for normal operating conditions (ambient temperature +40°C, altitude below 1000 m above sea level, air pressure up to 1050 hPa). In case of any divergence from these conditions, please contact COLASIT.

Compliance with these operating conditions is the responsibility of the operator.

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2 Explosion protection

COLASIT plastic fans are suitable for the conveyance of gases in Zone 1 or 2 (Equipment Category 1 or 2) depending on the model. COLASIT plastic fans are not suitable for the conveyance of gases in Zone 0 (Equipment Category 1).
The zone classification of the conveyed medium and the site of installation must be made known by the fan operator so that COLASIT can take the necessary measures to prevent the risk of ignition.

The explosion-proof COLASIT fans are not suitable for the conveyance of explosive dusts

No modifications may be made to ATEX-certified fans. All work on the fan may only be carried out by ATEX-trained skilled personnel. Otherwise the ATEX Certificate will lose its validity.

On ATEX certified fans, the external grounding terminal of the motor and fan must be connected to a potential equalization system.

Motors with protection type "e" are standard for using in the explosion-proof design of our fans. The standard version of the motors used complies with temperature class T3 (maximum surface temperature 200ºC). As special-purpose design, motors with protection type "d" or motors with temperature class T4 (maximum surface temperature 135°C) are also available.

The user must define a suitable temperature class for his application that does not reach the ignition temperature of his conveyed medium.

Please also observe the specifications in the operating instructions of the motor manufacturer. The thermal motor protection must be connected in compliance with the manufacturer's specifications (operating instructions).

If a frequency converter is fitted, we recommend using pressure-proof enclosed motors. In addition, a certified PTC resistor releasing device must be fitted. The following specifications must be included on the motor rating plate: min and max frequencies, min and max speeds, min and max torque or output, limit temperature PTC and PTC release time.

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2.1 Fan Ex marking

The Ex marking is located on the rating plate of each ATEX fan. On a fan of Equipment Category 2 (Zone 1), it looks like this

II 2/3G c T3

	CE-marking
	Marking denoting prevention of explosions
II	Equipment Category II, for all Ex applications which do not fall in Class I (mines and surface workings).
2/3G	Equipment Category inside/outside the fan Equipment Category 2 is the equivalent of Zone 1 and Equipment Category 3 is the equivalent of Zone 2 “G“ fan fort he conveyance of expolosive gases
c	Protection type „design safety“
T3	Temperature class T3: Max. surface temp. 200 °C T4: Max. surface temp.. 135 °C

2.2 Correct installation of ATEX fan

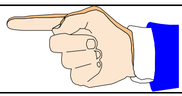
The fan must be installed properly to guarantee trouble-free operation. To document proper installation, you will find a form on the last pages of this operating manual. The fitter must confirm the proper installation item for item on this form.
The signed form must be kept by the safety officer or operating company.

COLASIT also offers a comprehensive installation service for fans.

3 Shipping, unpacking, inspection, storage

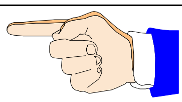
The fan is completely assembled and can be delivered in a closed film wrapping.
Please make sure the delivery corresponds to the shipping documents.

Please examine the packaging for external damage and report any damage immediately to the transport company, the supervisor and the manufacturer.

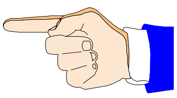


Please handle the fan with care. During transportation, only apply strain on the steel parts. Plastic is sensitive to impact and knocks, especially in the temperature range under +5°C.

When the film is removed, the intake and pressure nozzles are open and unprotected against the intrusion of foreign objects. Therefore, please do not remove the protective film until shortly before final installation.



Storage
If the fans are not put into operation immediately, store them in a clean dry place where they are protected from impacts, vibrations, and temperature fluctuations and where the air humidity is under 90%.
If these storage conditions are not available, switch the fans on at regular intervals to exclude the risk of condensate forming. Before switching on, unscrew the condensate drain plugs each time and replace them afterwards.



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Store the fan in a dry, weather-protected place and cover with a tarpaulin to protect it from dust and soiling.
If stored for over one year, test whether the fan bearings rotate freely before putting into operation.

4 Installation, configuration

Before installation, check whether all the locking screws (including the motor screws) are tightened properly.
Check the electrical connections if wired at the factory.

Before installation, check that there are no foreign bodies in the coil or in the intake and pressure connections.

The fan must be installed at a location provided and prepared by the customer and must be secured and connected in such a way that any possible vibration occurring can be absorbed by the vibration dampers supplied by COLASIT.
If no ducting is foreseen on the intake side, the intake connection should be protected by a sturdy protective grating (10mm mesh) to be provided by the customer.
Connection ducting on the pressure side must be routed to prevent the backflow of foreign bodies, rainwater or condensate into the fan. To ensure this, please use the COLASIT condensate drain nozzles.
Due to the possibility of noise nuisance, we recommend that the fan should not be installed in the immediate vicinity of workplaces.

5 Commissioning, initial startup, test run

The fan should only be put into operation after inspection and approval by the safety officer.

5.1 Inspection of the installation and settings

Check list:
Prior to commissioning and initial start-up, it must be guaranteed that

- ☐ the fan is installed vibration-free and mechanically secured,
- ☐ all components are cleaned both on the inside and the outside and are free from foreign bodies,
- ☐ all intake and pressure ducts connections are leak-proofed
- ☐ all rotating parts are protected against unintentional contact,
- ☐ the electrical connections are installed and their function tested,
- ☐ a lockable main control switch is available to which the fan is connected
- ☐ the EMERGENCY-STOP equipment is functionally tested,
- ☐ the safety inspector has made sure that safety equipment exists,
- ☐ the operating personnel is familiar with the operating manual,
- ☐ the safety inspector has given his approval fort he operation of the installation and that no external persons are present in the plant area

If envisaged by procedural regulations provided by the operator, minutes have to be taken on the commissioning work, including the observance of the check list.

Edition 2011 / Subject to alteration

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5.2 Drive

The fan is driven by an electric motor which is connected to the impeller shaft either directly or via a V-belt.

The motor electrical specifications are indicated on the motor's rating plate or in the motor manufacturer's data sheet.

When speed is controlled by means of a frequency converter, the maximum speed is limited by COLASIT to the value indicated on the manufacturer's rating plate.

If the frequency converter is not supplied by COLASIT, the operator is responsible for compliance with the maximum speed limitation. In this case, COLASIT will not assume any liability for damage that may be attributed to exceeding the maximum speed.

In the case of motor outputs over 3kW, we recommend the use of a soft starter or a star-delta connection.

5.3 Electrical installations, EMERCENCY STOP

The electrical installations may only be carried out by an authorised electrician in accordance with the regulations prevailing at the site at which the fan is installed.

To interrupt the power supply, an EMERGENCY STOP switch must be provided. It is advisable to mount this switch in the vicinity of the emergency exit.

Please request confirmation from an in-house electrician that the electrical installations were carried out and tested in accordance with regulations, that all functions were tested (or simulated) and that the rotational direction is correct.

Warning
Do not turn power on or off without prior warning to persons in the area where the fan is operating. Switching operations must be co-ordinated with other functions in the working area of the fan.

6 Operation

6.1 Safety instructions

The fan must be operated according to this manual. This will avoid the occurrence of any damage.

Supervision
The fan must not be operated unattended as long as it conveys substances whose reactions are unknown or if unexpected reactions are anticipated.
If supervision must be withdrawn for operational reasons, this must be reported to the safety officer and the system must be secured in such a way that no unauthorized intervention can be carried out. The safety officer must decide on issues regarding supervision.

6.2 Putting out of operation

An internal process instruction must regulate the work to be carried out as well as the preparatory work for putting back into operation (e.g. cleaning).

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7 Maintenance, repair, cleaning

7.1 Preparation

Before any work is carried out on the fan, the fan must be set to its "safety position".

The „safety position“ is defined as follows:

- The drive must be currentless and the main switch secured against switching on,
- The fan impeller can be manually rotated,
- Fan must be flushed with fresh air and be condensate-free,
- Fan must be at room temperature,
- Personal protective equipment must be available and it must be worn. (Use of protective gloves because of sharp edges, ear protectors if necessary).
- A sign, e.g. „Under-repair“, must be attached to the system,
- The safety devices may be removed,
- The work to be carried out must not be done under time pressure,
- The general and specific regulations on accident prevention as well as the EKAS guidelines (Switzerland) must be observed,
- The safety officer must be informed about the nature and course of the work,

If the intake and delivery ducts of the fan are dismounted for a longer period of time, the openings must be closed off.

7.2 Performance

The fan must be maintained in accordance with the Maintenance Plan below. The maintenance work carried out must be noted down in the logbook (see the section on Logbook).

Every week	Every month	Every year
• Make a visual inspection of fan for damage, leaks, corrosion and attachment. • Check the smooth running of the fan and electric motor. • Check state and tension of the V-belt and replace if necessary.	• Check the impeller and casing for deposits and clean if necessary. • Check the shaft bearing for smooth running and vibrations. Bearing maintenance -> see chart below for regreasing intervals. • Remove any dust deposits on the fan and motor. • Check the flexible transitions from fan to duct system for leaks and state. • Check the function of the condensate nozzle. • Check the state of the vibration dampers. • Check the state of the hub gasket (if fitted).	• Carry out a thorough cleaning of the entire fan (including impeller). • Check the parts in contact with the conveyed medium for corrosion. • Check the minimum clearance between the impeller and casing (minimum 1% of intake diameter, maximum 20mm). • Measure the vibrations at bearings (KA) or motor (DA). Permitted value acc. to ISO 14694 Class BV-3, 5.1mm/s. • Check the safety devices (e.g. splinter protection or intake grating) for condition and function. • Check the stands for damage and stability. • Check all screw unions for firm seating.

Normally the bearings are designed for a service life of 40,000 hrs. After this period the bearings must be replaced. The service life of the bearings is reduced when subjected to increased requirements (e.g. high temperature, aggressive ambient air or operation with frequency converter).

On drives with V-belts, check the tension regularly and monitor the belts closely particularly during the first weeks of operation. This also applies after long periods of downtime. Excessive tension leads to bearing damage, insufficient tension leads to slip, wear and frictional heat.

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After replacing a V-belt, check the tension after 1 to 4 hours of operation and retension as necessary.
The fan bearings are maintenance-free.
The bearing temperature of 70ºC may not be exceeded. In cases of high stress (environment) the grease quantity loses its lubricity over time due to mechanical stresses, ageing and increasing contamination. This issue can reduce the service life of the bearings.

Components which are not intended for repair by the operator must be sent to the manufacturer or agent for repair or replacement (e.g. damaged impeller).

Your agent or COLASIT also offers customer services

Manufacturer	**COLASIT AG** P.O. 85 CH 3700 Spiez / Switzerland	
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	Fax.:	0041 (0)33 654 81 61
	e-mail	info@colasit.ch
Agent	see front page	

Deposits on the impeller and soiling lead to imbalance and as a result to vibrations with undesirable side effects.
If vibration occurs, switch the fan off immediately

Contamination and encrustations should be removed with a soft tool without damaging the surface (e.g. with a wooden spatula or scraper).If possible, use water and a household cleaning agent

Solvents can corrode the material. These may only be used with the written consent of COLASIT.

To carry out cleaning work, we recommend the production of a process instruction

8 Spare parts

Please identify components by means of the position and drawing numbers as well as the order number and type designation.
Use only original spare parts. Our warranty becomes null and void if other or unapproved components are used.
Please address your spare parts order to our customer service department.

9 Operating instructions

To operate the fan, we recommend the production of process instructions. These documents are intended to simplify repetitive workflows, reduce the risk of incorrect operation and are a valuable aid for training and when personnel changes occur.
If the fan must be qualified, process instructions are an absolute prerequisite.
You will find important instructions on how to produce process instructions in various chapters of this operating manual.

To help ensure the safe operation of the fan, COLASIT offers the service of reviewing process instructions prepared by the operator

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10 Logbook

For your own safety and as an aid to personal responsibility, we recommend the keeping of a logbook for the entire period during which the fan is in service.
All events should be recorded in the logbook.
In case of damage and also in case of an accident, this document is the first source of information.
For example, enter the date and your signature:

- Start and end of a work cycle
- Special events, even if they do not concern the fan itself (e.g. power failure, alarm)
- Change of supervision staff (e.g. in case of shift operation),
- Repairs carried out and spare parts installed,
- Putting out of operation,
- Special instructions,
- etc.

11 Disposal

Before disposing of plastics and other components (complete or as broken parts), please clean them as necessary to avoid any danger to the environment.
Dispose of the components properly. Instruct a waste disposal company to do this or return them to us for disposal.

12 Troubleshooting

If faults occur, we recommend you identify and clear them using the following table.
If the fault cannot be cleared, please contact our customer service department.

Fault	Possible causes	Remedy
Fan not running smoothly	Impeller imbalance	Rebalance by specialist company
	Impeller caked up	Clean carefully rebalance if necessary
	Material corrosion on impeller due to aggressive conveyed medium.	Consult the manufacturer
	Impeller deformed due to high temperature.	Consult the manufacturer. Install new impeller. Check bearings
	V-belt drive not correctly aligned.	Adjust belt drive
V-belt torn or damaged	Normal wear and tear	Replace V-belts in sets
	V-belt pretensioned too strongly	Tension replacement belt to manufacturer's specifications
V-belts slip due to	Incorrect pretension	Check belt tension and retighten if necessary
	Foreign bodies or soiling in grooves or pulleys	Clean pulleys and check belt profile
Leak at shaft bushing	Seal not suitable for application	Consult the manufacturer
Leak on sleeves	Sleeves defective	Replace sleeves
	Tensioning straps not tight enough	Retighten tensioning straps
Fan output too low	Incorrect rotation direction of impeller	Change rotation direction
	Pressure losses in ducts too high	Change duct arrangement
	Restrictors not or only partly open	Check opening on site

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Fault	Possible causes	Remedy
	Intake or pressure duct blocked	Remove blockage
Fan fails to reach its rated speed	Electrical switching mechanisms incorrectly adjusted	Check motor protection setting and reset if necessary
	Motor winding defective	Please consult the manufacturer
	Drive motor drive not correctly designed	Please consult manufacturer to verify starting torque
Grinding noises when fan is running or starting	Intake duct fitted under tension	Remove intake duct an realign
Rise in temperature of roller bearings	Bearing was not greased	Change bearing and grease at regular intervals as stipulated in the maintenance instructions

13 Retrofittable original accessories

If not already a part of our scope of supply, these original parts are available ex stock when ordered.
- Frequency converters
- Elastic sleeves
- Vibration dampers
- Condensats drains
- Motor cover for outdoor installation
- Splinter protection

14 Fan identification

The following rating plate is affixed to each COLASIT fan:

1 Manufacturer

2 Field for CE marking and applicable standards

3 ATEX-identification, for details see the section on Explosion Protection

4 Fan specifications: fan type, casing design, material of casing and impeller, order number and date of manufacture.

5 Technical specifications

Part 2: Units

15 Design and function of the CMVeco 125 - 400

All impellers in this series are balanced to better than Q6.3 according to VDI 2060.
The casing with its thermoplastic rear panel is screwed onto the support base and can be easily dismantled for inspection or cleaning purposes.

The fans are available in 2 standard designs
- Direct drive
- V-belt drive

As a basic principle, plastic fans are to be installed on the intake side in order to avoid leaks.

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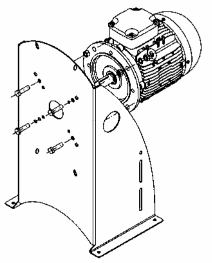
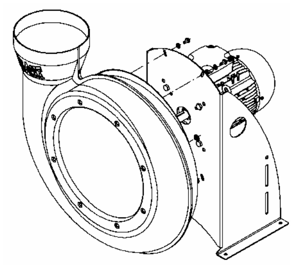
17 Assembly instructions

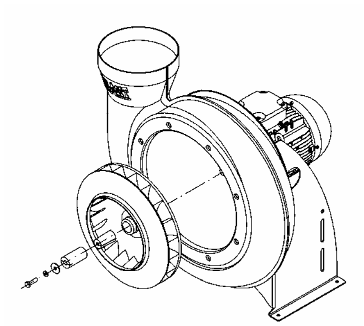
17.1 Assembly instructions CMVeco 125 – 400 with direct drive



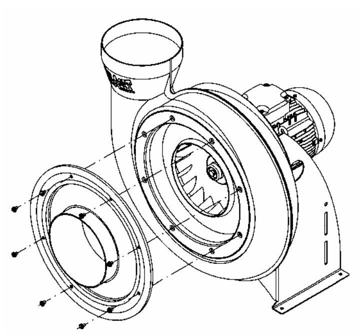
1. Attach motor to the support



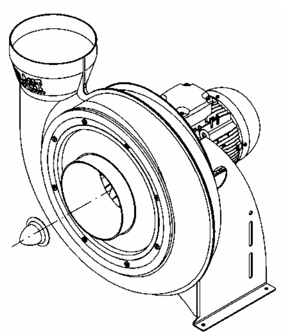
2. Attach casing to the support



3. Fasten impeller with the clamp adapter set on motor shaft (do not tight yet the clamp adapter)



4. Fasten inlet section on the casing



5. Adjust impeller, tighten clamp adapter set.
   Mount hub cap

Dismantling in the same way but in reverse order

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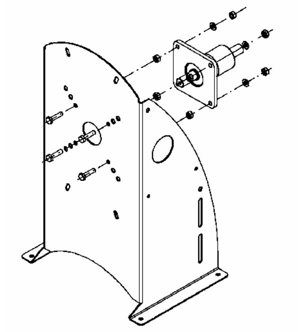
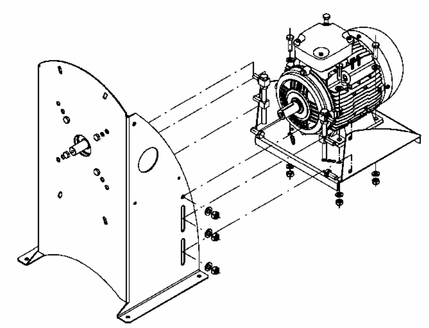
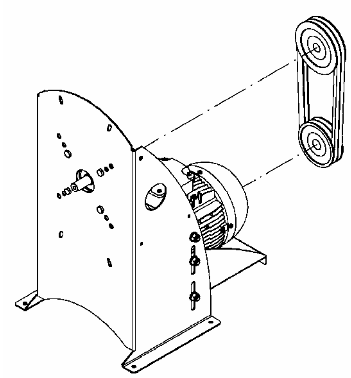
17.2 Assembly instructions for CMVeco 125 – 400 with V-belt drive



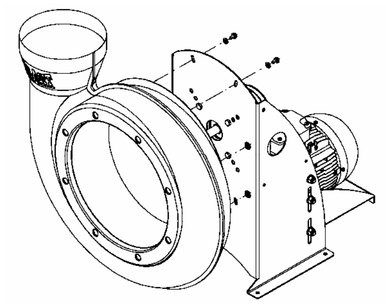
1. Install flanged bearings and support plates



2. Bolt motor bracket together and attach motor



3. Install V-belt drive. Tension drive belt



4. Attach casing to the support

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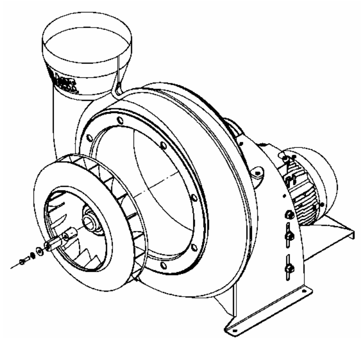
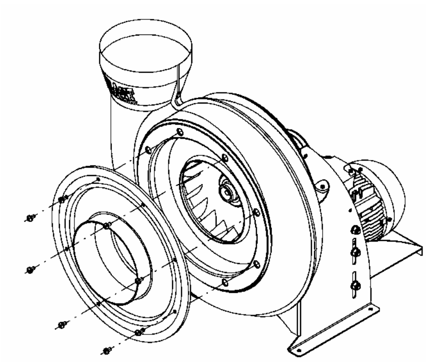
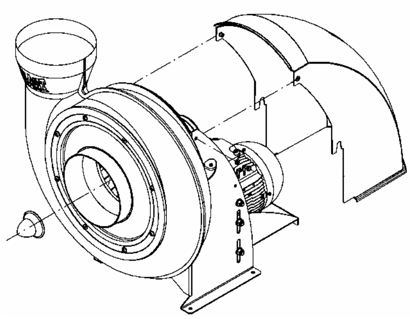


5. Fasten impeller with clamp adapter set on motor shaft
   (Do not tight yet the clamp adapter)



6. Fasten inlet section on the casing



7. Adjust impeller, tighten clamp adapter set
   Mount hub cap. Mount V-belt protection

Dismantling in the same way but in reverse order

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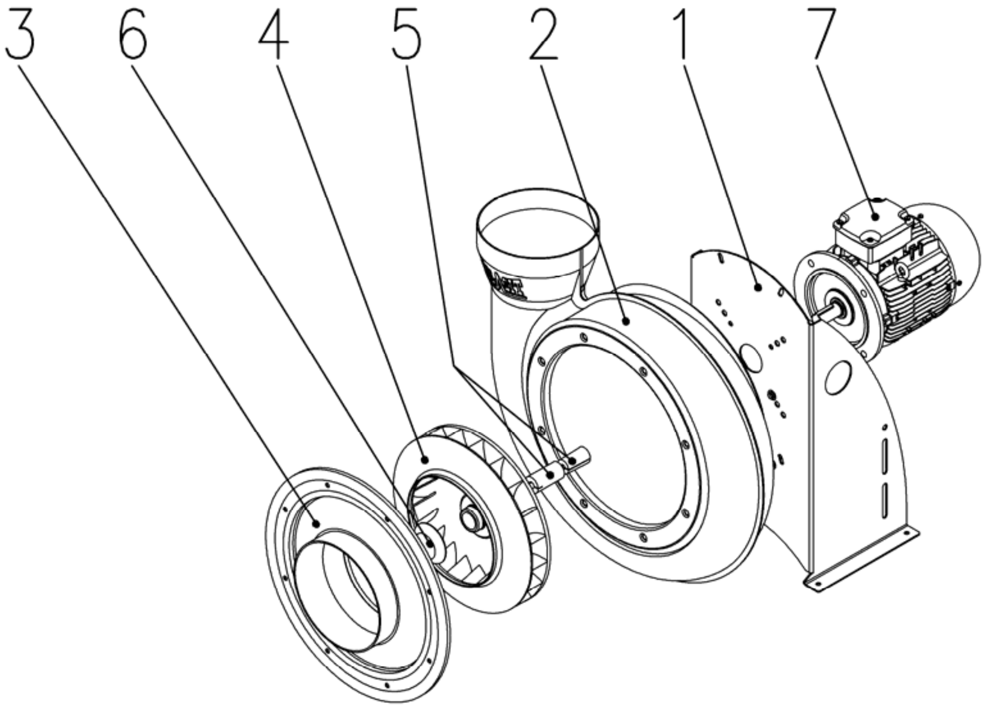
18 Spare parts lists

18.1 Spare parts list for CMVeco 125 – 400 with direct drive



1 Support
2 Casing
3 Inlet section
4 Impeller
5 Clamp adapter set
6 Hub cap
7 Flange motor

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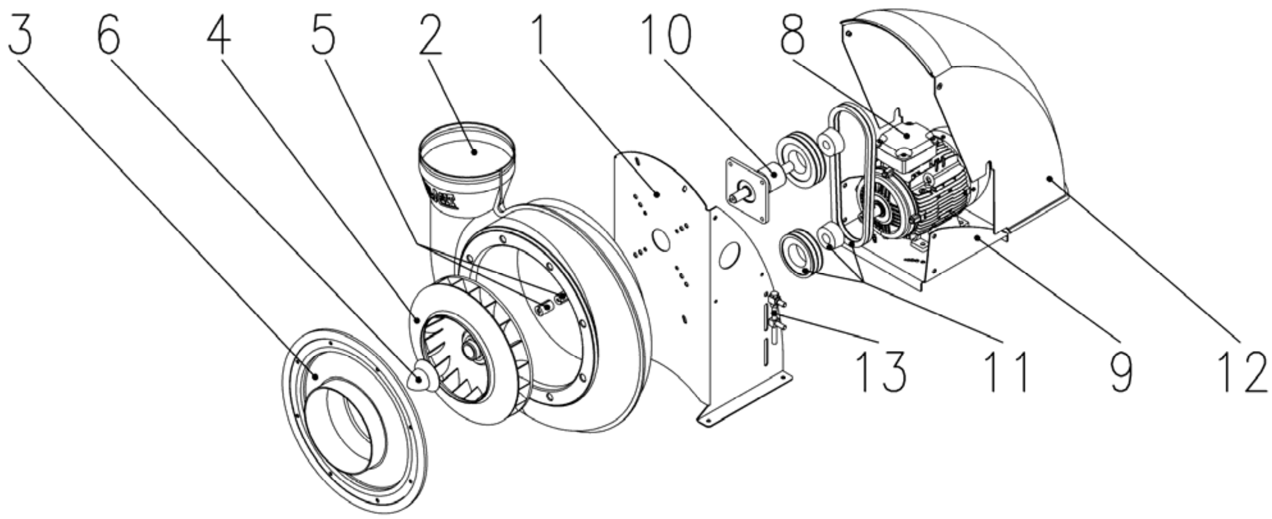
18.2 Spare parts list for CMVeco 125 – 400 with V-belt drive



1	Support	8	Feet motor
2	Casing	9	Motor plate with bracket
3	Inlet section	10	Flange bearing unit
4	Impeller	11	V-belt
5	Clamp adapter set	12	V-belt protection
6	Hub cap	13	Setting screw

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Part 3: Certification

19 Certifications

19.1 CE Manufacturer’s declaration

EG-Konformitätserklärung
CE Déclaration de conformité
EC Declaration of conformity

Wir Nous We	**COLASIT AG** **Postfach 85** **CH-3700 Spiez**
erklären in alleiniger Verantwortung, dass das Produkt déclarons de notre seule responsabilité que le produit bearing sole responsibility, hereby declare that the product	**Kunststoff-Industrieventilator** **Ventilateur industriel en plastique** **Plastic industrial fan** **CMVeco 125-400**

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normativen Dokumenten übereinstimmt:
auquel se rapporte la présente déclaration est conforme aux normes ou aux documents normatifs suivants:
referred to by this declaration is in conformity with the following standards or normative documents:

Bestimmungen der Richtlinie Désignation de la directive Provisions of the directive	**Titel und/oder Nummer sowie Ausgabedatum der Norm(en):** Titre et/ou numéro ainsi que date d'émission de la/des norme(s): Title and/or number and date of issue of the standard(s):
2006/42/EG: Maschinensicherheit 2006/42/CE: Sûreté des machines 2006/42/EC: Machinery safety	**EN ISO 12100-1: 2004** **EN ISO 12100-2: 2004** **EN ISO 14121-1: 2007** **EN ISO 13857: 2008** **EN 60204-1: 2006**
2004/108/EG: Elektromagnetische Verträglichkeit 2004/108/CE: Compatibilité électromagnétique 2004/108/EC: Electromagnetic compatibility	**EN 61000-6-2: 2005**
Name und Adresse des Dokumentationsverantwortlichen: Nom et addresse de la personne responsable de la documentation: Name and address of the person authorised to compile the relevant technical documentation:	**Urs Wenger** **COLASIT AG** **Faulenbachweg 63** **CH-3700 Spiez**
Bei Verwendung im Ex-Bereich Pour utilisation dans zone Ex For use in Ex zones	
94/9 EG: Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen 94/9 CE: Appareils et système de protection destinés à une utilisation correcte en atmosphère explosibles 94/9 EC: Equipment and protective systems intended for use in potentially explosive atmospheres	**EN 1127-1: 2008** **EN 13463-1: 2009** **EN 13463-5: 2005** **EN 14986: 2007**
Ex-Kennzeichnung: Marquage Ex: Ex Marking:	**II 3/- G c T4** **II 3/3G c T4** **II 2/3G c T4** **II 2/2G c T4**

Spiez, 22-12-2010

U.Moser (Leiter Technik/Responsable dép. technique/Chief technical officer)

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ATEX-Declaration of Conformity

Equipment, components and protection systems for use for their intended purpose in explosion protected zones – **Directive RL 94/9/EC (ATEX)**

Document number :	**TD-000 744**
Product designation:	Medium pressure radial fan CMVeco 125-400 ATEX
Hersteller:	COLASIT AG Postfach 85 3700 Spiez
Product description	Plastic industrial fan fort he conveyance of chemically aggressive gases, vapour or correspondingly contaminated air.

The conformity assessment process was conducted in compliance with Directive 94/9/EC (ATEX). The results are recorded in the confidential **Test Report TD-T586-21-3**. All related documents are kept at the centres named below:

QS Zürich AG, named centre CE 1254
Wehntalerstrasse 3
CH-8057 Zürich

COLASIT hereby certifies compliance with the basic health and safety requirements for the design and manufacture of equipment and protection systems for use for their intended purpose in explosive atmospheres in compliance with Annex II of the Directive.

The following harmonised standards were applied:

EN 1127-1: Explosive atmospheres – Explosion protection, Part 1, 2008
EN 13463-1: Non-electrical equipment for potentially explosive atmospheres, Part 1, 2009
EN 13463-5: Non-electrical equipment for potentially explosive atmospheres, Part 5, 2005
EN 14986: Design of fans working in potentially explosive atmospheres, 2007

The marking on the appliance must comprise the following information:

Ex II 3/- G c T4 (conveyed medium Zone 2, site of installation no zone)

Ex II 3/3 G c T4 (conveyed medium Zone 2, site of installation no Zone 2)

Ex II 2/3 G c T4 (conveyed medium Zone 1, site of installation no Zone 2)

Ex II 2/2 G c T4 (conveyed medium Zone 1, site of installation no Zone 1)

The associated operating instructions contain important safety instructions and regulations for putting the named equipment into operation in compliance with Directive 94/9/EC (ATEX).

Changes to the named equipment are prohibited except with the manufacturer's express approval in writing.

If the named equipment is built into a higher level machine, the new risks ensuing from the integration must be assessed by the manufacturer of the new machine.

Spiez, 21st. September 2009

Der ATEX-Officer

On behalf of the executive management

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Declaration of Conformity No. TD-000 744

Description of appliance or protective system

The radial fans CMVeco 125-400 ATEX with direct drive and V-belt drive extract room air or process exhaust air. They are directly or indirectly driven by electric motors via V-belts.

Special conditions :	If the fans are operated within explosive atmospheres in Zone 1 or 2, they may only be driven by motors for which an appropriate approval (EC type test certificate) has already been issued. Temperature Class T4: If the site of installation is Zone 1/2, an explosion proof motor with temperature class T4 must be fitted. If an explosion proof motor with temperature class T3 is used, temperature class T3 shall apply to the entire fan Ambient temperature: T 0-40°C Maximum temperature of intake medium: 60°C The minimum flow velocity through the fan has to be minimum 3m/s. On versions with V-belt drive, only V-belts may be used if they conform with the requirements of EN 13463-5 Chap. 7.2 and possess an appropriate factory certificate in compliance with EN 10204-2.1. All service and repair work must be carried out by trained service personnel.
Additional information:	The radial fans of Equipment Category 3 may only be used to extract gases where the frequency of occurrence of combustible or explosive atmospheres is equivalent to Ex-Zone 2.

Basic safety and health requirements:

Fulfilled by standards.

This certificate may only be copied in full without any changes.

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APPENDIX K

REMEDIAL SYSTEM OPTIMIZATION TABLE OF CONTENTS

REMEDIAL SYSTEM OPTIMIZATION FOR MINUTE MAN CLEANERS

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