Bianchi/Weiss Greenhouses Site, Suffolk County
East Patchogue, New York

Site Management Plan

NYSDEC Site Number: 152209
USEPA ID # NYR000209486

Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway
Albany, New York 12207

Prepared by

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Revisions to Final Approved Site Management Plan

Revision Number	Date Submitted	Summary of Revision	New York State Department of Environmental Conservation Approval Date

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JUNE 2019

CERTIFICATION STATEMENT

I Donald F. Conan, P.E. certify that I am currently a NYS registered Professional Engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

P.E.

6/18/19 DATE

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LIST OF ACRONYMS/ABBREVIATIONS

µg/L	Microgram(s) per liter
bgs	Below ground surface
CLP	Contract Laboratory Program
DER	Division of Environmental Remediation
EA	EA Engineering, P.C. and Its Affiliate EA Science and Technology
EC	Engineering Control
ECL	Environmental Conservation Law
EnviroScience	EnviroScience Consultants, Inc.
EWP	Excavation Work Plan
FS	Feasibility Study
Gal	Gallon(s)
HASP	Health and Safety Plan
Henron	Henron Development Corporation
IC	Institutional Control
in.	Inch(es)
IRM	Interim Remedial Measures
MW	Monitoring well
No.	Number
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
PRR	Periodic Review Report
PSI	Pounds per square inch
PW	Private well
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RI	Remedial Investigation

ROD	Record of Decision
RSO	Remedial Site Optimization
SCG	Standards, Criteria, and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
USEPA	United States Environmental Protection Agency

ES. EXECUTIVE SUMMARY

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

Site Identification No: 152209 Bianchi/Weiss Greenhouses Site
25 Orchard Road East
Patchogue, New York

Institutional Controls: Environmental Notice	• The property may be used for residential, restricted residential, commercial, and industrial use. • All Engineering Controls must be inspected at a frequency and in a manner defined in the Site Management Plan.
Engineering Controls	Offsite sump pumps and filters
Site Management Activities	**Frequency**
Inspections	
Basement sump pumps and filters	Annually
Monitoring	
Groundwater Monitoring Wells (See page 4-4 for full list)	Annually
Maintenance	
Sump pump and filter maintenance	Annually
Reporting	
Periodic Review Report	Every Three Years
Groundwater Monitoring Report	Annually

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

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1. INTRODUCTION

1.1 GENERAL

This Site Management Plan (SMP) is a required element of the remedial program for the Bianchi/Weiss Greenhouses Site located in East Patchogue, New York (hereinafter referred to as the "Site") (Figure 1). The Site is currently in the New York State Class 2 inactive hazardous waste disposal Site Number (No.) 152209, which is administered by New York State Department of Environmental Conservation (NYSDEC).

EA Engineering, P.C. and its affiliate EA Science and Technology (EA) was issued a work assignment to investigate and oversee the remediation of contaminated media at the Site. A figure showing the site location and boundaries of this Site is provided in Figure 1. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Notice provided in Appendix A.

After completion of the remedial work, some contamination was left at this Site, which is hereafter referred to as "remaining contamination". Institutional controls (ICs) and engineering controls (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 Notice granted to the NYSDEC, and recorded with the Suffolk 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 Notice 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 Notice 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 Notice. Failure to properly implement the SMP is a violation of the Environmental Notice.

- The NYSDEC is currently the remedial party responsible for conducting the site management activities detailed herein. The site owner shall submit a periodic certification of the site controls when requested by NYSDEC. A change in ownership and/or the remedial party will be documented in a revised SMP.

- Failure to comply with this SMP is also a violation of Environmental Conservation Law (ECL), 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 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 B of this SMP.

This SMP was prepared by EA on behalf of NYSDEC, in accordance with the requirements of the NYSDEC's Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation (NYSDEC 2010a), 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 Notice 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 shutdown 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 Notice 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 DER-10 for the following reasons:

- Sixty-day advance notice of any proposed changes in Site use that are required under the terms of the Record of Decision (ROD) (NYSDEC 2012), 6 NYCRR Part 375, and ECL.

- Seven-day advance notice of any field activity associated with the remedial program.

- Fifteen-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 ROD, 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.

The following table 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 B.

Notifications*

Name	Contact Information
Brian Jankauskas Central NYSDEC Representative	518-402-9626 brianjankauskas@dec.ny.gov
Walter Parish, Regional Office NYSDEC Representative	50 Circle Road SUNY at Stonybrook Stony Brook, New York 11790
Chief, Site Control NYSDEC Site Control Representative	Division of Environmental Remediation 625 Broadway Albany, New York 12233-7020
*Note: Notifications are subject to change and will be updated as necessary. Note: NYSDEC = New York State Department of Environmental Conservation SUNY = State University of New York	

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2. SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 SITE LOCATION AND DESCRIPTION

The Site is located in East Patchogue, Suffolk County, New York, and is identified as Section 979.60 Block 0300 and Lots 002, 008, 009, 011, and 020.001 on the Patchogue Tax Map (Figure 1). The Site is a 13.152-acre area and is bounded by Hedges Road to the north, private residential properties on South Country Road to the south, Hedges Road and private residential properties to the east, and Orchard Road and private residential properties to the west (Figure 1 Site Location and Layout Map). The boundaries of the Site are more fully described in Appendix A – Environmental Notice. The owner of the Site parcels at the time of issuance of this SMP is Henron Development Corporation (Henron).

2.2 PHYSICAL SETTING

2.2.1 Land Use

The Site is currently zoned residential and is vacant. The Site is surrounded by residential properties. The main access to the Site is from the west on Orchard Road. An alternative access road exists on Hedges Road to the north of the property, but is currently overgrown.

2.2.2 Geology

A review of the geologic map of New York (Lower Hudson Sheet published by the University of the State of New York, the State Education Department and dated 1970) indicates that the Site lies within the coastal plain deposits above the Monmouth, Matawan, and Magothy Groups, which are part of the Upper Cretaceous Period. According to the Environmental Data Resources, Inc. report, the Site is located within the sands and loams associated with the Pleistocene Epoch in the Quaternary Period.

A geologic cross section is shown in Figure 2. Site-specific boring logs are provided in Appendix C.

2.2.3 Hydrogeology

Based on groundwater monitoring performed in the vicinity of the Site, groundwater was typically encountered 5-6 feet (ft) below ground surface (bgs) at onsite monitoring locations and ranged from 5 ft bgs south of the Site to 13 ft bgs at monitoring locations north of the property. The lowest area on the site is 11 ft amsl; in this area groundwater is approximately 4 ft bgs. The regional shallow groundwater flow was previously determined to be in a south-southwest direction.

A groundwater contour map is shown in Figure 3. Groundwater elevation data is provided in Section 4. Groundwater monitoring well construction logs are provided in Appendix D.

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 used as a commercial greenhouse and nursery operation starting in 1929. Onsite structures consisted of three buildings (1.5-story storage building, 1.5-story brick/frame residential dwelling, and a generator building), a single story horse barn, a frame garage, and six greenhouses. Planting fields were reported to have been located on the eastern and western portions of the site; however, the western portions of the site are presently covered with asphalt or concrete foundations. Two 275-gallon (gal) fuel oil aboveground storage tanks, one 1,000-gal aboveground storage tank, and one 20,000-gal fuel oil underground storage tank were identified as being located on the property. Another underground storage tank was identified during the Remedial Investigation (RI) in 2009 just north of the former generator house.

The Site is currently zoned for residential use, but is unoccupied and vacant. It is estimated that the site operated as a greenhouse/nursery for at least 70 years. After taking ownership in 2005, Henron demolished all onsite structures.

The following is a summary of investigations and associated reports that have been completed at the Site:

- **2005**—Soil investigation conducted by EnviroScience Consultants, Inc. (EnviroScience). Eight surface soil samples (1-3 inches [in.] bgs) and four subsurface samples collected at depths of 9-12 in. bgs. Samples contained concentrations of chlordane, heptachlor, and arsenic in exceedance of the United States Environmental Protection Agency (USEPA) soil screening levels; additional subsurface investigation was requested by the Suffolk County Department of Health Services (SCDOH). Results of this investigation are detailed in the *Soil Investigation Report* (EnviroScience 2005).

- **2006—**Additional subsurface soil investigation conducted by EnviroScience. Activities included investigation of Site subsurface drainage structures as well as subsurface sampling at four of the surface sample locations previously investigated. Samples contained elevated concentrations of chlordane; subsurface drainage structures also contained lead, copper, and some semi-volatiles. Results of this investigation are detailed in the *Subsurface Investigation Report* (EnviroScience 2006).

- **2006**—Onsite and downgradient surface water and groundwater samples were collected by the SCDOH. Chlordane was detected in onsite groundwater and surface water and offsite groundwater as far as 3,000 ft south-southwest from the site. Results of this investigation are detailed in the *Surface Water and Groundwater Sampling Results* (SCDOH 2006).

- **2008-2009**—Interim remedial measures (IRM) were completed by EA to remove Site stockpiles and excavate soil from within the onsite subsurface drainage structures. All material was disposed of offsite and endpoint sampling was completed to confirm removal. Exposed surface soils were covered with mulch and silt barriers were placed along the perimeter of the Site to mitigate the potential migration and potential offsite release of the Site surface soil. Activities completed as part of the IRM as well as results of confirmation samples are summarized in the *Final Interim Remedial Measures Summary Report Bianchi/Weiss Greenhouses Site (1-52-209) East Patchogue, Suffolk County, New York* (EA 2009).

- **2009-2011**—RI completed by EA. This included collection and analysis of samples for onsite and offsite groundwater, surface water, soil, and sediment. Site-related contaminants of concern were identified as chlordane and lead. Results were detailed in the *Remedial Investigation Report Bianchi/Weiss Greenhouses Site (152209) East Patchogue, Suffolk County, New York* (EA 2011a).

- **2011**—Feasibility Study (FS) completed by EA. This involved evaluation of remedial alternatives for the site based on results of RI, detailed in the *Feasibility Study Bianchi/Weiss Greenhouses Site (152209) East Patchogue, Suffolk County, New York* (EA 2011b).

The following table is a summary of pre-remediation impacts from site related contaminants of concern.

Pre-Remediation Soil and Groundwater Contamination

Contaminants of Concern	Location and Media	Applicable Standards	SCG	Concentration Range Detected	Frequency of Exceeding SCG
Alpha-Chlordane	Onsite soil	Restricted Use – Residential SCOs	0.91 mg/kg[(a)]	ND – 31 mg/kg	41/279
	Offsite soil	Unrestricted Use SCOs	0.094 mg/kg	ND - 3.3 mg/kg	8/19 (Surface Soil)
Gamma-Chlordane	Onsite soil	Restricted Use – Residential SCOs[1]	0.54 mg/kg	ND – 26 mg/kg	46/279
	Offsite Soil			ND-1.3 mg/kg	1/19 (Surface Soil)
Lead	Onsite soil	Restricted Use – Residential SCOs	400 mg/kg	2.08 – 2,350 mg/kg	7/47
	Offsite soil	Unrestricted Use	63 mg/kg	25-397 mg/kg	6/13
Total Chlordane	Onsite and offsite groundwater	Ambient Water Quality Standards for Class GA Waters	0.05 µg/L[(b)]	ND-12.0 µg/L	21/25
		New York State Sanitary Code (10 NYCRR Part 5)	2 µg/L		9/25

(a) mg/kg = milligrams per kilogram
(b) µg/L = micrograms per liter
NYCRR = New York Codes, Rules, and Regulations
SCO = Soil cleanup objective
SCG = Standards, Criteria, and Guidelines
[1] No Unrestricted Use SCO for Gamma Chlordane

The historic layout of the site is shown on Figure 4. The spatial extent of impacts prior to remediation is shown on Figure 5.

2.4 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) for the Site as listed in the ROD (NYSDEC 2012) are as follows:

- Groundwater
  - RAOs for public health protection
    - Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
    - Prevent contact with contaminated groundwater.
  - RAOs for environmental protection

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

- Soil

  — RAOs for public health protection

    - Prevent ingestion/direct contact with contaminated soil.

    - Prevent inhalation of contaminated dust.

  — RAOs for Environmental Protection

    - Prevent migration of contaminants that would result in groundwater contamination.

    - Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

2.5 REMAINING CONTAMINATION

The remedial action for this Site involved excavation and offsite disposal of onsite soil exceeding Restricted Use – Residential SCOs, and offsite soil exceeding Unrestricted Use SCOs for site related contaminants of concern. Final excavation limits were based on confirmation samples collected from excavation sidewalls and bottoms, at a rate of one per 30 linear ft (sidewalls) and one per 900 square feet (ft^2) (excavation bottom), analyzed for alpha- and gamma- chlordane, and lead. Generally, if confirmation sample results exceeded the SCOs, the associated excavation was expanded and re-sampled. There are exceptions, as described in Section 2.5.1. Following the completion of onsite excavation activities, the site was re-graded prior to final restoration with six inches of clean topsoil from an outside source. Offsite, excavations were backfilled with clean soil from an outside source.

2.5.1 Soil

Onsite

Onsite soil exceeding Restricted Use – Residential SCOs was removed for offsite disposal, consistent with the ROD (NYSDEC 2012). It was determined that the remedy had satisfactorily achieved the soil cleanup levels per DER-10 paragraph 5.4(b)2.i when all but four of the approximately 700 final confirmation samples collected contained alpha- and gamma- chlordane and lead below the SCOs. One sample, identified as B-M10, marginally exceeded the Restricted Use – Residential SCO for alpha-chlordane (0.91 mg/kg) with a concentration of 1 mg/kg; no further excavation was requested. Four samples exceeded the Restricted Use – Residential SCO

for gamma-chlordane (0.54 mg/kg) by a small margin, including B-M10 (1.4 mg/kg). The other samples that exceeded the SCO for gamma chlordane were SW-F-0E-S (0.76 mg/kg), SW-G-0F-0E-E (0.75 mg/kg), and SW-O7-N-2 (0.58 mg/kg); again, no further excavation was requested. There were no onsite final confirmation samples that contained lead exceeding the Restricted Use – Residential SCO of 400 mg/kg. Following completion of soil excavation, the remaining onsite soil was re-graded to satisfy the intent of the design-grading scheme as provided on Sheet 9 of the Contract Drawings. Six in. of clean topsoil was placed across disturbed areas of site after re-grading.

Table 1 and Figure 6 summarize the results of onsite soil samples collected that exceed the Restricted Residential Use and Unrestricted Use SCOs after completion of the remedial action.

Offsite

While the majority of offsite soil exceeding Unrestricted Use SCOs was removed, there were some exceptions due to the property owner's requests. A portion of the original offsite excavation area fell within the drip edge of a mature Copper Beech tree. In addition, a residential structure is located south of the excavation area, and a septic leach field extends north toward the excavation. In order to preserve the health of this tree, and to avoid impacting the residential structure and leach field, excavation was limited. Four endpoint samples collected from the offsite excavation area contained alpha chlordane exceeding the Unrestricted Use SCO (0.094 mg/kg) with concentrations ranging from 0.140 to 0.270 mg/kg. Three of these samples were from along the southern excavation boundary, and one was from the bottom of the excavation. There is no Unrestricted Use SCO for gamma chlordane, but none of the offsite endpoint samples contained gamma chlordane exceeding the Restricted Use – Residential SCO (0.54 mg/kg). There is no Unrestricted Use SCO for gamma chlordane. There were no offsite endpoint samples that contained lead exceeding the Unrestricted Use SCO of 63 mg/kg.

Table 2 and Figure 6 summarize the results of offsite soil samples collected that exceed the Unrestricted Use SCOs after completion of the remedial action.

2.5.2 Groundwater

Onsite and downgradient groundwater was not treated as part of the remedial action. Although the source of contamination has been removed, groundwater contamination is expected to remain for several years. The onsite and downgradient monitoring wells, as well as one surface water location and one private well location, were sampled in December 2016, approximately seven months after completion of contaminated soil removal. Chlordane was present in the onsite and downgradient groundwater with concentrations ranging from 0.241 to 9.2 µg/L. Figure 7 summarizes the results of the December 2016 groundwater sampling event. A letter report with a full summary of the results from this sampling event is provided in Appendix E.

2.5.3 Surface Water

One surface water sample was collected as part of the post-remedial action groundwater-

sampling event in December 2016. This sample was collected from stream gauge location SG-03 in Abet's Creek as shown on Figure 8. Chlordane was not detected in this sample.

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3. INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 GENERAL

Since remaining contamination exists at the Site, ICs and 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 Notice
- 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) (Appendix F) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site
- 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 ROD (NYSDEC 2012) to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to residential uses only. Adherence to Site ICs is required by the Environmental Notice and will be implemented in accordance with this SMP. ICs identified in the Environmental Notice may not be discontinued without an amendment to or extinguishment of the Environmental Notice. The IC boundaries are shown on Figure 9. These ICs are:

- The property may be used for residential, restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), subject to local zoning laws
- 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 New York State Department of Health (NYSDOH) or the SCDOH 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 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 Notice.

- Raising of animals for consumption is prohibited.

3.3 ENGINEERING CONTROLS

3.3.1 Basement Sump Pump Filtration Systems

Sump pump and filter systems have been installed in one structure downgradient from the Site. One system consists of duplex sump pumps with float switch and alternating operation; the other (in the same structure) consists of a simplex sump pump activated by a single-float switch. The pumps force water through two particulate filters, installed in parallel, prior to discharge. A bypass valve allows for pump discharge in the event the filter housing malfunctions or the filters are clogged and in need of replacement. A process flow diagram is provided within the system installation Scope of Work in Appendix G. The systems help prevent contact with contaminated groundwater by filtering out chlordane, which is hydrophobic and adheres to particulates in groundwater. The system was installed within a residence at 547 South Country Road in East Patchogue, New York, in May 2014. Since start-up on 8 May 2014, the system filters have been changed two times.

Procedures for operating and maintaining the sump pump and filtration system are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). Figure 9 shows the location of the ECs for the site.

3.3.2 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 (NYSDEC 2010a).

3.3.2.1 Monitoring Wells associated with Long Term Groundwater Monitoring

Groundwater monitoring activities to assess the effectiveness of the remedy will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the Site SCGs, or have become asymptotic at an acceptable level over an extended period. Approval from NYSDEC must be obtained prior to discontinuing monitoring activities. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment, and/or control measures will be evaluated.

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4. INSPECTION AND MONITORING PLAN

4.1 GENERAL

This section describes the measures for evaluating the overall effectiveness of the remedy. The Monitoring and Sampling Plan described in this section 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 (QAPP) provided in Appendix H. Details regarding health and safety procedures for all fieldwork conducted as part of site management for the Site are included in the Health and Safety Plan provided in Appendix I.

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 SCGs, particularly groundwater standards and Part 375 SCOs for soil

- 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
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 SITEWIDE INSPECTION

Sitewide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Sitewide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During each inspection, an inspection form will be completed as provided in Appendix J – 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
- Confirm that site records are up-to-date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive sitewide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). 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 Notice
- Achievement of remedial performance criteria
- If Site records are complete and up-to-date
- Reporting requirements are outlined in Section 7.0 of this SMP.

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 by a qualified environmental professional, as determined by the NYSDEC, to verify the effectiveness of the ICs/ECs. Written confirmation of the inspection 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

4.3.1 Remedial System Monitoring

Monitoring of the sump pump and filtration system will be performed on a routine basis, as

identified in the following table. 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 sump pump and filtration system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Sump pump and filtration system components to be monitored include, but are not limited to, the components included in this table.

Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Filter Housings	Bypass flow	Change since previous inspection	Annual

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix J – 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 (O&M) Plan is required immediately.

4.4 POST-REMEDIATION MEDIA MONITORING AND SAMPLING

Samples shall be collected from the groundwater and surface water-monitoring network on a routine basis. Sampling locations, required analytical parameters, and sampling schedule are provided in the following table. Sampling locations are shown on Figure 8. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Post Remediation Sampling Requirements

Sampling Location	Gauge Water Elevation	Sample for Chlordane (EPA Method 608)
TPMW-01	X	X
PDI-PZ-01	X	X
PDI-PZ-02	X	X
MW-33D	X	X
MW-33I	X	X
MW-33S	X	X
WO-33P	X	X
MW-41	X	X
MW-42	X	
WO-07	X	X
WO-08	X	X
WO-09	X	X
WO-10	X	X
WO-11	X	
WO-15	X	
WO-16	X	
WO-17	X	
WO-18	X	
WO-19	X	X
WO-21	X	
WO-25	X	
WO-26	X	X
WO-27	X	X
WO-28	X	X
WO-30	X	X
WO-31	X	X
WO-34	X	
WO-36	X	
PW-01		X
PW-01A		X
PW-02		X
SG-03	X	X

Note: USEPA = Environmental Protection Agency
PW = Private well
SG = Stream gauge
MW = Monitoring well
WO = Monitoring well

A round of gauging is to be completed prior to each groundwater-sampling event to record the static water level. Groundwater samples are to be collected using low-flow methods. Purge water is to be filtered with a 0.5-micron filter prior to discharge. Private well owners will need

to be contacted by NYSDEC to gain access prior to sampling. Detailed sample collection and analytical procedures and protocols are provided in Appendix K – Field Sampling Plan and Appendix H – QAPP.

4.4.1 Groundwater Sampling

Groundwater monitoring will be performed annually to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The network of monitoring wells has been installed to monitor onsite and downgradient groundwater conditions at the Site. The network of onsite and offsite wells to be sampled were selected based on their location within the groundwater flow path from the Site.

The following table summarizes the data for each of the wells to be sampled including identification number, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, one upgradient well, three onsite wells and eighteen downgradient wells, including three private wells, are sampled to evaluate the effectiveness of the remedial action.

Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (northing/ easting)	Well Diameter (inches)	Well Depth (inches)	Elevation (above mean sea level)			
					Casing	Surface	Screen Top	Screen Bottom
TPMW-01	Onsite	217971.2521 1269596.5874	1	12.51	14.59	12.20	7.20	2.2
PDI-PZ-01	Onsite	217909.6150 1269836.6795	1	17.47	15.67	13.22	7.22	-1.78
PDI-PZ-02	Onsite	218123.0136 1269902.2808	1	17.50	16.00	13.7	7.70	-1.30
MW-33D	Downgradient	215784.359 1267781.767	2	56.48	2.64	2.83	-52.17	-57.17
MW-33I	Downgradient	215775.936 1267781.767	2	24.3	2.86	2.79	-17.21	-22.21
MW-33S	Downgradient	215768.091 1267777.468	2	10.00	2.72	2.79	-2.21	-7.21
WO-33P	Downgradient	215784.358 1267781.766	1	39.65	ND	ND	ND	ND
MW-41	Upgradient	218550.729 1270338.35	2	34.62	20.46	20.59	-9.41	-14.41
WO-07	Downgradient	217526.218 1269717.018	2	20.05	11.66	11.87	1.87	-3.13
WO-08	Downgradient	217579.246 1269611.877	2	20.32	11.88	12.11	2.11	-2.89
WO-09	Downgradient	217619.425 1269528.141	2	20.28	11.27	11.5	ND	ND
WO-10	Downgradient	217661.734 1269448.94	2	20.33	10.72	11.16	1.16	-3.84
WO-19	Downgradient	217311.829 1269384	2	19.81	8.93	9.1	-0.90	-5.90
WO-26	Downgradient	216889.549 1268859.293	1	39.97	11.07	11.28	-18.72	-23.72
WO-27	Downgradient	216588.49 1268692.085	2	40.61	10.86	11.17	-18.83	-23.83
WO-28	Downgradient	216448.529 1268470.565	1	39.25	15.71	15.87	-19.13	-24.13
WO-30	Downgradient	216294.267 1268171.414	2	45.54	11.52	11.88	-33.12	-38.12
WO-31	Downgradient	216053.371 1268108.836	1	39.43	8.28	8.42	-26.58	-31.58
PW-01	Downgradient	ND	ND	ND	ND	ND	ND	ND
PW-01A	Downgradient	ND	ND	ND	ND	ND	ND	ND
PW-02	Downgradient	ND	ND	ND	ND	ND	ND	ND

Note: ID = Identification
WO = Monitoring well
MW = Monitoring well
PW = Private well
PZ = Piezometer

The monitoring well network to be gauged as part of site monitoring includes several wells that were installed during the 2006 surface water and groundwater sampling event completed by the SCDOH, a few installed by EA during the RI, as well as three onsite piezometers that were replaced during the remedial action. Of these wells, only downgradient monitoring wells that have historically contained the site-related contaminants of concern, one upgradient monitoring well, the three onsite piezometers, as well as three private wells and one surface water location are included in the sampling program. The layout of the monitoring well network is shown on Figure 8.

While monitoring wells were installed at varying depths, all well screens fall within a homogeneous fine to medium coarse grain sand. Depth to water ranges from 2.9 to 13.21 ft bgs.

All groundwater samples collected are to be analyzed for chlordane using USEPA Method 608 by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program. Chlordane has a method and reporting detection limit of 0.05 micrograms per liter (µg/L).

Monitoring well construction logs are included in Appendix D of this document.

If biofouling or silt accumulation occurs in the onsite and/or offsite 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 PRR. 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" (NYSDEC 2009). 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.

4.4.2 Surface Water Sampling

Surface water sampling will be performed annually along with groundwater sampling to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The surface water sample location, at stream gauge SG-03 in Abet's Creek, was selected based on its location directly downgradient from the Site. The surface water sample location is identified on Figure 8 in relation to the monitoring well network. The surface water sample is to be collected during the groundwater-sampling event and analyzed for chlordane using USEPA Method 608 by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program.

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 surface water-sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.3 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix J – Site Management Forms. 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. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan provided as Appendix K of this document.

5. OPERATION AND MAINTENANCE PLAN

5.1 GENERAL

This section provides a brief description of the measures necessary to operate, monitor, and maintain the mechanical components of the basement sump pump filtration system. This Operation and Maintenance Plan described in this section:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the sump pump and filtration systems
- Will be updated, as needed, to reflect changes in site conditions or the manner in which the sump pump and filtration systems are operated and maintained.

Further detail regarding the O&M of the basement sump pump system is provided in Appendix L – Operation and Maintenance Manual. 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 SUMP PUMP AND FILTRATION SYSTEM PERFORMANCE CRITERIA

The sump pump and filtration systems were installed in 2014 and serve to treat groundwater that enters the sumps via sub-slab piping by a perimeter drain system to prevent contact with contaminants. Two systems were installed at the same structure; one involves duplex pumps and one involves simplex pumps. Both systems convey water to two particulate filter canisters, operating in parallel prior to discharge outside of the structure. Both systems have a filter bypass line that will allow the systems to continue to operate if the filters become blocked or fouled; a pressure relief valve is set to open at 8 pounds per square inch (psi) and routes effluent directly to discharge. Effluent pressure, bypass flow rate, and bypass totalizer readings should be recorded at each inspection. A Site data information sheet is provided in the O&M Manual in Appendix L.

5.3 OPERATION AND MAINTENANCE OF SUMP PUMP AND FILTRATION SYSTEM

The following sections provide a description of the O&M of the sump pump filtration system. Cut-sheets and as-built drawings for the sump pumps and filters are provided in Appendix L – O&M Manual.

5.3.1 System Start-Up and Testing

System start-up information for the pumps and controls is provided in the manufacturer's technical data sheets, provided in Appendix L – O&M Manual.

Prior to system start-up, clean water is to be run through the system to ensure the system is working properly:

- Record bypass line flow meter reading
- Remove lid from sump pump housing
- Fill housing to top float switch with clean water and allow to run through system
- Record bypass line flow meter reading; if reading has not changed, system is opened properly. If reading changes, replace filters and test system again.

The system testing described above will be conducted in the event that, in the course of the sump pump and filtration 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

The sump pump and filtration system equipment, piping, and controls should be inspected on an annual basis to prevent the system from shutting down due to malfunctioning equipment or worn-out parts. Check for failure of floats, pumps, gauges, and filters. Filters should be inspected annually. Troubleshooting guides are provided in Appendix L – O&M Manual.

5.3.3 Non-Routine Operation and Maintenance

Components of the sump pump and filtration system should be replaced in kind should the system be damaged. Component cut sheets are provided in Appendix L – O&M Manual.

5.3.4 System Monitoring Devices and Alarms

The sump pump filtration system includes a bypass line, which can be used in the event of filter failure. A flow meter and totalizer on the bypass line will indicate whether or not the bypass line has been used since the last inspection. A site data information sheet is to be maintained at the Site of the system and updated during each inspection, including bypass line flow rate (if in use at the time of inspection) and bypass line totalizer volume. An example of a site-specific site data information sheet is provided as an attachment to Appendix L – O&M Manual.

In the event that the bypass flow meter and totalizer is activated, applicable maintenance and repairs will be conducted, as specified in the O&M Manual, and the sump pump and filtration system will be restarted. Operational problems will be noted in the PRR to be prepared for that reporting period.

6. 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 climatic 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.

The site groundwater is approximately 4 ft below the lowest point on the Site, within an intended stormwater retention area; however, in the event this stormwater retention volume is exceeded, stormwater will flow to the east onto Hedges Road to avoid discharging directly onto surrounding residential properties. Site slopes are shallow and major erosion is not anticipated. Contaminated soils have been removed from the Site; however, contamination still exists in particulates within the groundwater on and downgradient from the Site. If groundwater elevation rises, contaminated suspended solids may impact uncontaminated material.

6.2 GREEN REMEDIATION EVALUATION

NYSDEC's DER-31 Green Remediation (NYSDEC 2010b) 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 PRR.

Waste Generation—Very limited waste is generated through site management activities. Tubing and small filters for purge water treatment are disposed of during each groundwater-sampling event. In addition, the filter cartridges from the sump pump filtration system are changed out annually.

Energy Usage—The sump pump filtration system only runs periodically; energy usage is negligible.

Emissions—Emissions are minimal as monitoring is only to be conducted annually and systems do not run continuously.

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 Site 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.

6.2.3 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.

6.2.4 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix J – Site Management Forms, information on 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 SITE OPTIMIZATION

An 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 remedy is not performing as expected or as designed
- Previously unidentified source material may remain
- 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
- 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 is not a PRR but is complementary to the PRR. While the PRR focuses on the protectiveness of the remedy and compliance with the SMP, and reports on the remedial progress, the RSO focuses on optimization of and improvements to the remedy. An RSO is a thorough evaluation of and implementation of actions that will move the Site to closure in a shorter timeframe and/or provide cost savings in the long term. Some recommendations developed in the RSO process may address concepts such as:

- Application of a new technology or remedial approach
- Improvements that will reduce energy cost or frequency of site visits
- Evaluation of vendors for cost savings
- Consideration of alternate site management techniques
- Implementation of green remediation concepts.

The phases of an RSO include:

- Work plan development

- Work plan implementation (usually includes data gathering and conceptual site model verification)

- RSO report

- Implementation of recommended actions and final report.

7. 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 J. 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 the following table and summarized in the PRR.

Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Groundwater Monitoring Report	Annually
Periodic Review Report	Every three years, or as otherwise determined by the

* Note: The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.
PRR = Periodic Review Report

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
- 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)
- 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)
- 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 PRR will be submitted to NYSDEC beginning sixteen months after the Certificate of Completion or equivalent document is issued. After submittal of the initial PRR, the next PRR shall be submitted annually to NYSDEC or at another frequency as may be required by NYSDEC. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in Appendix A – Environmental Notice. 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 PRR. 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 ROD

  — 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

— 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:

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

— A description of the resolution of performance problems

— Trends in equipment failure

— Comments, conclusions, and recommendations based on data evaluation.

7.2.1 Certification of Institutional Controls

Following the last inspection of the reporting period, a Qualified Environmental Professional 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 notice*

- *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*

- *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 NYSDEC's Designated Site Representative.

The signed certification will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC Central Office, the Regional Office in which the site is located, and the NYSDOH Bureau of Environmental Exposure Investigation. The PRR 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 IC or EC, 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.

7.4 REMEDIAL SITE OPTIMIZATION REPORT

In the event that an RSO is to be performed, (Section 6.3), upon completion of an RSO, an RSO report must be submitted to NYSDEC for approval. A general outline for the RSO report is provided in Appendix M. 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. REFERENCES

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———. 2012. *Record of Decision, Bianchi/Weiss Greenhouses State Superfund Project, East Patchogue, Suffolk County Site No. 152209.* January.

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Figures

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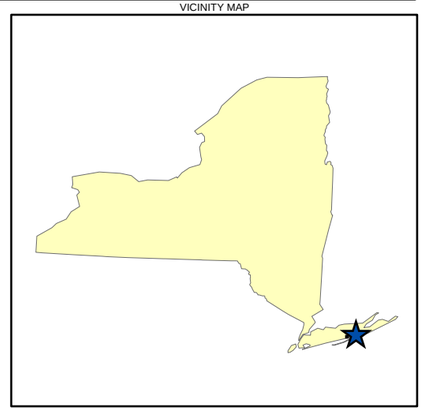
VICINITY MAP



Legend

- Fenceline
- Parcel Boundaries
- Institutional Control Boundaries

Aerial: ESRI, 2011

Map Date: 3/21/2017

N

0 100 200
Feet

EA | NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

Figure 1
Site Location and Layout
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

G:\Projects\State&Local\NYSDEC - D007624D007624 - Work Assignments\149907.29 - Bianchi CM\GIS and CAD\Projects\SMP\Bianchi_Fig1_Site_Location_and_Layout_rev.mxd

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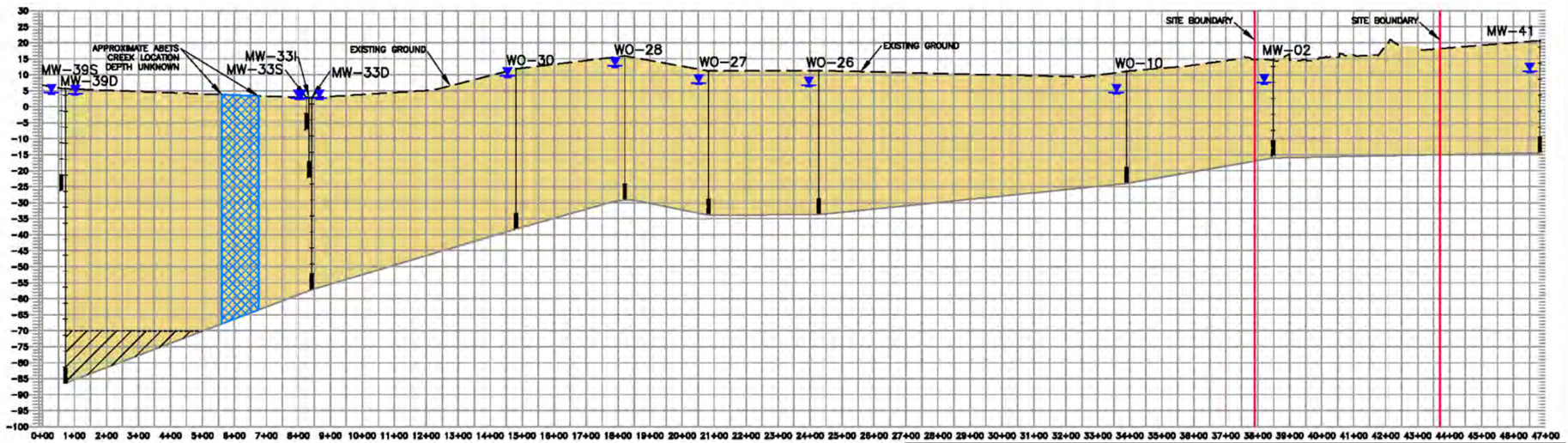
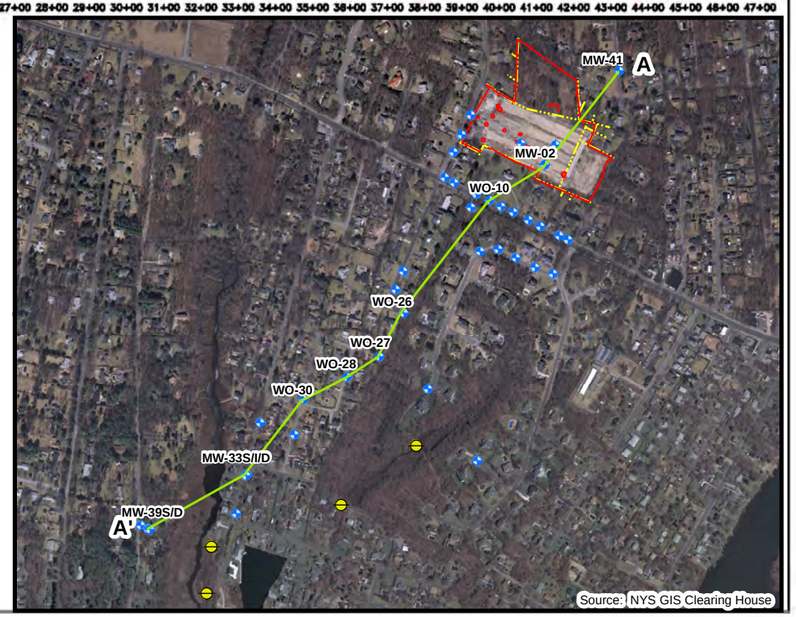




MONITORING WELL LEGEND

MW-02 — BORING AND MONITORING WELL NUMBER

GROUND WATER ELEVATION (DECEMBER 2009)

SCREENED INTERVAL OF MONITORING WELL

FINE TO MEDIUM COARSE GRAIN SAND

FINE SAND AND SILT

APPROXIMATE ABETS CREEK LOCATION DEPTH UNKNOWN

SECTION A – A'

SCALE: HORIZONTAL

350 175 0 350

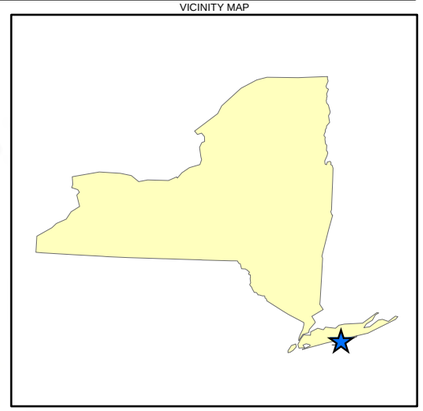
GRAPHIC SCALE IN FEET

SCALE: VERTICAL

35 17.5 0 35

GRAPHIC SCALE IN FEET

VICINITY MAP



Legend

- Monitoring Well Locations
- Piezometer Locations
- Fenceline
- Property Boundaries

Aerial: ESRI, 2011

Map Date: 3/7/2017

N

0 500 1,000

Feet

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Figure 2
Geologic Cross-Section A-A'
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

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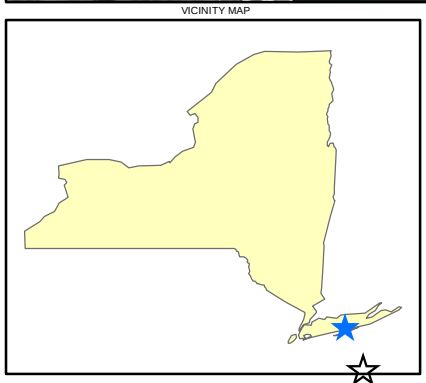
VICINITY MAP



Legend

- Groundwater Monitoring Well
- PDI Piezometer
- Groundwater Contour (1 ft. interval)
- Inferred Groundwater Contour
- Groundwater Flow Direction
- Fenceline
- Property Boundaries

Note: Contours are reported in ft AMSL (feet Above Mean Sea Level)

0 250 500
Feet

N

Figure 3
Groundwater Contours
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 7/24/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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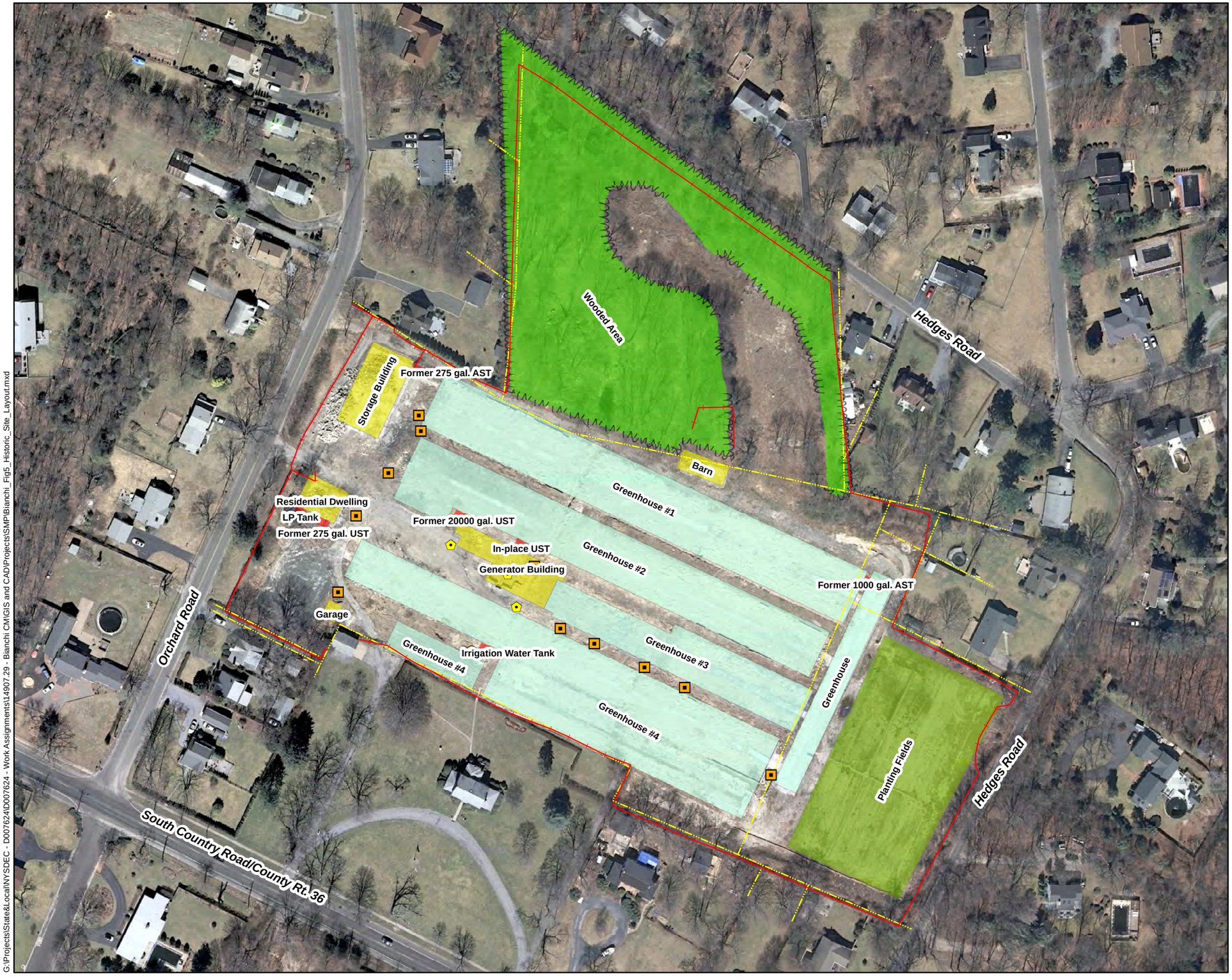
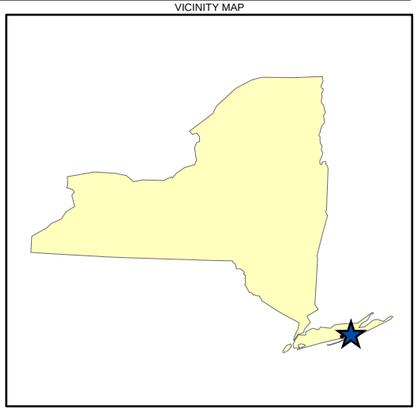


VICINITY MAP



Legend

- Subsurface Drainage Structure
- Former Private Wells
- Unknown Drainage Structure
- Fenceline
- Property Boundaries

Former Greenhouse Facilities

- UST/AST
- Planting Fields
- Building
- Greenhouse
- Wooded Area

Aerial: ESRI, 2011

Map Date: 2/22/2017

N

0 100 200
Feet

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Figure **4**
Historic Site Layout
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

G:\Projects\State&Local\NYSDEC - D007624\D007624 - Work Assignments\114907.29 - Bianchi CM\GIS and CAD\Projects\SMP\Bianchi_Fig5_Historic_Site_Layout.mxd

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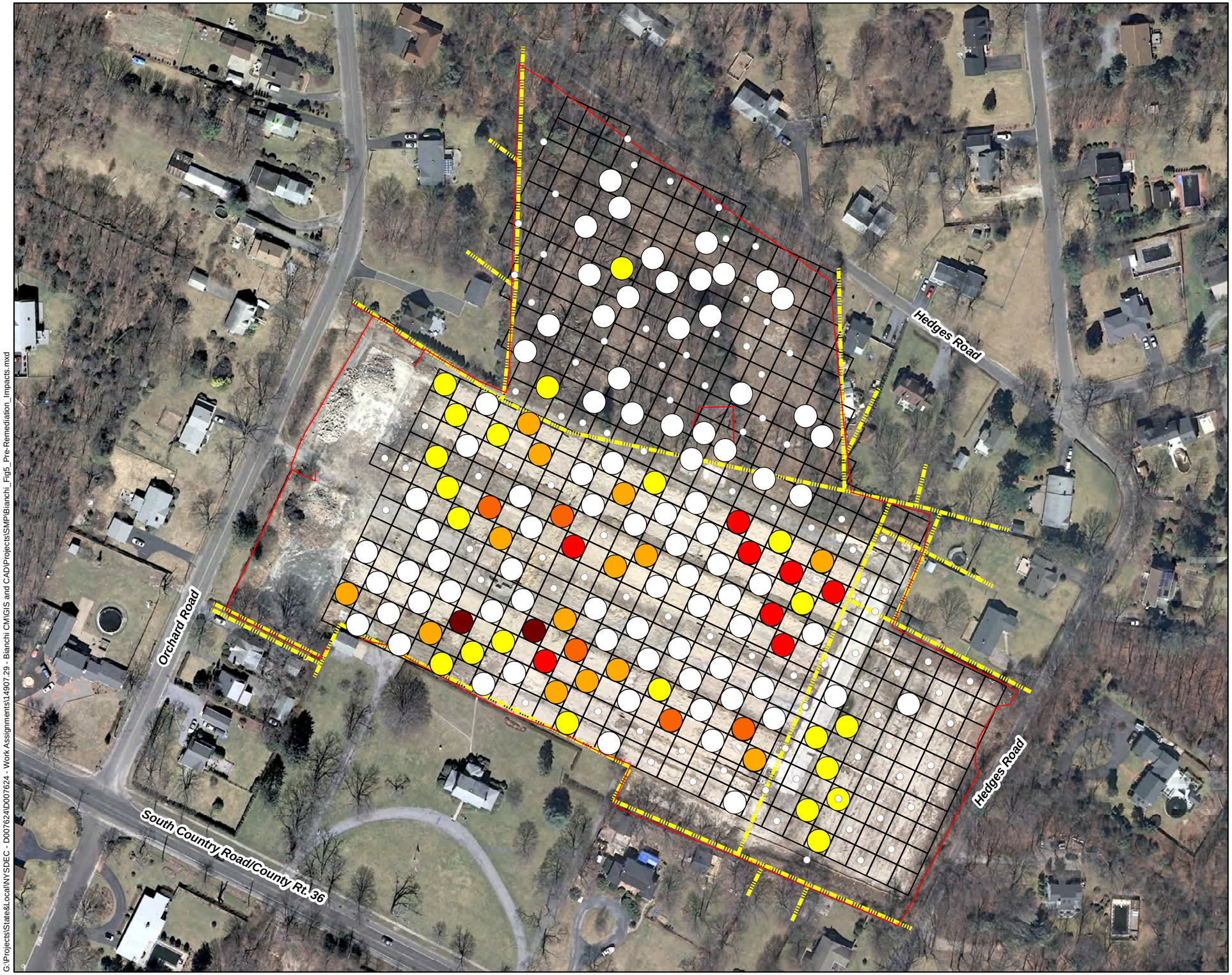
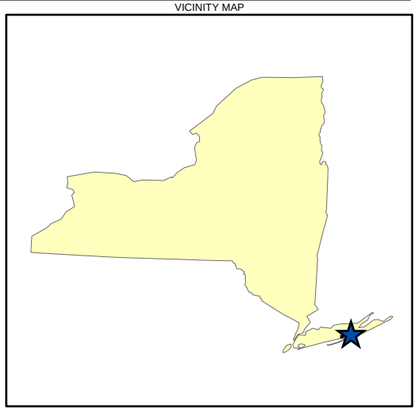


VICINITY MAP



Legend

- Fenceline
- Parcel Boundaries

Chlordane Concentration

- Location sampled, but result does not exceed SCO

Deepest SCO Exceedance For Chlordane:

- 0 - 2"
- 1 - 1.5'
- 2 - 2.5'
- 3 - 3.5'
- 4 - 4.5'
- 5 - 5.5'

Note: Immunoassay, alpha-Chlordane, and gamma-Chlordane results from historical RI and recent PDI sampling events included. Lab sample exceedances weighted heavier than Immunoassay.
RI: Remedial Investigation
PDI: Preliminary Design Investigation

Aerial: ESRI, 2011

Map Date: 3/22/2017

N

0 100 200
Feet

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Figure 5
Pre-Remediation **Soil** Impacts
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

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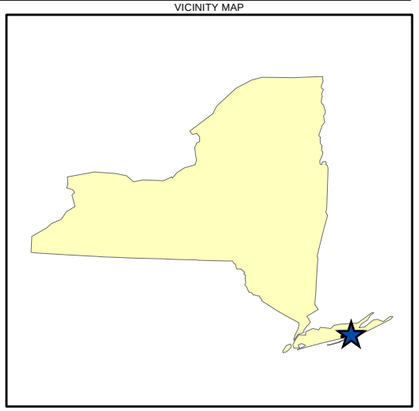
VICINITY MAP



Legend

Property Boundaries

Lead

- Less than or equal to UU SCO
- Less than or equal to RU SCO

Gamma Chlordane

- Less than or equal to RU SCO
- Greater than RU SCO

Alpha Chlordane

- Less than or equal to UU SCO
- Greater than UU SCO but less than RU SCO
- Greater than RU SCO

Note:
Unrestricted Use (UU)
Residential Use (RU)
SCO: Soil Cleanup Objective as determined by applicable land use and Tables 375-6.8(a) and 375-6.8(b) of 6 NYCRR Part 375.
Alpha Chlordane: UU SCO- 0.094 ppm RU SCO- 0.91 ppm
Lead: UU SCO- 63 ppm RU SCO- 400 ppm
Per CP-51 (Commissioner Policy #51):
Gamma Chlordane: RU SCO- 0.54 ppm
ppm: parts per million

Aerial: ESRI, 2011

Map Date: 7/25/2017

N

0 100 200
Feet

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Figure 6
Post-Remediation Data
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

G:\Projects\State&Local\NYSDEC - D007624\D007624 - Work Assignments\14907.29 - Bianchi CM\GIS and CAD\Projects\SMP\Bianchi_Fig6_Post-Remediation_Results.mxd

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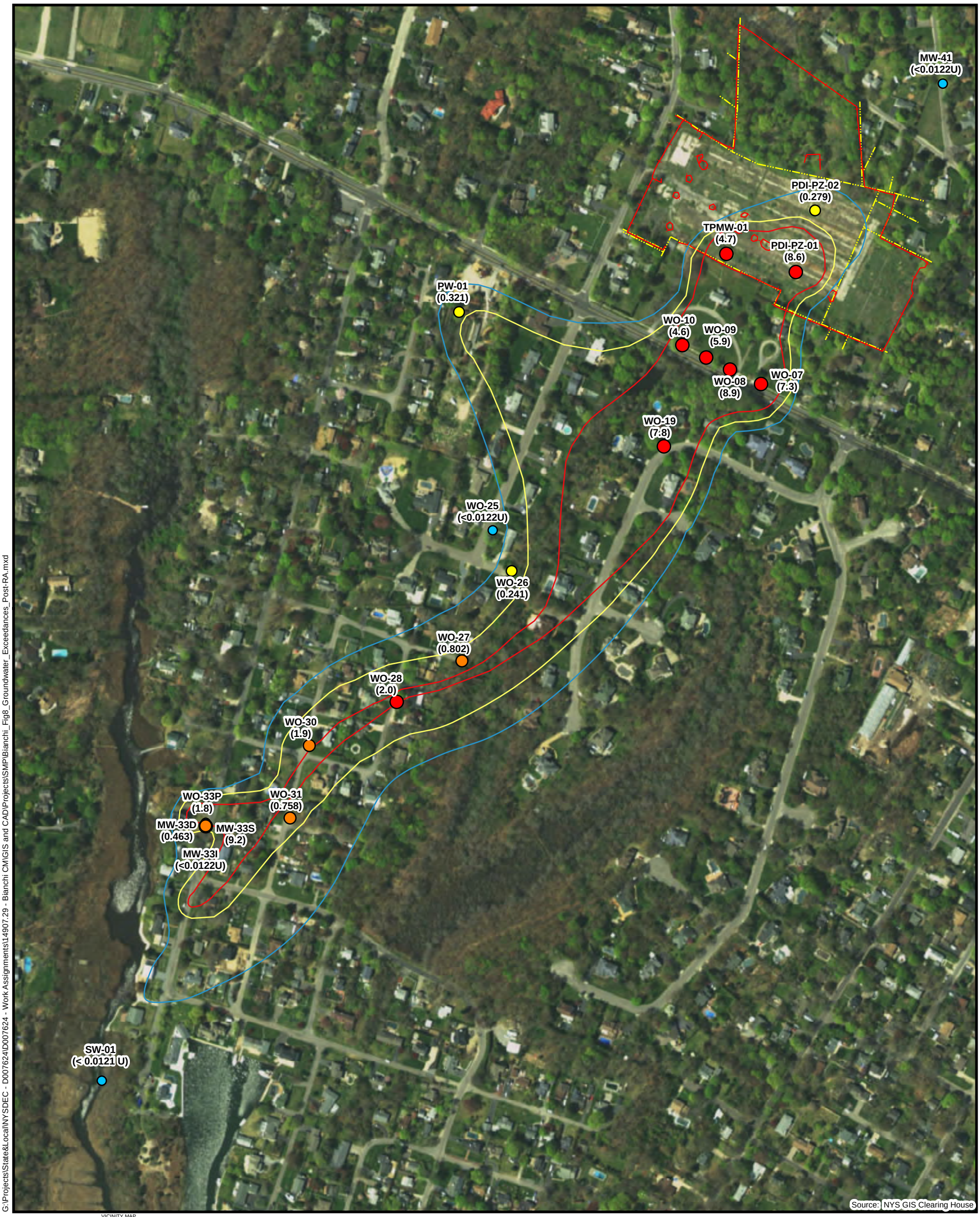
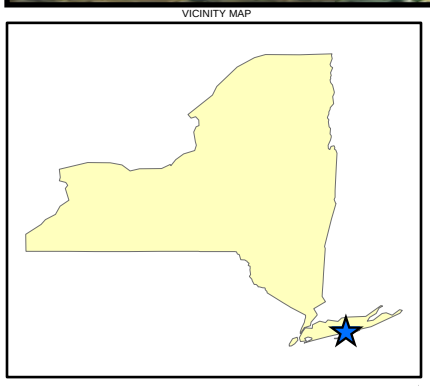


G:\Projects\State&Local\NYSDEC - D007624\D007624 - Work Assignments\14907.29 - Bianchi CM\GIS and CAD\Projects\SMP\Bianchi_Fig8_Groundwater_Exceedances_Post-RA.mxd

VICINITY MAP



0 250 500
Feet
N

Legend

Chlordane (total) Concentration Range (ug/L)

- = Non-detect
- = > 0.05 (ug/L)
- = > 0.5 (ug/L)
- = > 2 (ug/L)
- Fenceline
- Property Boundaries

Note: NYSDEC AWQS - Chlordane = 0.05 ug/L
AWQS= Ambient Water Quality Standards

Figure 7
Remaining Groundwater Exceedances
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 3/6/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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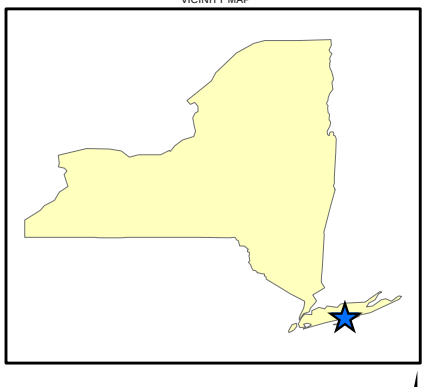
VICINITY MAP



Legend

- Groundwater Monitoring Well
- PDI Piezometer
- Potable Well
- Surface Water Location
- Groundwater Contour (1 ft. interval)
- Inferred Groundwater Contour
- Groundwater Flow Direction
- Fenceline
- Property Boundaries

Note: Contours are reported in ft AMSL (feet Above Mean Sea Level)

0 250 500
Feet

N

Figure **8**
Site Monitoring Network Location
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 8/7/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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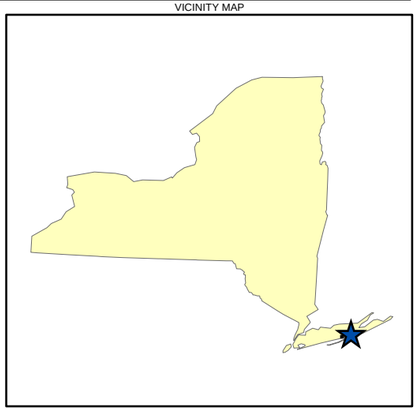
VICINITY MAP



Legend

- Fenceline
- Parcel Boundaries
- Institutional Control Boundaries

Aerial: ESRI, 2011

Map Date: 3/7/2017

N

0 100 200
Feet

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Figure **9**
Engineering and Institutional Controls Location
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

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Tables

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Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
1	AA10	SW-AA10-NE	4/28/2016	U	U	1.64
2		SW-AA10-NW	4/28/2016	U	U	0.766
3	AA10 A10	B-AA-A10	4/28/2016	0.0224J	0.0148	14.6
4	AA11	B-AA11	4/28/2016	0.0022J	0.0018J	0.926 J
5		SW-AA11-W	4/28/2016	U	U	0.817
6	AA12	SW-AA12-SW	4/28/2016	U	U	3.37
7	AA12 A12	B-AA-A12	4/28/2016	0.0014J	0.0012J	1.94
8	A1	B-A-1-2	3/29/2016	0.0153	0.0127	**76.2 J**
9		SW-A-1-N-2	3/29/2016	0.0002853J	U	10.54 J
10		SW-A-1-W	3/16/2016	0.0054J	0.0049J	**313**
11	A2	B-A-2	2/23/2016	**0.37J**	0.44J	**315 J**
12		SW-A-2-S	3/16/2016	**0.34J**	0.42J	**145**
13		SW-A-2-W-2	3/29/2016	0.0166J	0.0145J	**120 J**
14	A9	B-A9-2	5/5/2016	**0.100J**	0.0695D	43.9
15		SW-A9-N	4/28/2016	U	U	3.76
16		SW-A9-W	4/28/2016	0.0011J	0.0004876J	20.3
17	A10	B-A10	4/28/2016	0.0331D	0.0247J	10.51
18	A11	B-A11	4/28/2016	0.0526J	0.0303J	8.54
19	A12	SW-A12-S	4/28/2016	0.0005248J	0.0003763J	1.62
20	B1	B-B-1	2/23/2016	**0.13J**	0.14J	**120 J**
21		SW-B-1-N	3/16/2016	**0.13J**	0.15J	**211**
22	B2	B-B-2	2/23/2016	**0.25J**	0.3J	**360 J**
23	B3	B-B-3-2	3/29/2016	0.0168J	0.0116	**146 J**
24		SW-B-3-W	4/6/2016	**0.19D**	0.15P	**186**
25	B4	B-B-4	2/23/2016	**0.11J**	0.13J	**194 J**
26		SW-B4-W-2	4/13/2016	0.0197J	0.0146J	**152**
27	B5	B-B-5	2/23/2016	0.0372J	0.0419J	44.1 J
28		SW-B-5-W	4/6/2016	**0.56J**	0.4D	21.9
29	B6	B-B6	4/19/2016	0.0283J	0.0181J	15.6
30		SW-B6-W	4/19/2016	0.0762	0.0525	**122**
31	B7	B-B7	4/28/2016	0.0106J	0.0085	12.3
32		SW-B7-W	4/28/2016	0.0025J	0.0019	6.48
33	B8	B-B8	4/28/2016	**0.1J**	0.0854J	**152**
34		SW-B8-W	4/28/2016	0.009J	0.0057	8.88
35	B9	B-B9	4/28/2016	**0.21J**	0.17	**98**
36	B10	B-B10	4/28/2016	**0.19D**	0.16	21.9
37	B11	B-B11	4/28/2016	**0.11**	0.0869	33.9
38	B12	B-B12	4/28/2016	0.0706J	0.0541J	20.6
39		SW-B12-S	4/28/2016	0.0285	0.0129J	38.7
40		SW-B12-W	4/28/2016	0.0006413J	0.0004847J	2.87
41	C1	B-C-1	2/23/2016	**0.27J**	0.32J	**156 J**
42		SW-C-1-N-2	3/29/2016	0.0925J	0.0454J	**316 J**
43	C2	B-C-2	2/23/2016	**0.41J**	0.5J	**132 J**
44	C3	B-C-3	3/16/2016	**0.26J**	0.32J	34
45	C4	B-C-4	3/16/2016	0.0055	0.0056	53.2
46		SW-C4-NE-2	4/11/2016	0.0037	0.0027	15.6
47		SW-C-4-SE	3/30/2016	**0.17J**	0.13J	9.41 J
48	C5	B-C-5	3/16/2016	0.0078	0.0101J	19.7

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
49	C6	B-C6	4/19/2016	0.0208J	0.0239J	8.04
50	C7	B-C7	4/19/2016	0.0023J	0.0018J	8.06
51	C8	B-C8	4/21/2016	0.002	0.0014J	7.52
52	C9	B-C9	4/21/2016	**0.37D**	0.26D	**181**
53	C10	B-C10	4/21/2016	**0.55J**	0.34D	**148**
54	C11	B-C11	4/21/2016	**0.26J**	0.16J	**121**
55	C12	B-C12	4/21/2016	0.071J	0.04	11.7
56		SW-C12-S	4/28/2016	U	U	5.03
57	C0C	SW-C-0C-SW	3/10/2016	0.0013J	0.001J	33.5
58	C0C	B-C-0D-0C	3/17/2016	0.0615	0.0679	26
59	C0D	SW-C-0D-0C-W	3/11/2016	0.0113J	0.0097J	35.5
60	C0D	SW-C-0D-NW	3/10/2016	0.0792J	0.0802J	23.3
61	C0H C0G	SW-C-0H-0G-SW	1/21/2016	**0.25J**	0.26J	15.2 J
62	C0H C0I	B-C-0H-0I	1/20/2016	0.0255J	0.0281J	3.56 J
63	C0H C0I	SW-C-0I-0H-W	1/21/2016	0.036J	0.0339J	7.04
64	C0J C0I	SW-C-0J-0I-W	1/21/2016	0.0239J	0.022J	19.4
65	C0J	B-C-0J-0K	1/20/2016	0.028J	0.0319J	3.12 J
66	C0K	SW-C-0K-0J-W	1/21/2016	0.0042J	0.0038J	3.68
67	C0K C0L	SW-C-0L-0K-W	1/21/2016	0.0045J	0.0048J	9.79
68	C0L	B-C-D-0L	1/20/2016	0.0003209J	0.0004188J	8.4 J
69	D1	B-D-1	3/16/2016	0.0317J	0.0424J	41.7
70		SW-D-1-N	3/10/2016	0.0064J	0.0064	**263 J**
71	D2	B-D-2	3/16/2016	0.0116J	0.014J	5.25
72	D3	B-D-3-2	4/5/2016	0.0457J	0.0343	47.9
73		SW-D3-NE-2	4/11/2016	0.0493D	0.0348J	3.29
74		SW-D3-SE-2	4/11/2016	**0.5J**	0.41J	20.1
75	D5	B-D-5	2/17/2016	0.0108J	0.0135J	1.99
76		SW-D-5-NE	3/30/2016	0.0932J	0.0629J	26.5 J
77	D6	B-D-6	3/25/2016	0.0737J	0.0502	**74.7**
78	D7	B-D7	4/14/2016	U	U	5.59
79		SW-D7-E	4/14/2016	U	U	36.3
80	D8	B-D8	4/19/2016	0.007J	0.0047J	11.6
81	D9	B-D9	4/19/2016	**0.17J**	0.12J	34.9
82	D10	B-D10	4/19/2016	**0.56D**	0.38D	**91.6**
83	D11	B-D11	4/19/2016	0.0655J	0.0405	16.4
84	D12	B-D12	4/19/2016	**0.13J**	0.0819J	20.5
85		SW-D12-S	4/28/2016	0.0128J	0.0147J	7.7
86	D0C	B-D-0C	3/16/2016	0.0386J	0.0424J	29.6
87		SW-D-0C-E	3/10/2016	0.008J	0.0077J	14.9
88		SW-D-0C-S-2	3/25/2016	**0.33J**	0.19J	**95.1**
89	D0D	B-D-0D	3/16/2016	0.0187J	0.0208J	13.8
90		SW-D-0D-E	3/10/2016	**0.11J**	0.11J	**71**
91		SW-D-0D-N--3	4/5/2016	0.0029J	0.0014J	4.43
92	D0F E0F	SW-D-E-0F-S-2	3/25/2016	0.00094J	0.0004862J	3.34

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
93	D0F D0G	SW-D-0G-0F-W	3/10/2016	0.0064J	0.0068J	3.65
94	D0G	B-D-0G	2/23/2016	**0.24J**	0.25J	14 J
95	D0G D0H	SW-D-0H-0G-S-2	3/25/2016	0.002J	0.0009839J	5.52
96	D0H	B-D-0H	2/23/2016	**0.17J**	0.16J	15.6 J
97	D0I	B-D-0I	1/20/2016	**0.36J**	0.42J	6.56 J
98	D0J	B-D-0J	1/20/2016	0.0546J	0.0624J	2.83
99	D0K	B-D-0K	1/21/2016	0.0082J	0.0082	3.84
100		SW-D-0K-E	1/21/2016	**0.18J**	0.17J	21
101	D0L	SW-D-0L-NE	1/21/2016	0.0024J	0.0022J	9.07
102	D0L	SW-C-D-0L-N	1/21/2016	0.002J	0.0016J	13.3
103	E1	B-E-1	3/16/2016	0.0794J	0.1J	19.5
104	E2	B-E-2-2	4/5/2016	0.0153J	0.0106J	1.13 J
105	E3	SW-E-3-SW	3/30/2016	0.0035J	0.0012J	36.7 J
106	E4	B-E-4	2/17/2016	0.0791J	0.0829	49.6
107		SW-E-4-NW	3/30/2016	**0.58J**	0.43D	**153 J**
108	E5	B-E-5	2/17/2016	0.0294J	0.0368J	14.1
109	E6	B-E-6	2/17/2016	**0.14J**	0.16J	**79.8**
110		SW-E6-S	4/19/2016	**0.43J**	0.29D	**286**
111	E8	B-E8	4/14/2016	0.0154	0.0114	19.7
112		SW-E8-E	4/14/2016	U	U	**124**
113		SW-E8-N	4/14/2016	U	U	8.16
114	E9	B-E9-2	4/28/2016	0.0019	0.0014J	1.75
115	E10	B-E10	4/13/2016	0.0027J	0.0022	3.16
116	E11	B-E11	4/13/2016	0.0158J	0.012	**97.1**
117	E12	B-E12	4/13/2016	0.0138	0.0111	5.93
118	E0A	B-E-0A	3/16/2016	**0.11J**	0.14J	38.7
119		SW-E-0A-E	3/10/2016	0.0309J	0.0351J	19.6
120		SW-E-0A-W	3/10/2016	0.0033J	0.0026J	34.6 J
121	E0B	B-E-0B	3/16/2016	**0.31J**	0.4J	**97.9**
122		SW-E-0B-E	3/10/2016	0.0123J	0.0124J	**84.5 J**
123		SW-E-0B-N	3/10/2016	0.0029J	0.0023J	30
124		SW-E-0B-W	3/10/2016	U	U	4.67 J
125	E0E	B-E-0F-0E	4/6/2016	**0.79J**	0.47J	**97.7**
126	E0F	SW-E-0F-0E-W	3/10/2016	0.0353J	0.0344J	57.3
127	E0E	SW-E-0E-SW	3/10/2016	**0.27J**	0.3J	**92.8**
128	E0G	B-E-0G	2/23/2016	**0.23J**	0.25J	6.46 J
129	E0H	B-E-0H	2/23/2016	**0.13J**	0.13J	4.15 J
130	E0I	B-E-0I	1/20/2016	0.0841	0.12	3.78
131	E0J	B-E-0J	1/20/2016	0.0793J	0.0849J	6
132		SW-E-0J-N-2	2/18/2016	**0.3J**	0.27J	16.3
133	F1	B-F-1	2/17/2016	0.0169J	0.0193J	4.29
134		SW-F-1-N	3/10/2016	0.0006747J	0.0913	22.2
135	F2	B-F-2	3/25/2016	**0.13J**	0.54J	19.2

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
136	F3	B-F-3	2/17/2016	**0.44J**	0.26J	61.6
137		SW-F-3-S	3/30/2016	0.0288J	0.24J	**137 J**
138	F4	B-F-4	2/17/2016	**0.23J**	0.0004794J	**209**
139		SW-F4-NW-3	4/21/2016	U	0.0146	9.3
140	F5	B-F-5	2/17/2016	**0.21J**	0.0246J	26.3
141	F6	B-F6	4/19/2016	0.0007275J	0.0004794J	1.1 J
142		SW-F6-S	4/19/2016	U	U	21.8
143	F9	B-F9	4/13/2016	0.0567	U	7.89
144		SW-F9-N	4/14/2016	U	U	3.98
145	F10	B-F-10	4/13/2016	0.0022J	0.0017J	4.13
146	F11	B-F11	4/13/2016	0.021J	0.0155	11.2
147	F12	B-F12	4/13/2016	0.0315J	0.0245	5.11
148	F0E	B-F-0E	2/23/2016	0.0023J	0.0017J	36.6
149		SW-F-0E-S	2/23/2016	**0.69J**	**0.76J**	**113**
150	F0F	B-F-0F-2	3/25/2016	0.0839J	0.0519J	7.2
151	F0G	B-F-0G	2/23/2016	0.0866J	0.0943J	7.92 J
152	F0H	B-F-0H	2/23/2016	0.0392J	0.0408J	3.93 J
153	F0I	B-F-0I	1/20/2016	0.0841	0.54J	14.7
154	F0J	B-F-0J	1/20/2016	**0.11J**	0.12J	7.33
155		SW-F-0J-N-2	2/18/2016	**0.4J**	0.39J	7.47
156	G1	B-G-1-2	3/22/2016	**0.13J**	0.0967J	12.2
157		SW-G-1-N	3/10/2016	0.0562J	0.0636J	**102**
158	G2	B-G-2	3/25/2016	0.0506J	0.0333	4.95
159	G3	SW-G-3-SE	3/30/2016	0.0007187J	0.0006015J	7.57 J
160	G4	B-G-4	2/17/2016	0.0049J	0.0041	29.1
161	G5	B-G-5	2/17/2016	0.0488	0.0574J	23.7
162		SW-G5-S	4/19/2016	0.0017J	0.0014J	9.58
163	G7	B-G7	4/13/2016	0.0084	0.0069	7.04
164		SW-G7W	4/14/2016	U	U	3.7
165	G8	B-G8	4/13/2016	0.0057J	0.0043J	2.46
166		SW-G8W	4/14/2016	U	U	9.36
167	G9	B-G9	4/13/2016	0.0689	0.0634	34.9
168	G10	B-G-10	4/13/2016	**0.13J**	0.11	27
169	G11	B-G11	4/13/2016	0.0448J	0.0356	39.2
170	G12	B-G12	4/13/2016	0.0181J	0.0145J	8.06
171	G0B	B-G-0B	3/16/2016	0.0007553J	0.0007553J	10.02
172		SW-G0B-S	4/14/2016	0.0036J	0.0017J	49.6
173		SW-G-0B-W	3/17/2016	0.0005647J	0.0005866J	**266 J**
174	G0C	B-G-0C	3/16/2016	0.0247J	0.0286J	**220 J**
175		SW-G-0C-W	3/17/2016	**0.36J**	0.46J	**283 J**
176	G0D	SW-G-0D-NW	3/17/2016	0.0481J	0.0525J	48.7 J
177	G0D	B-G-H-0D	2/3/2016	0.0161J	0.0164J	24.5 J
178	H0D	SW-G-H-0D-N	2/3/2016	0.0806J	0.0854J	**117**

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
179	G0D G0E	SW-G-0E-0D-SE	2/23/2016	**0.39J**	0.42J	53.9
180	G0E	B-G-0F-0E	4/6/2016	0.0632J	0.0396D	18.5
181	G0F	SW-G-0F-0E-E	2/23/2016	**0.66J**	**0.75J**	**88**
182	G0F G0G	SW-G-0G-0F-S	2/23/2016	**0.35J**	0.35J	38.3
183	G0G	B-G-0G	2/23/2016	0.0734J	0.0808J	3.2 J
184	G0H	B-G-0H	2/23/2016	**0.41J**	0.47J	12.5 J
185	G0I	B-G-0I-2	2/18/2016	**0.11J**	0.11	5.29
186	G0J	B-G-0J-2	2/18/2016	**0.15J**	0.15	7.79
187		SW-G-0J-N-2	2/18/2016	0.0066J	0.0057J	3.82
188	H1	B-H-1-2	3/22/2016	**0.21J**	0.14	**129**
189		SW-H-1-N	3/10/2016	0.0043J	0.0052J	**246**
190	H2	B-H-2	2/3/2016	**0.13J**	0.15J	**201**
191	H3	B-H-3	2/3/2016	**0.34J**	0.39J	51.3
192		SW-H-3-NW	3/30/2016	**0.31D**	0.22D	10.78 J
193		SW-H-3-SW	3/30/2016	0.0051	0.0033	12.7 J
194	H4	B-H-4	2/3/2016	0.0048J	0.005	1.19
195	H5	B-H-5	2/3/2016	0.0573J	0.0665J	9.47
196		SW-H5-S	4/19/2016	0.001J	0.0008256J	1.81
197	H7	B-H7	4/14/2016	0.0753J	0.0496	37.6
198		SW-H7-E	4/21/2016	U	U	1.41
199		SW-H7-N	4/21/2016	0.0122J	0.0077	46.5
200	H8	B-H8	4/14/2016	**0.15J**	0.1	37.9
201	H9	B-H-9	4/13/2016	**0.2D**	0.19J	33.1
202	H10	B-H-10	4/13/2016	**0.46D**	0.39D	**279**
203	H11	B-H-11	4/13/2016	0.0561J	0.0475	22.2
204	H12	B-H12	4/13/2016	**0.42J**	0.35D	**64.1**
205	H0A H0B	SW-H-0B-0AS	2/3/2016	**0.23J**	0.25J	**273**
206	H0B	B-H-0B	2/3/2016	0.0338J	0.0365J	**84.1**
207	H0C	B-H-0C	2/3/2016	0.0589J	0.0658J	**86.8**
208	H0D	SW-H-0D-NE	2/3/2016	0.0004668J	0.0005061J	28.2
209	H0G	B-H-0G	2/23/2016	0.0316J	0.0336J	3.65 J
210		SW-H-0G-S	2/23/2016	**0.35J**	0.33J	44.3
211	H0H	B-H-0H-2	3/22/2016	0.0663J	0.0356	6.51
212	H0I	B-H-0I	1/20/2016	**0.17J**	0.17	9.84
213	H0J	B-H-0J-2	2/18/2016	**0.11J**	0.0987	5.42
214		SW-H-0J-N-2	2/18/2016	0.0504J	0.0463J	8.88
215	I1	B-I-1-2	3/22/2016	**0.32**	0.25	14.4
216		SW-I-1-N-2	3/25/2016	U	U	9.25
217	I2	B-I-2-2	3/22/2016	**0.13**	0.0976	7.71
218	I3	B-I-3	2/3/2016	**0.12J**	0.14J	**87.1 J**
219	I4	B-I-4	2/3/2016	**0.0983J**	0.13J	25.3 J
220	I5	B-I-5	2/3/2016	0.0353J	0.0423J	1.49 J
221		SW-I5-S	4/19/2016	0.0018J	0.0019J	47.7

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
222	I8	B-I8	4/13/2016	0.0401	0.0336	21.4 J
223		SW-I-8-N	4/14/2016	U	U	1.02
224	I9	B-I9	4/13/2016	**0.18J**	0.14J	13.8 J
225	I10	B-I10	4/13/2016	**0.15J**	0.11J	23.3 J
226	I11	B-I11	4/13/2016	**0.12J**	0.0818J	56.8 J
227	I12	B-I12-2	4/28/2016	0.0584D	0.0512D	8.37
228	I0B	B-I-0B	2/3/2016	0.0811J	0.0831J	**69.5**
229		SW-I-0B-S	2/3/2016	**0.63J**	0.53J	**152**
230	I0C	B-I-0C	2/3/2016	0.0023J	0.0019J	12.5
231		SW-I-0C-N	2/3/2016	0.0124J	0.0117J	32.2
232	I0F	B-I-0F	2/3/2016	**0.23J**	0.26J	16.4
233		SW-I-0F-E	2/3/2016	U	U	10.52
234		SW-I-0F-W-2	3/22/2016	**0.3DP**	0.15J	51.3
235	I0G	B-I-0G	2/3/2016	0.0763J	0.0839J	19.6
236	I0H	B-I-0H	2/3/2016	**0.1J**	0.13J	16.3
237	I0I	B-I-0I-2	2/18/2016	0.068J	0.0699J	4.52
238	I0J	B-I-0J	1/20/2016	0.0523J	0.0579J	9.28
239		SW-I-0J-N	1/21/2016	**0.33J**	0.32J	33.1
240	J1	B-J-1	2/3/2016	**0.28J**	0.33J	15.5
241		SW-J-1-N	3/10/2016	0.0024J	0.0025	41.1
242	J2	B-J-2	2/3/2016	**0.44J**	0.54J	24.9
243	J3	B-J-3-2	3/22/2016	0.0377J	0.0262	3.28
244	J4	B-J-4	2/3/2016	**0.31J**	0.36J	27.8
245	J5	B-J-5	2/3/2016	0.0681J	0.0785J	5.18
246		SW-J-5-S	2/23/2016	**0.12J**	0.14J	54.2
247	J7	B-J7	4/13/2016	**0.24J**	0.17J	49.4 J
248		SW-J7-N	4/13/2016	**0.14J**	0.0797J	74.7 J
249		SW-J-7-W	4/14/2016	0.0492J	0.0311D	14
250	J8	B-J8	4/13/2016	**0.37J**	0.25D	36.1 J
251	J9	B-J9	4/13/2016	0.0769J	0.0607	5.86 J
252	J10	B-J10	4/13/2016	**0.19J**	0.15J	28.6 J
253	J11	B-J11	4/13/2016	**0.62J**	0.43J	30.9 J
254	J12	B-J12	4/13/2016	**0.28J**	0.2J	25.3 J
255	J0B	B-J-0B	2/3/2016	0.0243J	0.0212J	19.8
256		SW-J-0B-S	2/3/2016	0.0133J	0.013J	7.5
257	J0C	B-J-0C	2/3/2016	0.0174J	0.0181J	13
258		SW-J-0C-N	2/3/2016	0.0169J	0.0167J	12.9
259	J0G	B-J-0G	2/3/2016	0.0132J	0.0137J	5.9
260		SW-J-0G-E	2/3/2016	0.001J	0.0006751J	23.3
261		SW-J-0G-S	2/3/2016	**0.16J**	0.18J	13.1
262	J0H	B-J-0H	2/3/2016	0.026J	0.0292J	16.1
263		SW-J-0H-E	2/3/2016	0.0093J	0.0091J	11.8
264	J0I	B-J-0I	1/20/2016	0.0645J	0.0708J	7.56

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
265	J0I K0I	SW-J-K-0I-SE	1/21/2016	**0.11J**	0.11J	18.1 J
266	J0J	B-J-0J	1/20/2016	0.0149J	0.0156J	5.71
267		SW-J-0J-N	1/21/2016	0.0099J	0.0099J	12.4
268	K1	B-K-1	2/3/2016	0.0907J	0.11J	10.04 J
269	K2	B-K2-2	4/14/2016	0.0115	0.0093	22.1
270	K3	B-K-3-2	3/22/2016	0.0643	0.0503	4.25
271	K4	B-K-4	2/3/2016	0.0785J	0.1J	2.3 J
272	K5	B-K-5	2/17/2016	**0.32J**	0.39J	27.1 J
273		SW-K-5-S	2/23/2016	**0.14J**	0.18J	12.1
274	K7	B-K7	1/6/2016	**0.35J**	0.45J	23.4
275		SW-K7-N	1/7/2016	0.053J	0.0668J	25.2
276	K8	B-K8	1/6/2016	**0.21J**	0.25J	19.9
277	K9	B-K-9	2/17/2016	**0.25J**	0.31J	50.9
278	K10	B-K-10	2/17/2016	0.0443J	0.0587	0.747
279	K11	B-K-11	2/17/2016	**0.2J**	0.24J	11.4
280	K12	B-K-12-2	3/17/2016	0.0934J	0.12J	7.33 J
281		SW-K12-S	1/7/2016	**0.15J**	0.18D	6.78
282	K0A	B-K-0A	2/17/2016	0.0051J	0.0046J	12.4
283		SW-K-0A-W	3/10/2016	0.0548J	0.0587J	58.6
284	K0B	B-K-0B	2/3/2016	0.0012J	0.0017J	5.05
285	K0C	B-K-0C	2/3/2016	0.0044J	0.0041J	4.99
286		SW-K-0C-N	2/3/2016	0.0013J	0.0011J	3.92
287	K0I	B-K-L-0I	1/20/2016	**0.23J**	0.23J	11.4
288	L0I	SW-K-L-0I-S	1/21/2016	**0.27J**	0.29J	15.2 J
289	K0J	B-K-0J	1/20/2016	**0.34J**	0.37J	13.9
290		SW-K-0J-N-2	2/18/2016	0.0376J	0.0376J	6.28
291	L1	B-L-1-2	3/23/2016	0.0339	0.0247	2.76
292	L2	B-L-2	2/3/2016	**0.25J**	0.3J	23.7 J
293	L3	B-L-3	2/3/2016	**0.28J**	0.34J	52.9 J
294	L4	B-L-4	2/3/2016	**0.15J**	0.19J	4.92 J
295	L5	B-L-5	2/3/2016	**0.27J**	0.34J	8.46 J
296		SW-L-5-S	2/23/2016	**0.38J**	0.47J	56.9
297	L7	B-L7	1/6/2016	**0.15J**	0.18J	40
298		SW-L7-N	1/7/2016	0.0104J	0.0077J	17.7
299	L8	B-L8	1/6/2016	**0.28**	0.39J	25.2
300	L9	B-L-9	2/17/2016	0.0062J	0.0083J	0.481 J
301	L10	B-L-10-2	3/17/2016	**0.23J**	0.36J	3.96
302	L11	B-L-11	2/17/2016	0.0572J	0.0648J	2.67
303		SW-L11-E	5/26/2016	0.079J	0.0785J	3.33
304	L12	B-L-12	2/17/2016	**0.18**	0.22J	17
305		SW-L-12-S-2	3/17/2016	0.089J	0.11J	6.06
306	L0A	B-L-0A	2/17/2016	0.0155J	0.0173J	26
307	L0B	B-L-0B	2/3/2016	0.0219J	0.0225J	10.66
308	L0C	B-L-0C	2/3/2016	0.0036J	0.0034J	8.22
309		SW-L-0C-N	2/3/2016	0.0007744J	0.0005087J	6.91
310	L0D L0E	SW-L-0E-0D-SW	1/21/2016	0.0125J	0.0124J	19.3
311	L0E L0F	SW-L-0F-0E-W-3	3/22/2016	0.0013J	0.0005117J	6.69

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
312	L0F	B-L-0F	1/20/2016	0.0331J	0.0389J	8.44
313	L0F M0F	SW-L-M-0F-N	1/21/2016	0.0126J	0.0096J	16.4
314	L0I	B-L-M-0I	1/20/2016	**0.13J**	0.12J	7.18
315	M0I	SW-L-M-0I-S	1/21/2016	**0.27J**	0.29J	15.2 J
316	L0J	B-L-0J	1/20/2016	0.0284J	0.0326J	7.79
317		SW-L-0J-N	1/21/2016	0.0265J	0.0256J	9.56
318	M1	B-M-1-2	3/25/2016	0.0245	0.0184	1.94
319	M2	B-M-2-2	3/23/2016	0.0202J	0.0153J	2.91
320	M3	B-M-3	2/3/2016	**0.27J**	0.31J	40.7 J
321	M4	B-M-4	2/3/2016	**0.15J**	0.18J	60 J
322	M5	B-M-5-2	3/23/2016	**0.25J**	0.19D	42.2
323		SW-M-5-S	2/23/2016	**0.15J**	0.18J	43.4
324	M7	B-M7	1/6/2016	0.0764J	0.1J	8.33
325		SW-M7-N	1/7/2016	0.0074J	0.0081J	41.6
326	M8	B-M-8-2	3/25/2016	**0.16J**	0.12J	6.06
327	M9	B-M9	12/3/2015	0.0689J	0.0882J	1.49
328	M10	B-M10	12/3/2015	**1.0D**	**1.4J**	**102**
329		SW-M10-S	12/3/2015	0.0767J	0.1J	1.38 J
330	M12	B-M-12	2/17/2016	**0.27J**	0.33J	3.24
331		SW-M-12-N-2	3/17/2016	0.0163J	0.0114J	**64.2**
332		SW-M-12-S-2	3/17/2016	**0.25J**	0.34J	4.82
333	M0A	B-M-0A	2/17/2016	**0.2J**	0.23J	47.2
334		SW-M-0A-E	2/23/2016	0.0139J	0.0149J	49.2
335	M0B	B-M-0B	2/3/2016	0.0332J	0.0377J	13.2
336	M0C	SW-0C-M-N	2/3/2016	0.0007796J	0.0007796J	7.6
337		B-M-0C	2/3/2016	0.0107J	0.0102J	5.96 J
338	M0E	B-M-0E	1/20/2016	0.009J	0.0091J	6.55
339		SW-M0E-E	1/21/2016	0.0083J	0.007J	7.96
340		SW-M0E-S	1/21/2016	0.0565J	0.0528J	13.2
341	M0F	SW-M0F-NE	1/21/2016	0.0224J	0.0212J	9.46
342	M0I	SW-M-0I-SE-3	3/22/2016	U	U	5.58
343	M0J	B-M-0J	1/20/2016	**0.16J**	0.16J	7.84
344		SW-M-0J-E	1/21/2016	0.0245JP	0.027JP	12.9
345		SW-M-0J-N	1/21/2016	**0.29JP**	0.31JP	26.1
346	N1	B-N-1-3	4/5/2016	**0.17J**	0.14	10.59
347		SW-N-1-N	2/23/2016	**0.26J**	0.29J	17.6
348	N2	B-N-2-2	3/23/2016	**0.34J**	0.23D	**114**
349	N3	B-N-3	2/3/2016	**0.25J**	0.28J	**63.6**
350	N4	B-N-4	2/3/2016	**0.21J**	0.27J	6.69
351	N5	B-N-5-2	3/23/2016	**0.22D**	0.16D	**74.8**
352		SW-N-5-S-3	4/5/2016	0.0049J	0.0016J	29.8
353	N7	B-N-7-2	3/25/2016	**0.15J**	0.11J	21.2
354		SW-N7-N	1/7/2016	0.0372J	0.0383J	**306**
355	N8	B-N-8-2	3/25/2016	0.0608J	0.0431	13
356	N9	B-N9	12/3/2015	**0.14J**	0.14	26.7
357	N10	B-N10	12/3/2015	**0.13J**	0.14	25.2
358	N11	B-N11	12/3/2015	**0.22J**	0.24J	16.8
359		SW-N11-E	12/3/2015	0.0355J	0.0407J	3.65
360		SW-N11-W	12/3/2015	**0.15J**	0.17J	26.5

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
361	N12	B-N-12-2	3/17/2016	**0.16J**	0.2J	2.65
362		SW-N12-S-3	5/26/2016	U	U	**75.7**
363	N0B	B-N-0B	1/20/2016	0.0631J	0.0692J	13.3
364		SW-N-0B-S	1/21/2016	**0.15J**	0.14	**129 J**
365	N0C	B-N-0C	1/20/2016	0.0227J	0.0261J	6.44
366		SW-N0C-N	1/21/2016	0.0876J	0.0832J	7.16 J
367	O1	B-O-1	2/3/2016	**0.11J**	0.13J	8.2
368		SW-O-1-N	2/23/2016	0.0011J	0.001J	1.24
369	O2	B-O-2	2/3/2016	0.0666J	0.0832J	1.3
370	O3	B-O-3	2/3/2016	**0.41J**	0.52J	19
371	O4	B-O-4	2/3/2016	**0.28J**	0.32J	18
372	O5	B-O-5	2/3/2016	**0.11J**	0.15J	4.76
373		SW-O-5-S-2	3/23/2016	**0.13J**	0.0732	21.2
374	O7	B-O7	1/6/2016	**0.14J**	0.17J	16.7
375		SW-O7-N-2	5/2/2016	**0.72D**	**0.58D**	12.8
376	O8	B-O-8-2	3/25/2016	0.0575J	0.0411	7.07
377	O9	B-O9	12/3/2015	0.0329	0.0419J	1.12
378	O10	B-O10	12/3/2015	0.0081J	0.0092J	0.55
379		SW-O10-S	12/3/2015	0.0107J	0.0875J	2.04
380	O11	SW-O-11-12	12/3/2015	0.0823J	0.0323J	**108**
381	O12	B-O12	12/3/2015	0.0298J	0.0323J	36
382		SW-O12-SE	4/28/2016	0.074J	0.0479D	37.5
383	O0B	B-O-0B	1/20/2016	0.0272J	0.0314J	1.61
384		SW-O-0B-S	1/21/2016	0.0559J	0.0447J	10.73 J
385	O0C	B-O-0C	1/20/2016	0.0369J	0.0401J	13.8
386		SW-O0C-N	1/21/2016	0.023J	0.0233J	6.69 J
387	O0D O0E	SW-O0E-0D-SW	1/21/2016	0.0153J	0.0129J	6.31 J
388	O0E O0F	SW-O0E-0E-W	1/21/2016	0.0167J	0.016J	7.21 J
389	O0F	B-O-0F	1/20/2016	0.0092J	0.0089J	7.89
390	O0F P0F	SW-O-P-0F-N	1/21/2016	0.0406J	0.0389J	14.6
391	P1	B-P-1	1/20/2016	**0.18J**	0.2J	2.39
392		SW-P1-N	1/7/2016	0.0013J	0.0011J	0.694
393	P2	B-P2	1/6/2016	0.0276J	0.0365J	0.664
394	P3	B-P-3-2	3/22/2016	**0.25J**	0.2J	1.59
395	P4	B-P4	1/6/2016	**0.11J**	0.15J	5.19
396	P5	B-P5	1/6/2016	**0.28J**	0.36J	23.3
397		SW-P5-S	1/7/2016	**0.21J**	0.27J	3.17 J
398	P7	B-P7	1/6/2016	**0.29J**	0.36J	14.6
399		SW-P7-N-2	5/2/2016	0.084J	0.0657D	19.2
400	P8	B-P8	1/6/2016	**0.24J**	0.32J	1.34 J
401	P9	B-P9	12/3/2015	**0.38J**	0.44J	7.27
402	P10	B-P10	12/3/2015	**0.24J**	0.26J	6.29 J
403		SW-P10-S	12/3/2015	0.025	0.0381J	0.815
404	P0B	B-P-0B	1/20/2016	0.0059J	0.0057J	6.87
405		SW-P-0B-S	1/21/2016	0.0031J	0.0027J	15.4 J
406	P0C	B-P-0C	1/20/2016	0.0074J	0.0062J	13.6
407		SW-P0C-N	1/21/2016	**0.21J**	0.23J	9.21 J

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
408	P0E	B-P-0E	1/20/2016	0.0199J	0.022J	6.22
409		SW-P0E-S	1/21/2016	0.0303J	0.0318J	7.82 J
410	P0F	SW-P0F-NE	1/21/2016	0.0026J	0.0022	6.74
411	Q1	B-Q-1	1/20/2016	**0.28J**	0.32J	1.26
412		SW-Q1-N	1/7/2016	0.0003726J	0.0003795J	0.908
413	Q2	B-Q2	1/6/2016	0.0514J	0.0707J	0.494
414	Q3	B-Q3	1/6/2016	**0.23J**	0.27J	4.93
415	Q4	B-Q-4-2	3/22/2016	**0.150J**	0.11	3.15
416	Q5	B-Q-5-2	3/22/2016	**0.34J**	0.21J	9.38
417		SW-Q-5-S-2	4/5/2016	0.0024J	0.0012J	3.59
418	Q7	B-Q-7-2	3/17/2016	0.0322J	0.0402J	1.02
419		SW-Q-7-N-2	3/17/2016	U	U	1.15
420	Q8	B-Q-8-2	3/17/2016	**0.2J**	0.3J	0.987
421	Q9	B-Q-9-2	3/17/2016	**0.21J**	0.31J	3.72
422	Q10	B-Q-10-2	3/17/2016	**0.15J**	0.17J	1.99
423		SW-Q-10-S-2	3/17/2016	**0.15J**	0.18J	12.7
424	Q0B	B-Q-0B	1/20/2016	0.0083J	0.0085J	5.55
425	Q0C	B-Q-0C	1/20/2016	0.006J	0.0068J	14.5 J
426		SW-Q0C-N	1/21/2016	**0.23J**	0.23J	8.05
427	Q0D	SW-Q-0D-S	1/21/2016	0.0882J	0.0765	**359 J**
428	Q0E	B-Q-0E	1/20/2016	0.013J	0.0137J	10.62 D
429		SW-Q0E-E	1/21/2016	0.0048J	0.0041J	16
430		SW-Q0E-N	1/21/2016	0.0175J	0.0166J	26.8
431		SW-Q0E-S	1/21/2016	0.027J	0.0256J	16.3
432	R1	B-R-1	1/20/2016	**0.13J**	0.12	1.39
433		SW-R1-N	1/7/2016	U	U	0.54 J
434	R2	B-R2	1/6/2016	**0.1J**	0.13J	0.978
435	R3	B-R3	1/6/2016	**0.13J**	0.15J	2.99
436	R4	B-R4	1/6/2016	0.0396J	0.0458J	2.1
437	R5	B-R5	1/6/2016	**0.27J**	0.32J	7.07
438		SW-R5-S	1/7/2016	**0.22J**	0.32J	1.63
439	R7	B-R-7-2	3/17/2016	0.0708J	0.0979J	0.929
440		SW-R-7-N-2	3/17/2016	U	U	0.855
441	R8	B-R-8-2	3/17/2016	**0.12J**	0.15J	3.09
442	R9	B-R9	12/3/2015	**0.46J**	0.48J	50.7 J
443	R10	B-R-10-2	3/17/2016	**0.32J**	0.43J	8.32
444		SW-R10-S-3	4/11/2016	0.0004065J	0.000357J	3.44
445	R0A R0B	SW-R0B-0A-SE	1/21/2016	0.0026J	0.0023J	10.17 J
446	R0B	B-R-0C-0B	1/20/2016	0.0112J	0.0128J	18.1 J
447	R0C	SW-R-0C-0B-E-2	3/29/2016	0.0393	0.0211J	42.6 J
448	R0C R0D	SW-R0D-0C-NE	1/21/2016	0.0061J	0.0053J	17 J
449	S1	B-S-1	1/20/2016	**0.11J**	0.1	0.954
450		SW-S1-N	1/7/2016	0.0004307J	0.0004805J	0.586
451	S2	B-S2	1/6/2016	0.0179J	0.0248J	0.387 J
452	S3	B-S3	1/6/2016	0.0424	0.055J	0.737
453	S4	B-S4	1/6/2016	**0.26J**	0.29J	11.8

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
454	S5	B-S5	1/6/2016	**0.1J**	0.13J	2.59
455		SW-S5-E	1/7/2016	0.034J	0.0476J	2.29
456		SW-S5-S	1/7/2016	0.0312J	0.044J	0.997
457	S7	B-S-7-2	3/17/2016	**0.0998J**	0.13J	4.57
458		SW-S-7-N-2	3/17/2016	0.0014J	0.0012J	1.53
459	S8	B-S8	12/3/2015	**0.43J**	0.52J	13.5 J
460	S9	B-S9	12/3/2015	**0.32J**	0.39J	2.38 J
461	S10	B-S10	12/3/2015	**0.36J**	0.49J	8.01
462		SW-S10-S	12/3/2015	**0.38J**	0.47J	7.95 J
463	S11 T11 S12 T12	SW-S-T-11-12	12/3/2015	0.0193J	0.0226J	24.2 J
464	S12	SW-S12-W	12/3/2015	0.0484J	0.0549J	62.7
465	S12	B-S-T-12	12/3/2015	0.0076J	0.0076J	**145**
466	T12	SW-S-T-12-S	12/3/2015	0.0246J	0.0287J	**102**
467	T1	B-T-1	1/20/2016	**0.15J**	0.16J	1.11
468		SW-T1-E	1/7/2016	**0.22J**	0.29J	0.752
469		SW-T1-N	1/7/2016	U	U	0.595
470	T2	B-T2	1/6/2016	**0.19J**	0.23J	1.64
471		SW-T2-E	1/7/2016	**0.12J**	0.17J	1.33
472	T3	B-T3	1/6/2016	**0.16J**	0.18J	3.62
473		SW-T3-E	1/7/2016	0.0629J	0.0777J	0.93
474	T4	B-T4	1/6/2016	**0.19J**	0.22J	10.63
475		SW-T-4-E-2	3/22/2016	0.0627J	0.0394	1.95
476	T5	SW-T-5-SE-2	3/22/2016	0.0173J	0.0098	16.9
477	T7	B-T-7-2	3/17/2016	0.0895J	0.11J	3.09
478		SW-T-7-E-2	3/17/2016	**0.12J**	0.15J	1.85
479		SW-T-7-N-2	3/17/2016	U	U	1.41
480	T8	B-T-8-2	3/17/2016	**0.14J**	0.17J	5.78
481		SW-T-8-E-2	3/17/2016	**0.13J**	0.17J	2.68
482	T9	B-T9	12/3/2015	**0.2J**	0.24J	5.4 J
483		SW-T9-E	12/3/2015	0.0468J	0.0585J	13.1
484	T10	B-T10	12/3/2015	0.0439D	0.0552J	3.9 J
485		SW-T10-E	12/3/2015	**0.16**	0.19	7.5
486		SW-T10-S	12/3/2015	0.0035J	0.005J	1.59
487	T11	SW-T-11-N	12/3/2015	0.0035J	0.0031J	23.9 J
488		B-T-11-12	12/3/2015	**0.46J**	0.54J	**98.2**
489		SW-S-T-11-12	12/3/2015	0.0193J	0.0226J	24.2 J
490	T11 T12 U11 U12	SW-T-U-11-12	12/3/2015	0.0741J	0.1DP	55.2
491	T12	SW-T-U-12-S	12/3/2015	0.0486J	0.053J	**91.6**
492	U12	B-U-T-12	12/3/2015	**0.19J**	0.21J	59.8
493	U8	A1B-U8	11/18/2015	0.0614J	0.0714J	17.5
494		A1SW-U8-N	11/18/2015	**0.3J**	0.32	**111**
495		A1SW-U8-W	11/18/2015	**0.29J**	0.38J	28.2
496	U8 V8	A1SW-U/V8-S	11/18/2015	0.0612J	0.0739J	25.7

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
497	U12	SW-U12-E	12/3/2015	0.0247J	0.0304J	39.7
498	V6	A1B-V6	11/18/2015	0.0772J	0.0999J	14.4
499		A1SW-V6-E	11/18/2015	0.0167J	0.0226J	17
500		A1SW-V6-N	11/18/2015	**0.0966J**	0.12J	34.2
501		A1SW-V6-W	11/18/2015	**0.26J**	0.29J	40.9
502	V7	A1B-V7	11/18/2015	**0.27**	0.370J	19.5
503		A1SW-V7-W	11/18/2015	U	U	9.46
504	V8	A1B-V8	11/18/2015	**0.350P**	0.360P	15.3
505	V9	B-V-9-2	3/17/2016	0.0087J	0.0112J	23.4
506		A1SW-V9-S	11/18/2015	**0.41J**	0.48J	**82.3**
507		A1SW-V9-W-2	3/17/2016	0.0031J	0.0036J	11.7
508	V11	B-V-11-2	3/17/2016	**0.120J**	0.150J	37.7
509		A1SW-V11-N	11/18/2015	**0.29J**	0.31J	48.3
510		SW-V-11-S-2	3/17/2016	0.0107J	0.0126	36.5
511		SW-V-11-W-2	3/17/2016	0.0042J	0.004J	14.2
512	W6	A1B-W6	11/18/2015	**0.170J**	0.18	11.9
513		SW-W-6-NE-2	3/17/2016	**0.170J**	0.240J	24.7
514	W7	A1B-W7	11/18/015	0.0427J	0.0497J	6.1J
515	W8	A1B-W8	11/18/2015	**0.220J**	0.250J	23.2
516	W9	A1B-W9	11/18/2015	**0.270J**	0.300J	21.6
517	W10	A1B-W10	11/18/2015	0.0236J	0.0319J	2.97
518		A1SW-W10-W	11/18/2015	0.0879J	0.13J	6.19
519	W11	A1B-W11	11/18/2015	0.0336	0.0406J	10.44
520	W12	A1B-W12	11/18/2015	0.012	0.0183J	2.76
521		A1SW-W12-S	11/18/2015	0.0372	0.0525J	16.6
522		A1SW-W12-W	11/18/2015	**0.26J**	0.28J	27.7
523	X7	A1B-X7	11/18/2015	0.061J	0.0737J	21.1
524		A1SW-X7-E	11/18/2015	0.0107J	0.0143J	58.7
525		A1SW-X7-N	11/18/2015	0.0488D	0.0621J	8.76
526	X8	A1B-X8	11/18/2015	**0.250J**	0.270J	13.1
527		SW-X-8-E-2	3/17/2016	0.0051	0.0062J	7.95
528	X9	A1B-X9-E	11/18/2015	0.0767D	0.0997J	11.6
529		A1B-X9-W	11/18/2015	0.0584J	0.0769J	44.9
530		A1SW-X9-N	11/18/2015	0.0704J	0.0841J	12.7
531		SW-X-9-E-3	4/12/2016	0.002J	0.0012J	5.74
532		A1SW-X9-SE	11/18/2015	**0.14J**	0.16J	15.6
533	X10	B-X-10-2	3/17/2017	0.0087	0.012J	7.34
534	X11	A1B-X11-E	11/18/2015	0.005	0.0055J	1.99
535		A1SW-X11-E	11/28/2015	**0.16**	0.18	23.5
536	X12	A1B-X12-E	11/18/2015	0.0284	0.0343 J	5.49
537		SW-X-12-S-2	3/17/2016	0.0572J	0.0624J	26.2

Table 1 Summary of Onsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094) RU (0.91)	RU (0.54)	UU (63) RU (400)
538	Y5	A1B-Y5	11/18/2015	**0.170J**	0.18	41.1
539		SW-Y-5-E-2	3/16/2016	**0.140J**	0.170J	18.8J
540		SW-Y-5-N-2	3/17/2016	0.0441J	0.0475J	45.2
541		SW-Y-5-S-2	3/16/2016	**0.260J**	0.32J	35.3J
542		A1SW-Y5-W	11/18/2015	**0.37J**	0.39J	20.8
543	Y10	A1B-Y10	11/18/2015	**0.420J**	0.520J	15.2
544		A1SW-Y10-E	11/18/2015	**0.18J**	0.2J	6.78
545		A1SW-Y10-N	11/18/2015	**0.42J**	0.49J	9.67
546		SW-Y-10-S-2	3/17/2016	0.0621	0.0799J	20.7
547	Y12	A1B-Y12	11/18/2015	**0.39J**	0.49J	27.6
548		A1SW-Y12-E	11/18/2015	**0.11J**	0.15J	45.6
549		A1SW-Y12-N	11/18/2015	**0.17J**	0.17J	3.9
550		A1SW-Y12-S	11/18/2015	0.0286J	0.0312J	24.7

Note:

1 = Alpha-chlordane and lead SCOs from NYSDEC 6 NYCRR Tables 375-6.8(a) &6.8(b) Soil Cleanup Objectives Tables (December 2006), Gamma-chlordane SCO from CP-51 Soil Cleanup GuidanceTable 1 Supplemental Soil Cleanup Objectives (October 2010)

SCO = Soil Cleanup Objectives

UU = Unrestricted Use SCO for offsite soil

RU = Restricted Use - Residential SCO for onsite soil

J =Results is less than the reporting limit but greater than or equal to the method of detection limit

U =Indicates the analyte was analyzed for but not detected

D =Dilution

P =Indicated >25% difference for detected concentrations between the two GC columns

ID = Identification

ppm = parts per million, equivalent to milligrams per kilogram, mg/kg in soil

Cells exceeding the NYSDEC Soil Cleanup Objectives for residential use are shaded.

Cells exceeding the NYSDEC Soil Cleanup Objectives for unrestricted use are in bold.

Table 2 Summary of Offsite Endpoint Results for Alpha-Chlordane, Gamma-Chlordane and Lead in Excavation Sidewalls and Base

SN	Excavation Grid	Sample ID	Sample Date	Alpha-Chlordane	Gamma-Chlordane	Lead
				SCO[1] (ppm)		
				UU (0.094)	RU (0.54)	UU (63)
1	E13	B-E13	5/26/2016	0.077J	0.0224	11
2		SW-E13-W	5/26/2016	0.0764J	0.0181	26
3	E14	B-E14	5/26/2016	0.0052J	0.0017J	5.9
4		SW-E14-S	5/26/2016	0.0273	0.008	9.51
5		SW-E14-W	5/26/2016	0.033	0.0116	6.56
6	F13	B-F13	5/26/2016	0.0255J	0.0075	5.65
7	F14	B-F14	5/26/2016	0.0348	0.0112	15.9
8		SW-F14-S	5/26/2016	0.27D	0.13D	23.5
9	G13	B-G13	5/26/2016	0.17J	0.0723J	18.8
10	G14	B-G14	5/26/2016	0.0641J	0.027	11.3
11		SW-G14-S	5/26/2016	0.14J	0.0623J	13.4
12	H13	B-H13	5/5/2016	0.0369	0.0123	13
13	H14	B-H14	5/5/2016	0.0533	0.0289	13.3
14		SW-H14-S	5/5/2016	0.15	0.0483	24.7
15	I13	B-I13	5/5/2016	0.085	0.0389	5.46
16	I14	B-I14	5/5/2016	0.0159	0.0057	18.4
17		SW-I14-S	5/5/2016	0.0792	0.0197	20.9
18	J13	B-J13-14-E	5/5/2016	0.026	0.0127	12.2
19	J14	SW-J13-14-E	5/5/2016	0.0175J	0.0026	17.4
20	J14	SW-J14-SE	5/5/2016	0.0393	0.0072	24.4

Note:

1 = Alpha-chlordane and lead SCOs from NYSDEC 6 NYCRR Tables 375-6.8(a) &6.8(b) Soil Cleanup Objectives Tables (December 2006), Gamma-chlordane SCO from CP-51 Soil Cleanup GuidanceTable 1 Supplemental Soil Cleanup Objectives (October 2010)

SCO = Soil Cleanup Objectives

UU = Unrestricted Use SCO for offsite soil

RU = Restricted Use - Residential SCO for onsite soil

J =Results is less than the reporting limit but greater than or equal to the method of detection limit

U =Indicates the analyte was analyzed for but not detected

D =Dilution

P =Indicated >25% difference for detected concentrations between the two GC columns

ID = Identification

ppm = parts per million, equivalent to milligrams per kilogram, mg/kg in soil

Cells exceeding the NYSDEC Soil Cleanup Objectives for unrestricted use are shaded.

Appendix A

Environmental Notice

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ENVIRONMENTAL NOTICE

THIS ENVIRONMENTAL NOTICE is made the 7th day of August 2018, by the New York State Department of Environmental Conservation (Department), having an office for the transaction of business at 625 Broadway, Albany, New York 12233.

WHEREAS, a parcel of real property identified as Bianchi/Weiss Greenhouses (Site152209), located on Orchard Road, East Patchogue in the Town of Brookhaven, County of Suffolk, State of New York, which is part of lands conveyed by Weiss, Russell/Weiss, Kirk/Weiss, Wayne to Henron Development Corporation by deed dated November 2, 2005 and recorded in the Suffolk County Clerk's Office on December 2, 2005 in Book 12423 of Deeds at Page 385 and being more particularly described in Appendix "A", attached to this noticed and made a part hereof, and hereinafter referred to as " the Property" is part of the Department's State Superfund Program; and

WHEREAS, the Department approved a cleanup to address contamination disposed at the Property and such cleanup was conditioned upon certain limitations.

NOW, THEREFORE, the Department provides notice that:

FIRST, the Property subject to this Environmental Notice is as shown on a map attached to this Notice as Appendix "B" and made a part hereof.

SECOND, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results or may result in a significantly increased threat of harm or damage at any site as a result of exposure to soils. A violation of this provision is a violation of 6 NYCRR 375-1.11(b)(2).

THIRD, no person shall disturb, remove, or otherwise interfere with the installation, use, operations, and maintenance of engineering controls required for the Remedy, including but not limited to those engineering controls described in the SMP and listed below, unless in each instance they first obtain a written waiver of such prohibition from the Department or Relevant Agency.

FOURTH, the remedy was designed to be protective for the following uses: **Residential as described in 6 NYCRR Part 375-1.8(g)(2)(i), Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), 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)** Therefore, any use for purposes other than Residential without the express written waiver of such prohibition by the Relevant Agency may result in a significantly increased threat of harm or damage at any site.

FIFTH, no person shall use the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department or Relevant Agency; the prohibition of raising livestock or producing animal products for human consumption; and the prohibition of installation of a basement beneath on-site structures. Inappropriate actions may result in a significantly increased threat of harm or damage at the site;

SIXTH, it is a violation of 6 NYCRR 375-1.11(b) to use the Property in a manner inconsistent with this environmental notice;

SEVENTH, monitoring and periodic reporting to assess the performance and effectiveness of the remedy must be performed as defined in the SMP. The Department or Relevant Agency shall be permitted access to the site to confirm compliance with the SMP. Site owners shall participate in periodic reporting to confirm that site controls are unchanged from the previous certification or changed with Department or Relevant Agency approval.

IN WITNESS WHEREOF, the undersigned, acting by and though the Department of Environmental Conservation as Designee of the Commissioner, has executed this instrument the day written below.

By: _____
Michael J. Ryan, P.E,
Director, Division of
Environmental
Remediation

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 7th day of August, in the year 2018, before me, the undersigned, personally appeared Michael Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his signature on the instrument, the individual, or the person upon behalf of which individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2022

APPENDIX "A" PROPERTY DESCRIPTION

All that certain plot, piece or parcel of land, situate, lying and being at East Patchogue, in the Town of Brookhaven, County of Suffolk and State of New York, being more particularly bounded and described as follows:

Beginning at a point on the southeasterly side of Orchard Road distant 258.00 feet northeasterly from the corner formed by the intersection of the southeasterly side of Orchard Road with the northeasterly side of South Country Road;

Thence from said point of beginning North 24° 21' 03" East along the southeasterly side of Orchard Road a distance of 431.58 feet to land now or formerly of John Christie;

Thence along the land now or formerly of John Christie the following five (5) courses and distances:

1. South 59° 09' 57" East a distance of 29.34 feet to a point; thence
2. South 58° 44' 47" East a distance of 121.45 feet to a point; thence
3. South 58° 34' 17" East a distance of 17.29 feet to a point; thence
4. South 58° 48' 07" East a distance of 68.75 feet to a point; thence
5. North 26° 20' 23" East a distance of 5.27 feet to a point on the easterly boundary of lands now or formerly of John Christie;

Thence North 2° 06' 23" East along the land now or formerly of John Christie and then along land now or formerly of Sandra Zylowski and then along land now or formerly of George Zylowski a distance of 448.48 feet to the southwesterly side of Old Orchard Road;

Thence South 54° 25' 07" East along the southwesterly side of Old Orchard Road a distance of 500.31 feet to land now or formerly of Doreen Drapal;

Thence South 4° 33' 17" East along land now or formerly of Doreen Drapal and then along land now or formerly of Kerry Young a distance of 287.26 feet;

Thence South 75° 23' 27" East still along land now or formerly of Kerry Young and then along land now or formerly of Michael Jorgensen a distance of 118.54 feet to land now or formerly of Rose & Robert O. Gruber;

Thence along the land now or formerly of Rose & Robert O. Gruber the following two (2) courses and distances;

1. South 23° 01' 08" West a distance of 155.90 feet to a point; thence
2. South 63° 27' 17" East a distance of 200.00 feet to the westerly side of a Right of Way known as Hedges Road;

Thence South 26° 29' 33" West along the westerly side of said Right of Way a distance of 343.00 feet to land now or formerly of Julio Claudio;

Thence North 67° 17' 57" West along the land now or formerly of Julio Claudio a distance of 145.87 feet to land now or formerly of Gregory C. Garner & Nicole M. Novellano;

Thence North 67° 12' 47" West along the land now or formerly of Gregory C. Garner & Nicole M. Novellano and then along land now or formerly of then Peter Ross & Patricia Cleland a distance of 99.21 feet to a point a point on the northerly boundary of lands now or formerly of Peter Ross & Patricia Cleland;

Thence North 67° 22' 17" West still along the land now or formerly of Peter Ross & Patricia Cleland a distance of 172.99 feet to land now or formerly of Shimante Devlin;

Thence along the land now or formerly of Shimante Devlin the following four (4) courses and distances;

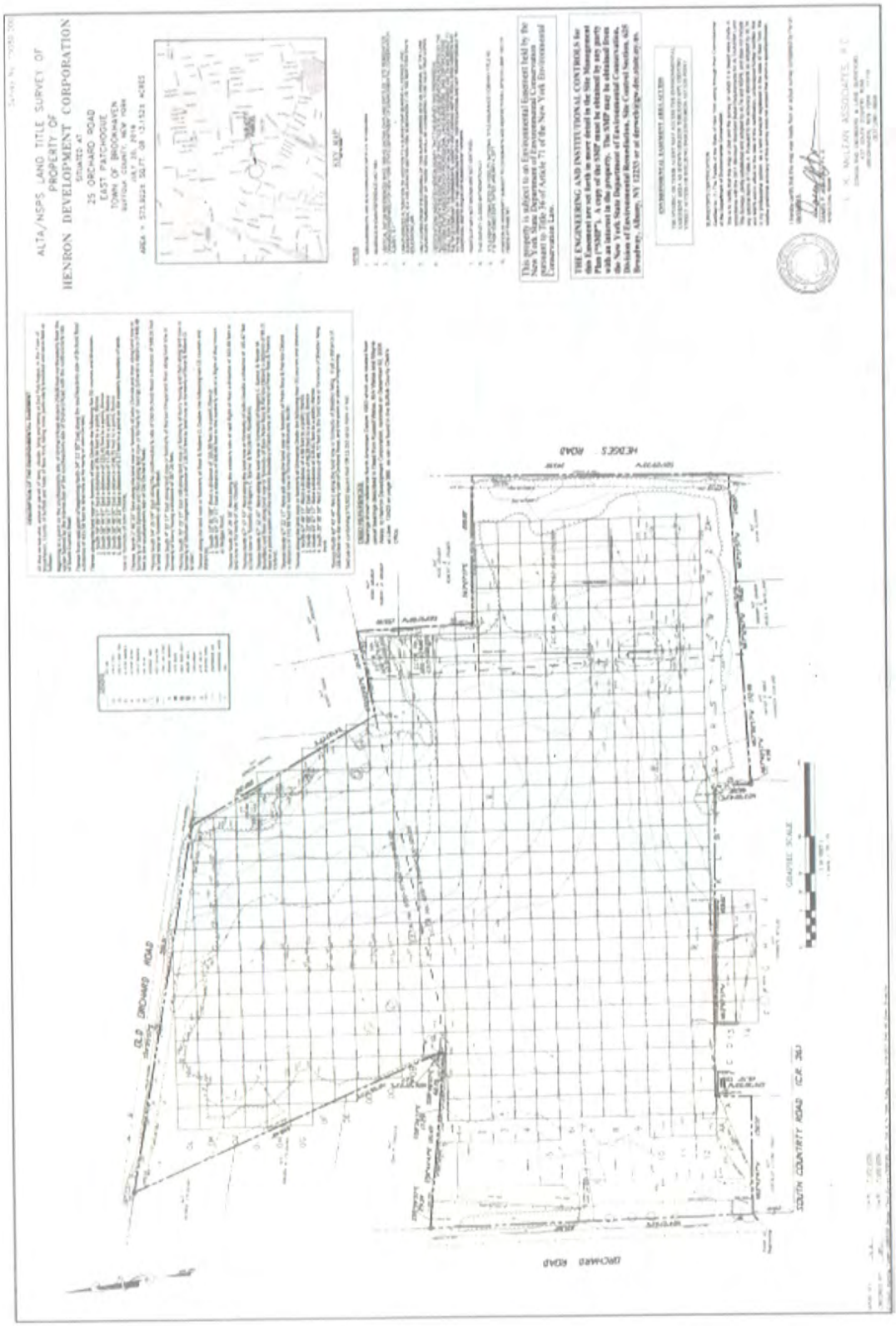
1. North 67° 40' 17" West a distance of 4.98 feet to a point; thence
2. North 23° 00' 43" East a distance of 48.58 feet to a point; thence
3. North 63° 07' 17" West a distance of 419.61 feet to a point; thence
4. South 25° 30' 53" West a distance of 48.72 feet to the land now or formerly of Shiebler living trust;

Thence North 63° 43' 47" West along the land now or formerly of Shiebler living trust a distance of 158.50 feet to the southeasterly side of Orchard Road, and the point or place of beginning.

Said parcel containing 573,922 square feet OR 13.152 acres more or less.

Suffolk County Tax Map numbers (District-Section-Block-Lot)
0200-979.60-03.00-002.000
0200-979.60-03.00-008.000
0200-979.60-03.00-009.000
0200-979.60-03.00-011.000
0200-979.60-03.00-020.001

APPENDIX "B" SITE MAP




N
STEPHANO RD
HEDGES AVE
HEDGES RD
ERVING AVE
ORCHARD RD
SITE
ORCHARD RD S
S COUNTRY RD
DRIVEWAY

Appendix B

Site Contact List

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EA Engineering, P.C. and Its Affiliate
EA Science and Technology

Contact List
Bianchi/Weiss Greenhouses Site Remedial Action
East Patchogue, New York
Site No. 152209

Project Role	Organization	Contact Name	Phone Numbers	Mailing address	Email address
Site Owner	Henron Development Corporation	Henry Schreiber		2150 Smithtown Avenue Ronkonkoma, New York 11779-7366	
NYSDEC DER Project Manager	NYSDEC DER	Brian Jankauskas NYSDEC Project Manager - Site Management	O: 518-402-9626		brian.jankauskas@dec.ny.gov
NYSDEC Regional HW Engineer	NYSDEC DER Regional Representative	Walter Parish		50 Circle Road SUNY at Stony Brook Stony Brook, NY 11790	
NYSDEC Site Control	NYSDEC	Chief, Site Control Section		625 Broadway Albany, NY 12233-7020	
NYSDOH Site Contact	NYSDOH	Jacquelyn Nealon	O: 518-402-7860	New York State Department of Health BEEI- Empire State Plaza, Corning Tower, Room 1787 Albany, NY 12237	
Private Well Homeowners - East Patchogue, New York 11772					
PW-01 (garden shop) and PW-01A (irrigation well)	470 South Country Road	PW-02	23 Roosevelt Boulevard		
Adjacent Property Owners - East Patchogue, New York 11772					
14 Hedges Road	25 Hedges Road	56 Hedges Road	66 Hedges Road	90 Hedges Road	96 Hedges Road
108 Hedges Road	123 Hedges Road	149 Hedges Road	153 Hedges Road	6 Moss Creek Lane	8 Moss Creek Lane
15 Orchard Road	17 Orchard Road	18 Orchard Road	38 Orchard Road	48 Orchard Road	56 Orchard Road
61 Orchard Road	81 Orchard Road	85 Orchard Road	503 South Country Road	547 South Country Road	573 South Country Road
581 South Country Road	591 South Country Road				

Note:
NYSDEC = New York State Department of Environmental Conservation
DER = Division of Environmental Remediation
NYSDOH = New York State Department of Health

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Appendix C

Boring Logs

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FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	Geoprobe Direct-push	Soil Boring Number: HP-1
Sampling Method:	Hydropunch	Sheet 1 of 1

					Drilling	
Water Lev.	6 ft bgs				Start	Finish
Time					6.18.09 / 8:05	6.18.09 / 8:15

Surface Conditions: Gravel, shrubs
Weather: Light Rain
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		0-3' Dark Brown / Black Medium Fine to Medium Coarse, GRAVELY SILTY SAND.
						Loose, Moist.
				1		
				2		
				3		3-10' Brown / Light Brown Medium Coarse to Coarse GRAVELLY SAND.
						Moist to Wet.
				4		
				5		
				6		Groundwater at 6 ft. bgs.
				7		
				8		
				9		
				10		End of Boring.
				11		
				12		
						Note: Collected sample at top of groundwater table at approximately 6 ft bgs.
				13		
				14		
				15		
				16		
				17		
				18		
				19		
				20		

Logged by: D. Crandall Date: 6/18/09

Drilling Contractor: Aztech Driller: B. Gannon

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	Geoprobe Direct-push	Soil Boring Number: HP-2
Sampling Method:	Hydropunch	Sheet 1 of 1

					Drilling	
Water Lev.	5 ft bgs				Start	Finish
Time					6.18.09 / 9:15	6.18.09 / 9:24

Surface Conditions: Gravel, shrubs
Weather: Light Rain
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		
				1		
				2		
				3		
				4		
				5		Groundwater at 5 ft bgs.
				6		
				7		
				8		
				9		
				10		End of Boring.
				11		
				12		
						Note: Collected sample from top of groundwater table 5 ft bgs for Pesticides.
				13		
				14		
				15		
				16		
				17		
				18		
				19		
				20		

Logged by: D. Crandall Date: 6/18/09

Drilling Contractor: Aztech Driller: B. Gannon

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	Geoprobe Direct-push	Soil Boring Number: HP-3
Sampling Method:	Hydropunch	Sheet 1 of 1

Water Lev.	3 ft bgs				Drilling Start	Drilling Finish
Time					6.18.09 / 10:00	6.18.09 / 10:11

Surface Conditions: Gravel, shrubs
Weather: Light Rain
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		
				1		
				2		
				3		Groundwater at 3 ft bgs.
				4		
				5		
				6		
				7		
				8		
				9		
				10		End of Boring.
				11		
				12		
						Note: Collected sample from top of groundwater table 3 ft bgs for Pesticides.
				13		
				14		
				15		
				16		
				17		
				18		
				19		
				20		

Logged by: D. Crandall Date: 6/18/09

Drilling Contractor: Aztech Driller: B. Gannon

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:		Location:
14368.33		New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:		Geoprobe Direct-push to install temporary MW (1" screen to 10 ft)	Soil Boring Number: TPMW-01
Sampling Method:		Peristaltic Pump	Sheet 1 of 1

Water Lev.					Drilling Start	Drilling Finish
Time					6.18.09 / 7:40	6.18.09 / 8:00

Surface Conditions: Gravel, shrubs
Weather: Light Rain
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet		USCS Log	
				0			0-3' Dark Brown / Black Medium Fine to Medium Coarse, GRAVELY SILTY SAND.
							Loose, Moist.
				1			
				2			
				3			3-10' Brown / Light Brown Medium Coarse to Coarse GRAVELLY SAND.
							Moist to Wet.
				4			
				5			
				6			Groundwater at 6 ft. bgs.
				7			
				8			
				9			
				10			End of Boring.
							Well Screen grade - 10'
				11			Sand Pack grade - 10'
				12			
							Note Collected one water sample for Pesticides from top of water table.
				13			GW at 9 ft, purged until clear, approx. 5 min. with peristaltic pump.
				14			
				15			
				16			
				17			
				18			
				19			
				20			

Logged by: D. Crandall Date: 6/18/09

Drilling Contractor: Aztech Driller: B. Gannon

Appendix D

Monitoring Well Construction Logs

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NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WO7

County Suffolk Well Number s125179

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
360 yaphank Ave. Suite 1C yaphank N.Y. 11980

LOCATION OF WELL
South Country Rd. Bellport

Depth of Well Below Surface	Depth to Groundwater From Surface
20'	4.6'

CASING

Diameter				
	2 in.	in.	in.	in.
	15 ft.	ft.	ft.	ft.

SEALING

OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	2 in.	in.	in.	in.
Length	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE

TEST OR PERMANENT PUMP

DURATION OF TEST days hours

MAXIMUM DISCHARGE gallons per min.

STATIC LEVEL PRIOR TO TEST ft. in.

LEVEL DURING MAXIMUM PUMPING ft. in.

MAXIMUM DRAWDOWN ft.

Approx. time of return level after of pumping hours min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity g.p.m.against ft. of discharge head

NUMBER OF BOWLS OR STAGES ft. of total head

DROP LINE	SUCTION LINE
DIAMETER in.	DIAMETER in.
Length ft.	Length in.

METHOD OF DRILLING
☐ rotory ☐ cable tool ■ other Auger

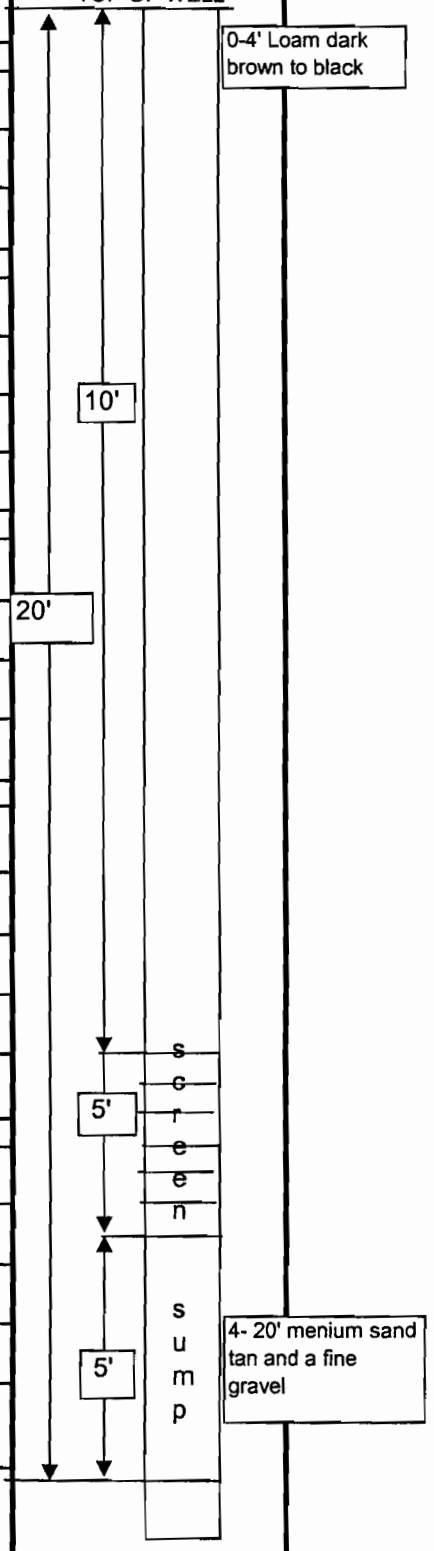
USE OF WATER
Test

WORK STARTED	COMPLETED
5/1/2006	5/1/2006

DATE	DRILLER	REGISTRATION NO.
5/1/2006	Farnlk Iannazzo	1658

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

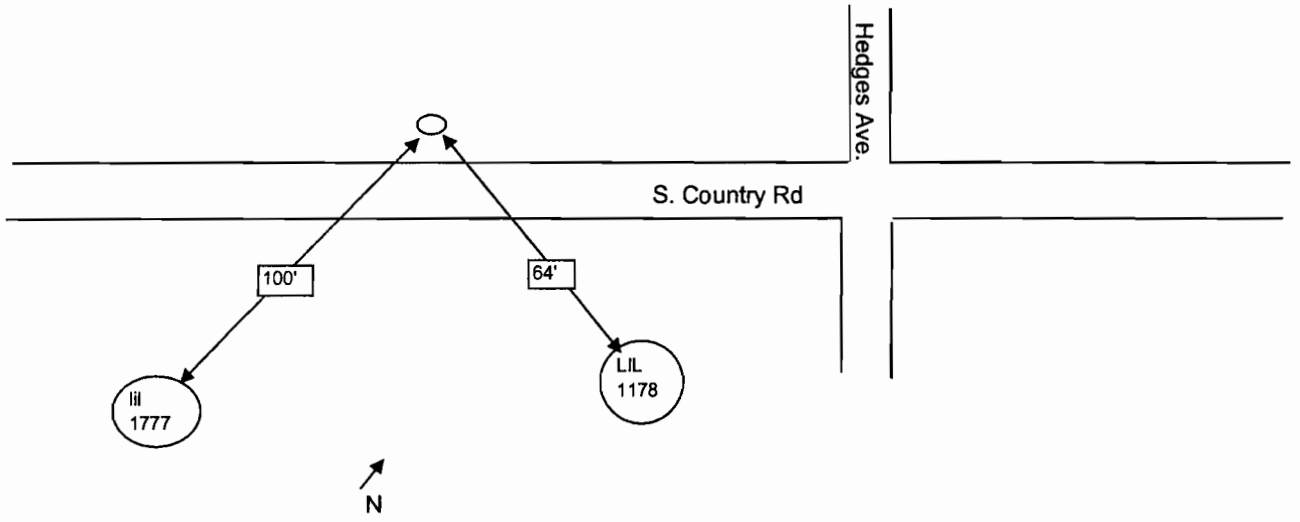
LOG
Ground Surface
EL. Ft. above sea
ft.
TOP OF WELL



ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

1) Community	Bellport	WO7	2)N.Y.S. Well#	125179	
3) Township	Brookhaven		4)Lat, Long.&Seq,#		
5)Owner	SuffolK County Department of Health Services				
6)Address	Suite 1C 360 Yaphank Ave Yaphank N.Y. 11980				
7)Completion Date of Well	5/1/2006		8) Aquifer Screened	10-15'	
9)Des. of MP					
10)Elev. of MP>			11)Elev. of Land Surface		
12) MP At		at/above/below Land Surface	13)Diam. of Casing	2"	
14) Well Depth	20'		15) Screened Interval	5'	
16) Type of Well	PVC		17) Depth to Water	4.5'	
18) Use of Well	Profile		19) Quadrangle Name		



Sketch By	Iannazzo	Date	5/1/2006	Hagstrom Map	18 P 18

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WO8

County Suffolk Well Number s125180

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
360 yaphank Ave. Suite 1C yaphank N.Y. 11980

LOCATION OF WELL
South Country Rd. Bellport

Depth of Well Below Surface	Depth to Groundwater From Surface
20'	4.6'

CASING

Diameter				
	2 in.	in.	in.	in.
	15' ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	2 in.	in.	in.	in.
Length	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against / ft. of discharge head

NUMBER OF BOWLS OR STAGES / ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Auger

USE OF WATER: Test

WORK STARTED	COMPLETED
5/3/2006	5/3/2006

DATE	DRILLER	REGISTRATION NO.
5/3/2006	Farnlk Iannazzo	1658

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

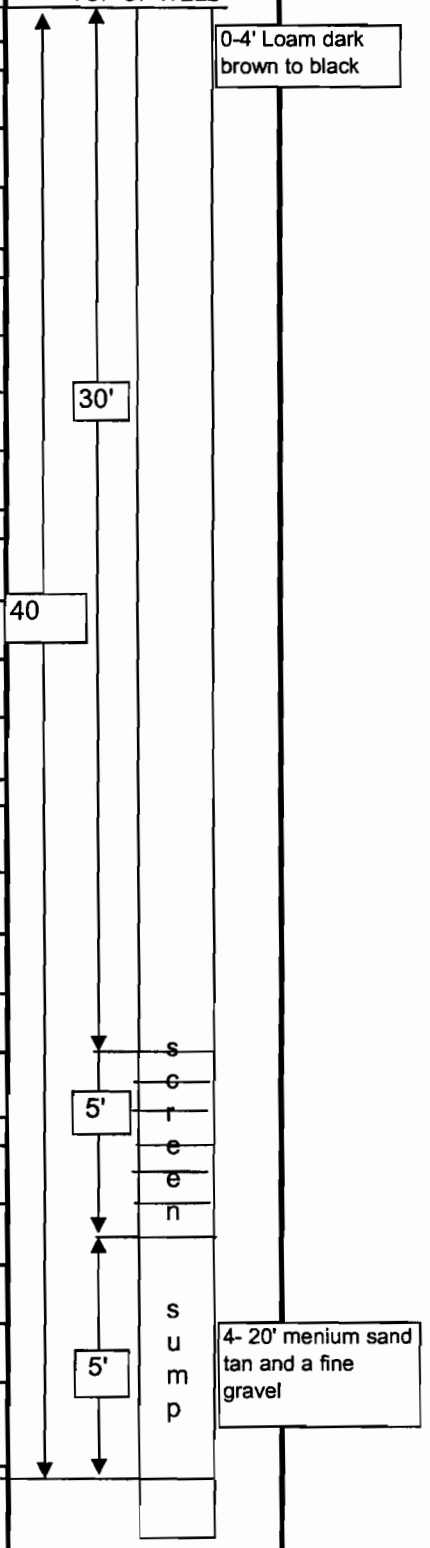
LOG

Ground Surface

EL. Ft. above sea

ft.

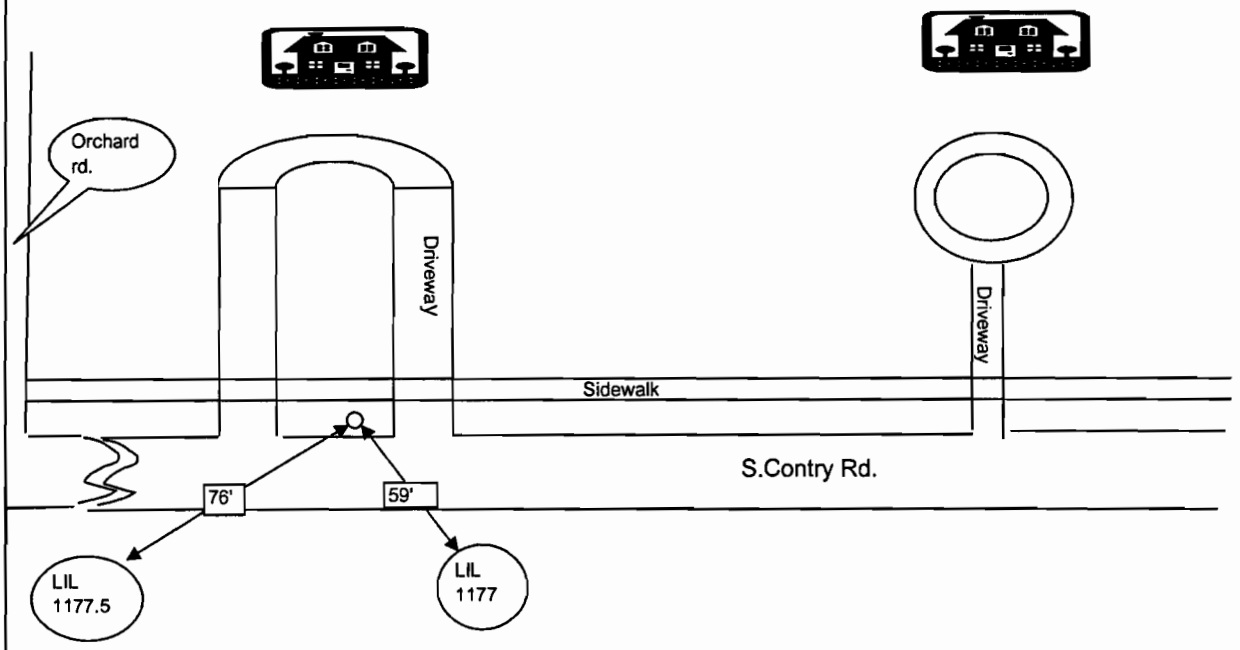
TOP OF WELL



ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

1) Community	Bellport WO8	2)N.Y.S. Well#	s125180
3) Township	Brookhaven	4)Lat, Long.&Seq,#	
5)Owner	SuffolK County Department of Health Services		
6)Address	Suite 1C 360 Yaphank Ave Yaphank N.Y. 11980		
7)Completion Date of Well	5/3/2006	8) Aquifer Screened	10-15'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	2"
14) Well Depth	20'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	4.8'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	Iannazzo	Date	5/3/2006	Hagstrom Map	18 P 18

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WO10

County Suffolk Well Number s125181

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
360 yaphank Ave. Suite 1C yaphank N.Y. 11980

LOCATION OF WELL
South Country Rd. Bellport

Depth of Well Below Surface	Depth to Groundwater From Surface
20'	4.6'

CASING

Diameter				
	2 in.	in.	in.	in.
	15 ft.	ft.	ft.	ft.

SEALING | OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	2 in.	in.	in.	in.
Length	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE | TEST OR PERMANENT PUMP

DURATION OF TEST (days / hours) | MAXIMUM DISCHARGE (gallons per min.)

STATIC LEVEL PRIOR TO TEST (ft. / in.) | LEVEL DURING MAXIMUM PUMPING (ft. / in.)

MAXIMUM DRAWDOWN (ft.) | Approx. time of return level after of pumping (hours / min.)

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity (g.p.m.against / ft. of discharge head)

NUMBER OF BOWLS OR STAGES (ft. of total head)

DROP LINE	SUCTION LINE
DIAMETER in.	DIAMETER in.
Length ft.	Length in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Auger

USE OF WATER: Test

WORK STARTED 5/3/2006 | COMPLETED 5/3/2006

DATE 5/3/2006 | DRILLER Farnlk Iannazzo | REGISTRATION NO. 1658

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

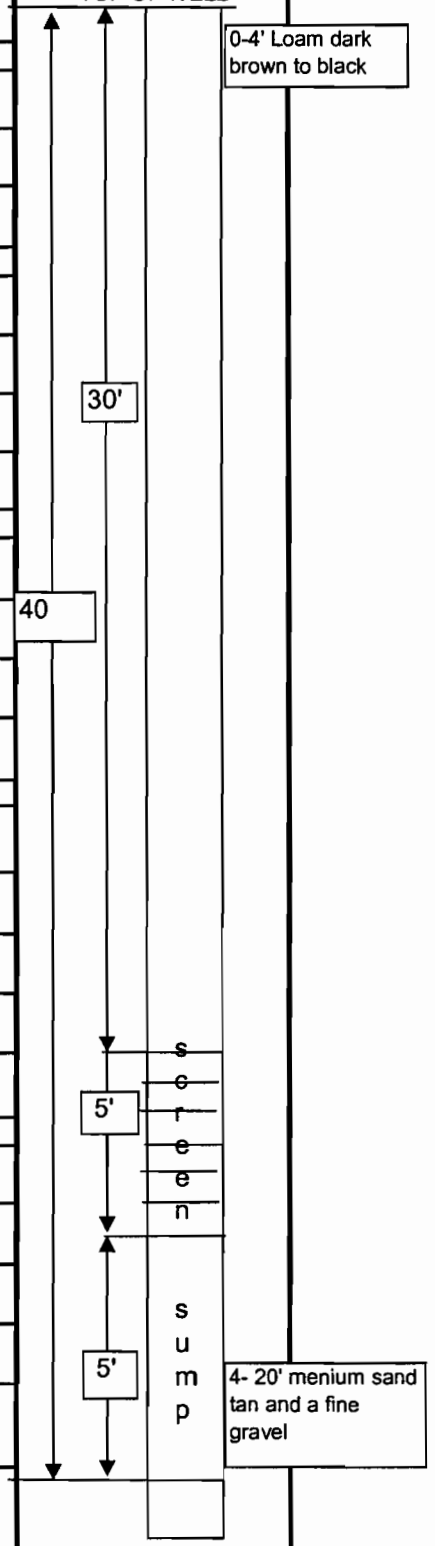
LOG

Ground Surface

EL. _____ Ft. above sea

_____ ft.

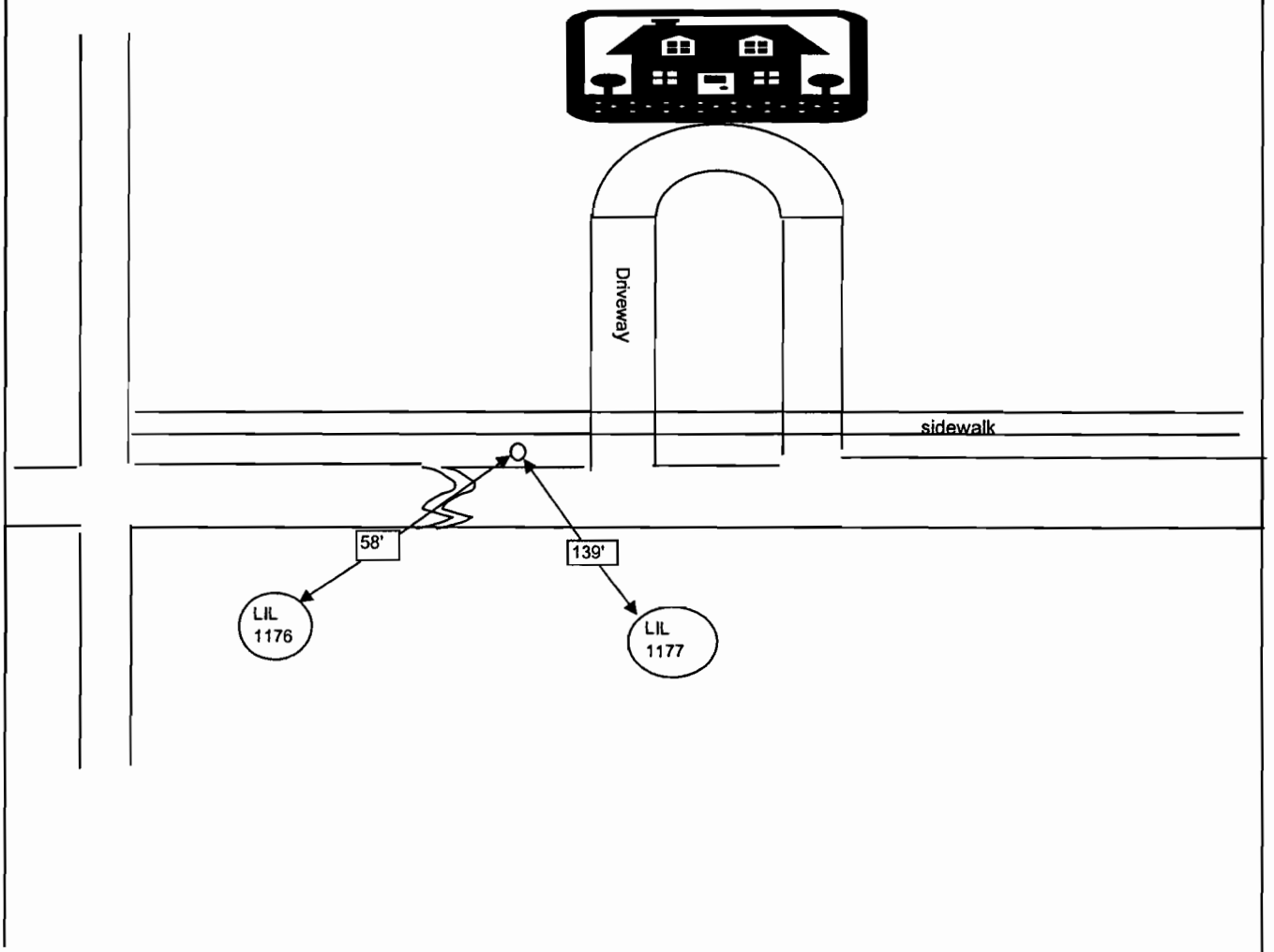
TOP OF WELL



ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

1) Community	Bellport WO10	2)N.Y.S. Well#	s125181
3) Township	Brookhaven	4)Lat, Long.&Seq,#	
5)Owner	SuffolK County Department of Health Services		
6)Address	Suite 1C 360 Yaphank Ave Yaphank N.Y. 11980		
7)Completion Date of Well	5/3/2006	8) Aquifer Screened	10-15'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	2"
14) Well Depth	20'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	4.8'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	Iannazzo	Date	5/3/2006	Hagstrom Map	18 P 18

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-17 Well Number S-125513

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
Moss Creek Lane, east patghogue

Depth of Well Below Surface	Depth to Groundwater From Surface
40'	2.70'

CASING

Diameter				
	2 in.	in.	in.	in.
Length	35' ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	2 in.	in.	in.	in.
Length	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING
30'

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.
	hours

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against / ft. of discharge head

NUMBER OF BOWLS OR STAGES / ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.
METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe	USE OF WATER: TEST
WORK STARTED: 6/8/2006	COMPLETED: 6/8/2006

DATE	DRILLER	REGISTRATION NO.
7/17/2006	Frank Basile	1834

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

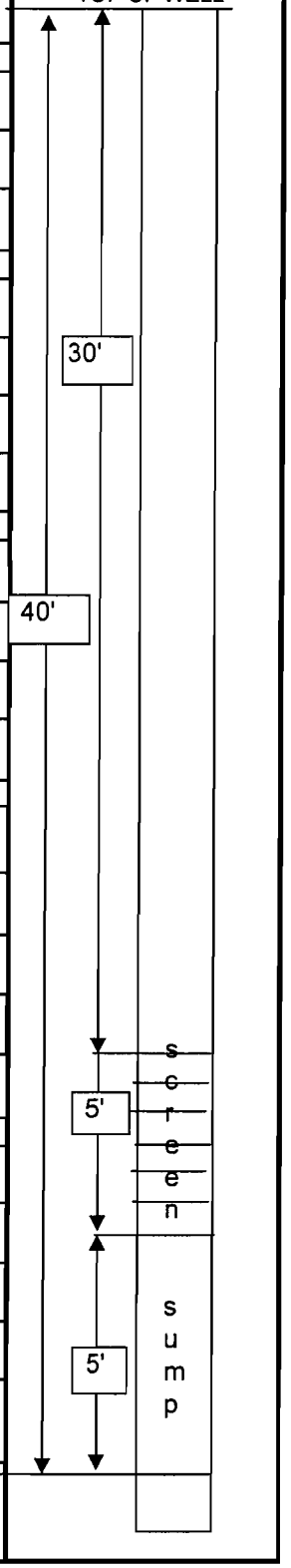
LOG

Ground Surface

EL. _____ Ft. above sea

_____ ft.

TOP OF WELL

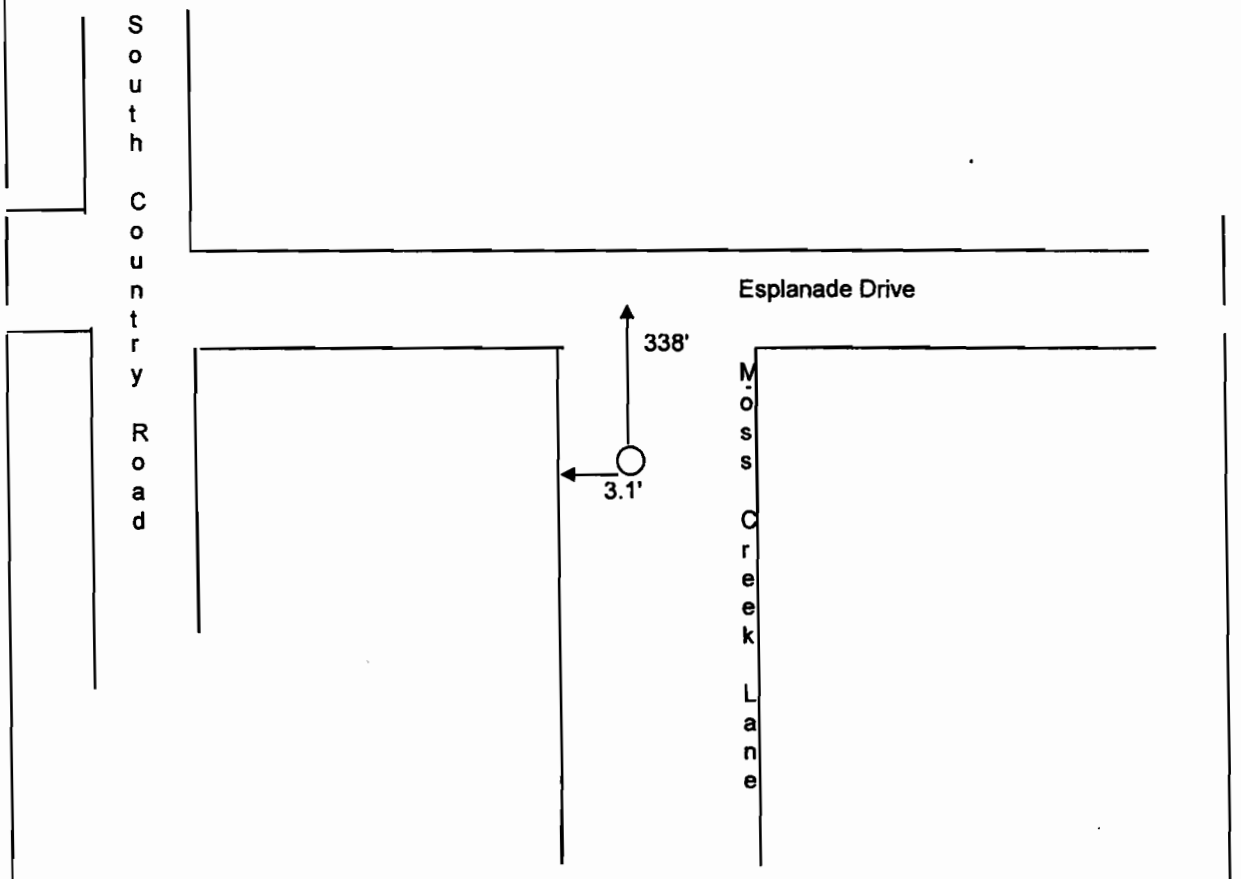


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-17

1) Community	East Patchogue	2)N.Y.S. Well#	5125517
3) Township	Brookhaven	4)Lat, Long.&Seq,#	N40.75841
5)Owner	SuffolK County Department of Health Services		W072.96983
6)Address	220Rabro Drive East Hauppauge N.Y.		
7)Completion Date of Well	6/8/2006	8) Aquifer Screened	30' to 35'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	2"
14) Well Depth	40'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	3.69'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	7/17/2006	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-19 Well Number S125515

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
Moss Creek Lane, east patghogue

Depth of Well Below Surface	Depth to Groundwater From Surface
40'	2.90'

CASING

Diameter				
	2 in.	in.	in.	in.
Length				
	35' ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	2 in.	in.	in.	in.
Length				
	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING
30'

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against / ft. of discharge head

NUMBER OF BOWLS OR STAGES / ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.
METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe	USE OF WATER: TEST
WORK STARTED: 6/8/2006	COMPLETED: 6/8/2006

DATE	DRILLER	REGISTRATION NO.
7/17/2006	Frank Basile	1834

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job. See instructions as to Well Driller's Regulation and Reports.

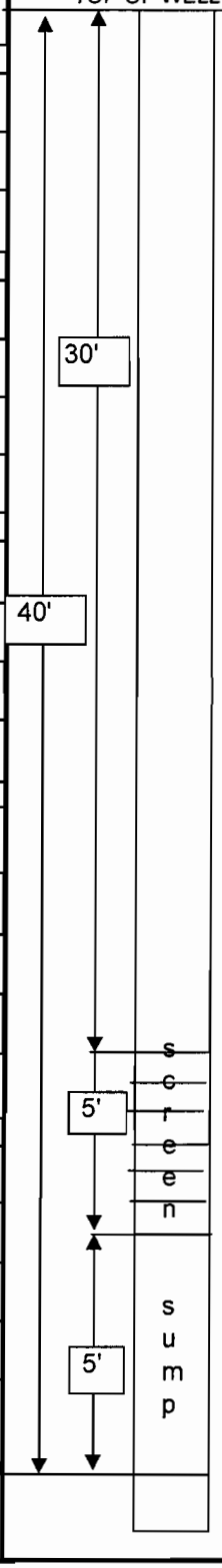
LOG

Ground Surface

EL. _____ Ft. above sea

_____ ft.

TOP OF WELL

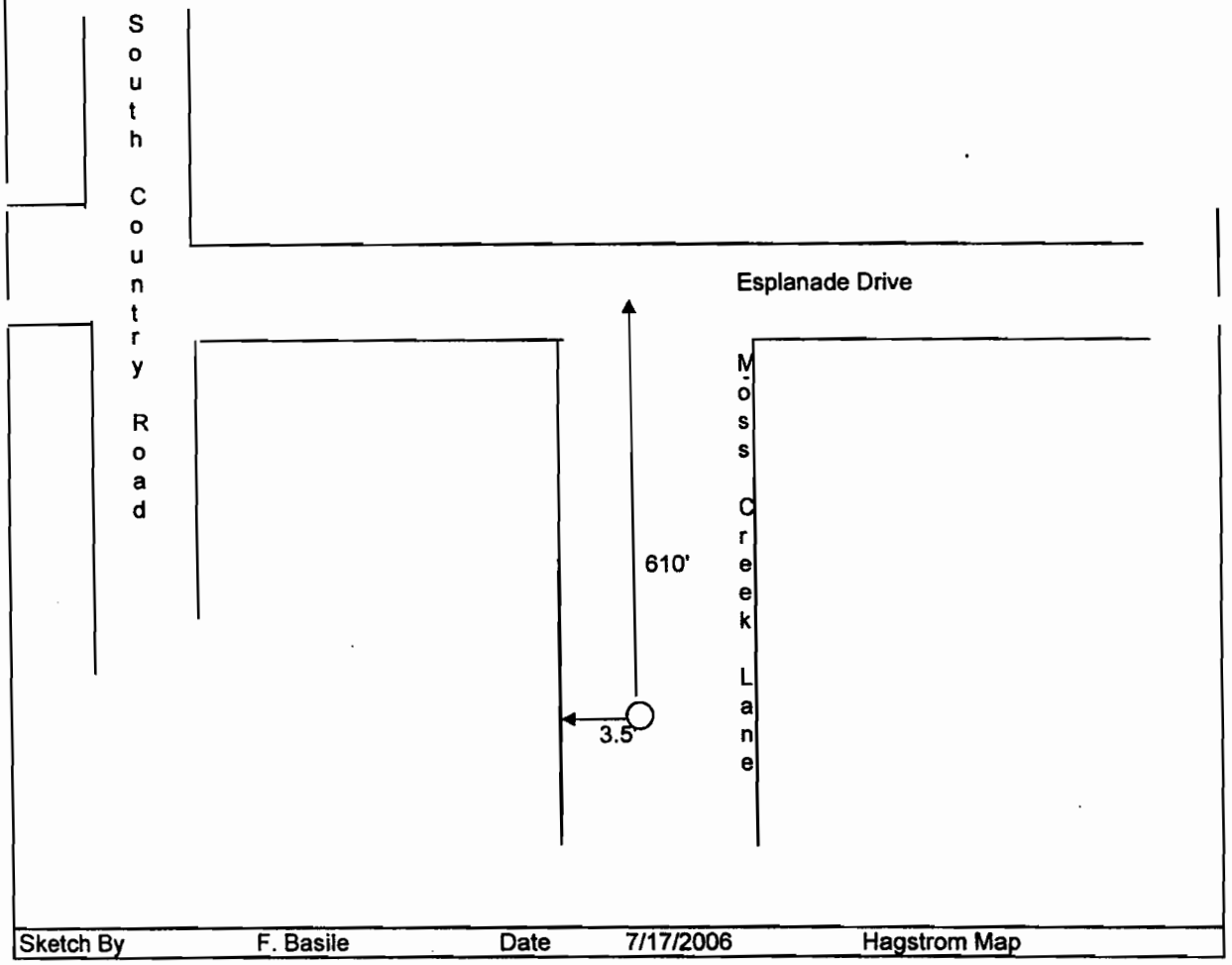


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-19 (6)

1) Community	East Patchogue	2)N.Y.S. Well#	5125515
3) Township	Brookhaven	4)Lat, Long.&Seq,#	N40.75849
5)Owner	SuffolK County Department of Health Services		W072.97076
6)Address	220Rabro Drive East Hauppauge N.Y.		
7)Completion Date of Well	6/8/2006	8) Aquifer Screened	30' to 35'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	2"
14) Well Depth	40'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	2.90'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	7/17/2006	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-25 Well Number

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
South Orchard Road, East Patchogue

Depth of Well Below Surface: 50"

Depth to Groundwater From Surface: 12.42

CASING

Diameter	Length
1 in.	50 ft.
in.	ft.
in.	ft.
in.	ft.

SEALING

OPENINGS

SCREEN

Make: Johnson

OPENINGS: 10slot

Diameter	Length
1 in.	5 ft.
in.	ft.
in.	ft.
in.	ft.

DEPTH TO TOP FROM TOP OF CASING: 40'

PUMP TEST

DATE

TEST OR PERMANENT PUMP

DURATION OF TEST: days hours

MAXIMUM DISCHARGE: gallons per min.

STATIC LEVEL PRIOR TO TEST: ft. in.

LEVEL DURING MAXIMUM PUMPING: ft. in.

MAXIMUM DRAWDOWN: ft.

Approx. time of return level after of pumping: hours min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against ft. of discharge head

NUMBER OF BOWLS OR STAGES: ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe

USE OF WATER: Test

WORK STARTED: 7/24/2006

COMPLETED: 7/24/2006

DATE: 1/25/2007

DRILLER: Frank Basile

REGISTRATION NO.: 1834

NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

LOG

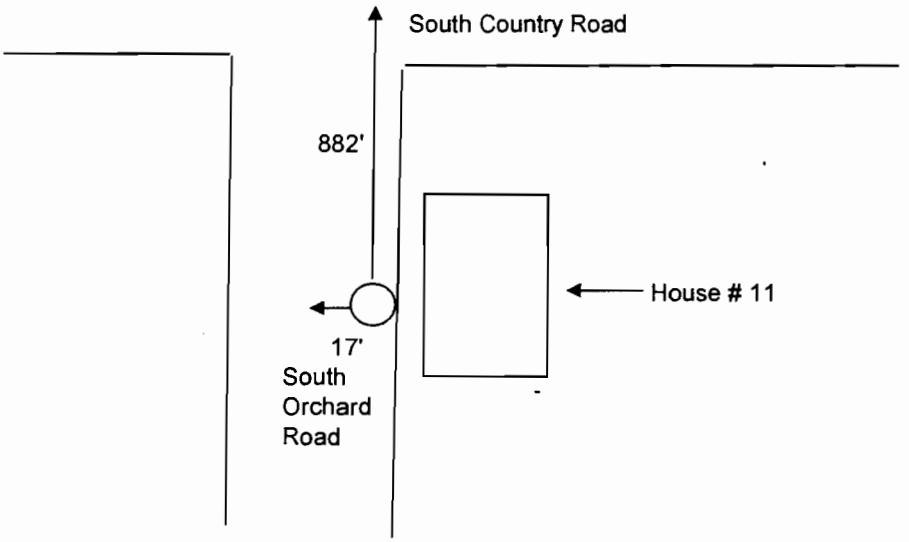
Ground Surface

EL. Ft. above sea

ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH WO-25

1) Community	East Patchogue	2)N.Y.S. Well#	
3) Township	Brookhaven	4)Lat, Long.&Seq,#	
5)Owner	SuffolK County Department of Health Services		
6)Address	220Rabro Drive East	Hauppauge	N.Y.
7)Completion Date of Well	7/24/2006	8) Aquifer Screened	40-45'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	1"
14) Well Depth	50'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	12.42'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	7/24/2006	Hagstrom Map

County Suffolk WO-26 Well Number

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
South Orchard Road, East Patchogue

Depth of Well Below Surface	Depth to Groundwater From Surface
50"	7.39'

CASING

Diameter			
1 in.	in.	in.	in.
Length			
50 ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS		
Johnson	10slot		
Diameter			
1 in.	in.	in.	in.
Length			
5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING
40'

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against | ft. of discharge head

NUMBER OF BOWLS OR STAGES | ft. of total head

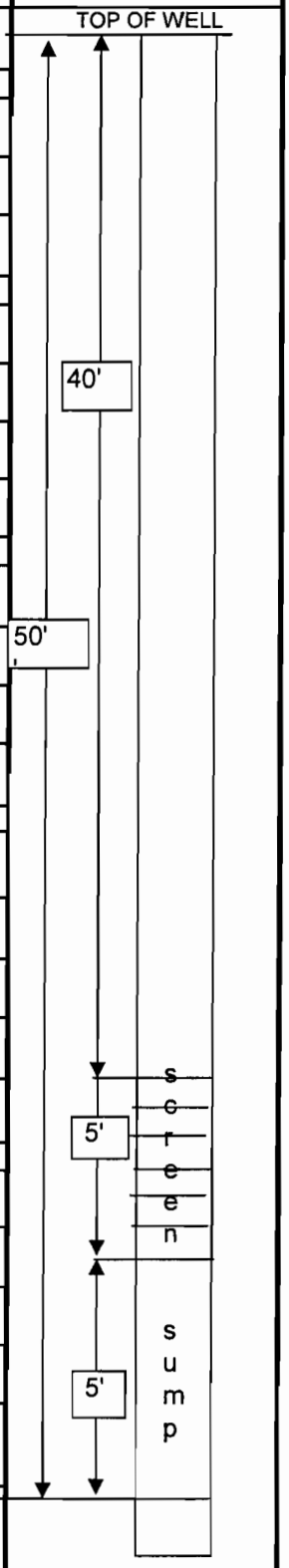
DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.
METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe	USE OF WATER: Test
WORK STARTED: 7/24/2006	COMPLETED: 7/24/2006
DATE: 1/25/2007	DRILLER: Frank Basile
	REGISTRATION NO.: 1834

NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

LOG

Ground Surface

EL. _____ Ft. above sea

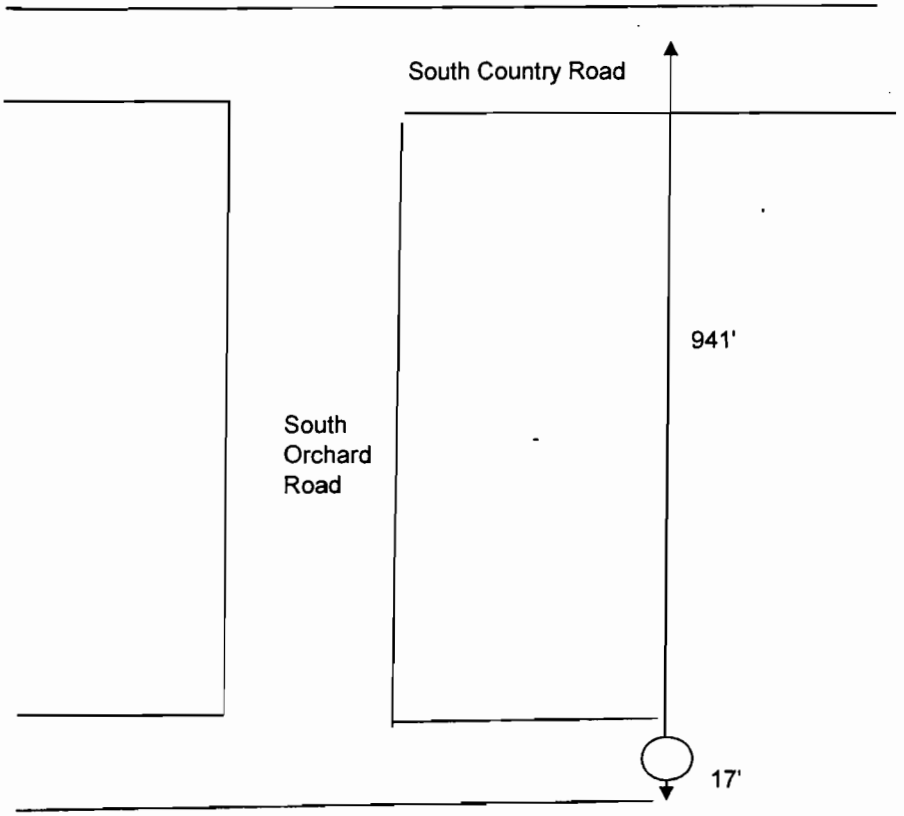


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-26

1) Community	East Patchogue	2)N.Y.S. Well#	
3) Township	Brookhaven	4)Lat, Long.&Seq,#	
5)Owner	SuffolK County Department of Health Services		
6)Address	220Rabro Drive East Hauppauge N.Y.		
7)Completion Date of Well	7/24/2006	8) Aquifer Screened	40-45'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	1"
14) Well Depth	50'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	7.39'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	7/24/2006	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-27 Well Number

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
Anthony Street, East Patchogue

Depth of Well Below Surface	Depth to Groundwater From Surface
50'	7.72'

CASING

Diameter				
	1 in.	in.	in.	in.
Length				
	50 ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	1 in.	in.	in.	in.
Length				
	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING
40'

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against ft. of discharge head

NUMBER OF BOWLS OR STAGES: ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe

USE OF WATER: Test

WORK STARTED	COMPLETED
7/24/2006	7/24/2006

DATE	DRILLER	REGISTRATION NO.
1/25/2007	Frank Basile	1834

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

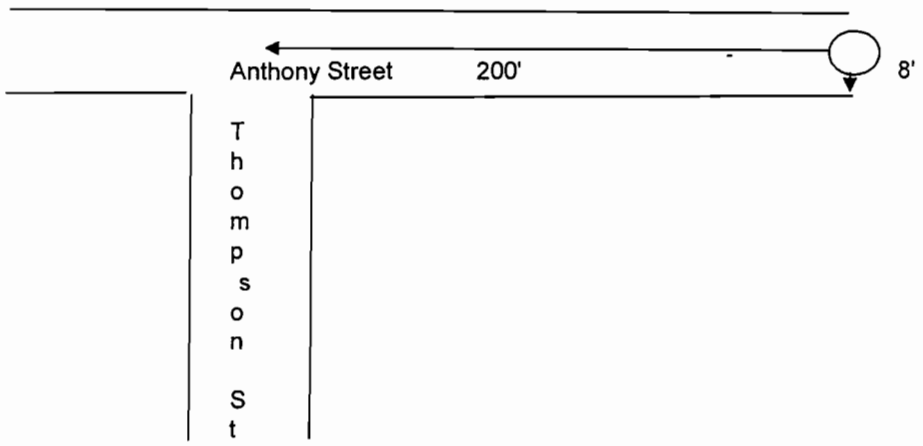
LOG
Ground Surface
EL. Ft. above sea

ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-27

1) Community	East Patchogue	2)N.Y.S. Well#	
3) Township	Brookhaven	4)Lat, Long.&Seq,#	
5)Owner	SuffolK County Department of Health Services		
6)Address	220Rabro Drive East Hauppauge N.Y.		
7)Completion Date of Well	7/24/2006	8) Aquifer Screened	40-45'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	1"
14) Well Depth	50'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	7.72'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	7/24/2006	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-28 Well Number S126027

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
S William Street

Depth of Well Below Surface: 45'

Depth to Groundwater From Surface: 12.93'

CASING

Diameter	Length
1 in.	40 ft.
in.	ft.
in.	ft.
in.	ft.

SEALING

OPENINGS

SCREEN

Make: Johnson

OPENINGS: 10slot

Diameter	Length
1 in.	5 ft.
in.	ft.
in.	ft.
in.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE

TEST OR PERMANENT PUMP

DURATION OF TEST: days hours

MAXIMUM DISCHARGE: gallons per min.

STATIC LEVEL PRIOR TO TEST: ft. in.

LEVEL DURING MAXIMUM PUMPING: ft. in.

MAXIMUM DRAWDOWN: ft.

Approx. time of return level after of pumping: hours min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against ft. of discharge head

NUMBER OF BOWLS OR STAGES

ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe

USE OF WATER: Test

WORK STARTED: 9/19/2006

COMPLETED: 9/19/2006

DATE: 1/3/2007

DRILLER: Frank Basile

REGISTRATION NO.: 1834

*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

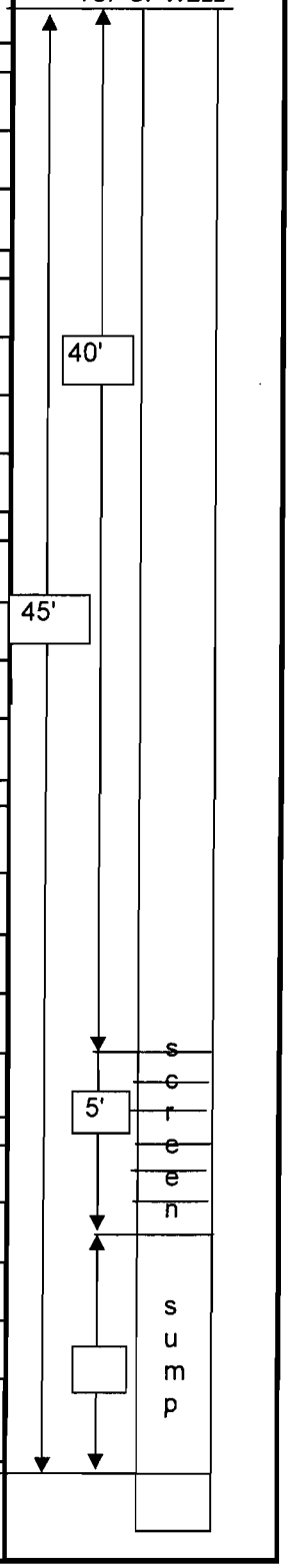
LOG

Ground Surface

EL. Ft. above sea

ft.

TOP OF WELL

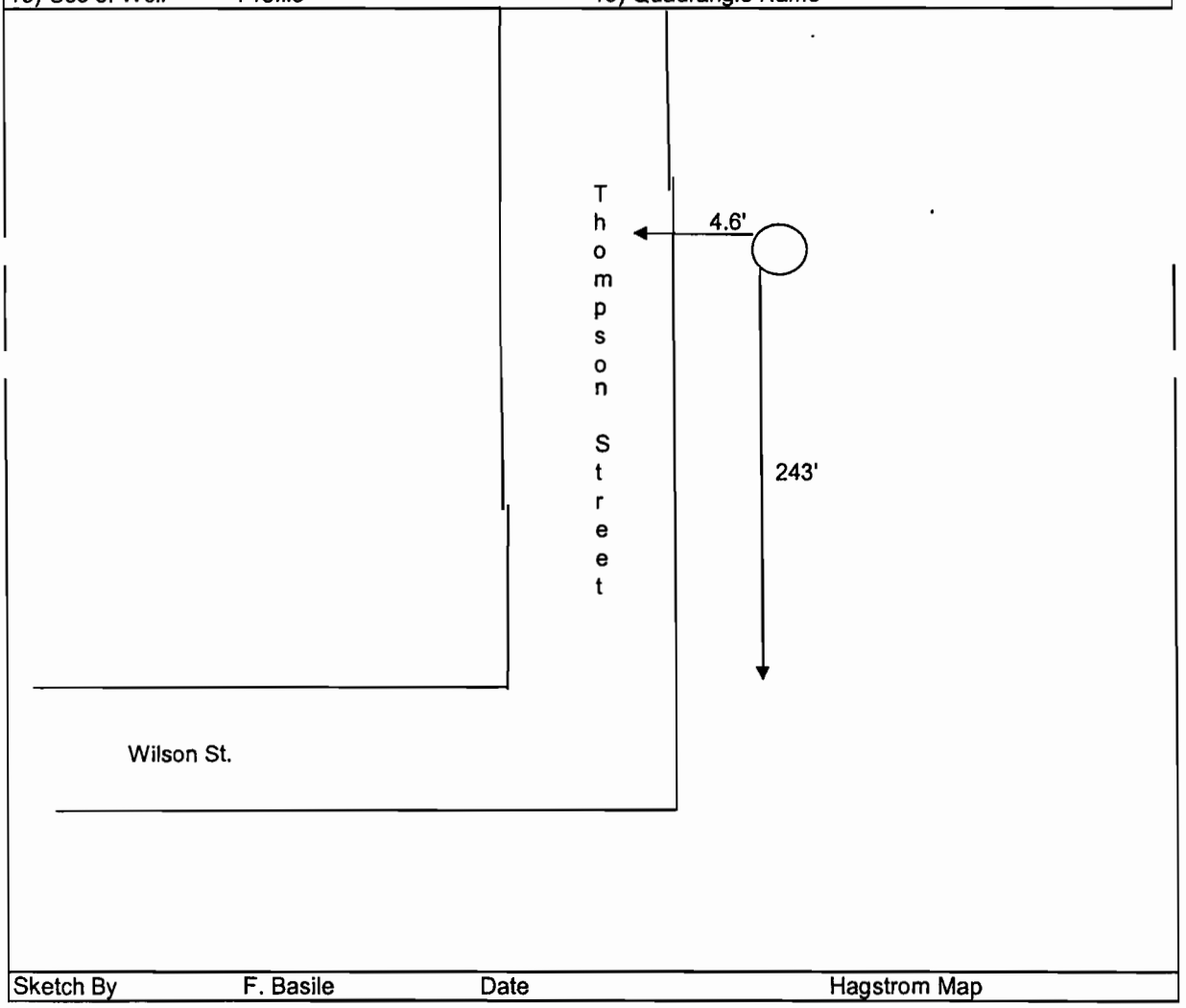


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-28 C

1) Community	East Patchougue	2)N.Y.S. Well#	3126027
3) Township		4)Lat, Long.&Seq,#	N40.45.374
5)Owner	SuffolK County Department of Health Services		W072.58.445
6)Address	220Rabro Drive East Hauppauge N.Y.		
7)Completion Date of Well	9/19/2006	8) Aquifer Screened	40' to 45'
9)Des. of MP			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	1"
14) Well Depth	45'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	12.93'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-30 Well Number S126025

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
S William Street

Depth of Well Below Surface	Depth to Groundwater From Surface
50'	10.56

CASING

Diameter				
	1 in.	in.	in.	in.
Length				
	45 ft.	ft.	ft.	ft.

SEALING

OPENINGS

SCREEN

Make	OPENINGS		
Johnson	10slot		
Diameter			
1 in.	in.	in.	in.
Length			
5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST days hours	MAXIMUM DISCHARGE gallons per min.
STATIC LEVEL PRIOR TO TEST ft. in.	LEVEL DURING MAXIMUM PUMPING ft. in.
MAXIMUM DRAWDOWN ft.	Approx. time of return level after of pumping hours min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity g.p.m.against ft. of discharge head

NUMBER OF BOWLS OR STAGES ft. of total head

DROP LINE	SUCTION LINE
DIAMETER in.	DIAMETER in.
Length ft.	Length in.

METHOD OF DRILLING ☐ rotory ☐ cable tool ■ other Geoprobe

USE OF WATER Test

WORK STARTED	COMPLETED
9/18/2006	9/18/2006

DATE	DRILLER	REGISTRATION NO.
1/3/2007	Frank Basile	1834

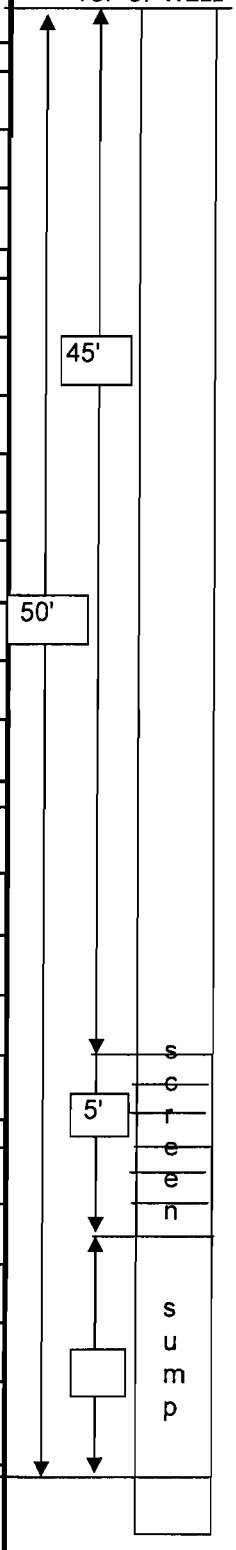
*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job.See instructions as to Well Driller's Regulation and Reports.

LOG

Ground Surface

EL. _____ Ft. above sea

_____ ft.

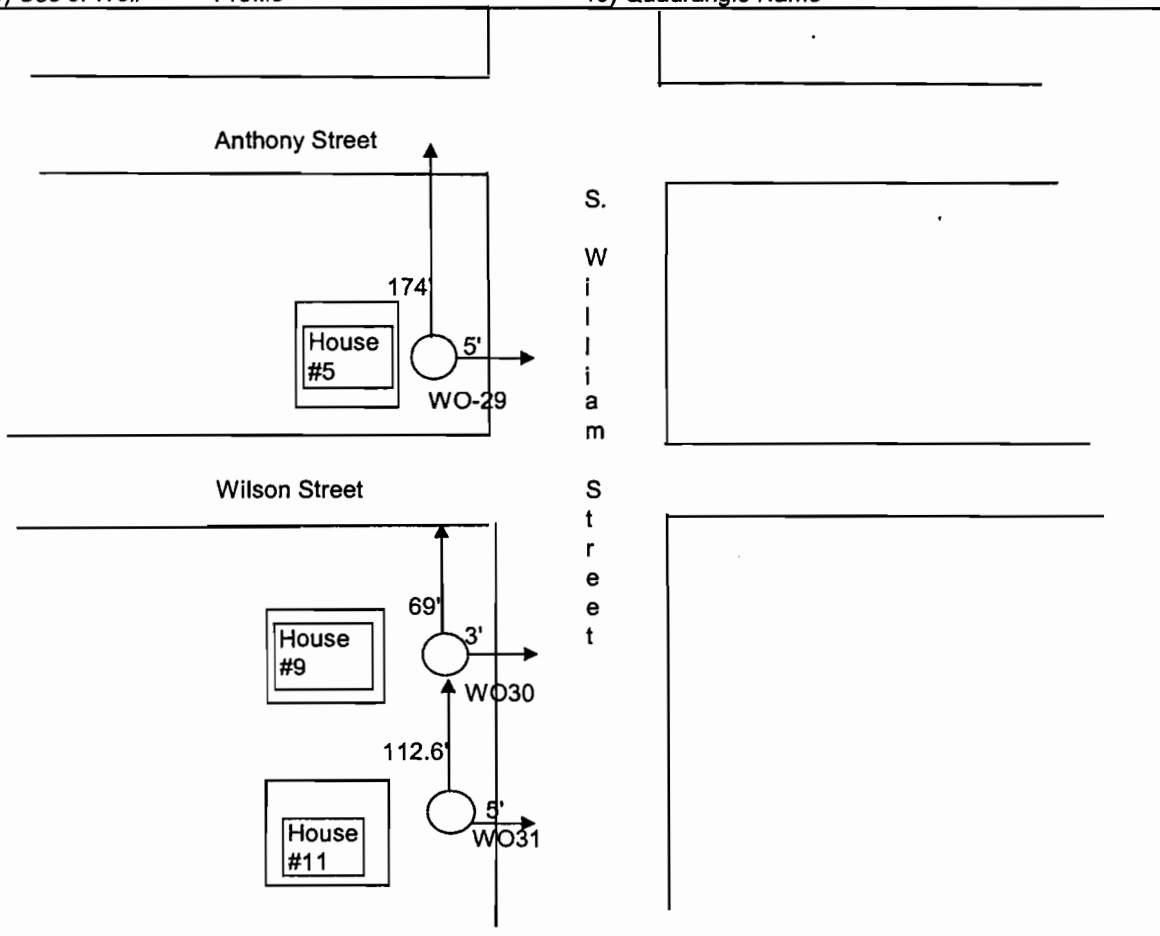


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-30

1) Community	East Patchougue	2)N.Y.S. Well#	5126025
3) Township	Brookhaven	4)Lat, Long.&Seq,#	N40.45.384
5)Owner	SuffolK County Department of Health Services		W072.58.502
6)Address	220Rabro Drive East Hauppauge N.Y.		
Pushpins	e of Well 7/24/2006	8) Aquifer Screened	45' to 50'
My Pushpins			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	1"
14) Well Depth	50'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	10.56'
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	Hagstrom Map

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

County Suffolk WO-31 Well Number S126023

COMPLETION REPORT-LONG ISLAND WELL

OWNER
Suffolk County Department of Health Services

ADDRESS
220 Rabro Dr. East Hauppauge N.Y. 11788

LOCATION OF WELL
South Country Road, East Patchouge

Depth of Well Below Surface	Depth to Groundwater From Surface
50'	6.77

CASING

Diameter				
	1 in.	in.	in.	in.
Length	45 ft.	ft.	ft.	ft.

SEALING	OPENINGS

SCREEN

Make	OPENINGS
Johnson	10slot

Diameter				
	1 in.	in.	in.	in.
Length	5 ft.	ft.	ft.	ft.

DEPTH TO TOP FROM TOP OF CASING

PUMP TEST

DATE	TEST OR PERMANENT PUMP
DURATION OF TEST: days / hours	MAXIMUM DISCHARGE: gallons per min.
STATIC LEVEL PRIOR TO TEST: ft. / in.	LEVEL DURING MAXIMUM PUMPING: ft. / in.
MAXIMUM DRAWDOWN: ft.	Approx. time of return level after of pumping: hours / min.

PUMPING INSTALLED

TYPE	MAKE	MODEL NUMBER
MOTIVE POWER	MAKE	H.P.

Capacity: g.p.m.against / ft. of discharge head

NUMBER OF BOWLS OR STAGES / ft. of total head

DROP LINE	SUCTION LINE
DIAMETER: in.	DIAMETER: in.
Length: ft.	Length: in.

METHOD OF DRILLING: ☐ rotory ☐ cable tool ■ other Geoprobe

USE OF WATER: Test

WORK STARTED	COMPLETED
9/18/2006	9/18/2006

DATE	DRILLER	REGISTRATION NO.
1/3/2007	Frank Basile	1834

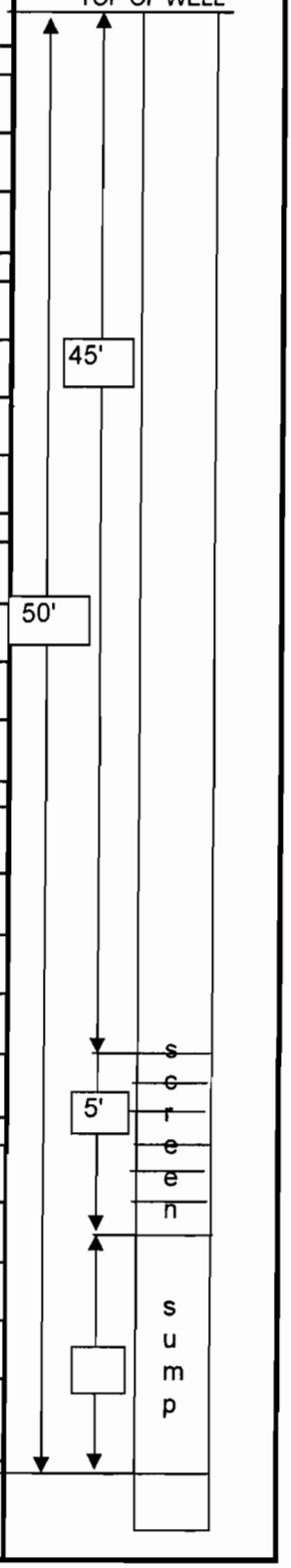
*NOTE: Show log of well materials encountered with depth below ground surface water bearing beds and water levels in each casing screen pump additional pumping test and other matters of interest. Describe repair job. See instructions as to Well Driller's Regulation and Reports.

LOG

Ground Surface

EL. _____ Ft. above sea

_____ ft.

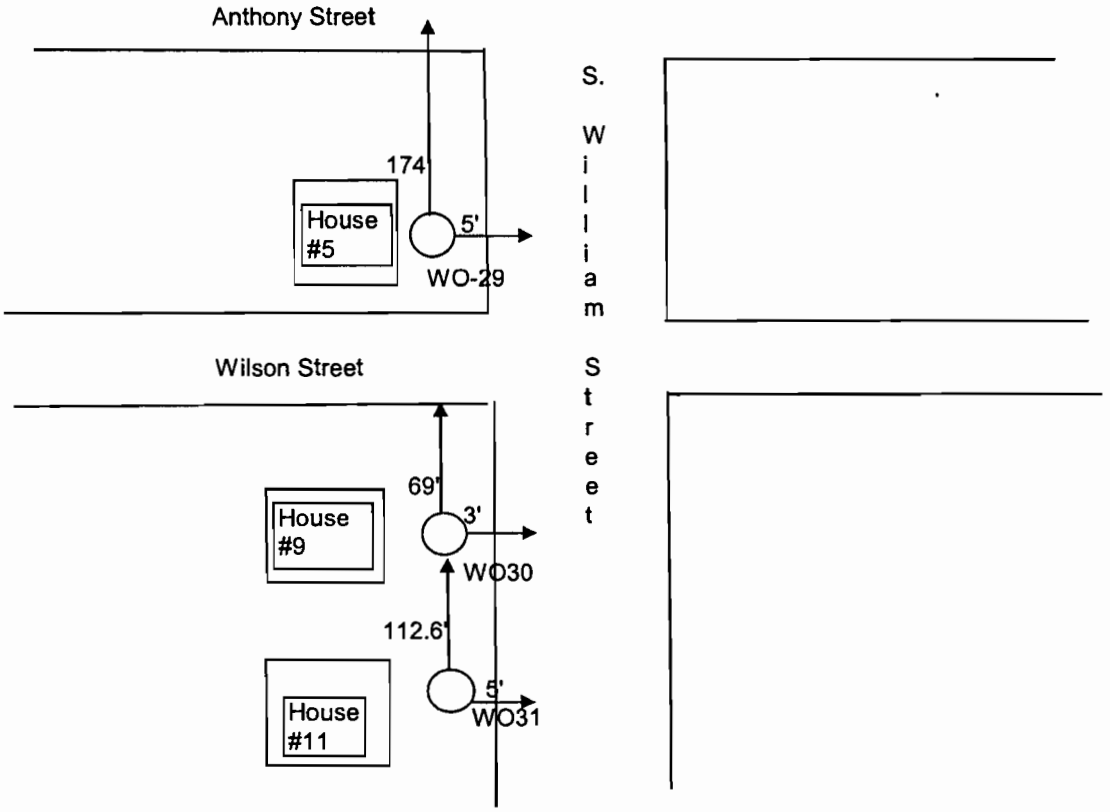


ORIGINAL- Environmental Conservation Copy

LOCATION SKETCH

WO-31

1) Community	East Patchougue	2)N.Y.S. Well#	S126023
3) Township		4)Lat, Long.&Seq,#	N40, 45.311 W072.58.528
5)Owner	SuffolK County Department of Health Services		
6)Address	220Rabro Drive East	Hauppauge	N.Y.
Pushpins	e of Well ~~7/24/2000~~ 9/18/66	8) Aquifer Screened	~~30' to 35'~~ 45' TO 50'
My Pushpins			
10)Elev. of MP>		11)Elev. of Land Surface	
12) MP At	at/above/below Land Surface	13)Diam. of Casing	~~2"~~ 1"
14) Well Depth	~~40'~~ 50'	15) Screened Interval	5'
16) Type of Well	PVC	17) Depth to Water	~~4.15~~ 6.72
18) Use of Well	Profile	19) Quadrangle Name	



Sketch By	F. Basile	Date	Hagstrom Map

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA	Soil Boring Number: MW-33 D
Sampling Method:	Split Spoon	Sheet 1 of 3

Water Lev. / Time	Drilling Start	Drilling Finish
	6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: grass, right of way infront of someones house
Weather: partly sunny, light breeze from the north
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
3	1.5/2		0.0	0		0-2' (0-.5') Dark Brown / Balck Topsoil.
6						(0.5-2') Dark Brown Medium Fine SAND, Some Gravel. Dense, moist.
7			0.0	1		
7						
				2		
				3		
	1.5/2			4		Groundwater at 5.5 ft bgs.
5			0.0	5		5-7' Dark Brown Medium Fine to Coarse SAND and GRAVEL. Slightly dense, wet.
6						
9			0.0	6		
12						
				7		
				8		
				9		
7			0.0	10		10-12' Tans Coarse SAND. Slightly loose, wet.
12						
15			0.0	11		
17						
				12		
				13		
				14		
6			0.0	15		
8						15-17' Tan Coarse SAND and GRAVEL. Loose, wet.
9			0.0	16		
11						
				17		
				18		
				19		
				20		

Logged by: D. Crandall Date: 6/16/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA / Casing	Soil Boring Number: MW-33 D
Sampling Method:	Split Spoon	Sheet 2 of 3

Water Lev.					Drilling Start	Drilling Finish
Time					6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: asphalt
Weather: sunny
Temperature: 70 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
5	1.5/2		0.0	20		20-22' Tan Coarse SAND, Some Gravel. Loose, wet.
8						
15			0.0	21		
21						
				22		
				23		
	1/2			24		
4			0.0	25		25-27' Tan Coarse SAND. Loose, wet.
6						
10			0.0	26		
13						
				27		
				28		
	1/2					
				29		
12			0.0	30		30-32' Tan Coarse SAND. Loose, wet.
15						
			0.0	31		
				32		
				33		
				34		
4				35		35-37' No recovery.
6						
11				36		
17						
				37		
	0/2			38		
				39		
				40		

Logged by: D. Crandall Date: 6/16/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA / Casing	Soil Boring Number: MW-33 D
Sampling Method:	Split Spoon	Sheet 3 of 3

Water Lev.					Drilling Start	Drilling Finish
Time					6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: asphalt
Weather: sunny
Temperature: 70 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
12				40		40-42' Tan Coarse SAND and GRAVEL. Loose, wet.
18			0.0			
28				41		
28	1/2					
				42		
				43		
				44		
22				45		45-57' Tan Coarse SAND and GRAVEL. Loose, wet.
28	1/2		0.0			
28				46		
21						
				47		
				48		
				49		
	1/2					
10			0.0	50		50-52' Tan Coarse SAND, Some Gravel. Loose, wet.
18						
22				51		
22						
				52		
				53		
				54		
15			0.0	55		55-57' Tan Coarse SAND, Some Gravel. Loose, wet.
19						
21				56		
17						well screen: 55-60'
				57		well riser: grade-55'
						sand pack: 53-60'
	1/2			58		bentonite seal: 51-53'
						grout: grade-51'
				59		Flush mount.
				60		

Logged by: D. Crandall Date: 6/16/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA	Soil Boring Number: MW-33 I
Sampling Method:	Split Spoon	Sheet 1 of 2

Water Lev. / Time	Drilling Start	Drilling Finish
	6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: grass, right of way infront of someones house
Weather: partly sunny, light breeze from the north
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log
				0	
				1	
				2	
				3	
				4	
				5	
				6	
				7	
				8	
				9	
				10	
				11	
				12	
				13	
				14	
				15	
				16	
				17	
				18	
				19	
				20	

well screen: 20-25'
well riser: grade-20'
sand pack: 18-25'
bentonite seal: 15-18'
grout: grade-15'
Flush mount.

Logged by: D. Crandall Date: 6/16/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA / Casing	Soil Boring Number: MW-33 I
Sampling Method:	Split Spoon	Sheet 2 of 2

Water Lev.					Drilling Start	Drilling Finish
Time					6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: asphalt
Weather: sunny
Temperature: 70 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet		USCS Log	
				20			
				21			
				22			well screen: 20-25'
				23			well riser: grade-20'
				24			sand pack: 18-25'
				25			bentonite seal: 15-18'
				26			grout: grade-15'
				27			Flush mount.
				28			
				29			
				30			
				31			
				32			
				33			
				34			
				35			
				36			
				37			
				38			
				39			
				40			

Logged by: D. Crandall
Date: 6/16/09
Drilling Contractor: Aztech
Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method:	HSA	Soil Boring Number: MW-33 S
Sampling Method:	Split Spoon	Sheet 1 of 1

Water Lev. / Time					Drilling Start	Drilling Finish
					6.16.09 / 8:00	6.16.09 / 17:00

Surface Conditions: grass, right of way infront of someones house
Weather: partly sunny, light breeze from the north
Temperature: 60 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet		USCS Log	
				0			
				1			
							well screen: 5-10'
				2			well riser: grade-5'
							sand pack: 4-10'
				3			bentonite seal: 1-4'
							Flush mount.
				4			
				5			
				6			
				7			
				8			
				9			
				10			
				11			
				12			
				13			
				14			
				15			
				16			
				17			
				18			
				19			
				20			

Logged by: D. Crandall Date: 6/16/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method: HSA		Soil Boring Number: MW-41
Sampling Method: Split Spoon		Sheet 1 of 2

Water Lev. / Time	Drilling Start	Drilling Finish
	5.20.09 / 12:30	5.20.09 / 16:00

Surface Conditions: grass
Weather: sunny
Temperature: 75 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
5	1/2		0.0	0		0-2' 3" Asphalt. Dark Brown Fine to Medium SAND and GRAVEL (backfill).
5						
6				1		
				2		
				3		
	1/2			4		
6			0.0	5		5-7' Tan, Fine to Coarse SAND, Some Silt and Gravel. Moist, loose.
9						
15				6		
18						
				7		
	1/2			8		
				9		
7			0.0	10		10-12' Tan-orange, Fine to Coarse SAND, Some Silt and Gravel. Wet, loose.
8						
13				11		
13						Wet at 10'.
				12		
				13		
				14		
2			0.0	15		
1						15-17' Tan-orange, Fine to Coarse SAND, Some Silt and Gravel. Wet, loose.
3				16		Saturated.
3						
				17		
	1/2			18		
				19		
				20		

Logged by: S. Nelson Date: 5/20/09

Drilling Contractor: Aztech Driller: M. Harrington

FIELD BORING LOG FORM

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location:
14368.33	New York State Department of Environmental Conservation	Bianchi / Weiss Greenhouse
Drilling Method: HSA		Soil Boring Number: MW-41
Sampling Method: Split Spoon		Sheet 2 of 2

Water Lev. / Time	Drilling Start	Drilling Finish
	5.20.09 / 12:30	5.20.09 / 16:00

Surface Conditions: grass
Weather: sunny
Temperature: 75 F

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
2	1/2		0.0	20		20-22' Tan-orange, Fine to Coarse SAND, Some Silt, Trace Gravel. Saturated.
3						
6				21		
10						
				22		
				23		
				24		
2	1/2		0.0	25		25-27' Tan-orange, Fine to Coarse SAND, Some Silt and Gravel. Saturated.
3						Thin gravel lens at 27'.
4				26		
13						
				27		
	1/2			28		
				29		
5			0.0	30		30-32' Tan-orange, Fine to Coarse SAND, Some Silt, Trace Gravel. Saturated.
8						
11				31		
19						
				32		
				33		
				34		
2			0.0	35		35-37' Light Tan, Fine to Medium SAND, Trace Silt and Gravel.
5						
12				36		
30/3						
				37		
						well screen: 30-35'
	1/2			38		well riser: grade-30'
						sand pack: 28-35'
				39		bentonite seal: 25-28'
						grout: grade-25'
				40		Flush mount.

Logged by: S. Nelson Date: 5/20/09

Drilling Contractor: Aztech Driller: M. Harrington

Geologic Log & Well Construction Details

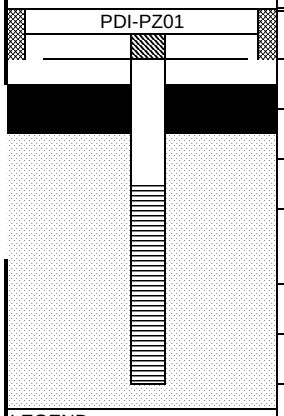
ENVIROTRAC LTD.

5 Old Dock Road, Yaphank, NY, 11980

Log Of Monitoring Well - PDI-PZ01

Client: NYSDEC		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name:	Address:	Date	DTW	NM
Bianchi Weiss Greenhouses	25 Orchard Road, East Patchogue, NY		NM	
Drilling Company:	Method:			
Associated Environmental	Geoprobe 4" Auger			Measuring Point Elevation
Date Started: 7/1/2016	Date Completed: 7/1/2016			NM
Completion Depth: 15'	ENVIROTRAC Geologist: John Szymanski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (ft.)	SAMPLES Blow per 6 in.	OVM (ppm)	SOIL DESCRIPTION
PDI-PZ01	0	NM	NM	0.0	0'-15' Med-fine light sand
	5	NM	NM	0.0	
	10	NM	NM	0.0	
	15				



LEGEND:
- Concrete
- Bentonite Pellets
- Sand Pack NO. 0 Grade
- Sandpack NO.00 Grade
- Cement Grout

Well Construction Details:

Bottom of Well:	15'
Screen Zone:	6'-15'
Silica Sand NO 0:	4'-15'
Screen material:	2" Sch 40 PVC 10 Slot
Casing material:	2" Sch 40 PVC
Bentonite Pellets:	2'-4'
Sand Pack:	NO.0 Grade Silica
Stick Up:	4" x 3'

Geologic Log & Well Construction Details

ENVIROTRAC LTD.

5 Old Dock Road, Yaphank, NY, 11980

Log Of Monitoring Well PDI-PZ02

Client: NYSDEC		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name:	Address:	Date	DTW	NM
Bianchi Weiss Greenhouses	25 Orchard Road, East Patchogue, NY		NM	
Drilling Company:	Method:			
Associated Environmental	Geoprobe 4" Auger			Measuring Point Elevation
Date Started: 7/1/2016	Date Completed: 7/1/2016			NM
Completion Depth: 15'	ENVIROTRAC Geologist: John Szymanski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (ft.)	SAMPLES Blow per 6 in.	SAMPLES OVM (ppm)	SOIL DESCRIPTION
PDI-PZ02	0	NM	NM	0.0	0'-15' Med-fine light sand
	5	NM	NM	0.0	
	10	NM	NM	0.0	
	15				

LEGEND:
- Concrete
- Bentonite Pellets
- Sand Pack NO. 0 Grade
- Sandpack NO.00 Grade
- Cement Grout

Well Construction Details:

Bottom of Well:	15'
Screen Zone:	6'-15'
Silica Sand NO 0:	4'-15'
Screen material:	2" Sch 40 PVC 10 Slot
Casing material:	2" Sch 40 PVC
Bentonite Pellets:	2'-4'
Sand Pack:	NO.0 Grade Silica
Stick Up:	4" x 3'

Geologic Log & Well Construction Details

ENVIROTRAC LTD.

5 Old Dock Road, Yaphank, NY, 11980

Log Of Monitoring Well TPMW-01

Client: NYSDEC		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name:	Address:	Date	DTW	NM
Bianchi Weiss Greenhouses	25 Orchard Road, East Patchogue, NY		NM	
Drilling Company:	Method:			
Associated Environmental	Geoprobe 4" Auger			Measuring Point Elevation
Date Started: 7/1/2016	Date Completed: 7/1/2016			NM
Completion Depth: 10'	ENVIROTRAC Geologist: John Szymanski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (ft.)	SAMPLES Blow per 6 in.	OVM (ppm)	SOIL DESCRIPTION
TPMW-01	0	NM	NM	0.0	0'-10' Med-fine light sand
	5	NM	NM	0.0	
	10	NM	NM	0.0	
	15				

LEGEND:
- Concrete
- Bentonite Pellets
- Sand Pack NO. 0 Grade
- Sandpack NO.00 Grade
- Cement Grout

Well Construction Details:

Bottom of Well:	10'
Screen Zone:	5'-10'
Silica Sand NO 0:	3'-10'
Screen material:	2" Sch 40 PVC 10 Slot
Casing material:	2" Sch 40 PVC
Bentonite Pellets:	1'-3'
Sand Pack:	NO.0 Grade Silica
Stick Up:	4" x 3'

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Appendix E

Post-Remediation Groundwater Summary Letter Report

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EA Engineering, P.C.
EA Science and Technology

6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
Telephone: 315-431-4610
Fax: 315-431-4280
www.eaest.com

29 March 2017

Brian Jankauskas
Remedial Bureau E, Section A
Div. Environmental Remediation
NYSDEC
625 Broadway, 12th Floor, Albany, NY 12233-7017

RE: 2016 Groundwater Sampling Event
EA Project No. 14907.29

Dear Mr. Jankauskas:

EA Engineering, P.C. and its affiliate EA Science and Technology (EA) completed post-remediation groundwater sampling activities in December 2016 at the request of the New York State Department of Environmental Conservation (NYSDEC) at the Bianchi/Weiss Greenhouses site (152209) located in East Patchogue, New York (**Figure 1**).

EA completed a remedial investigation (RI) and feasibility study (FS) at the site, and presented the findings in a RI Report (EA 2011a)[1] and a FS Report (EA 2011b)[2], respectively. A groundwater sampling event was completed in May 2013 to satisfy the objectives outlined in the NYSDEC 2012 Record of Decision (ROD) (2012)[3]. Results from this groundwater sampling event were presented in a Pre-Design Investigation (PDI) Groundwater Sampling Report (EA 2013)[4]. A pre-remedial action groundwater sampling event was completed by the NYSDEC in May 2015 and documented in a memorandum dated 1 September 2015 (NYSDEC 2015)[5]. A total of 28,511 cubic yards (yd^3) of impacted soil was removed from the site during remedial construction activities that concluded in July 2016. The wells selected for sampling during the December 2016 sampling event were based off the detections recorded from the May 2015 sampling event.

EA completed the following tasks during the December 2016 groundwater sampling event:

- Located monitoring wells to be sampled using a global positioning system (GPS) unit, and verified the monitoring wells' coordinates
- Gauged all locatable/functioning monitoring wells and piezometers associated with the site

1 EA. 2011a. Final RI Report, Bianchi/Weiss Greenhouses Site (152209), East Patchogue, Suffolk County, New York. August.
2 EA. 2011b. FS, Bianchi/Weiss Greenhouses Site (152209), East Patchogue, Suffolk County, New York. September.
3 NYSDEC. 2012. ROD, Bianchi/Weiss Greenhouses State Superfund Project, East Patchogue, Suffolk County, Site Number 152209. January.
4 EA. 2013. Pre-Design Investigation Groundwater Sampling Report, Contract/Work Assignment No: D007624-18 Bianchi/Weiss Greenhouses Site, East Patchogue, New York (152209). October.
5 NYSDEC. 2015. Memorandum; Groundwater Monitoring May 2015, Bianchi/Weiss Greenhouses. September 1.

- Collected groundwater samples from three on-site shallow piezometers replaced during the remedial action
- Collected groundwater samples from 16 off-site monitoring wells
- Collected a groundwater sample from one off-site private well
- Collected one surface water sample from Abet's Creek.

Each groundwater sample was analyzed for pesticides by U.S. Environmental Protection Agency (EPA) Method 608. Category A deliverables were requested for samples collected from monitoring wells and surface water. Category B deliverables were requested for the sample collected from a private well.

Monitoring Well Locations

Monitoring well locations were compared against surveyed coordinates using a GPS unit prior to gauging and sampling. The coordinates of the monitoring well cluster MW-33(-D, -I, and –S) were off by approximately 250 ft. The coordinates of the monitoring well WO-34 were off by approximately 100 ft. The wells are located 250 and 100 ft north of the previously surveyed locations. Monitoring well WO-33P was not previously surveyed. The data gathered using the GPS unit is summarized below, with former coordinates shown for comparison.

Summary of Revised Monitoring Well Locations

Monitoring Well ID	Revised X-Coordinate	*Previously Surveyed X-Coordinate*	Revised Y-Coordinate	*Previously Surveyed Y-Coordinate*
MW-33D	1267819.7	*1267781.7668*	216029.2	*215784.3593*
MW-33I	1267819.9	*1267779.5951*	216037.6	*215775.9363*
MW-33S	1267819.9	*1267777.4677*	216026.1	*215768.0909*
WO-33P	1267819.7	Not surveyed	216027.4	Not surveyed
WO-34	1267821.8	*1267872.65*	216043.4	*216134.5947*

Monitoring Well Gauging

Prior to the start of the groundwater sampling event, a complete round of static water level measurements were taken from each monitoring well location to prepare a groundwater contour map and evaluate groundwater flow patterns. Groundwater elevations are summarized in the following table:

Summary of Groundwater Elevations December 2016			
Monitoring Well ID	Depth to Water (ft btoc)	Well Casing Elevation (ft AMSL)	Groundwater Elevation (ft AMSL)
TPMW-01	8.73	14.59	5.86
PDI-PZ-01	9.48	15.67	6.19
PDI-PZ-02	9.32	16.00	6.68
MW-33D	2.66	2.64	-0.02
MW-33I	2.92	2.86	-0.06
MW-33S	2.73	2.72	-0.01
MW-41	12.56	20.46	7.90
MW-42	9.45	12.43	2.98
WO-07	6.21	11.66	5.45
WO-08	6.41	11.88	5.47
WO-09	5.65	11.27	5.62
WO-10	5.33	10.72	5.39
WO-11	5.55	10.90	5.35
WO-15	5.79	11.01	5.22
WO-16	4.81	9.98	5.17
WO-17	3.82	8.97	5.15
WO-18	3.41	8.49	5.08
WO-19	4.04	8.93	4.89
WO-21	9.32	14.94	5.62
WO-25	11.23	10.08	-1.15
WO-26	7.53	11.07	3.54
WO-27	7.90	10.86	2.96
WO-28	13.21	15.71	2.50
WO-30	9.62	11.52	1.90
WO-31	6.41	8.28	1.87
WO-34	2.77	0.43	-2.34
WO-36	6.82	9.92	3.10

NOTE: ID = Identification
ft = feet
btoc = Below top of casing
AMSL = Above mean sea level
NS = Not Surveyed
--- = No groundwater elevation data

A figure showing interpreted groundwater elevation contours is provided as **Figure 2**. Groundwater flows in a southwesterly direction toward Abet's Creek and Patchogue Bay.

Monitoring Well Sampling

During sampling, purge water was contained in a 5 gal bucket and then transferred into 55 gal drums located on-site for filtration prior to discharge. Groundwater sampling was conducted through the steps detailed below:

- Personal protective equipment was worn as specified in the Generic HASP (EA 2011c)[6].
- Monitoring locations were unlocked and the caps were removed.
- Static water levels were measured at each location using a water interface probe. The interface probe was washed with Alconox detergent and water, then rinsed with deionized water between locations to prevent cross-contamination.
- Low-flow purging techniques were used to purge the wells. Dedicated polyethylene tubing was used at each monitoring well location.
- Prior to sampling, wells were purged until the following conditions were met:
    - Three consecutive pH readings are ± 0.1 pH units of each other
    - Three consecutive dissolved oxygen readings are ± 10 percent of each other
    - Three consecutive Redox readings are ± 0.10 units of each other
    - Three consecutive measured specific conductance is ± 3 percent of each other
    - Turbidity is < 50 nephelometric turbidity units for three consecutive readings
    - Purge rate between 200 and 500 ml/min with a draw down less than 0.3 ft.
- Field measurements of pH, dissolved oxygen, temperature, and specific conductivity were recorded on the monitoring well gauging, purging, and sampling forms. The field instruments were decontaminated between wells to prevent cross-contamination.
- Once groundwater quality field parameters had stabilized under low-flow pumping conditions, sampling was performed.
- Sample bottles were obtained from the laboratory prior to field mobilization.
- Analytical samples were placed in coolers and chilled to 4ºC.
- The monitoring wells were capped and re-locked.
- Sample log sheets, labels, and chain-of-custody forms were completed after sampling at each monitoring well location.

Groundwater samples were collected from 16 off-site monitoring wells and three on-site monitoring wells. Groundwater was also collected from an off-site residential private monitoring well. One surface water sample (SW-01) was collected from Abet's Creek, from next to stream gauge SG-03 (**Figure 2**).

[6] EA. 2011c. Generic Health and Safety Plan for NYSDEC Standby Contract D007624. April.

Groundwater and surface water samples were placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis for pesticides by EPA Method 608. Field forms are provided in **Attachment A**.

Quality Assurance / Quality Control

All samples were labeled, handled, and packaged following the procedures described in the Generic Quality Assurance Project Plan (QAPP) (EA 2011d)[7]. Quality Assurance / quality control samples were collected at the frequency detailed in the letter work plan (EA 2016)[8]. Two duplicates, one matrix spike, and one matrix spike duplicate sample were collected and analyzed. Analytical data for the private well sample were sent to a third party validator, Environmental Data Services, Inc. (EDS), and data usability summary reports (DUSRs) were prepared for each analytical package. The DUSRs are provided in **Attachment B**.

Groundwater Sampling Results

Of the 19 groundwater samples collected, 16 samples contained chlordane at a concentration exceeding the NYSDEC Ambient Water Quality Standard (AWQS) for Class GA waters (0.05 µg/L). The highest detected concentration of chlordane was observed in monitoring well MW-33S at 9.2 µg/L located downgradient from the site, near Abet's Creek.

Chlordane was detected in the private well PW-01 at a concentration of 0.3206 µg/L. PW-01 was collected from a tap source located at a nearby nursery/flower market. A water sample was collected from PW-1A during the May 2015 sampling event. The well was turned off for the winter season and a water sample was not able to be collected during this sampling event. Both of these private wells are located along the western edge of the chlordane plume boundary. The chlordane detection in PW-01 did not exceed the New York State Department of Health (NYSDOH) drinking water standard of 2 µg/L, but did exceed the NYSDEC AWQS of 0.05 µg/L.

Chlordane was not detected in the surface water sample collected from location SW-01.

Analytical results from the December 2016 groundwater sampling event are summarized in **Table 1** and on **Figure 3**. Groundwater trends are provided in **Table 2**. Laboratory analytical results for total chlordane from the groundwater sampling event are provided in **Attachment C**.

CONCLUSIONS

Groundwater analytical results from this sampling event indicate that concentrations of chlordane within the plume are generally stable when compared to previous groundwater sampling results. On-site groundwater contains elevated concentrations of chlordane, though two of the three samples contained lower concentrations in 2016 than 2015.

[7] EA. 2011d. Generic Quality Assurance Project Plan For NYSDEC Standby Contract D007624. April.
[8] EA. 2016. Letter Work Plan. 2016 Groundwater Sampling Event. November.

The concentration of chlordane detected in MW-33S during the December 2016 sampling event was the highest detected during that event and higher than the concentration detected during the May 2015 sampling event. In contrast, the deeper wells within the same cluster, MW-33D, MW-33I, and WO-33P contained lower concentrations of chlordane than MW-33S, which were consistent with concentrations detected up-gradient from these wells. The increased concentration in MW-33S is likely the result of contamination from a separate source.

Surface water results were also consistent with previous results and indicate that site related contaminants are not migrating from groundwater to surface water within Abet's Creeks.

If you have any questions regarding the results of this groundwater sampling report, please do not hesitate to contact me at (315) 431-4610.

Sincerely yours,

EA SCIENCE AND TECHNOLOGY

Megan Miller
Project Manager

EA ENGINEERING, P.C.

Donald F. Conan, P.E.
Vice President

Attachments

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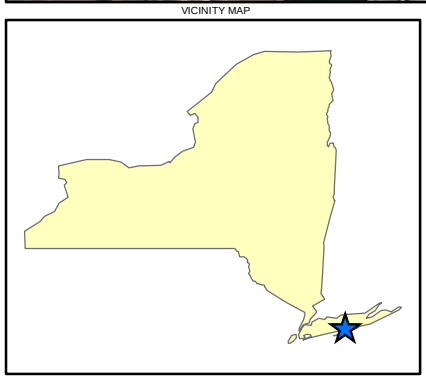
VICINITY MAP



Legend

- Groundwater Monitoring Well
- Potable Well
- PDI Piezometer
- Surface Water Location
- Fenceline
- Property Boundaries

0 250 500
Feet

N

Figure 1
2016 Groundwater Sampling Locations
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 3/23/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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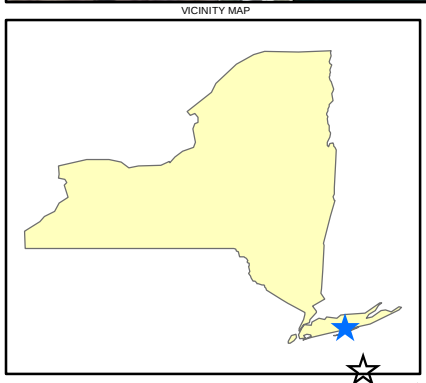
VICINITY MAP



Legend

- Groundwater Monitoring Well
- PDI Piezometer
- Groundwater Contour (1 ft. interval)
- Inferred Groundwater Contour
- Groundwater Flow Direction
- Fenceline
- Property Boundaries

0 250 500
Feet

N

Note: Contours are reported in ft AMSL (feet Above Mean Sea Level)

Figure 2
Groundwater Flow
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 3/23/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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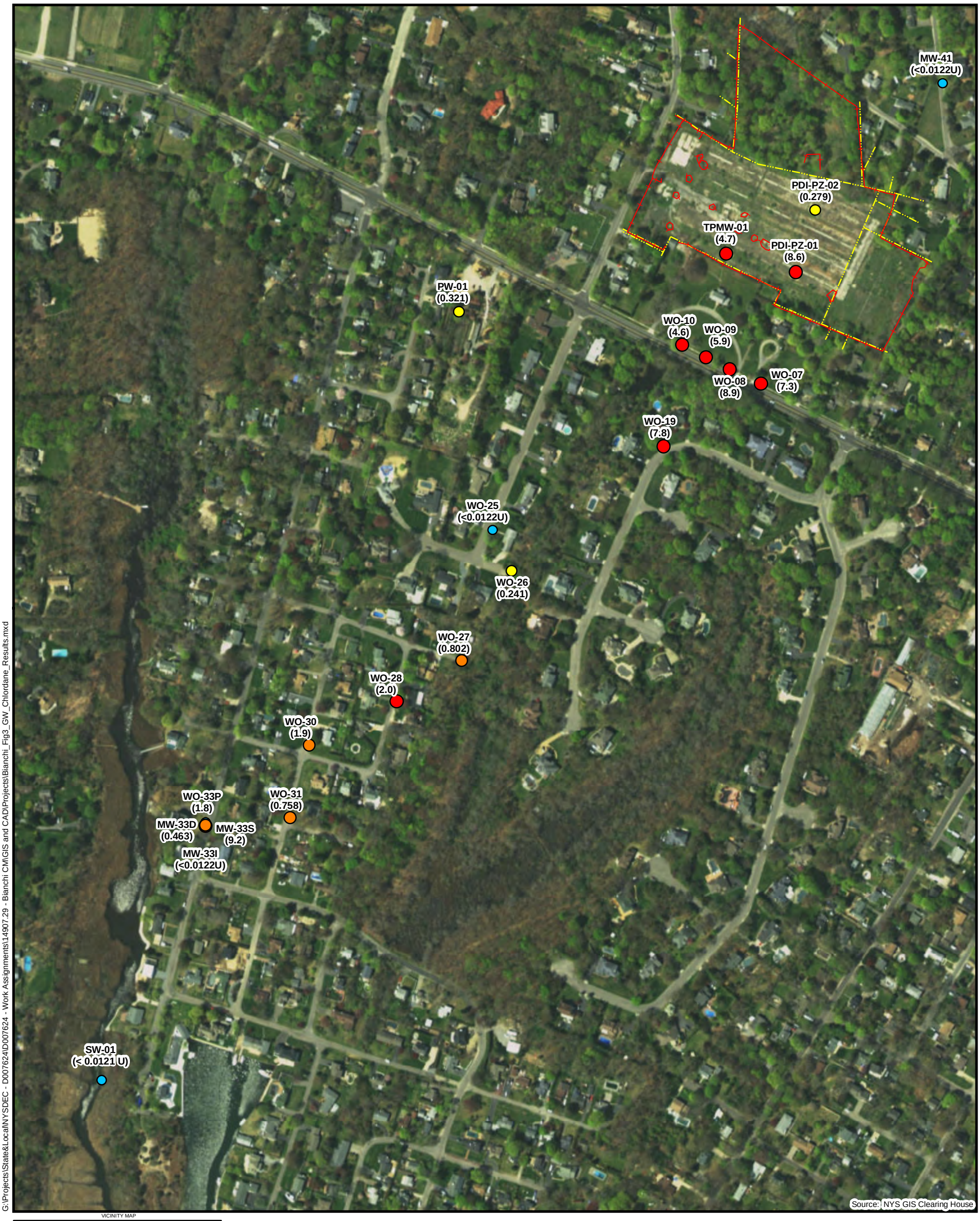

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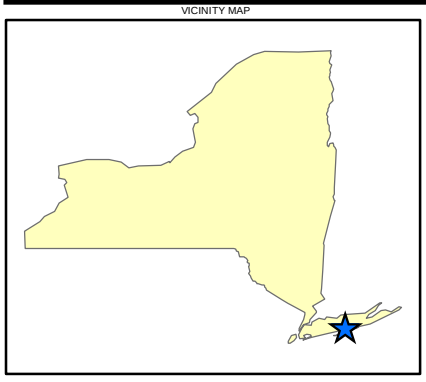

0 250 500
Feet

N

Legend

Chlordane (total) Concentration Range (ug/L)

- = Non-detect
- = > 0.05 (ug/L)
- = > 0.5 (ug/L)
- = > 2 (ug/L)
- Fenceline
- Property Boundaries

Note: NYSDEC AWQS - Chlordane = 0.05 ug/L

Figure 3
Groundwater Analytical Results Chlordane (total)
Bianchi Weiss Greenhouses (152209)
East Patchogue, New York

Map Date: 3/23/2017
Source: ESRI, 2011
Projection: NAD 1983 State Plane NY Long Island

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Table 1 Groundwater Analytical Data December 2016

Parameter List USEPA Method 608	Sample ID	TPMW-01		PDI-PZ-01		PDI-PZ-02		WO-07		WO-08		WO-09		WO-10		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	H5959-03		H5959-04		H5959-02		H5959-05		H5959-06		H5959-07		H5959-08		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	12/6/2016		12/6/2016		12/6/2016		12/6/2016		12/6/2016		12/6/2016		12/6/2016		
Chlordane	µg/L	**4.7**	**D**	**8.6**	**D**	**0.2794**		**7.3**	**D**	**8.9**	**D**	**5.9**	**D**	**4.6**	**D**	*0.05 (s)*

Parameter List USEPA Method 608	Sample ID	WO-19		WO-25		WO-26		WO-27		WO-28		WO-30		WO-31		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	H5959-13		H5959-15		H5959-24		H5959-14		H5959-18		H5959-16		H5959-17		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	12/7/2016		12/7/2016		12/7/2016		12/7/2016		12/7/2016		12/7/2016		12/7/2016		
Chlordane	µg/L	**7.8**	**D**	(<0.0122)	U	**0.241**		**0.8018**		**2.0**	**D**	**1.9**	**D**	**0.7584**	**P**	*0.05 (s)*

Parameter List USEPA Method 608	Sample ID	WO-33P		MW-33S		MW-33I		MW-33D		MW-41		PW-01		SW-01		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	H5959-12		H5959-11		H5959-09		H5959-10		H5959-01		H5958-01		H5959-25		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	12/6/2016		12/6/2016		12/6/2016		12/6/2016		12/6/2016		12/5/2016		12/5/2016		
Chlordane	µg/L	**1.8**	**D**	**9.2**	**D**	(<0.0122)	U	**0.4628**		(<0.0122)	U	**0.3206**		(<0.0121)	**U**	*0.05 (s)*

Parameter List USEPA Method 608	Sample ID	FD-01-20161206		FD-02-20161206		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	H5959-19		H5959-20		
	Sample Type	Groundwater		Groundwater		
	Sample Date	12/6/2016		12/6/2016		
Chlordane	µg/L	**5.3**	**D**	**7.1**	**D**	*0.05 (s)*

NOTE:
USEPA = U.S. Environmental Protection Agency
ID = Identification
NYSDEC = New York State Department of Enviornmental Conservation
µg/L = micrograms per liter
P = >25% difference detected between concentrations in pesticides.
D = Sample was diluted.
U = Non-detect, detection below the method detection limit.
J = The associated numerical value is an estimated quantity
(s) = Standard
December 2016 data provided by Chemtech Consulting Group, Inc. Data validation completed by Environmental Data Services, Inc.
Concentration values in **bold** indicate the concentration was above the respective standard, criteria, and guidance.
FD-01-20161206 was collected from WO-10 on 12/6/2016. FD-02-20161206 was collected from TPMW-01 on 12/6/2016.

Table 2 Groundwater Trends

Well Identification	Concentration of Chlordane - May 2015	Concentration of Chlordane - December 2016
MW-33D	**0.28**	**0.46**
MW-33I	**0.086**	U
MW-33S	**3.9**	**9.2 D**
MW-41	**0.1**	U
WO-07	**5.2**	**7.3 D**
WO-08	**6.6**	**8.9 D**
WO-09	**4.9**	**5.9 D**
WO-10	**3.5**	**4.6 D**
WO-17	U	
WO-19	**4.7**	**7.8 D**
WO-25	U	U
WO-26	**0.16**	**0.24**
WO-27	**0.98**	**0.80**
WO-28	**0.86**	**2.0 D**
WO-30	**1.50**	**1.9 D**
WO-31	**0.81**	**0.7584 P**
WO-33P	**0.9**	**1.8 D**
PDI-PZ-01	**12.0**	**8.6 D**
PDI-PZ-02	**2.7**	**0.28**
TPMW01	**2.9**	**4.7 D**
PW-1	**0.390**	**0.32**
PW-1A	0.045 J	
SW	0.034	
SW-01		U
DUP1	**0.098**	
DUP2	**0.32**	
FD-01-20161206		**5.3 D**
FD-02-20161206		**7.1 D**
FB-01	U	
FB-02	U	
FB-03	U	

Note:
J = The associated numerical value is an estimated quantity.
DJ = The associated numerical value is an estimated quantity from a dilution run.
U = Non-detect, detection below the method detection limit.
P = >25% difference detected between concentrations in pesticides.
Bold data represents data above the NYSDEC GA Groundwater standard for Chlordane of 0.05 ug/L.
Highlighted data is concentrations of Chlordane exceding the NYSDOH drinking water standard of 2 ug/L.
May 2015 data provided by Test America Laboratories, Inc.
December 2016 data provided by Chemtech Consulting Group, Inc. Data validation completed by Environmental Data Services, Inc.
DUP1 is a duplicate collected from MW-33I and DUP2 is a duplicate collected from PW-1.
FD-01-20161206 is a duplicate collected from WO-10. FD-02-20161206 is a duplicate collected from TPMW-01.
FB = Field Blank
PW = Private Well
SW = Surface Water

Attachment A

Field Forms

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EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: SW-SG-03	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: End of Roosevelt Ave	**Well Condition:** Surface Water	**Weather:** Cleaar, Calm 45°F
Sounding Method: NA	**Gauge Date:** NA	**Measurement Ref:** NA
	Gauge Time: NA	
Stick Up/Down (ft): NA	**PID Headspace Reading:** NA	**Well Diameter (in):** NA

Purge Date: 5-Dec-16	**Purge Time:** NA
Purge Method: NA	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): NA	**D. Well Volume (ft):** NA	**Depth/Height of Top of PVC:** NA
B. Depth to Water (ft): NA	**E. Well Volume (gal) C*D):** NA	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): NA	**F. Three Well Volumes (gal) (E3):** NA	**Pump Intake Depth:** NA

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1533	6.70	25.2	0	6.27	9.42	-112	NA	NA	NA

Total Quantity of Water Removed (gal):	0.25	**Sampling Time:**	1531
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	12/5/2016	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Surface Water sample

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: PW-01	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Basement of Residence	**Well Condition:** Good	**Weather:** Clear 50°, Calm
Sounding Method: NA	**Gauge Date:** NA	**Measurement Ref:** NA
	Gauge Time: NA	
Stick Up/Down (ft): NA	**PID Headspace Reading:** NA	**Well Diameter (in):** NA

Purge Date: 5-Dec-16	**Purge Time:** 1445-1455
Purge Method: spigot ran for ten minutes prior to sample collection	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): NA	**D. Well Volume (ft):** NA	**Depth/Height of Top of PVC:** NA
B. Depth to Water (ft): NA	**E. Well Volume (gal) C*D):** NA	**Pump Type:** Faucet
C. Liquid Depth (ft) (A-B): NA	**F. Three Well Volumes (gal) (E3):** NA	**Pump Intake Depth:** NA

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (Gallons)
1455	5.13	0.399	34.4	2	50.62	27	NA	NA	10

Total Quantity of Water Removed (gal):	10	**Sampling Time:**	1455
Samplers:	KT/SS/JM	**Split Sample With:**	ms/msd
Sampling Date:	12/5/2016	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: MS/MSD taken here

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EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: PDI-PZ-01	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Southern border of site	**Well Condition:** Good/New	**Weather:** Clear 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 7:20:00	
Stick Up/Down (ft): + 3	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1106
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 17.47	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.3
B. Depth to Water (ft): 9.47	**E. Well Volume (gal) C*D):** 1.304	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 8	**F. Three Well Volumes (gal) (E3):** 3.912	**Pump Intake Depth:** 12.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1107	5.43	0.241	234	5.47	13.02	180	9.5	0.20	--
1110	5.66	0.228	92.2	5.74	13.01	173	9.5	0.20	0.60
1113	5.69	0.233	70.9	5.69	13.09	175	9.5	0.20	1.20
1116	5.69	0.236	49.6	5.54	13.00	179	9.5	0.20	1.80
1119	5.63	0.238	40.5	5.43	13.01	182	9.5	0.20	2.40
1122	5.67	0.239	32.1	5.39	13.05	184	9.5	0.20	3.00
1124	5.69	0.239	24.1	5.43	13.09	185	9.5	0.20	3.60
1127	5.66	0.241	20.2	5.31	13.16	186	9.5	0.20	4.20
1130	5.66	0.239	19.1	5.35	13.14	187	9.5	0.20	4.80

Total Quantity of Water Removed (gal):	1.2680256	**Sampling Time:**	1130
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear and odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: PDI-PZ-02	**EA Personnel:** KT/SS	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Middle of Site	**Well Condition:** Good/New	**Weather:** Clear 38°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 7:15:00	**Measurement Ref:** TOC
Stick Up/Down (ft): + 3	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1012
Purge Method: Low Flow	**Field Technician:** KT/SS

Well Volume

A. Well Depth (ft): 17.5	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 9.4	**E. Well Volume (gal) C*D):** 1.3203	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 8.1	**F. Three Well Volumes (gal) (E3):** 3.9609	**Pump Intake Depth:** 17

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1013	6.07	0.338	748	4.61	11.38	195	9.35	0.25	--
1016	5.40	0.297	385	4.39	12.23	211	9.35	0.25	0.75
1019	5.32	0.279	162	4.71	12.39	211	9.35	0.25	1.5
1022	5.42	0.277	98.3	4.81	12.51	203	9.35	0.25	2.25
1025	5.24	0.283	68.3	4.51	12.70	209	9.35	0.25	3
1028	5.46	0.282	50..4	4.48	12.79	197	9.35	0.25	3.75
1031	5.52	0.28	38.5	4.48	12.87	194	9.35	0.25	4.5
1034	5.57	0.286	32.7	4.45	12.96	193	9.35	0.25	5.25

Total Quantity of Water Removed (gal):	1.386903	**Sampling Time:**	1034
Samplers:	KT/SS	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Cleared during purging; odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: TPMW-01	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Southern border of site	**Well Condition:** Good/New	**Weather:** Clear 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 7:22:00	**Measurement Ref:** TOC
Stick Up/Down (ft): + 3	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1033
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 12.51	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.3
B. Depth to Water (ft): 8.53	**E. Well Volume (gal) C*D):** 0.64874	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 3.98	**F. Three Well Volumes (gal) (E3):** 1.94622	**Pump Intake Depth:** 12.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1047	5.85	0.305	>1000	1.75	11.81	105	8.53	0.20	--
1050	5.53	0.296	672	1.78	12.27	141	8.54	0.20	0.60
1053	5.47	0.297	204	1.62	12.41	151	8.54	0.20	1.20
1056	5.44	0.288	123	1.48	12.49	155	8.54	0.20	1.80
1059	5.42	0.280	54.7	1.35	12.60	159	8.54	0.20	2.40
1102	5.41	0.276	31.7	1.29	12.59	161	8.54	0.20	3.00
1105	5.4	0.272	18.5	1.22	12.65	163	8.54	0.20	3.60
1108	5.4	0.269	13.8	1.27	12.67	164	8.54	0.20	4.20

Total Quantity of Water Removed (gal):	1.1095224	**Sampling Time:**	1108
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Duplicate FD-02 taken here

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: MW-33S	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: End of Roosevelt Blvd.	**Well Condition:** Good	**Weather:** Overcast 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/5/2016	**Measurement Ref:** TOC
	Gauge Time: 16:05:00	
Stick Up/Down (ft): -3"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1449
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 10	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 2.9	**E. Well Volume (gal) C*D):** 1.1573	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 7.1	**F. Three Well Volumes (gal) (E3):** 3.4719	**Pump Intake Depth:** 9.5

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1450	5.45	0.220	14.2	1.01	11.87	144	2.78	0.20	--
1453	5.19	0.224	9.8	0.57	11.83	158	2.78	0.20	0.60
1456	5.17	0.230	4.6	0.48	11.77	168	2.78	0.20	1.20
1459	5.14	0.232	3.7	0.42	11.68	177	2.78	0.20	1.80
1502	5.13	0.233	3.5	0.39	11.63	182	2.78	0.20	2.40
1505	5.13	0.232	3.9	0.39	11.61	186	2.78	0.20	3.00

Total Quantity of Water Removed (gal):	0.792516	**Sampling Time:**	1505
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: MW-33I	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Roosevelt Blvd.	**Well Condition:** No Bolts	**Weather:** Cloudy 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/5/2016	**Measurement Ref:** TOC
	Gauge Time: 16:00:00	
Stick Up/Down (ft): -2"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1416
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 24.3	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 3.08	**E. Well Volume (gal) C*D):** 3.45886	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 21.22	**F. Three Well Volumes (gal) (E3):** 10.37658	**Pump Intake Depth:** 24.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1417	5.65	0.248	4.7	1.81	11.97	174	3.08	0.20	--
1420	5.17	0.253	0	0.88	12.10	189	3.08	0.20	0.60
1423	5.05	0.256	0	0.62	12.24	200	3.08	0.20	1.20
1426	5.01	0.256	0	0.55	12.30	206	3.08	0.20	1.80
1429	5.00	0.258	0	0.50	12.33	210	3.08	0.20	2.40
1432	4.99	0.260	0	0.47	12.36	214	3.08	0.20	3.00
1435	4.99	0.260	0	0.46	12.38	216	3.08	0.20	3.60

Total Quantity of Water Removed (gal):	0.9510192	**Sampling Time:**	1435
Samplers:	KT/SS/JM	**Split Sample With:**	
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

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GROUNDWATER SAMPLING PURGE FORM

Well I.D.: MW-33D	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: End of Roosevelt Blvd.	**Well Condition:** Good	**Weather:** Cloudy 45°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/5/2016	**Measurement Ref:** TOC
	Gauge Time: 16:07:00	
Stick Up/Down (ft): -2"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1429
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 56.48	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 2.78	**E. Well Volume (gal) C*D):** 8.7531	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 53.7	**F. Three Well Volumes (gal) (E3):** 26.2593	**Pump Intake Depth:** 56.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1430	5.78	0.350	0	3.21	12.9	144	2.78	0.20	--
1433	5.73	0.350	0	4.94	12.9	158	2.78	0.20	0.60
1436	5.72	0.350	0	4.70	12.87	168	2.78	0.20	1.20
1439	5.71	0.350	0	4.45	12.92	177	2.78	0.20	1.80
1442	5.71	0.350	0	4.27	12.93	182	2.78	0.20	2.40
1445	5.71	0.350	0	4.11	12.85	186	2.78	0.20	3.00
1448	5.7	0.350	0	3.98	12.77	191	2.78	0.20	3.60

Total Quantity of Water Removed (gal):	0.9510192	**Sampling Time:**	1448
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

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GROUNDWATER SAMPLING PURGE FORM

Well I.D.: MW-41	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Hedges Ave; Side of Rd	**Well Condition:** No bolts, needs new j plug	**Weather:** Clear 35°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 9:38:00	
Stick Up/Down (ft): flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 947
Purge Method: Low Flow	**Field Technician:** KT/SS

Well Volume

A. Well Depth (ft): 34.62	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 12.56	**E. Well Volume (gal) C*D):** 3.59578	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 22.06	**F. Three Well Volumes (gal) (E3):** 10.78734	**Pump Intake Depth:** 12'

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
949	5.74	0.692	92.9	1.05	12.49	71	12.54	0.20	--
952	4.87	0.638	53.4	0.71	12.68	115	12.52	0.20	0.6
955	4.76	0.612	34.2	0.57	12.85	135	12.52	0.20	1.2
958	4.72	0.599	21.7	0.48	12.99	152	12.52	0.20	1.8
1001	4.71	0.595	7.7	0.43	13.07	163	12.52	0.20	2.4
1004	4.69	0.588	3.8	0.40	13.07	175	12.52	0.20	3
1007	4.68	0.585	2.3	0.37	13.14	184	12.52	0.20	3.6
1010	4.68	0.585	1.8	0.37	13.17	189	12.52	0.20	4.2

Total Quantity of Water Removed (gal):	1.1095224	**Sampling Time:**	1010
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	12/6/2016	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS:

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GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-07	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: S. Country Rd	**Well Condition:** Good	**Weather:** Cloudy 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 8:10:00	**Measurement Ref:** TOC
Stick Up/Down (ft): -4"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1155
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 20.05	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 6.16	**E. Well Volume (gal) C*D):** 2.26407	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 13.89	**F. Three Well Volumes (gal) (E3):** 6.79221	**Pump Intake Depth:** 19.5

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1156	6.04	0.189	15.9	6.83	12.82	126	6.16	0.20	--
1159	5.61	0.172	9.1	2.43	13.16	146	6.17	0.20	0.60
1202	5.39	0.167	2.4	2.17	13.50	158	6.17	0.20	1.20
1205	5.31	0.165	0	2.11	13.56	164	6.17	0.20	1.80
1208	5.26	0.168	0	2.07	13.60	168	6.17	0.20	2.40
1211	5.23	0.170	0	2.04	13.59	171	6.17	0.20	3.00
1214	5.21	0.172	0	2.03	13.61	173	6.17	0.20	3.60

Total Quantity of Water Removed (gal):	0.9510192	**Sampling Time:**	1214
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: PVC is broken at top

EA Engineering, P.C.
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GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-08	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: S. Country Rd	**Well Condition:** Good	**Weather:** Cloudy 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 8:10:00	**Measurement Ref:** TOC
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1158
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 20.32	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 6.4	**E. Well Volume (gal) C*D):** 2.26896	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 13.92	**F. Three Well Volumes (gal) (E3):** 6.80688	**Pump Intake Depth:** 20.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1159	5.84	0.140	309	5.63	13.69	19	6.45	0.20	--
1202	6.02	0.138	246	5.23	13.82	11	6.45	0.20	0.60
1205	6.07	0.128	126	5.16	13.92	26	6.45	0.20	1.20
1208	6.02	0.126	73.3	5.13	13.93	42	6.45	0.20	1.80
1211	5.99	0.126	47.5	5.09	13.94	54	6.45	0.20	2.40
1214	5.95	0.130	29.4	5.00	13.96	66	6.45	0.20	3.00
1217	5.93	0.129	27.8	5.04	13.96	71	6.45	0.20	3.60
1220	5.90	0.135	16.7	4.92	14.00	82	6.45	0.20	4.20
1223	5.89	0.133	17.2	5.02	14.02	85	6.45	0.20	4.80
1226	5.87	0.132	11.5	4.92	14.05	91	6.45	0.20	5.40

Total Quantity of Water Removed (gal):	1.4265288	**Sampling Time:**	1226
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Initially turbid; cleard up, odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-09	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: S. Country Rd	**Well Condition:** Good	**Weather:** Cloudy 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 13:15:00	
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1334
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 20.28	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 5.64	**E. Well Volume (gal) C*D):** 2.38632	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 14.64	**F. Three Well Volumes (gal) (E3):** 7.15896	**Pump Intake Depth:** 20.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1335	5.84	0.177	2.4	5.72	12.36	148	5.64	0.20	--
1338	6.09	0.173	0.8	5.55	12..85	124	5.64	0.20	0.60
1341	6.12	0.171	0	5.53	13.05	107	5.64	0.20	1.20
1344	6.11	0.171	0	5.41	13.17	95	5.64	0.20	1.80
1347	6.12	0.171	0	5.36	13.24	87	5.64	0.20	2.40
1350	6.10	0.171	0	5.37	12.27	81	5.64	0.20	3.00

Total Quantity of Water Removed (gal):	0.792516	**Sampling Time:**	1350
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear, odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-10	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: S. Country Rd	**Well Condition:** No Bolts	**Weather:** Cloudy 40°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 13:15:00	
Stick Up/Down (ft): -6"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 6-Dec-16	**Purge Time:** 1330
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 20.33	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 5.35	**E. Well Volume (gal) C*D):** 2.44174	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 14.98	**F. Three Well Volumes (gal) (E3):** 7.32522	**Pump Intake Depth:** 20.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1331	6.03	0.156	43.5	3.14	13.40	139	5.35	0.20	--
1334	5.74	0.154	25.3	2.42	13.73	154	5.35	0.20	0.60
1337	5.52	0.154	11.3	2.20	13.86	166	5.35	0.20	1.20
1340	5.41	0.154	7.5	2.13	13.98	173	5.35	0.20	1.80
1343	5.35	0.155	3.9	2.07	13.94	177	5.35	0.20	2.40
1346	5.33	0.155	2.1	2.03	14.02	179	5.35	0.20	3.00
1349	5.30	0.155	1.4	1.99	14.05	180	5.35	0.20	3.60

Total Quantity of Water Removed (gal):	0.9510192	**Sampling Time:**	1349
Samplers:	KT/SS/JM	**Split Sample With:**	FD-01
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Collected FD-01 here

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EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-19	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Moss Creek Lane	**Well Condition:** No bolts	**Weather:** Overcast/Rain 45°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 8:00:00	
Stick Up/Down (ft): -1"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 7-Dec-16	**Purge Time:** 710
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 19.81	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 3.82	**E. Well Volume (gal) C*D):** 2.60637	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 15.99	**F. Three Well Volumes (gal) (E3):** 7.81911	**Pump Intake Depth:** 19.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
725	6.47	0.470	908	3.12	13.20	-22	4.00	0.20	--
728	6.12	0.485	383	1.45	13.16	-22	4.00	0.20	0.60
731	5.99	0.393	149	1.64	13.11	-2	4.00	0.20	1.20
734	5.98	0.347	135	1.75	13.10	5	4.00	0.20	1.80
737	5.99	0.332	50.2	1.79	13.08	16	4.00	0.20	2.40
740	5.97	0.328	22.6	1.79	13.03	29	4.00	0.20	3.00
743	5.96	0.328	29.6	1.77	12.94	40	4.00	0.20	3.60
746	5.95	0.329	45.9	1.79	12.82	35	4.00	0.20	4.20
749	5.94	0.334	75.5	1.73	12.82	20	4.00	0.20	4.80
752	5.94	0.335	38.7	1.76	12.81	23	4.00	0.20	5.40
755	5.93	0.333	12.2	1.92	12.80	37	4.00	0.20	6.00
758	5.93	0.334	12.9	1.79	12.75	42	4.00	0.20	6.60
801	5.93	0.334	8.2	1.75	12.66	41	4.00	0.20	7.20

Total Quantity of Water Removed (gal):	1.9020384	**Sampling Time:**	801
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Cleared during purging; odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-25	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location:	**Well Condition:** Good	**Weather:** Overcast 35°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 9:10:00	
Stick Up/Down (ft): -1"	**PID Headspace Reading:** NA	**Well Diameter (in):** 1

Purge Date: 7-Dec-16	**Purge Time:** 833
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 18.8	**D. Well Volume (ft):** 0.041	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 11.23	**E. Well Volume (gal) C*D):** 0.31037	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 7.57	**F. Three Well Volumes (gal) (E3):** 0.93111	**Pump Intake Depth:** 18.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
834	6.28	1.230	>1000	5.15	13.08	-22	NA	0.20	--
837	6.02	0.427	230	3.21	13.31	41	NA	0.20	0.60
840	5.92	0.343	89.6	3.24	13.42	60	NA	0.20	1.20
843	5.75	0.273	33.5	3.19	13.55	88	NA	0.20	1.80
846	5.64	0.245	21.1	3.18	13.66	108	NA	0.20	2.40
849	5.58	0.235	8.9	3.14	13.74	122	NA	0.20	3.00
852	5.54	0.231	9.9	3.12	13.66	135	NA	0.20	3.60
855	5.52	0.229	7.6	3.11	13.74	143	NA	0.20	4.20
858	5.52	0.228	1.0	3.09	13.80	148	NA	0.20	4.80
901	5.51	0.228	0.0	3.07	13.82	153	NA	0.20	5.40

Total Quantity of Water Removed (gal):	1.4265288	**Sampling Time:**	901
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless
1" Well, could not fit water level for readings

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-26	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Corner of Wilson St	**Well Condition:** Good	**Weather:** Overcast 45°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 10:15:00	**Measurement Ref:** TOC
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 1

Purge Date: 7-Dec-16	**Purge Time:** 1020
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 39.97	**D. Well Volume (ft):** 0.041	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 7.53	**E. Well Volume (gal) C*D):** 1.33004	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 32.44	**F. Three Well Volumes (gal) (E3):** 3.99012	**Pump Intake Depth:** 39.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1023	5.20	0.328	>1000	0.98	11.42	65	7.53	0.20	--
1026	5.1	0.317	>1000	0.57	11.79	77	7.53	0.20	0.60
1029	5.08	0.311	>1000	0.49	11.73	86	7.53	0.20	1.20
1032	5.09	0.319	>1000	0.36	11.77	72	7.53	0.20	1.80
1038	5.22	0.32	287.0	0.47	11.86	92	7.53	0.20	2.40
1041	5.07	0.32	113.0	0.36	11.91	105	7.53	0.20	3.00
1044	5.06	0.319	33.1	0.31	11.97	125	7.53	0.20	3.60
1047	5.08	0.319	17.4	0.29	11.99	132	7.53	0.20	4.20
1050	5.1	0.319	14.1	0.27	12.03	138	7.53	0.20	4.80
1053	5.11	0.318	8.6	0.27	12.04	140	7.53	0.20	5.40

Total Quantity of Water Removed (gal):	1.4265288	**Sampling Time:**	1053
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Drained Horiba at 1033 to clear it of turbid water

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-27	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location:	**Well Condition:** Good	**Weather:** Overcast 41°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/7/2016	**Measurement Ref:** TOC
	Gauge Time: 8:30:00	
Stick Up/Down (ft): -1"	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 7-Dec-16	**Purge Time:** 833
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 40.61	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 7.87	**E. Well Volume (gal) C*D):** 5.33662	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 32.74	**F. Three Well Volumes (gal) (E3):** 16.00986	**Pump Intake Depth:** 40.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
835	5.66	0.375	12.3	2.81	11.47	97	7.87	0.20	--
838	5.64	0.377	7.5	2.40	11.74	108	7.87	0.20	0.60
841	5.63	0.38	1.5	2.18	11.84	122	7.87	0.20	1.20
844	5.62	0.386	0	2.04	11.90	134	7.87	0.20	1.80
847	5.6	0.388	0	1.93	11.96	140	7.87	0.20	2.40
850	5.61	0.386	0	1.82	11.96	144	7.87	0.20	3.00
853	5.61	0.389	0	1.70	12.00	149	7.87	0.20	3.60

Total Quantity of Water Removed (gal):	0.9510192	**Sampling Time:**	853
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-28	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Side of the road by a bank	**Well Condition:** Good	**Weather:** Overcast 42°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/5/2016	**Measurement Ref:** TOC
	Gauge Time: 16:33:00	
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 1

Purge Date: 7-Dec-16	**Purge Time:** 1045
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 39.25	**D. Well Volume (ft):** 0.041	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 13.16	**E. Well Volume (gal) C*D):** 1.06969	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 26.09	**F. Three Well Volumes (gal) (E3):** 3.20907	**Pump Intake Depth:** 39.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1048	5.59	0.238	170	1.47	11.57	170	13.16	0.20	--
1051	5.56	0.24	136	1.26	11.79	190	--	0.20	0.60
1054	5.56	0.24	124	1.16	11.86	201	--	0.20	1.20
1057	5.56	0.24	113	1.12	11.89	204	--	0.20	1.80
1100	5.56	0.24	107.0	1.08	11.93	209	--	0.20	2.40
1103	5.56	0.24	101.0	1.05	11.94	214	--	0.20	3.00
1106							--	0.20	3.60
1107	5.52	0.247	361.0	1.35	11.80	209	--	0.20	4.20
1110	5.55	0.241	211.0	1.06	11.80	216	--	0.20	4.80
1113	5.54	0.241	200.0	1.04	11.83	218	--	0.20	5.40
1116	5.54	0.241	150	1.04	11.87	221	--	0.20	6.00
1119	5.54	0.241	102	0.99	11.87	223	--	0.20	6.60
1122	5.54	0.241	84.2	0.96	11.91	224	--	0.20	7.20
1125	5.54	0.242	43.2	0.93	11.92	226	--	0.20	7.80
1128	5.54	0.242	25.1	0.91	11.92	227	--	0.20	8.40
1131	5.54	0.242	4.2	0.88	11.9	228	--	0.20	9.00

Total Quantity of Water Removed (gal):	2.377548	**Sampling Time:**	1131
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Drained Horiba at 1106 to clear it of turbid water

Could not take water level due to 1" well diameter

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-30	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: Corner of Wilson St	**Well Condition:** Good	**Weather:** Overcast 45°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016 **Gauge Time:** 9:30:00	**Measurement Ref:** TOC
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 2

Purge Date: 7-Dec-16	**Purge Time:** 940
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 45.54	**D. Well Volume (ft):** 0.163	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 9.59	**E. Well Volume (gal) C*D):** 5.85985	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 35.95	**F. Three Well Volumes (gal) (E3):** 17.57955	**Pump Intake Depth:** 45.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
941	6.18	0.150	2.3	3.86	12.01	112	9.59	0.20	--
944	6.03	0.159	1.7	3.14	12.30	130	--	0.20	0.60
947	5.93	0.181	0.0	2.41	12.38	142	9.59	0.20	1.20
950	5.81	0.206	0.0	1.76	12.52	148	--	0.20	1.80
953	5.89	0.218	0.0	1.41	12.45	151	--	0.20	2.40
956	5.85	0.221	0.0	1.27	12.45	152	9.59	0.20	3.00
959	5.85	0.224	0.0	1.12	12.52	140	--	0.20	3.60
1002	5.85	0.226	0.0	1.07	12.51	136	9.59	0.20	4.20

Total Quantity of Water Removed (gal):	1.1095224	**Sampling Time:**	1002
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: WO-31	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location:	**Well Condition:** No well cover	**Weather:** Overcast 35°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 9:10:00	
Stick Up/Down (ft): Flush	**PID Headspace Reading:** NA	**Well Diameter (in):** 1

Purge Date: 7-Dec-16	**Purge Time:** 930
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 39.43	**D. Well Volume (ft):** 0.041	**Depth/Height of Top of PVC:** -0.2
B. Depth to Water (ft): 6.37	**E. Well Volume (gal) C*D):** 1.35546	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 33.06	**F. Three Well Volumes (gal) (E3):** 4.06638	**Pump Intake Depth:** 39.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
930	6.04	0.096	>1000	5.78	10.53	20	6.37	0.20	--
933	5.72	0.063	275	6.45	10.64	43	--	0.20	0.60
936	5.65	0.054	115	6.68	10.87	65	--	0.20	1.20
939	5.65	0.049	56.1	6.70	10.99	87	--	0.20	1.80
942	5.7	0.047	42.7	6.66	11.06	101	--	0.20	2.40
945	5.72	0.047	35.7	6.05	11.15	110	--	0.20	3.00
948	5.72	0.047	30.4	6.69	11.21	117	--	0.20	3.60
951	5.72	0.047	24.5	6.66	11.25	121	--	0.20	4.20
954	5.72	0.047	21.2	6.67	11.28	124	6.37	0.20	4.80

Total Quantity of Water Removed (gal):	1.2680256	**Sampling Time:**	954
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	7-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Clear; odorless

Could not take water level reading during sampling due to 1" well diameter

EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: MW-33P	**EA Personnel:** KT/SS/JM	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location: End of Rosevelt Blvd	**Well Condition:** Good	**Weather:** Overcast/Rain 45°F
Sounding Method: Solonist 100'	**Gauge Date:** 12/6/2016	**Measurement Ref:** TOC
	Gauge Time: 14:50:00	
Stick Up/Down (ft): -1"	**PID Headspace Reading:** NA	**Well Diameter (in):** 1

Purge Date: 6-Dec-16	**Purge Time:** 1503
Purge Method: Low Flow	**Field Technician:** KT/SS/JM

Well Volume

A. Well Depth (ft): 39.65	**D. Well Volume (ft):** 0.041	**Depth/Height of Top of PVC:** -0.1
B. Depth to Water (ft): 2.8	**E. Well Volume (gal) C*D):** 1.51085	**Pump Type:** PERI
C. Liquid Depth (ft) (A-B): 36.85	**F. Three Well Volumes (gal) (E3):** 4.53255	**Pump Intake Depth:** 39.0

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (°C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1504	6.06	0.337	112	2.86	12.74	28	2.80	0.20	--
1507	6.13	0.347	136	1.89	12.78	41	2.80	0.20	0.60
1510	6.16	0.359	99.0	1.38	12.81	69	2.80	0.20	1.20
1513	6.16	0.361	73.6	1.23	12.80	81	2.80	0.20	1.80
1516	6.16	0.362	48.3	1.13	12.81	91	2.80	0.20	2.40
1519	6.16	0.363	29.7	1.06	12.85	97	2.80	0.20	3.00
1522	6.14	0.363	17.9	1.02	12.86	101	2.80	0.20	3.60
1525	6.16	0.362	9.5	0.98	12.85	95	2.80	0.20	4.20

Total Quantity of Water Removed (gal):	1.1095224	**Sampling Time:**	1525
Samplers:	KT/SS/JM	**Split Sample With:**	--
Sampling Date:	6-Dec-16	**Sample Type:**	GRAB

COMMENTS AND OBSERVATIONS: Cleared during purging; odorless

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Attachment B

Data Usability Summary Reports

ENVIRONMENTAL
Data Services, Inc.

DATA USABILITY SUMMARY REPORT
BIANCHI/WEISS GREENHOUSES, EAST PATCHOGUE, NEW YORK

Client: EA Engineering, Science & Technology, Inc., Syracuse, New York
SDG: H5958
Laboratory: Chemtech, Mountainside, New Jersey
Site: Bianchi/Weiss Greenhouses, East Patchogue, New York
Date: February 15, 2017

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	152209-PW-01	H5958-01	Water
1MS	152209-PW-01MS	H5958-01MS	Water
1MSD	152209-PW-01MSD	H5958-01MSD	Water

A Data Usability Summary Review was performed on the analytical data for one water sample collected on December 5, 2016 by EA Engineering at the Bianchi/Weiss Greenhouses site in East Patchogue, New York. The samples were analyzed under Environmental Protection Agency (USEPA) *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.*

Specific method references are as follows:

Analysis	*Method References*
Pesticides (Chlordane only)	USEPA Method 608

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA Region II Data Review Standard Operating Procedures (SOPs) as follows:

- SOP Number HW-36A, Revision 0, July 2015: Pesticide Data Validation;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Data Completeness
- Holding times and sample preservation
- Initial and continuing calibration summaries
- Method blank and field blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- GC/ECD Instrument Performance Check

- Analytical Sequence Check
- Extraction Method Cleanup
- Pesticide Identification
- Compound Quantitation
- Field Duplicate sample precision

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

Data Completeness

- The data is a complete Category B data package as defined under the requirements for the NYS Department of Environmental Conservation Analytical Services Protocol.

Pesticides

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Initial Calibration

- All %RSD criteria were met.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D values.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not collected.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable %R values.

GC/ECD Instrument Performance Check

- All % breakdown and retention time (RT) criteria were met.

Analytical Sequence Check

- All criteria were met.

Extraction Method Cleanup

- All criteria were met.

Pesticide Identification

- All criteria were met.

Compound Quantitations

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 2/16/17

Nancy Weaver
Senior Chemist

Data Qualifiers

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the sample reporting limit; and the reporting limit is approximate.

U = The analyte was analyzed for, but was not detected above the sample reporting limit.

R = The sample results is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/05/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/08/16
Client Sample ID:	152209-PW-01	SDG No.:	H5958
Lab Sample ID:	H5958-01	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	550 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021736.D	1	12/09/16 10:00	12/14/16 18:10	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.321		0.0218	0.0455	0.0909	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.1		25 - 156		91%	SPK: 20
2051-24-3	Decachlorobiphenyl	14.8		10 - 148		74%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

NW 2/15/17

Attachment C

Laboratory Data

CHEMTECH

ANALYTICAL RESULTS SUMMARY

GC SEMI-VOLATILES

PROJECT NAME : 2016 BIANCHI WEISS GREENHOUSE

EA ENGINEERING SCIENCE & TECHNOLOGY

6712 Brooklawn Parkway, Suite 104

Suite 104

East Syracuse, NY - 13211-2158

Phone No: 315-431-4610

ORDER ID : H5959

ATTENTION : Megan Miller

ACCREDITED IN ACCORDANCE WITH nelac

DoD ELAP

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Hit Summary Sheet
SW-846

SDG No.: H5959 **Order ID:** H5959

Client: EA Engineering Science & Technology **Project ID:** 2016 Bianchi Weiss Greenhouse

Sample ID	Client ID		Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID : 152209-PDI-PZ-02									
H5959-02	152209-PDI-PZ-02	Water	Chlordane	0.28		0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**0.28**					
Client ID : 152209-TPMW-01									
H5959-03	152209-TPMW-01	Water	Chlordane	4.80	E	0.0122	0.0255	0.051	ug/L
			Total Concentration:	**4.80**					
Client ID : 152209-TPMW-01DL									
H5959-03DL	152209-TPMW-01DL	Water	Chlordane	4.70	D	0.0612	0.1276	0.255	ug/L
			Total Concentration:	**4.70**					
Client ID : 152209-PDI-PZ-01									
H5959-04	152209-PDI-PZ-01	Water	Chlordane	9.40	E	0.012	0.025	0.05	ug/L
			Total Concentration:	**9.40**					
Client ID : 152209-PDI-PZ-01DL									
H5959-04DL	152209-PDI-PZ-01DL	Water	Chlordane	8.60	D	0.12	0.25	0.5	ug/L
			Total Concentration:	**8.60**					
Client ID : 152209-WO-07									
H5959-05	152209-WO-07	Water	Chlordane	7.40	E	0.0121	0.0253	0.0505	ug/L
			Total Concentration:	**7.40**					
Client ID : 152209-WO-07DL									
H5959-05DL	152209-WO-07DL	Water	Chlordane	7.30	D	0.121	0.2525	0.505	ug/L
			Total Concentration:	**7.30**					
Client ID : 152209-WO-08									
H5959-06	152209-WO-08	Water	Chlordane	9.60	E	0.0122	0.0255	0.051	ug/L
			Total Concentration:	**9.60**					
Client ID : 152209-WO-08DL									
H5959-06DL	152209-WO-08DL	Water	Chlordane	8.90	D	0.122	0.2551	0.51	ug/L
			Total Concentration:	**8.90**					
Client ID : 152209-WO-09									
H5959-07	152209-WO-09	Water	Chlordane	6.20	E	0.012	0.025	0.05	ug/L
			Total Concentration:	**6.20**					

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Hit Summary Sheet
SW-846

SDG No.: H5959 **Order ID:** H5959

Client: EA Engineering Science & Technology **Project ID:** 2016 Bianchi Weiss Greenhouse

Sample ID	Client ID		Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID : 152209-WO-09DL									
H5959-07DL	152209-WO-09DL	Water	Chlordane	5.90	D	0.12	0.25	0.5	ug/L
			Total Concentration:	**5.90**					
Client ID : 152209-WO-10									
H5959-08	152209-WO-10	Water	Chlordane	4.40	E	0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**4.40**					
Client ID : 152209-WO-10DL									
H5959-08DL	152209-WO-10DL	Water	Chlordane	4.60	D	0.0619	0.1289	0.258	ug/L
			Total Concentration:	**4.60**					
Client ID : 152209-MW33D									
H5959-10	152209-MW33D	Water	Chlordane	0.46		0.012	0.025	0.05	ug/L
			Total Concentration:	**0.46**					
Client ID : 152209-MW33S									
H5959-11	152209-MW33S	Water	Chlordane	9.20	E	0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**9.20**					
Client ID : 152209-MW33SDL									
H5959-11DL	152209-MW33SDL	Water	Chlordane	9.20	D	0.124	0.2577	0.516	ug/L
			Total Concentration:	**9.20**					
Client ID : 152209-WO-33P									
H5959-12	152209-WO-33P	Water	Chlordane	2.10	E	0.0122	0.0255	0.051	ug/L
			Total Concentration:	**2.10**					
Client ID : 152209-WO-33PDL									
H5959-12DL	152209-WO-33PDL	Water	Chlordane	1.80	D	0.0612	0.1276	0.255	ug/L
			Total Concentration:	**1.80**					
Client ID : 152209-WO-19									
H5959-13	152209-WO-19	Water	Chlordane	7.90	E	0.0122	0.0255	0.051	ug/L
			Total Concentration:	**7.90**					
Client ID : 152209-WO-19DL									
H5959-13DL	152209-WO-19DL	Water	Chlordane	7.80	D	0.122	0.2551	0.51	ug/L
			Total Concentration:	**7.80**					

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Hit Summary Sheet
SW-846

SDG No.: H5959 **Order ID:** H5959

Client: EA Engineering Science & Technology **Project ID:** 2016 Bianchi Weiss Greenhouse

Sample ID	Client ID		Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID : 152209-WO-27									
H5959-14	152209-WO-27	Water	Chlordane	0.80		0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**0.80**					
Client ID : 152209-WO-30									
H5959-16	152209-WO-30	Water	Chlordane	1.80	E	0.0122	0.0255	0.051	ug/L
			Total Concentration:	**1.80**					
Client ID : 152209-WO-30DL									
H5959-16DL	152209-WO-30DL	Water	Chlordane	1.90	D	0.0245	0.051	0.102	ug/L
			Total Concentration:	**1.90**					
Client ID : 152209-WO-31									
H5959-17	152209-WO-31	Water	Chlordane	0.76	P	0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**0.76**					
Client ID : 152209-WO-28									
H5959-18	152209-WO-28	Water	Chlordane	2.20	E	0.0121	0.0253	0.0505	ug/L
			Total Concentration:	**2.20**					
Client ID : 152209-WO-28DL									
H5959-18DL	152209-WO-28DL	Water	Chlordane	2.00	D	0.0606	0.1263	0.252	ug/L
			Total Concentration:	**2.00**					
Client ID : 152209-FD-01									
H5959-19	152209-FD-01	Water	Chlordane	6.00	E	0.012	0.025	0.05	ug/L
			Total Concentration:	**6.00**					
Client ID : 152209-FD-01DL									
H5959-19DL	152209-FD-01DL	Water	Chlordane	5.30	D	0.12	0.25	0.5	ug/L
			Total Concentration:	**5.30**					
Client ID : 152209-FD-02									
H5959-20	152209-FD-02	Water	Chlordane	7.20	E	0.0121	0.0253	0.0505	ug/L
			Total Concentration:	**7.20**					
Client ID : 152209-FD-02DL									
H5959-20DL	152209-FD-02DL	Water	Chlordane	7.10	D	0.121	0.2525	0.505	ug/L
			Total Concentration:	**7.10**					

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Hit Summary Sheet
SW-846

SDG No.: H5959 **Order ID:** H5959

Client: EA Engineering Science & Technology **Project ID:** 2016 Bianchi Weiss Greenhouse

Sample ID	Client ID		Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID : 152209-FB-120516									
H5959-21	152209-FB-120516	Water	Chlordane	0.08		0.0122	0.0255	0.051	ug/L
			Total Concentration:	**0.08**					
Client ID : 152209-FB-120616									
H5959-22	152209-FB-120616	Water	Chlordane	0.13		0.0124	0.0258	0.0515	ug/L
			Total Concentration:	**0.13**					
Client ID : 152209-WO-26									
H5959-24	152209-WO-26	Water	Chlordane	0.24		0.0122	0.0255	0.051	ug/L
			Total Concentration:	**0.24**					

CHEMTECH

ANALYTICAL RESULTS SUMMARY

GC SEMI-VOLATILES

PROJECT NAME : 2016 BIANCHI WEISS GREENHOUSE

EA ENGINEERING SCIENCE & TECHNOLOGY

6712 Brooklawn Parkway, Suite 104

Suite 104

East Syracuse, NY - 13211-2158

Phone No: 315-431-4610

ORDER ID : H5958

ATTENTION : Megan Miller

ACCREDITED IN ACCORDANCE WITH nelac

DoD ELAP

Table Of Contents for H5958

CHEMTECH
284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Cover Page

Order ID : H5958

Project ID : 2016 Bianchi Weiss Greenhouse

Client : EA Engineering Science & Technology

Lab Sample Number	Client Sample Number
H5958-01	152209-PW-01
H5958-02	H5958-01MS
H5958-03	H5958-01MSD

I certify that the data package is in compliance with the terms and conditions of the contract,both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature : Mildred V Reyes

APPROVED Date: 12/21/2016

By Mildred V Reyes, QAQC Supervisor at 3:53 pm, Dec 21, 2016

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-I

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

NYSDEC Sample ID/Code	Laboratory Sample ID/Code	VOA GC/MS (Method #)	BNA GC/MS (Method #)	VOA GC (Method #)	Pest PCBs (Method #)	Metals (Method #)	Other (Method #)
152209-PW-01	H5958-01				608		

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIa

SAMPLE PREPARATION AND ANALYSIS SUMMARY SEMIVOLATILE (BNA) ANALYSES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIc

SAMPLE PREPARATION AND ANALYSIS SUMMARY PESTICIDE/PCB ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
H5958-01	Water	12/05/16	12/08/16	12/09/16	12/14/16

* Details For Test :PESTICIDE Group1

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-III

SAMPLE PREPARATION AND ANALYSIS SUMMARY
MISCELLANEOUS ORGANIC ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor
H5958-01	Water	608	3510C		

CHEMTECH
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CASE NARRATIVE

EA Engineering Science & Technology
Project Name: 2016 Bianchi Weiss Greenhouse
Project # N/A
Chemtech Project # H5958
Test Name: PESTICIDE Group1

A. Number of Samples and Date of Receipt:
3 Water samples were received on 12/08/2016.

B. Parameters
According to the Chain of Custody document, the following analyses were requested: PESTICIDE Group1. This data package contains results for PESTICIDE Group1.

C. Analytical Techniques:
The analysis was performed on instrument ECD_L. The front column is ZB-MR1 which is 30 meters, 0.32 mm ID, 0. 5 um df,: Catalog # 7HM-G016-17. The rear column is ZB-MR2 which is 30 meters, 0.32 mm ID, 0.25 um df, Catalog #: 7HMG017- 11.The analysis of PESTICIDE Group1s was based on method 608 and extraction was done based on method 3510C.

D. QA/ QC Samples:
The Holding Times were met for all analysis.
The Surrogate recoveries met the acceptable criteria.
The Retention Times were acceptable for all samples.
The MS recoveries met the requirements for all compounds.
The MSD {H5958-03MSD} recoveries met requirements.
The RPD recoveries met criteria.
The Blank Spike met requirements for all samples.
The Blank analysis did not indicate the presence of lab contamination.
The Initial Calibration met the requirements.
The second column has % RSD more than 10 % with average but first column is passing, as per method no corrective action was required
The Continuous Calibration met the requirements except for Tetrachloro-m-xylene, Decachlorobiphenyl in second column but it is passing in first column in file id PL021724.D.
The Continuous Calibration met the requirements except for Tetrachloro-m-xylene in second column but it is passing in first column in PL021743.D.
All the associates samples were passing for the surrogate recoveries for this target compound.

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E. Additional Comments:
The sample # 152209-PW-01 , 152209-PW-01MS and 152209-PW-01MSD were extracted with reduce weight volume due having very limited volume received .
.
The Chlordane compound is not a part of the spike mix list; therefore the matrix spike and Matrix spike dup form are not reported.

F. Manual Integration Comments:
Please refer to the Manual integration Report included with the Run Logs for information on the manual integrations performed.

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature Mildred V Reyes

APPROVED
By Mildred V Reyes, QAQC Supervisor at 3:53 pm, Dec 21, 2016

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
ND	Indicates the analyte was analyzed for, but not detected
J	Indicates an estimated value**.** This flag is used: (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.) (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
B	Indicates the analyte was found in the blank as well as the sample report as "12 B".
E	Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
N	This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.
A	This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product.
Q	Indicates the LCS did not meet the control limits requirements

APPENDIX A

QA REVIEW GENERAL DOCUMENTATION

Project #: H5958

	Completed
For thorough review, the report must have the following:	
GENERAL:	
Are all original paperwork present (chain of custody, record of communication,airbill, sample management lab chronicle, login page)	✓
Check chain-of-custody for proper relinquish/return of samples	✓
Is the chain of custody signed and complete	✓
Check internal chain-of-custody for proper relinquish/return of samples /sample extracts	✓
Collect information for each project id from server. Were all requirements followed	✓
COVER PAGE:	
Do numbers of samples correspond to the number of samples in the Chain of Custody on login page	✓
Do lab numbers and client Ids on cover page agree with the Chain of Custody	✓
CHAIN OF CUSTODY:	
Do requested analyses on Chain of Custody agree with form I results	✓
Do requested analyses on Chain of Custody agree with the log-in page	✓
Were the correct method log-in for analysis according to the Analytical Request and Chain of Castody	✓
Were the samples received within hold time	✓
Were any problems found with the samples at arrival recorded in the Sample Management Laboratory Chronicle	✓
ANALYTICAL:	
Was method requirement followed?	✓
Was client requirement followed?	✓
Does the case narrative summarize all QC failure?	✓
All runlogs and manual integration are reviewed for requirements	✓
All manual calculations and /or hand notations verified	✓

1st Level QA Review Signature: KALPANA RAYTHATTHA **Date:** 12/21/2016

2nd Level QA Review Signature: Mildred V Reyes Date:

APPROVED
By Mildred V Reyes, QAQC Supervisor at 3:53 pm, Dec 21, 2016

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey - 07092

Phone: (908) 789 8900 Fax: (908) 789 8922

LAB CHRONICLE

OrderID:	H5958	**OrderDate:**	12/8/2016 3:29:40 PM
Client:	EA Engineering Science & Technology	**Project:**	2016 Bianchi Weiss Greenhouse
Contact:	Megan Miller	**Location:**	O51

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
H5958-01	**152209-PW-01**	**Water**			**12/05/16**			**12/08/16**
			PESTICIDE Group1	608		12/09/16	12/14/16	

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Hit Summary Sheet
SW-846

SDG No.: H5958 **Order ID:** H5958

Client: EA Engineering Science & Technology **Project ID:** 2016 Bianchi Weiss Greenhouse

Sample ID	Client ID		Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID : 152209-PW-01									
H5958-01	152209-PW-01	Water	Chlordane	0.32		0.0218	0.0455	0.0909	ug/L
			Total Concentration:	**0.32**					

SAMPLE DATA

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/05/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/08/16
Client Sample ID:	152209-PW-01	SDG No.:	H5958
Lab Sample ID:	H5958-01	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	550 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021736.D	1	12/09/16 10:00	12/14/16 18:10	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.321		0.0218	0.0455	0.0909	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.1		25 - 156		91%	SPK: 20
2051-24-3	Decachlorobiphenyl	14.8		10 - 148		74%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

QC SUMMARY

Surrogate Summary

SDG No.: H5958

Client: EA Engineering Science & Technology

Analytical Method: 608 Pest

Lab Sample ID	Client ID	Parameter	Column	Spike	Result	Rec	Qual	Limits Low	Limits High
I.BLK-PL021561.D	PIBLK-PL021561.D	Decachlorobiphenyl	1	20	20.06	100		10	192
		Tetrachloro-m-xylene	1	20	18.76	94		10	172
		Decachlorobiphenyl	2	20	20.28	101		10	192
		Tetrachloro-m-xylene	2	20	19.02	95		10	172
I.BLK-PL021723.D	PIBLK-PL021723.D	Tetrachloro-m-xylene	1	20	18.08	90		25	156
		Decachlorobiphenyl	1	20	16.19	81		10	148
		Tetrachloro-m-xylene	2	20	18.64	93		25	156
		Decachlorobiphenyl	2	20	13.59	68		10	148
PB95164BS	PB95164BS	Tetrachloro-m-xylene	1	20	17.78	89		25	156
		Decachlorobiphenyl	1	20	16.85	84		10	148
		Tetrachloro-m-xylene	2	20	17.93	90		25	156
		Decachlorobiphenyl	2	20	14.84	74		10	148
H5958-01	152209-PW-01	Tetrachloro-m-xylene	1	20	18.11	91		25	156
		Decachlorobiphenyl	1	20	14.84	74		10	148
		Tetrachloro-m-xylene	2	20	16.92	85		25	156
		Decachlorobiphenyl	2	20	13.05	65		10	148
H5958-02MS	152209-PW-01MS	Tetrachloro-m-xylene	1	20	18.62	93		25	156
		Decachlorobiphenyl	1	20	16	80		10	148
		Tetrachloro-m-xylene	2	20	17.61	88		25	156
		Decachlorobiphenyl	2	20	13.29	66		10	148
H5958-03MSD	152209-PW-01MSD	Tetrachloro-m-xylene	1	20	15.18	76		25	156
		Decachlorobiphenyl	1	20	15.57	78		10	148
		Tetrachloro-m-xylene	2	20	16.44	82		25	156
		Decachlorobiphenyl	2	20	13.54	68		10	148
PB95164BL	PB95164BL	Tetrachloro-m-xylene	1	20	16.39	82		25	156
		Decachlorobiphenyl	1	20	15.42	77		10	148
		Tetrachloro-m-xylene	2	20	16.43	82		25	156
		Decachlorobiphenyl	2	20	13.39	67		10	148
I.BLK-PL021741.D	PIBLK-PL021741.D	Tetrachloro-m-xylene	1	20	19.07	95		25	156
		Decachlorobiphenyl	1	20	17.62	88		10	148
		Tetrachloro-m-xylene	2	20	19.3	97		25	156
		Decachlorobiphenyl	2	20	16.07	80		10	148

Matrix Spike/Matrix Spike Duplicate Summary

SW-846

SDG No.: H5958

Client: EA Engineering Science & Technology

Analytical Method: _____ **DataFile :**

Lab Sample ID:	Parameter	Spike	Sample Result	Result	Units	Rec	Rec Qual	RPD	RPD Qual	Limits Low	Limits High	RPD
Client Sample ID:												

Matrix Spike/Matrix Spike Duplicate Summary

SW-846

SDG No.: H5958

Client: EA Engineering Science & Technology

Analytical Method: _____ **DataFile :**

Lab Sample ID:	Parameter	Spike	Sample Result	Result	Units	Rec	Rec Qual	RPD	RPD Qual	Limits Low	Limits High	RPD
Client Sample ID:												

Laboratory Control Sample/Laboratory Control Sample Duplicate Summary

SW-846

SDG No.: H5958

Client: EA Engineering Science & Technology

Analytical Method: _____ **Datafile :**

Lab Sample ID	Parameter	Spike	Result	Units	Rec	RPD	Qual	RPD Qual	Limits Low	Limits High	RPD

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4C

PESTICIDE METHOD BLANK SUMMARY

EPA SAMPLE NO.

PB95164BL

Lab Name: CHEMTECH Contract: EAEN05

Lab Code: CHEM Case No.: H5958 SAS No.: H5958 SDG NO.: H5958

Lab Sample ID: PB95164BL Lab File ID: PL021739.D

Matrix: (soil/water) Water Extraction: (Type) SEPF

Sulfur Cleanup: (Y/N) N Date Extracted: 12/09/2016

Date Analyzed (1): 12/14/2016 Date Analyzed (2): 12/14/2016

Time Analyzed (1): 18:53 Time Analyzed (2): 18:53

Instrument ID (1): ECD_L Instrument ID (2): ECD_L

GC Column (1): ZB-MR1 ID: 0.32 (mm) GC Column (2): ZB-MR2 ID: 0.32 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED 1	DATE ANALYZED 2
PB95164BS	PB95164BS	PL021725.D	12/14/2016	12/14/2016
152209-PW-01	H5958-01	PL021736.D	12/14/2016	12/14/2016
152209-PW-01MS	H5958-02MS	PL021737.D	12/14/2016	12/14/2016
152209-PW-01MSD	H5958-03MSD	PL021738.D	12/14/2016	12/14/2016

COMMENTS:

QC SAMPLE DATA

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	
Client Sample ID:	PB95164BL	SDG No.:	H5958
Lab Sample ID:	PB95164BL	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021739.D	1	12/09/16 10:00	12/14/16 18:53	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.05	U	0.012	0.025	0.05	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.4		25 - 156		82%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.4		10 - 148		77%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/07/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/07/16
Client Sample ID:	PIBLK-PL021561.D	SDG No.:	H5958
Lab Sample ID:	I.BLK-PL021561.D	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021561.D	1		12/07/16	PL120716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.5	U	0.1	0.1	0.5	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	20.1		10 - 192		100%	SPK: 20
877-09-8	Tetrachloro-m-xylene	18.8		10 - 172		94%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/14/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/14/16
Client Sample ID:	PIBLK-PL021723.D	SDG No.:	H5958
Lab Sample ID:	I.BLK-PL021723.D	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021723.D	1		12/14/16	PL121416

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.5	U	0.12	0.25	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.1		25 - 156		90%	SPK: 20
2051-24-3	Decachlorobiphenyl	16.2		10 - 148		81%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/14/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/14/16
Client Sample ID:	PIBLK-PL021741.D	SDG No.:	H5958
Lab Sample ID:	I.BLK-PL021741.D	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021741.D	1		12/14/16	PL121416

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.5	U	0.12	0.25	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	19.1		25 - 156		95%	SPK: 20
2051-24-3	Decachlorobiphenyl	17.6		10 - 148		88%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	
Client Sample ID:	PB95164BS	SDG No.:	H5958
Lab Sample ID:	PB95164BS	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021725.D	1	12/09/16 10:00	12/14/16 15:31	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
SURROGATES							
877-09-8	Tetrachloro-m-xylene	17.8		25 - 156		89%	SPK: 20
2051-24-3	Decachlorobiphenyl	16.8		10 - 148		84%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/05/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/08/16
Client Sample ID:	152209-PW-01MS	SDG No.:	H5958
Lab Sample ID:	H5958-02MS	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	540 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021737.D	1	12/09/16 10:00	12/14/16 18:24	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.531		0.0222	0.0463	0.0926	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.6		25 - 156		93%	SPK: 20
2051-24-3	Decachlorobiphenyl	16		10 - 148		80%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

Report of Analysis

Client:	EA Engineering Science & Technology	Date Collected:	12/05/16
Project:	2016 Bianchi Weiss Greenhouse	Date Received:	12/08/16
Client Sample ID:	152209-PW-01MSD	SDG No.:	H5958
Lab Sample ID:	H5958-03MSD	Matrix:	Water
Analytical Method:	E608	% Moisture:	100 Decanted:
Sample Wt/Vol:	540 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021738.D	1	12/09/16 10:00	12/14/16 18:39	PB95164

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
57-74-9	Chlordane	0.696		0.0222	0.0463	0.0926	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	15.2		25 - 156		76%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.6		10 - 148		78%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

CALIBRATION SUMMARY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

RETENTION TIMES OF INITIAL CALIBRATION

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Calibration Date(s):** 12/07/2016 12/07/2016

Calibration Times: 21:04 22:01

GC Column: ZB-MR1 ID: 0.32 (mm)

LAB FILE ID: RT 1000 = PL021573.D RT 750 = PL021574.D

RT 500 = PL021575.D RT 250 = PL021576.D RT 050 = PL021577.D

COMPOUND		RT 1000	RT 750	RT 500	RT 250	RT 050	MEAN RT	RT WINDOW FROM	RT WINDOW TO
Chlordane-1	(1)	4.67	4.67	4.67	4.67	4.67	4.67	4.57	4.77
Chlordane-2	(2)	4.85	4.85	4.85	4.85	4.85	4.85	4.75	4.95
Chlordane-3	(3)	5.74	5.74	5.74	5.74	5.74	5.74	5.64	5.84
Chlordane-4	(4)	5.82	5.82	5.82	5.82	5.82	5.82	5.72	5.92
Chlordane-5	(5)	6.59	6.59	6.59	6.59	6.59	6.59	6.49	6.69
Decachlorobiphenyl		8.60	8.60	8.60	8.60	8.60	8.60	8.50	8.70
Tetrachloro-m-xylene		3.72	3.72	3.72	3.72	3.72	3.72	3.62	3.82

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RETENTION TIMES OF INITIAL CALIBRATION

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Calibration Date(s):** 12/07/2016 12/07/2016

Calibration Times: 21:04 22:01

GC Column: ZB-MR2 ID: 0.32 (mm)

LAB FILE ID: RT 1000 = PL021573.D RT 750 = PL021574.D

RT 500 = PL021575.D RT 250 = PL021576.D RT 050 = PL021577.D

COMPOUND		RT 1000	RT 750	RT 500	RT 250	RT 050	MEAN RT	RT WINDOW FROM	RT WINDOW TO
Chlordane-1	(1)	3.95	3.95	3.95	3.95	3.95	3.95	3.85	4.05
Chlordane-2	(2)	4.10	4.10	4.10	4.10	4.10	4.10	4.00	4.20
Chlordane-3	(3)	4.97	4.97	4.97	4.97	4.97	4.97	4.87	5.07
Chlordane-4	(4)	5.03	5.03	5.03	5.03	5.03	5.03	4.93	5.13
Chlordane-5	(5)	5.83	5.83	5.83	5.83	5.83	5.83	5.73	5.93
Decachlorobiphenyl		7.75	7.75	7.75	7.75	7.75	7.75	7.65	7.85
Tetrachloro-m-xylene		3.13	3.13	3.13	3.13	3.13	3.13	3.03	3.23

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CALIBRATION FACTOR OF INITIAL CALIBRATION

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Calibration Date(s):** 12/07/2016 12/07/2016

Calibration Times: 21:04 22:01

GC Column: ZB-MR1 **ID:** 0.32 **(mm)**

LAB FILE ID: **CF 1000 =** PL021573.D **CF 750 =** PL021574.D

CF 500 = PL021575.D **CF 250 =** PL021576.D **CF 050 =** PL021577.D

COMPOUND	CF 1000	CF 750	CF 500	CF 250	CF 050	CF	% RSD
Chlordane-1 (1)	44839900	44110000	45969500	45233400	42424400	44515400	3
Chlordane-2 (2)	50527900	49901600	52570500	51476600	50104600	50916200	2
Chlordane-3 (3)	160540000	155881000	163116000	166353000	162747000	161727000	2
Chlordane-4 (4)	187744000	183216000	192929000	193732000	198009000	191126000	3
Chlordane-5 (5)	37464200	36984500	39511300	40066300	40614000	38928100	4
Decachlorobiphenyl	79331000	79942400	86619800	90186500	101545000	87525000	10
Tetrachloro-m-xylene	101442000	100153000	104285000	101656000	102821000	102071000	2

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CALIBRATION FACTOR OF INITIAL CALIBRATION

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Calibration Date(s):** 12/07/2016 12/07/2016

Calibration Times: 21:04 22:01

GC Column: ZB-MR2 **ID:** 0.32 (mm)

LAB FILE ID: **CF 1000 =** PL021573.D **CF 750 =** PL021574.D

CF 500 = PL021575.D **CF 250 =** PL021576.D **CF 050 =** PL021577.D

COMPOUND	CF 1000	CF 750	CF 500	CF 250	CF 050	CF	% RSD
Chlordane-1 (1)	142540000	139584000	144046000	137881000	140279000	140866000	2
Chlordane-2 (2)	208591000	204096000	210805000	200982000	197093000	204314000	3
Chlordane-3 (3)	467654000	454729000	470337000	444442000	413765000	450185000	5
Chlordane-4 (4)	467061000	455289000	475600000	449468000	431261000	455736000	4
Chlordane-5 (5)	140962000	136909000	142792000	134554000	131480000	137340000	3
Decachlorobiphenyl	316757000	317093000	340097000	348694000	396618000	343852000	10
Tetrachloro-m-xylene	341952000	336760000	347803000	333733000	326390000	337328000	2

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INITIAL CALIBRATION OF MULTICOMPONENT ANALYTES

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Date(s) Analyzed:** 12/07/2016 12/07/2016

GC Column: ZB-MR1 **ID:** 0.32 (mm)

COMPOUND	AMOUNT (ng)	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR
Chlordane	1000	1	4.67	4.57	4.77	44839900
		2	4.85	4.75	4.95	50527900
		3	5.74	5.64	5.84	160540000
		4	5.82	5.72	5.92	187744000
		5	6.59	6.49	6.69	37464200
Chlordane	250	1	4.67	4.57	4.77	45233400
		2	4.85	4.75	4.95	51476600
		3	5.74	5.64	5.84	166353000
		4	5.82	5.72	5.92	193732000
		5	6.59	6.49	6.69	40066300
Chlordane	50	1	4.67	4.57	4.77	42424400
		2	4.85	4.75	4.95	50104600
		3	5.74	5.64	5.84	162747000
		4	5.82	5.72	5.92	198009000
		5	6.59	6.49	6.69	40614000
Chlordane	500	1	4.67	4.57	4.77	45969500
		2	4.85	4.75	4.95	52570500
		3	5.74	5.64	5.84	163116000
		4	5.82	5.72	5.92	192929000
		5	6.59	6.49	6.69	39511300
Chlordane	750	1	4.67	4.57	4.77	44110000
		2	4.85	4.75	4.95	49901600
		3	5.74	5.64	5.84	155881000
		4	5.82	5.72	5.92	183216000
		5	6.59	6.49	6.69	36984500

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INITIAL CALIBRATION OF MULTICOMPONENT ANALYTES

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Instrument ID: ECD_L **Date(s) Analyzed:** 12/07/2016 12/07/2016

GC Column: ZB-MR2 **ID:** 0.32 (mm)

COMPOUND	AMOUNT (ng)	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR
Chlordane	1000	1	3.95	3.85	4.05	142540000
		2	4.10	4.00	4.20	208591000
		3	4.97	4.87	5.07	467654000
		4	5.03	4.93	5.13	467061000
		5	5.83	5.73	5.93	140962000
Chlordane	250	1	3.95	3.85	4.05	137881000
		2	4.10	4.00	4.20	200982000
		3	4.97	4.87	5.07	444442000
		4	5.03	4.93	5.13	449468000
		5	5.83	5.73	5.93	134554000
Chlordane	50	1	3.95	3.85	4.05	140279000
		2	4.10	4.00	4.20	197093000
		3	4.97	4.87	5.07	413765000
		4	5.03	4.93	5.13	431261000
		5	5.83	5.73	5.93	131480000
Chlordane	500	1	3.95	3.85	4.05	144046000
		2	4.10	4.00	4.20	210805000
		3	4.97	4.87	5.07	470337000
		4	5.03	4.93	5.13	475600000
		5	5.83	5.73	5.93	142792000
Chlordane	750	1	3.95	3.85	4.05	139584000
		2	4.10	4.00	4.20	204096000
		3	4.97	4.87	5.07	454729000
		4	5.03	4.93	5.13	455289000
		5	5.83	5.73	5.93	136909000

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CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Continuing Calib Date: 12/14/2016 **Initial Calibration Date(s):** 12/07/2016 12/07/2016

Continuing Calib Time: 15:17 **Initial Calibration Time(s):** 18:55 19:52

GC Column: ZB-MR1 **ID:** 0.32 **(mm)**

COMPOUND		CCAL RT	AVG RT	RT WINDOW FROM	RT WINDOW TO	DIFF RT
Chlordane-1	(1)	4.66	0.00	-0.10	0.10	-4.66
Chlordane-2	(2)	4.84	0.00	-0.10	0.10	-4.84
Chlordane-3	(3)	5.73	0.00	-0.10	0.10	-5.73
Chlordane-4	(4)	5.81	0.00	-0.10	0.10	-5.81
Chlordane-5	(5)	6.58	0.00	-0.10	0.10	-6.58
Tetrachloro-m-xylene		3.71	3.72	3.62	3.82	0.01
Decachlorobiphenyl		8.60	8.61	8.51	8.71	0.01

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CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Continuing Calib Date: 12/14/2016 **Initial Calibration Date(s):** 12/07/2016 12/07/2016

Continuing Calib Time: 15:17 **Initial Calibration Time(s):** 18:55 19:52

GC Column: ZB-MR2 **ID:** 0.32 **(mm)**

COMPOUND		CCAL RT	AVG RT	RT WINDOW FROM	RT WINDOW TO	DIFF RT
Chlordane-1	(1)	3.95	0.00	-0.10	0.10	-3.95
Chlordane-2	(2)	4.09	0.00	-0.10	0.10	-4.09
Chlordane-3	(3)	4.97	0.00	-0.10	0.10	-4.97
Chlordane-4	(4)	5.02	0.00	-0.10	0.10	-5.02
Chlordane-5	(5)	5.82	0.00	-0.10	0.10	-5.82
Tetrachloro-m-xylene		3.12	3.13	3.03	3.23	0.01
Decachlorobiphenyl		7.73	7.75	7.65	7.85	0.02

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CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

GC Column: ZB-MR1 **ID:** 0.32 (mm) **Initi. Calib. Date(s):** 12/07/2016 12/07/2016

Client Sample No.: CCAL01 **Date Analyzed:** 12/14/2016

Lab Sample No.: PCHLORCCC500 **Data File :** PL021724.D **Time Analyzed:** 15:17

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT(ng)	NOM AMOUNT(ng)	%D
Chlordane-1	4.658	-0.100	0.100	536.580	500.000	7.3
Chlordane-2	4.839	-0.100	0.100	556.170	500.000	11.2
Chlordane-3	5.733	-0.100	0.100	484.570	500.000	-3.1
Chlordane-4	5.808	-0.100	0.100	482.620	500.000	-3.5
Chlordane-5	6.579	-0.100	0.100	462.450	500.000	-7.5
Decachlorobiphenyl	8.596	8.505	8.705	47.120	50.000	-5.8
Tetrachloro-m-xylene	3.708	3.615	3.815	54.090	50.000	8.2

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

GC Column: ZB-MR2 **ID:** 0.32 **(mm)** **Initi. Calib. Date(s):** 12/07/2016 12/07/2016

Client Sample No.: CCAL01 **Date Analyzed:** 12/14/2016

Lab Sample No.: PCHLORCCC500 **Data File :** PL021724.D **Time Analyzed:** 15:17

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT(ng)	NOM AMOUNT(ng)	%D
Chlordane-1	3.946	-0.100	0.100	523.240	500.000	4.6
Chlordane-2	4.088	-0.100	0.100	522.000	500.000	4.4
Chlordane-3	4.965	-0.100	0.100	486.550	500.000	-2.7
Chlordane-4	5.019	-0.100	0.100	499.520	500.000	-0.1
Chlordane-5	5.824	-0.100	0.100	507.900	500.000	1.6
Decachlorobiphenyl	7.733	7.646	7.846	40.530	50.000	-18.9
Tetrachloro-m-xylene	3.120	3.025	3.225	61.670	50.000	23.3

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Continuing Calib Date: 12/14/2016 **Initial Calibration Date(s):** 12/07/2016 12/07/2016

Continuing Calib Time: 19:50 **Initial Calibration Time(s):** 18:55 19:52

GC Column: ZB-MR1 **ID:** 0.32 **(mm)**

COMPOUND	CCAL RT	AVG RT	RT WINDOW FROM	RT WINDOW TO	DIFF RT
Chlordane-1 (1)	4.66	0.00	-0.10	0.10	-4.66
Chlordane-2 (2)	4.84	0.00	-0.10	0.10	-4.84
Chlordane-3 (3)	5.73	0.00	-0.10	0.10	-5.73
Chlordane-4 (4)	5.81	0.00	-0.10	0.10	-5.81
Chlordane-5 (5)	6.58	0.00	-0.10	0.10	-6.58
Tetrachloro-m-xylene	3.71	3.72	3.62	3.82	0.01
Decachlorobiphenyl	8.59	8.61	8.51	8.71	0.02

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

Continuing Calib Date: 12/14/2016 **Initial Calibration Date(s):** 12/07/2016 12/07/2016

Continuing Calib Time: 19:50 **Initial Calibration Time(s):** 18:55 19:52

GC Column: ZB-MR2 **ID:** 0.32 **(mm)**

COMPOUND		CCAL RT	AVG RT	RT WINDOW FROM	RT WINDOW TO	DIFF RT
Chlordane-1	(1)	3.94	0.00	-0.10	0.10	-3.94
Chlordane-2	(2)	4.09	0.00	-0.10	0.10	-4.09
Chlordane-3	(3)	4.96	0.00	-0.10	0.10	-4.96
Chlordane-4	(4)	5.02	0.00	-0.10	0.10	-5.02
Chlordane-5	(5)	5.82	0.00	-0.10	0.10	-5.82
Tetrachloro-m-xylene		3.12	3.13	3.03	3.23	0.01
Decachlorobiphenyl		7.73	7.75	7.65	7.85	0.02

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CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

GC Column: ZB-MR1 **ID:** 0.32 **(mm)** **Initi. Calib. Date(s):** 12/07/2016 12/07/2016

Client Sample No.: CCAL02 **Date Analyzed:** 12/14/2016

Lab Sample No.: PCHLORCCC500 **Data File :** PL021743.D **Time Analyzed:** 19:50

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT(ng)	NOM AMOUNT(ng)	%D
Chlordane-1	4.656	-0.100	0.100	561.680	500.000	12.3
Chlordane-2	4.837	-0.100	0.100	574.550	500.000	14.9
Chlordane-3	5.731	-0.100	0.100	513.160	500.000	2.6
Chlordane-4	5.806	-0.100	0.100	513.810	500.000	2.8
Chlordane-5	6.577	-0.100	0.100	484.000	500.000	-3.2
Decachlorobiphenyl	8.594	8.505	8.705	47.840	50.000	-4.3
Tetrachloro-m-xylene	3.706	3.615	3.815	55.870	50.000	11.7

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CALIBRATION VERIFICATION SUMMARY

Contract: EAEN05

Lab Code: CHEM **Case No.:** H5958 **SAS No.:** H5958 **SDG NO.:** H5958

GC Column: ZB-MR2 **ID:** 0.32 **(mm)** **Initi. Calib. Date(s):** 12/07/2016 12/07/2016

Client Sample No.: CCAL02 **Date Analyzed:** 12/14/2016

Lab Sample No.: PCHLORCCC500 **Data File :** PL021743.D **Time Analyzed:** 19:50

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT(ng)	NOM AMOUNT(ng)	%D
Chlordane-1	3.944	-0.100	0.100	556.720	500.000	11.3
Chlordane-2	4.087	-0.100	0.100	549.890	500.000	10.0
Chlordane-3	4.962	-0.100	0.100	555.550	500.000	11.1
Chlordane-4	5.018	-0.100	0.100	542.110	500.000	8.4
Chlordane-5	5.822	-0.100	0.100	540.840	500.000	8.2
Decachlorobiphenyl	7.729	7.646	7.846	44.290	50.000	-11.4
Tetrachloro-m-xylene	3.119	3.025	3.225	63.890	50.000	27.8

Analytical Sequence

Client: EA Engineering Science & Technology **SDG No.:** H5958

Project: 2016 Bianchi Weiss Greenhouse **Instrument ID:** ECD_L

GC Column: ZB-MR1 **ID:** 0.32 (mm) **Inst. Calib. Date(s):** 12/07/2016 12/07/2016

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	DATAFILE	DCB RT #	TCX RT #
I.BLK	I.BLK	12/07/2016	18:12	PL021561.D	8.61	3.72
PCHLORICC1000	PCHLORICC1000	12/07/2016	21:04	PL021573.D	8.60	3.72
PCHLORICC750	PCHLORICC750	12/07/2016	21:18	PL021574.D	8.60	3.72
PCHLORICC500	PCHLORICC500	12/07/2016	21:32	PL021575.D	8.60	3.72
PCHLORICC250	PCHLORICC250	12/07/2016	21:47	PL021576.D	8.60	3.72
PCHLORICC050	PCHLORICC050	12/07/2016	22:01	PL021577.D	8.60	3.72
I.BLK	I.BLK	12/14/2016	15:02	PL021723.D	8.60	3.71
PCHLORCCC500	PCHLORCCC500	12/14/2016	15:17	PL021724.D	8.60	3.71
PB95164BS	PB95164BS	12/14/2016	15:31	PL021725.D	8.60	3.71
152209-PW-01	H5958-01	12/14/2016	18:10	PL021736.D	8.60	3.71
152209-PW-01MS	H5958-02MS	12/14/2016	18:24	PL021737.D	8.59	3.71
152209-PW-01MSD	H5958-03MSD	12/14/2016	18:39	PL021738.D	8.60	3.71
PB95164BL	PB95164BL	12/14/2016	18:53	PL021739.D	8.60	3.71
I.BLK	I.BLK	12/14/2016	19:22	PL021741.D	8.59	3.71
PCHLORCCC500	PCHLORCCC500	12/14/2016	19:50	PL021743.D	8.59	3.71

Analytical Sequence

Client: EA Engineering Science & Technology **SDG No.:** H5958

Project: 2016 Bianchi Weiss Greenhouse **Instrument ID:** ECD_L

GC Column: ZB-MR2 **ID:** 0.32 (mm) **Inst. Calib. Date(s):** 12/07/2016 12/07/2016

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	DATAFILE	DCB RT #	TCX RT #
I.BLK	I.BLK	12/07/2016	18:12	PL021561.D	7.75	3.12
PCHLORICC1000	PCHLORICC1000	12/07/2016	21:04	PL021573.D	7.75	3.13
PCHLORICC750	PCHLORICC750	12/07/2016	21:18	PL021574.D	7.75	3.13
PCHLORICC500	PCHLORICC500	12/07/2016	21:32	PL021575.D	7.75	3.13
PCHLORICC250	PCHLORICC250	12/07/2016	21:47	PL021576.D	7.75	3.13
PCHLORICC050	PCHLORICC050	12/07/2016	22:01	PL021577.D	7.75	3.13
I.BLK	I.BLK	12/14/2016	15:02	PL021723.D	7.73	3.12
PCHLORCCC500	PCHLORCCC500	12/14/2016	15:17	PL021724.D	7.73	3.12
PB95164BS	PB95164BS	12/14/2016	15:31	PL021725.D	7.73	3.12
152209-PW-01	H5958-01	12/14/2016	18:10	PL021736.D	7.73	3.12
152209-PW-01MS	H5958-02MS	12/14/2016	18:24	PL021737.D	7.73	3.12
152209-PW-01MSD	H5958-03MSD	12/14/2016	18:39	PL021738.D	7.73	3.12
PB95164BL	PB95164BL	12/14/2016	18:53	PL021739.D	7.73	3.12
I.BLK	I.BLK	12/14/2016	19:22	PL021741.D	7.73	3.12
PCHLORCCC500	PCHLORCCC500	12/14/2016	19:50	PL021743.D	7.73	3.12

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

SAMPLE NO.
152209-PW-01

Contract: EAEN05

Lab Code: CHEM Case No.: H5958 SAS No.: H5958 SDG NO.: H5958

Lab Sample ID: H5958-01 Date(s) Analyzed: 12/14/2016 12/14/2016

Instrument ID (1): ECD_L Instrument ID (2): ECD_L

GC Column: (1): ZB-MR1 ID: 0.32 (mm) GC Column:(2): ZB-MR2 ID: 0.32 (mm)

Data file PL021736.D

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	%RPD
Chlordane	1	4.66	4.61	4.71	0.80		
	2	0.00	0.00	0.00	0.00		
	3	5.73	5.68	5.78	0.16		
COLUMN 1	4	5.81	5.76	5.86	0.17		
	5	6.58	6.53	6.63	0.15	0.321	
	1	3.95	3.90	4.00	0.73		
	2	0.00	0.00	0.00	0.00		
	3	4.96	4.91	5.01	0.11		
	4	5.02	4.97	5.07	0.25		
COLUMN 2	5	5.82	5.77	5.87	0.17	0.314	1.98

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IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

SAMPLE NO.
152209-PW-01MS

Contract: EAEN05

Lab Code: CHEM Case No.: H5958 SAS No.: H5958 SDG NO.: H5958

Lab Sample ID: H5958-02MS Date(s) Analyzed: 12/14/2016 12/14/2016

Instrument ID (1): ECD_L Instrument ID (2): ECD_L

GC Column: (1): ZB-MR1 ID: 0.32 (mm) GC Column:(2): ZB-MR2 ID: 0.32 (mm)

Data file PL021737.D

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	%RPD
Chlordane	1	4.66	4.61	4.71	1.12		
	2	4.84	4.79	4.89	0.46		
	3	5.73	5.68	5.78	0.32		
COLUMN 1	4	5.80	5.75	5.85	0.29		
	5	6.58	6.53	6.63	0.16	0.469	
	1	3.94	3.89	3.99	0.80		
	2	4.09	4.04	4.14	0.44		
	3	4.96	4.91	5.01	0.31		
	4	5.02	4.97	5.07	0.43		
COLUMN 2	5	5.82	5.77	5.87	0.68	0.531	12.32

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IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

SAMPLE NO.
152209-PW-01MSD

Contract: EAEN05

Lab Code: CHEM Case No.: H5958 SAS No.: H5958 SDG NO.: H5958

Lab Sample ID: H5958-03MSD Date(s) Analyzed: 12/14/2016 12/14/2016

Instrument ID (1): ECD_L Instrument ID (2): ECD_L

GC Column: (1): ZB-MR1 ID: 0.32 (mm) GC Column:(2): ZB-MR2 ID: 0.32 (mm)

Data file PL021738.D

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	%RPD
Chlordane	1	4.66	4.61	4.71	1.88		
	2	4.84	4.79	4.89	0.49		
	3	5.73	5.68	5.78	0.37		
COLUMN 1	4	5.80	5.75	5.85	0.52		
	5	6.58	6.53	6.63	0.22	0.696	
	1	3.95	3.90	4.00	0.91		
	2	4.09	4.04	4.14	0.45		
	3	4.96	4.91	5.01	0.35		
	4	5.02	4.97	5.07	0.51		
COLUMN 2	5	5.82	5.77	5.87	0.64	0.571	19.71

SHIPPING DOCUMENTS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. H5958
QUOTE NO. JC
COC Number 043489

6.1

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: EA ENGINEERING, PC
ADDRESS: 6712 BROOKLAWN PKWY, STE 104
CITY: SYRACUSE STATE: NY ZIP: 13211
ATTENTION: MEGAN MILLER
PHONE: 315 431 4610 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: BIANCHI - WEISS GREENHOUSE
PROJECT NO.: 14907.29 LOCATION: PATCHOGUE, NY
PROJECT MANAGER: MEGAN MILLER
e-mail: MMILLER@EAEST.COM
PHONE: 315-431-4610 FAX:

CLIENT BILLING INFORMATION

BILL TO: EA ACCTS. PAYABLE PO#: 14907.29
ADDRESS: NORTHEASTAP@EAEST.COM
CITY: NEWBURGH STATE: NY ZIP:
ATTENTION: MELANIE DINA PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: EA IQ IQ TAT DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☒ EDD Format: NYSDEC EQUIS
☒ Others SEE BELOW

ANALYSIS

EPA Me1400 (608 Chlord...

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1 (E)	2	3	4	5	6	7	8	9	COMMENTS
1. H595[illegible]	152209-PW-01	GW		X	12/5/16	1455	3	X						CAT B			MS/MSD HERE
2. LD	152209-SW-01	SW			12/5/16	1531	1							DELIVERABLES			*SURFACE WATER
3.	152209-MW-41	GW			12/6/16	1010											
4.	152209-PDI-PZ-02					1034											
5. H5[illegible]	152209-TPMW-01					1108								CAT A			
6.	152209-PDI-PZ-01					1130								DELIVERABLES			
7. LD	152209-WO-07					1214											
8.	152209-WO-08					1226											
9.	152209-WO-09					1350											
10.	152209-WO-10					1349											

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. STEPHEN SOLOMON	12/7/16 1300	1. UPS
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. UPS	12-8-16 10:30	3. [illegible]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant Cooler Temp. 5.2
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: CAT B. FOR PW-01 & SW-01; CAT A FOR ALL OTHERS
Ice in Cooler?: yes

Page 1 of 3

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT
Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

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(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. H5958
QUOTE NO.
COC Number 043487

6.1

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY:
ADDRESS: SAME
CITY: STATE: ZIP: A
ATTENTION:
PHONE: FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME:
PROJECT NO.: LOCATION:
PROJECT MANAGER: PAGE
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS: 1
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: DAYS *
HARD COPY: DAYS *
EDD: DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only
☒ Others CAT A
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☒ EDD Format: NYSDEC EQuIS

ANALYSIS

1 EPA METHOD 608 (CHLORDANE) 2 3 4 5 6 7 8 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	152209 - MW33I	GW		X	12/6/16	1435	1	X									
2.	152209 - MW33D					1498											
3.	152209 - MW33S					1505											
4.	152209 - ~~MW33P~~ WO-33P					1525											
5.	152209 - WO-19				12/7/16	0801											
6.	152209 - WO-27				12/7/16	0853											
7.	152209 - WO-25					0901											
8.	152209 - WO-30					1002											
9.	152209 - WO-31					0954											
10.	152209 - WO-28					1131											

PRESERVATIVES: ← Specify Preservatives
A – HCl B – HNO_3 C – H_2SO_4 D – NaOH E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. STEPHEN SCLOWER 8PM	12/07/16 1300	1. UPS
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. UPS	12-8-16 1030	3. Chris

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant Cooler Temp. 5.2
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: Ice in Cooler?: YES

Page 2 of 3

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT
Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. H5958
QUOTE NO.
COC Number 043488

6.1

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY:
ADDRESS: SAME
CITY: STATE: ZIP:
ATTENTION:
PHONE: FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME:
PROJECT NO.: LOCATION:
PROJECT MANAGER: PAGE
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: DAYS *
HARD COPY: DAYS *
EDD: STANDARD DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only
☒ Others CATA
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☒ EDD Format: NYSDEC EQUIS

ANALYSIS

1 EIA Method 6200 (Chlorides)
2
3
4
5
6
7
8
9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	152209 - FD-01	GW		X	12/06/16	—	1	X									
2.	152209 - FD-02				12/06/16	—											
3.	152209 - FB-120516				12/05/16	1630											
4.	152209 - FB-120616				12/06/16	1630											
5.	152209 - FB-120716				12/07/16	1145											
6.	152209 - WO-26				12/07/16	1053											
7.																	
8.																	
9.																	
10.																	

PRESERVATIVES: E

COMMENTS — ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. Stephen Soldner	12/07/16 1300	1. UPS
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. UPS	12-8-16 1030	3.

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant Cooler Temp. 3.2
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Ice in Cooler?: Yes

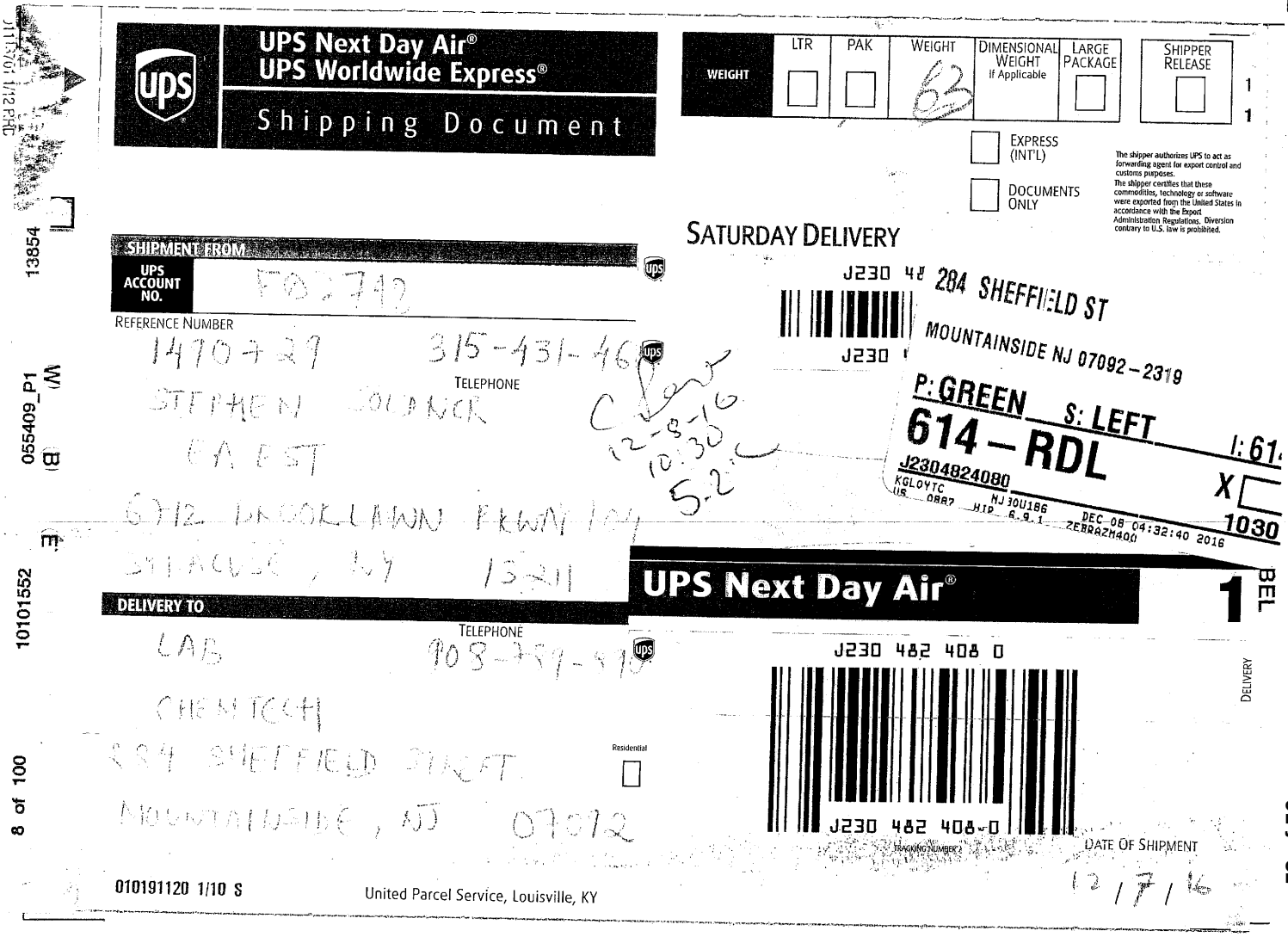
Page 3 of 3

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY



UPS Next Day Air®
UPS Worldwide Express®
Shipping Document

WEIGHT | LTR | PAK | WEIGHT 63 | DIMENSIONAL WEIGHT If Applicable | LARGE PACKAGE | SHIPPER RELEASE

EXPRESS (INT'L)
DOCUMENTS ONLY

The shipper authorizes UPS to act as forwarding agent for export control and customs purposes.
The shipper certifies that these commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

SATURDAY DELIVERY

SHIPMENT FROM
UPS ACCOUNT NO. F0:742
REFERENCE NUMBER
1470429
315-431-46
TELEPHONE
STEPHEN SOLONCK
EAST
6012 BROOKLAWN PKWY 104
SYRACUSE, NY 13211

J230 482 284 SHEFFIELD ST
MOUNTAINSIDE NJ 07092-2319
P:GREEN S:LEFT
614 – RDL
J2304824080
KGLOYTC US 0882 NJ 30U186 HIP 6.9.1 DEC 08 04:32:40 2016 2ERRAZM400

DELIVERY TO
LAB
CHEMTECH
284 SHEFFIELD STREET
MOUNTAINSIDE, NJ 07092
TELEPHONE 908-789-8900
Residential

UPS Next Day Air®

J230 482 408 0
J230 482 408-0
TRACKING NUMBER

DATE OF SHIPMENT
12/7/16

010191120 1/10 S
United Parcel Service, Louisville, KY

C 12-8-16 10:30 5.2

13854
055409_P1
10101552
8 of 100
53 of 56
H5958

6.2

UPS Next Day Air®
UPS Worldwide Express®
Shipping Document

WEIGHT	LTR	PAK	WEIGHT	DIMENSIONAL WEIGHT If Applicable	LARGE PACKAGE	SHIPPER RELEASE
	☐	☐	4kg		☐	☐

☐ EXPRESS (INT'L)

☐ DOCUMENTS ONLY

SATURDAY DELIVERY ☐

The shipper authorizes UPS to act as forwarding agent for export control and customs purposes. The shipper certifies that these commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

J230 482 407 1

J230 482 407 1

EXPORT

EXPORT

WITHIN BRACKETS

13854

055410_P1

10101552

7 of 100

SHIPMENT FROM

UPS ACCOUNT NO. [illegible]

REFERENCE NUMBER

14901 21

TELEPHONE 1-431 4-12

[illegible] CST

4212 Buckman Hwy 101

SYRACUSE NY 13211

Chem Tech
12-8-16
10:30
4.8

DELIVERY TO

LAB

CHEMTECH

249 Sheffield St

[illegible] NY 14212

TELEPHONE 708 731 2128

Residential ☐

UPS Next Day Air® 1

J230 482 407 1

J230 482 407 1

TRACKING NUMBER

DATE OF SHIPMENT

12/7/16

DELIVERY

010191120 1/10 S

United Parcel Service, Louisville, KY

54 of 56

H5958

6.2

01113701 1/12 RRD

13853

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10101552

9 of 100

UPS Next Day Air®
UPS Worldwide Express®
Shipping Document

WEIGHT	LTR	PAK	WEIGHT	DIMENSIONAL WEIGHT If Applicable	LARGE PACKAGE	SHIPPER RELEASE
	☐	☐	4½		☐	☐

1

☐ EXPRESS (INT'L)

☐ DOCUMENTS ONLY

☐

SATURDAY DELIVERY

The shipper authorizes UPS to act as forwarding agent for export control and customs purposes.
The shipper certifies that these commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

SHIPMENT FROM

UPS ACCOUNT NO. [illegible]

REFERENCE NUMBER

TELEPHONE

J230 482 409 9

J230 482 409 9

EXPORT

Clara
12-8-16
10:30

DELIVERY TO

TELEPHONE

Residential ☐

UPS Next Day Air® 1

J230 482 409 9

J230 482 409 9

TRACKING NUMBER

DATE OF SHIPMENT 12/7/16

DELIVERY

55 of 56

010191120 1/10 S

United Parcel Service, Louisville, KY

H5958

Laboratory Certification

Certified By	License No.
CAS EPA CLP Contract	EP-W-14-030
Connecticut	PH-0649
DOD ELAP (L-A-B)	L2219
Florida	E87935
Maine	2012025
Maryland	296
New Hampshire	255413
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	P330-13-00380
Texas	T104704488-13-5

Appendix F

Excavation Work Plan

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Bianchi/Weiss Greenhouses Site, Suffolk County
East Patchogue, New York

Excavation Work Plan

NYSDEC Site Number: 152209
USEPA ID # NYR000209486

Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway
Albany, New York 12207

Prepared by

EA Engineering, P.C. and its Affiliate
EA Science and Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
(315) 431-4610

Revisions to Final Approved Excavation Work Plan

Revision Number	Date Submitted	Summary of Revision	New York State Department of Environmental Conservation Approval Date

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JUNE 2019

CERTIFICATION STATEMENT

I Donald Conan, P.E. certify that I am currently a NYS registered professional engineer and that this Excavation Work 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).

Donald Conan P.E.

6/18/19

DATE

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TABLE OF CONTENTS

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LIST OF ACRONYMS/ABBREVIATIONS

DER	Division of Environmental Remediation
EWP	Excavation Work Plan
HASP	Health and Safety Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules, and Regulations
ppm	Parts per million
SMP	Site Management Plan
TCL	Target Compound List
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank

1. INTRODUCTION

1.1 NOTIFICATION

At least 15 days prior to the start of any activity, which is anticipated to encounter remaining contamination in soils, the Site owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC). The following table 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 B of the Site Management Plan (SMP).

Notifications*

Name	Contact Information
Brian Jankauskas Central NYSDEC Representative	518-402-9626 brianjankauskas@dec.ny.gov
Walter Parish, Regional Office NYSDEC Representative	50 Circle Road SUNY at Stonybrook Stony Brook, New York 11790
Chief, Site Control NYSDEC Site Control Representative	Division of Environmental Remediation 625 Broadway Albany, New York 12233-7020
*Notifications are subject to change and will be updated as necessary. Note: NYSDEC = New York State Department of Environmental Conservation SUNY = State University of New York	

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 ground surface, 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 Excavation Work Plan (EWP).

- A statement that the work will be performed in compliance with this EWP and 29 Code of Federal Regulations 1910.120.
- A copy of the contractor's health and safety plan (HASP), in electronic format.

- Identification of disposal facilities for potential waste streams.

- Identification of sources of any anticipated backfill, along with all required chemical testing results.

1.2 SOIL SCREENING METHODS

Prior to intrusive soil screening, onsite utilities shall be field located. Soil screening is to take place prior to any excavation or disposal of soil within Site boundaries. Soil samples shall be collected at a minimum of 1 three to five point composite sample per Division of Environmental Remediation (DER)-10 Section 5.4(e) or as approved by NYSDEC, and analyzed for chlordane by U.S. Environmental Protection Agency (USEPA) Method 8081B and lead by USEPA Method 6010B, if soil is to be disposed of offsite, follow the disposal facility's requirements.

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.

Soils will be segregated based on previous environmental data and screening results into material that requires offsite disposal and material that requires testing to determine if the material can be reused onsite as soil beneath a cover or if the material can be used as cover soil. Further discussion of offsite disposal of materials and onsite reuse is provided in Section 1.6 of this EWP.

1.3 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, maintained at the Site, and available for inspection by the NYSDEC.

1.4 MATERIALS EXCAVATION AND LOAD-OUT

Excavated potentially contaminated soils shall be stockpiled separately from uncontaminated soils and debris prior to load-out. Excavations left open overnight or longer shall be surrounded by temporary construction fencing. 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 EWP. The presence of utilities and notices 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 notices 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 New York State Department of Transportation requirements (and all other applicable transportation requirements).

A truck wash will be operated onsite, 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 offsite in an appropriate manner. Locations where vehicles enter or exit the Site shall be inspected daily for evidence of offsite 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.

1.5 MATERIALS TRANSPORT OFFSITE

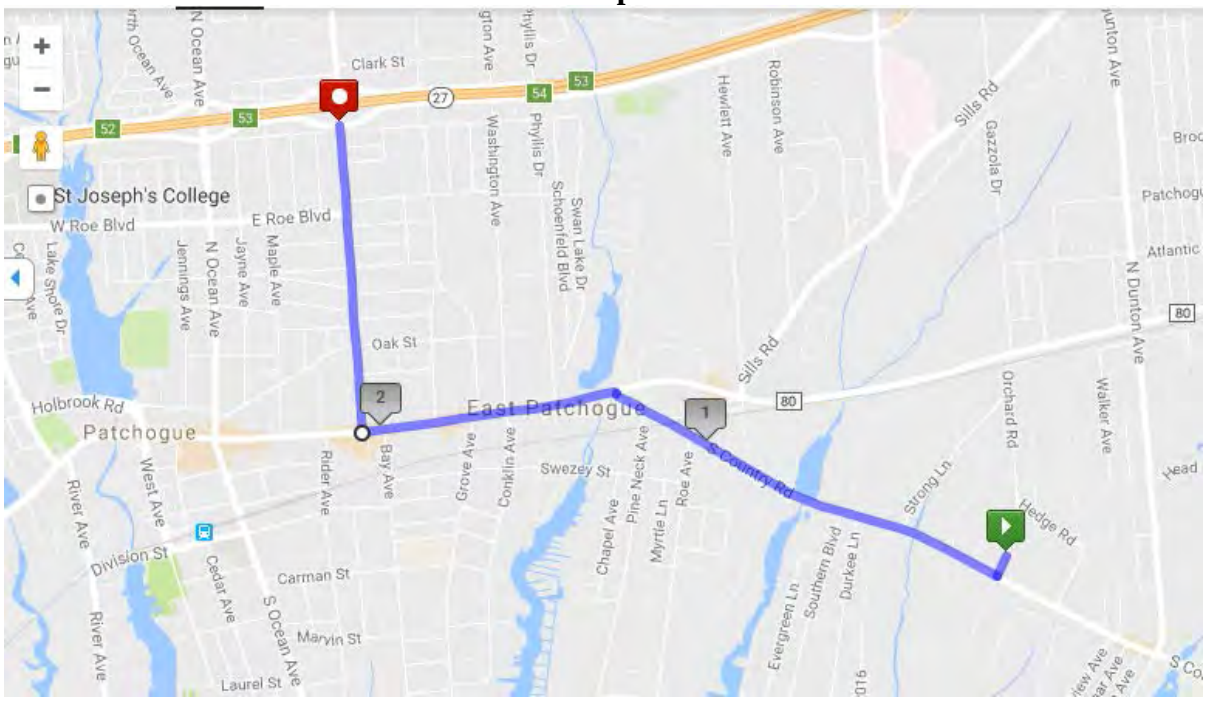
All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6New York Codes, Rules, and Regulations (NYCRR) Part 364. Haulers will be appropriately licensed and trucks properly placarded.

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:

- Exit the Site going southwest on Orchard Road
- Take first right onto S Country Road/County Highway-36
- Turn left onto E Main Street/County Highway-80
- Turn right onto Medford Avenue/NY-112
- Follow signs to enter Sunrise Highway east or west, as necessary.

Truck Transport Route



Map courtesy of mapmyrun.com

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 offsite 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.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development. Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Queuing of trucks will be performed onsite in order to minimize offsite disturbance. Offsite queuing will be prohibited.

1.6 MATERIALS DISPOSAL OFFSITE

All material excavated and removed from the Site (USEPA ID # NYR000209486) 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 offsite disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated offsite management of materials from this Site will not occur without formal NYSDEC approval.

Offsite 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, construction/debris 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 offsite 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).

1.7 MATERIALS REUSE ONSITE

Analytical results from soil screening activities, which are completed in accordance with Section 1.2 of this EWP, will be used to determine if reuse is appropriate. Material is suitable for onsite re-use if the following criteria is met:

Material Re-use Criteria

Constituent	NYCRR Part 375 Table 375-6.8(b) Restricted Use Soil Cleanup Objectives, Residential (ppm)	NYSDEC CP-51 Table 1 Supplemental Soil Cleanup Objectives, Residential (ppm)
Alpha chlordane	0.91	—
Gamma chlordane	—	0.54
Lead	400	—

Note:
ppm = Parts per million
NYSDEC = New York State Department of Environmental Protection
NYCRR = New York Codes, Rules, and Regulations

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain onsite.

Concrete crushing or processing onsite will not be performed without prior NYSDEC approval.

1.8 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 offsite, 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.

1.9 BACKFILL FROM OFFSITE SOURCES

Action should describe all methods to be followed for the import, handling, and placement of backfill material from offsite. The requirements for backfill used at the Site should be consistent with the backfill requirements provided in NYSDEC DER-10 (e.g., Appendix 5).

The following topics should be covered:

- Department of Transportation Certification
  - — Chemical sampling.
- Stockpile procedures for imported backfill material
  - — Size of stockpiles, cover, etc.

The following text should be included in this section:

Soil fill material to be used onsite from an offsite location must be from a Department of Environmental Remediation (DER)-approved source. If the source has not been previously approved by the DER, the following must be submitted to the DER for approval:

- The name of the person providing the documentation and relationship to the source of the fill
- The location where the fill was obtained
- Identification of any state or local approvals as a fill source
- If no prior, approval is available for the source, a brief history of the use of the property, which is the source of the fill.

Any soil fill material brought onsite from offsite sources shall contain no contaminants exceeding the residential use Soil Cleanup Objectives as defined by Table 375-6.8(b) of 6 NYCRR Part 375. Common fill material from offsite sources shall not contain man-made fills, trash, refuse, frozen material, or any other deleterious materials. Material shall not contain free liquids when delivered, or placed and compacted. Manufactured sand is not acceptable for fill.

Common fill shall be tested in accordance with the following standard test methods and frequencies.

Fill Testing Requirements

Test	Method	Frequency
Chemical Testing for Contamination	USEPA SW-846	In accordance with DER-10 Section 5.4(e) or as approved by NYSDEC.

Note:
DER = Division of Environmental Remediation
NYSDEC = New York State Department of Environmental Conservation
USEPA = U.S. Environmental Protection Agency

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). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 375-6.8(b) for residential use. 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.

1.10 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, 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 this 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.

1.11 EXCAVATION CONTINGENCY PLAN

If underground storage tank (UST) or other previously unidentified contaminant sources or materials are found during post-remedial subsurface excavations or development related construction, the NYSDEC shall be notified immediately, and excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

All UST removal work shall be performed in accordance with Section 5.5 of the NYSDEC DER-10: *Technical Guidance for Site Investigation and Remediation* (May 2010). All UST removal work shall also comply with applicable local, county, state, and federal regulations. Ten days' notice must be provided to the NYSDEC DER prior to closure of a regulated UST.

The contractor shall monitor the Site with an explosimeter and an organic vapor detector to indicate the presence and concentration of flammable vapors and gas. The atmosphere in the bottom, middle, and top of the excavation shall be monitored with the explosimeter regularly until the tank is removed from the Site. If unsafe working conditions exist at any point during removal, work shall be suspended immediately until it is determined that conditions are acceptable for resuming work.

During excavation, extreme caution shall be exercised in order to maintain the integrity of the UST. Excavated material shall be placed in a separate stockpile, sampled, and submitted for acceptance by an approved disposal facility.

Removal of each tank shall consist of opening the tank, cleaning the interior, removal of the tank from the Site, and disposal. This includes removal and disposal of all service lines associated with each UST back to their source. Disposal shall be in strict accordance with NYSDEC and applicable local, county, state, and federal regulations. The contractor shall remove all liquid and sludge from the tank using explosion proof pumps. All equipment must be bonded to the tank, and the tank must be grounded to a separate ground when purging the tank with compressed air or inert gas under pressure. The contractor shall avoid leakage from the tanks onto the surrounding soil by properly pumping the contents of the tanks into permitted transport vehicles. Transport vehicles for tank contents shall not remain onsite for more than 24 hours. The removed contents shall be disposed of according to appropriate federal, state, and local laws. If leakage or spillage occurs, the contractor shall immediately notify the NYSDEC Spill Case Hotline, and the Suffolk County health department within 15 minutes.

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 (target analyte list metals; target compound list [TCL] volatiles and semi-volatiles, TCL pesticides, and polychlorinated biphenyls), 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 Spill Case Hotline. These findings will be also included in the Periodic Review Report.

1.12 COMMUNITY AIR MONITORING PLAN

Continuous air monitoring will be conducted for protection of the downwind community during site work activities, per the New York Department of Health (NYSDOH) generic Community Air Monitoring Plan in DER-10 Appendix 1A. Continuous monitoring for volatile organic compound (VOC) and particulate levels at the perimeter of the work area using approved instrumentation will be required during ground intrusive activities, which include excavation and handling of Site soil, test pitting, trenching, and the installation of soil borings. If total VOC levels exceed 5 parts per million (ppm) above background at the work area perimeter or 25 ppm (whichever is lower), work activities will be halted and monitoring continued. All readings will be recorded and available to the NYSDEC and NYSDOH personnel to review.

Because the site is surrounded by residential properties, fixed monitoring stations will be located at the site perimeter on all sides of the site, regardless of wind direction.

Exceedances of action levels listed in the Community Air Monitoring Plan will be reported to NYSDEC and NYSDOH Project Managers.

1.13 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors offsite, and onsite, if there are residents or tenants on the property. Specific odor control methods to be used on a routine basis will include odor-masking agents. 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 site developer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent onsite and offsite 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 offsite 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 construction activities that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to onsite 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.

1.14 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the use of a dedicated onsite water truck for road wetting. The truck will be equipped with 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.

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

1.15 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 construction activities.

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

Appendix G

Sump Pump Filtration System Installation Scope of Work

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SCOPE OF WORK
BASEMENT WATER (SUMP PUMP) FILTER SYSTEM INSTALLATION
BIANCHI-WEISS GREENHOUSES NYS SUPERFUND SITE
EAST PATCHOGUE, SUFFOLK COUNTY, NEW YORK

The New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) for the Bianchi-Weiss Greenhouses NYS Superfund Site (Site No. 152209) in East Patchogue, Suffolk County, New York. A component of the ROD included remedial action at selected residential structures in the vicinity of the site. The remedial action includes installation of a basement sump water filtration system at residences with impacted water infiltrating into the basement.

This scope of work describes the required tasks to install the system(s). The system modification shall be limited to the interior portion of the sump system. The contractor shall make the connection to the existing discharge line at the point of exit from the home. In the event that a new system is to be installed in a home without an existing foundation drainage system, a pressure analysis will be completed for the foundation walls to determine if a drainage system should or should not be installed at that home. If a drainage system is to be installed, a new discharge line will be installed to drain pumped water away from the home, to ground surface.

SITE EVALUATION

The CONTRACTOR shall perform a thorough evaluation of the property prior to commencement of work. The objective of this evaluation will be to determine the following:

1. Current location and size of existing sump.
    a. Confirm whether the existing sump (once removed) is sufficient to accommodate the duplex sump basin.
2. Identify a location for the new filter system. This must be determined with homeowner input/approval. The filters must be located inside, in an area protected from freezing temperatures, to prevent damage due to freezing.
3. Current condition size of electrical circuit servicing the existing pump.
    a. Confirm capacity of existing circuit to handle the new pump motor (1/3 Hp) and determine need for new circuit [120 V / 1 Phase / 60 Hz.].
    b. Scope of electrical work includes assessing the need for new circuit, installation of GFCI circuit breaker, circuit length from distribution panel to GFCI receptacle, size of conductors and conduit. Note: all work shall be performed in accordance with NEC by a licensed electrician.
4. Identification of foundation cracks that may require sealing.
5. If a residence has two sump pump systems, two independent pump and filter systems shall be installed.

GENERAL

1. CONTRACTOR shall obtain all required permits needed to complete this work.
2. Work shall be performed in accordance with all applicable Federal, State, and Local regulations.

HEALTH AND SAFETY

During all field activities, the Subcontractor shall follow all OSHA requirements for general industry, hazardous waste site operations, and construction.

PERSONNEL

The CONTRACTOR shall submit the name and registration number of the licensed electrician to NYSDEC before starting electrical work.

SUMP EXPANSION

The existing sump pit is to be removed and the hole expanded, if necessary, to fit the 36-inch diameter by 38" deep duplex sump pump basin. If the hole for the sump requires expansion, CONTRACTOR shall saw cut concrete. The annulus space between the sides of the hole and basin is to be filled with clean washed stone to within 3-inches of the basement floor. The contractor must follow the manufacturer's instructions for installation, Attachment A. Basement floor surrounding newly installed sump pit is to be returned to the original condition using QUIKRETE® Concrete Mix (No. 1101) concrete.

SUMP PUMP INSTALLATION

Two 250 Series Liberty Pumps shall be installed in the sump. The contractor must follow the manufacturer's instructions for installation, Attachment B. The pumps come with 1.5-inch discharge openings. CONTRACTOR shall install a 2" X 1.5" PVC reducer to allow for system pipe size of 2-inch. A check valve is to be installed at the outlet of the pump. A sketch showing the filter arrangement and by-pass line is included in Attachment D. All water piping shall be Schedule 40 PVC.

The sump basin includes a 2" vent opening in the cover. The CONTRACTOR shall install the vent pipe to extend through the wall of the house, care should be taken not to locate adjacent to any air intake devices. Vent location must be chosen with homeowner input/approval. DWV PVC pipe and fittings are acceptable for vent construction.

ELECTRICAL INSTALLATION

If, based on the initial site evaluation, it is determined a new dedicated circuit is required, the CONTRACTOR shall install a new GFCI breaker in the existing panel, and all conductors, conduit, and boxes necessary to install a GFCI receptacle within 5 feet of the

new sump pumps. If it is determined the existing circuit has capacity for the new pumps, the CONTRACTOR shall replace the circuit breaker and receptacle with GFCI devices if they are not already.

Pump controls are to be installed for the duplex sump pump system to enable float switch and alternating operation. Pump Control (Model AE21L=3) installation instructions are provided as Attachment C.

A licensed electrician shall perform all electrical work including sizing of breakers, conductors, conduit and receptacles.

FILTER INSTALLATION AND CONNECTIONS

Two (2) Parker (Fulflo® FP) filter housings, installed in parallel, shall be installed on the sump pump discharge line. Parker (Fulflo® Flo-Pac®) 0.5 micron filter cartridges shall be installed within the housing. The selected filter housing, FP1-2-2, is designed for a 36-inch cartridge. Each housing can accommodate either one 36-inch cartridge (FP-736-0.5-8 –V), or two 18-inch cartridges (FP-718-0.5-8 –V). Filter housings shall be secured to the basement floor in accordance with manufacturer's recommendations. Filter housing and cartridge information are included in Attachment C.

BYPASS LINE

In order to allow for pump discharge in the event that the filter housing malfunctions or the filters are clogged and in need of replacement, a bypass shall be installed before the filter housing. The bypass valve shall open when the pressure has reached 9 psi. The specified pressure relief valve is adjustable. CONTRACTOR shall test relief valve at time of installation by closing the valve at the filter inlet. An informational cut-sheet for the Dayton pressure relief valve is included as Attachment F. A flow meter shall be installed on the bypass line for ease of monitoring. An information sheet for the Badger Meter Recordall Model 170 is included as Attachment G.

SEALING FOUNDATION CRACKS

Foundation cracks identified during the site evaluation shall be sealed with Polygem's liquid concrete repair (LCR) epoxy or equivalent product, Attachment H.

Confirm the crack(s) is dry prior to sealing. If the crack is slightly damp, dry it with a blow-dryer, and then wait 15 minutes. Scrub the crack clean of any loose concrete, paint or old filler using a wire brush. Remove all dust and debris with a shop vacuum. Tap 3-in. (10d) finishing nails partway into the crack, spaced 12 in. apart. The nails will be used to align the injection ports with the crack.

Mix the two part epoxy crack sealer in accordance with manufacturer's recommendations. Spread some sealer onto the base of each of the plastic injection ports, being careful not to plug up its hole. Slide the port over one of the nails sticking out of

the crack and press it to the wall. Install the remaining ports in a similar manner. Next, apply epoxy sealer to the entire crack using a 1 ½-in.-wide putty knife or margin trowel. Spread the sealer about 1/8 in. thick and 1 in. on either side of the crack. Cover the entire flange of each injection port with crack sealer, leaving only the extended neck portion showing. Smooth out the sealer and feather its edges with a paintbrush dipped in mineral spirits. Allow the sealer to cure for 6 to 10 hours before injecting the epoxy.

Thoroughly mix the LCR epoxy. Place the LCR cartridge into a caulk gun. Starting at the lowest injection port, dispense the epoxy into the crack. Continue squeezing the trigger until epoxy begins to ooze out of the port directly above. Remove the gun and plug up the port you just filled. Now insert the cartridge tip into the port that's oozing and squeeze the trigger to dispense the epoxy. Repeat this procedure for the remaining ports; plug up each one before moving on to the next. Allow the LCR to cure for five days, and then cut off the necks of the ports with a hacksaw.

PRODUCTS

The following products are incorporated in the scope-of-work:

Item	Manufacturer	Model No.	Quantity
Duplex Sump Basin	Liberty Pumps	1100 Series	1
1/3 HP Sump Pump	Liberty Pumps	250 Series	2
Duplex Single Phase Pump Control	Liberty Pumps	AE-21L=3	1
Pressure Relief Valve	Dayton	Grainger Part No. 4KHA2	1
Filter Cartridge (0.5 µm)	Parker (Fulflo® Flo-Pac®)	FP-736-0.5-8 –V	4
Filter Cartridge (0.5 µm)	Parker (Fulflo® Flo-Pac®)	FP-718-0.5-8 –V*	8*
Filter Vessel Housing	Parker (Fulflo® FP)	FP1-2-2	2
Flow Meter	Badger Meter	M170	1

*Note: The FP housing specified is designed to take either one 36” cartridge, or two 18” tall (2) cartridges stacked one on top of each other. CONTRACTOR shall select the most economical filter length. The quantity of filters includes spare filters for the first change-out.

ATTACHMENTS

The following attachments are included with this Scope of Work:

Attachment	Description
A	Liberty Duplex Basin Information Sheet and Installation Manual
B	Liberty Pumps Series 250 Pump Information Sheet and Installation Manual
C	Liberty Pumps AE-Series Duplex Pump Controls Information Sheet and

Installation Manual

D Process Flow Diagram

E Fulflo® Flo-Pac® Filter Cartridge & FP Series Filter Vessels Information Sheets

F Dayton Pressure Relief Valve Cut Sheet

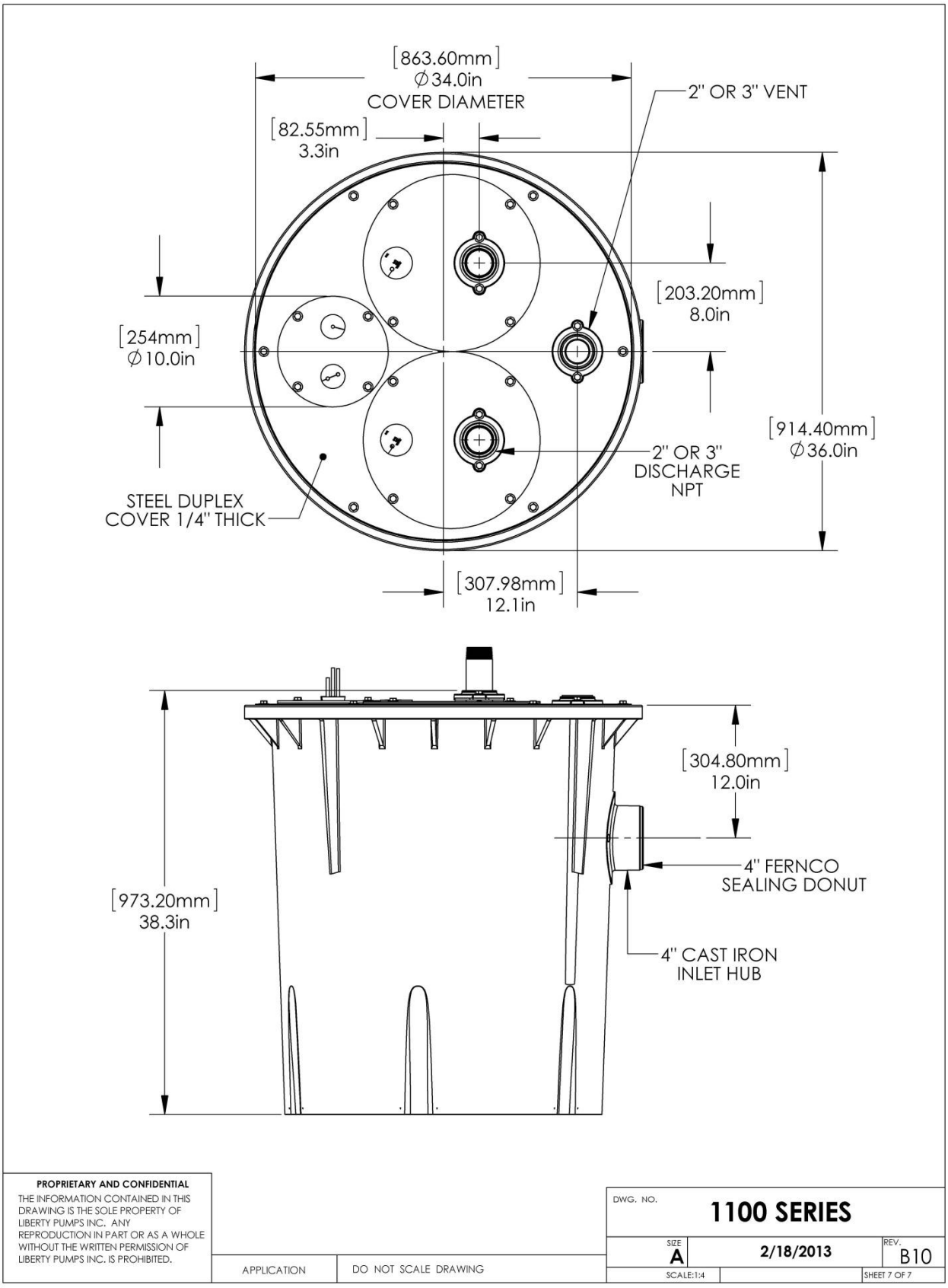
G Badger Meter Recordall Information Sheet

H Polygem Liquid Concrete Repair (LCR) Epoxy

Attachment A

Liberty Duplex Basin Information Sheet And Installation Manual

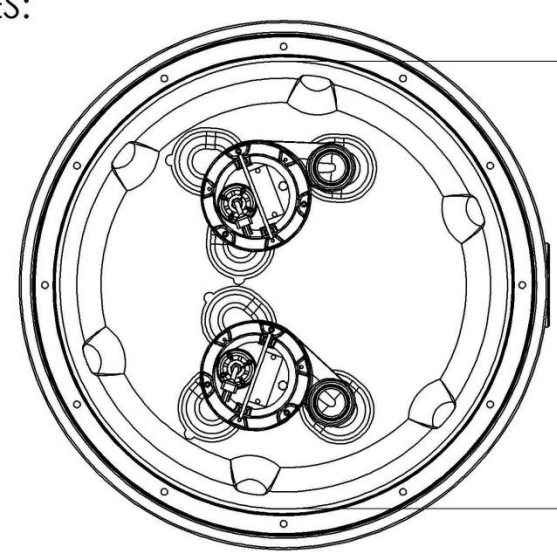
1100-Series Dimensional Data

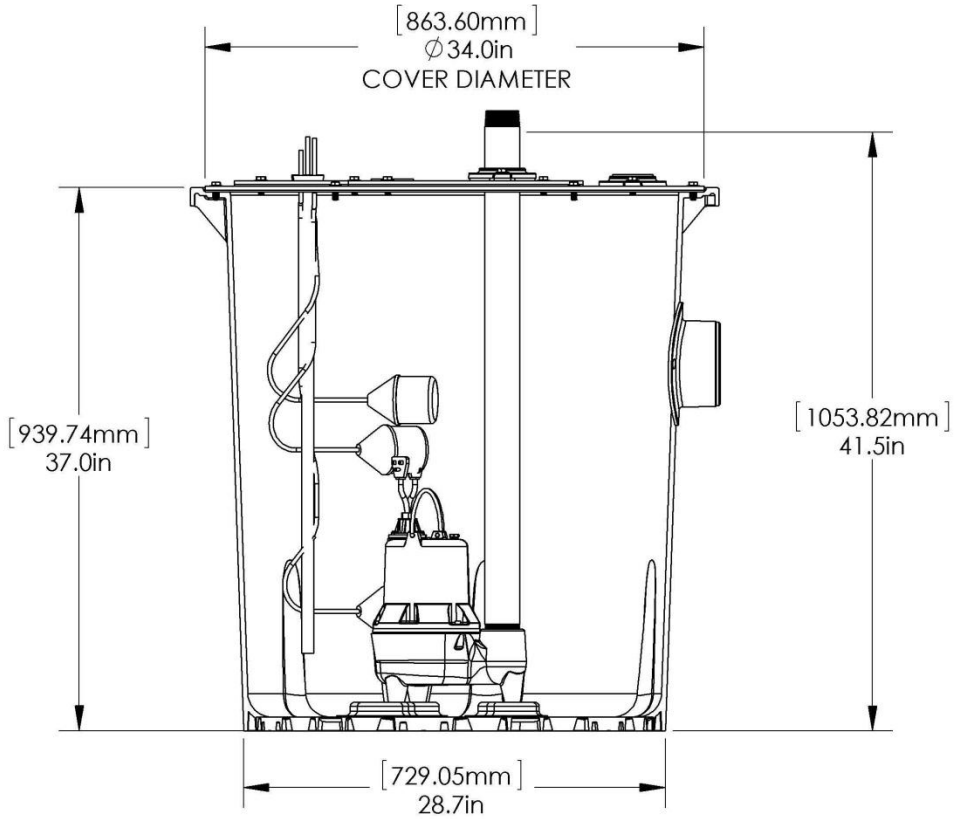


APPLICATION	DO NOT SCALE DRAWING	DWG. NO. **1100 SERIES**	
		SIZE **A**	**2/18/2013** REV. **B10**
		SCALE:1:4	SHEET 7 OF 7

LE40 SERIES SHOWN

AVAILABLE SERIES:
LE40
LE50
LE70
LE100
LEH100
LEH150
LEH200





APPLICATION | DO NOT SCALE DRAWING

DWG. NO. **1100 SERIES**

SIZE A | **9/12/2013** | REV. B10

SCALE:1:4 | SHEET 8 OF 9

Installation Manual

7034000K

LE and LEH Series Sewage Pumps

***Do not throw away or lose this manual.**

Models

LE40-Series	4/10 HP
LE50-Series	1/2 HP
LE70-Series	3/4 HP
LE100-Series	1 HP
LEH100-Series	1 HP
LEH150-Series	1.5 HP
LEH200-Series	2 HP

Contents

IMPORTANT:

Prior to installation, record Model, Serial Number, and Code Number from pump nameplate for future reference.

MODEL _____

SERIAL _____

CODE _____

INSTALLATION DATE _____

7000 Apple Tree Avenue
Bergen, NY 14416
Phone: (800) 543-2550
Fax: (585) 494-1839
www.libertypumps.com

1. General Information

Before Installation, read the following instructions carefully. Each Liberty pump is individually factory tested to assure proper performance. By closely following these instructions, potential operating problems should be eliminated, providing years of trouble-free service.

⚠ WARNING

- **Risk of electric shock**. Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.
- Always wear rubber boots when water is on the floor and you must unplug the pump.
- DO NOT bypass grounding wires or remove ground prong from attachment plugs.
- DO NOT use an extension cord.
- This pump requires a separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the pump, as noted on the nameplate.
- The electrical outlet shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code, Uniform Plumbing Code, International Plumbing Code, as well as all applicable local codes and ordinances.
- Sump and sewage pumps often handle materials which could cause illness or disease. Wear adequate protective clothing when working on a used pump or piping.
- Never enter a pump basin after it has been used. Sewage and effluent can emit several gases which are poisonous.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into pump while it is plugged in.
- DO NOT use this product for flammable or corrosive liquid.
- DO NOT use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, etc.)
- NEVER dispose of materials such as paint thinner or other chemicals down drains, as they can chemically attack and damage pump components, potentially causing product malfunction or failure.

⚠ CAUTION

- **DO NOT use pumps in water over 140°F (60°C).**
- DO NOT use pumps in mud, sand, cement, oil or chemicals.
- DO NOT modify the pump in any way.
- DO NOT lift or carry pump by power cord.
- DO NOT remove any tags from pump or cords.
- If pump is installed during construction before power is available, it must be protected from the environment to prevent water from entering through the cord plug end, etc.

⚠ WARNING **Disconnect old pump from power source before handling.**

Separate the discharge pipe at either the check valve or at the union. If neither a check valve nor a union is part of the existing discharge pipe, cut the pipe with a hacksaw and remove the pump (A union or check valve will need to be installed at this cut).

MODEL SPECIFICATIONS								
Model	**HP**	**Volts**	**Phase**	**Full Load Amps**	**Solids Handling**	**FNPT Discharge**	**Automatic or Manual***	**Shut-off Head**
LE41A	4/10	115	1	12	2”	2”	Automatic	19’
*LE41M	4/10	115	1	12	2”	2”	Manual*	19’
LE51A	1/2	115	1	12	2”	2”	Automatic	25’
*LE51M	1/2	115	1	12	2”	2”	Manual*	25’
LE52A	1/2	208-230	1	6.8	2”	2”	Automatic	25’
*LE52M	1/2	208-230	1	6.8	2”	2”	Manual*	25’
LE71A	3/4	115	1	12	2”	2” or 3”	Automatic	28’
*LE71M	3/4	115	1	12	2”	2” or 3”	Manual*	28’
LE72A	3/4	208-230	1	6	2”	2” or 3”	Automatic	28’
*LE72M	3/4	208-230	1	6	2”	2” or 3”	Manual*	28’
*LE73M	3/4	208-230	3	4.1	2”	2” or 3”	Manual*	28’
*LE74M	3/4	440-480	3	2.1	2”	2” or 3”	Manual*	28’
LE102A	1	208-230	1	8	2”	2” or 3”	Automatic	36’
*LE102M	1	208-230	1	8	2”	2” or 3”	Manual*	36’
*LE103M	1	208-230	3	5.3	2”	2” or 3”	Manual*	36’
*LE104M	1	440-480	3	2.5	2”	2” or 3”	Manual*	36’
*LE105M	1	575	3	1.9	2”	2” or 3”	Manual*	36’
NOTE: LEH100-Series High-Head pumps require a minimum application of 15’ head.								
LEH102A	1	230	1	12	2”	2” or 3”	Automatic	53’
*LEH102M	1	230	1	12	2”	2” or 3”	Manual*	53’
*LEH103M	1	208-230	3	9	2”	2” or 3”	Manual*	53’
*LEH104M	1	440-480	3	4.5	2”	2” or 3”	Manual*	53’
*LEH105M	1	575	3	3.3	2”	2” or 3”	Manual*	53’
NOTE: LEH150 & LEH200 Series High-Head pumps require a minimum application of 20’ head.								
LEH152A	1.5	208-230	1	15	2”	2” or 3”	Automatic	70’
*LEH152M	1.5	208-230	1	15	2”	2” or 3”	Manual*	70’
*LEH153M	1.5	208-230	3	10.6	2”	2” or 3”	Manual*	70’
*LEH154M	1.5	440-480	3	5.3	2”	2” or 3”	Manual*	70’
*LEH155M	1.5	575	3	4.9	2”	2” or 3”	Manual*	70’
*LEH202M	2	230	1	18	2”	2” or 3”	Manual*	83’
*LEH203M	2	208-230	3	13.2	2”	2” or 3”	Manual*	83’
*LEH204M	2	440-480	3	6.6	2”	2” or 3”	Manual*	83’
*LEH205M	2	575	3	5.5	2”	2” or 3”	Manual*	83’

* **Note:** Manual models (“M” suffix) and 3 phase models, as designated above, require a separate approved pump control device or panel for automatic operation. Operation of these models will be according to the control selected. Make sure the electrical specifications of the control selected properly match the electrical specifications of the pump. 3 phase models require overload elements selected or adjusted in accordance with the control or panel instructions.

WARNING:
Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.

2. The Basin

If the basin is already installed, proceed to Installation of the Pump.

The basin required for both effluent and sewage applications must be sealed and vented to meet health and plumbing code requirements. These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70. The diameter should be a minimum of 18" and the depth a minimum of 24". (These are minimum requirements. A larger basin may be required in both effluent and sewage applications depending on local codes and the number of fixture units entering the system. Check with the local authorities or contact Liberty Pumps if you are unsure of the proper basin size.) Installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, remove the check valve and size the basin and/or adjust pump differential to accommodate the additional backflow volume.

A. **Excavation:** Excavate the hole as small as possible, with a minimum recommended 8" diametrical clearance around the tank. Never place the basin directly in contact with rocks or other sharp objects. Place only fine, 1/8" to 3/4" pea gravel or 1/8" to 1/2" washed, crushed stone as bedding between the basin and the hole walls. Do not use sand or native soil as backfill. Properly compact underneath the basin to provide a solid, level base that can support the weight of the filled basin.

B. **Inlet Connection & Initial Backfill:** Only fine, 1/8" to 3/4" pea gravel or 1/8" to 1/2" washed, crushed stone should be used around the bottom of the basin to hold it in place. Do not use sand or native soil as backfill. Make the inlet connection as required for your basin.

Liberty P370 & P380-Series: The Liberty P370-& P380 Series basins have a 4" inlet molded to the side of the tank. This inlet is sized to accept a 4" no-hub type coupling. Connect the gravity drainage line from the fixtures to this hub.

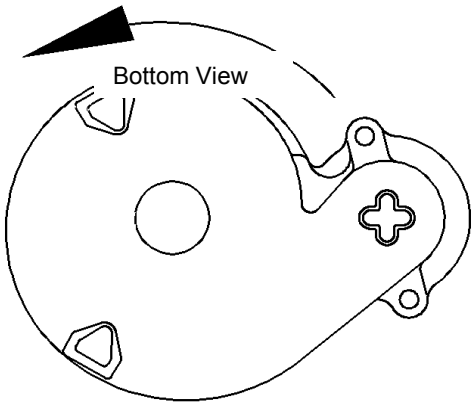
Other Basins: Other Liberty basins provide a 4" caulking hub or pipe grommet inlet. Hubs utilize caulking material or rubber donuts; grommets are a simple slip-fit. Connect the gravity drainage line from the fixtures to this opening. (Other inlet sizes available – consult factory.)

C. **Final Backfill:** Large rocks, clods, and foreign objects should be kept out of the backfill material. Only fine, 1/4" to 3/4" pea gravel, or 1/8" to 1/2" washed, crushed stone is recommended. Do not use sand or native soil as backfill. Mound the backfill slightly and allow for natural settling. Provide access to the basin cover for maintenance and service.

⚠ CAUTION **Do not exert heavy pressure or run heavy equipment on the backfill material as this could cause the tank to collapse.**

3. Installation of the Pump

⚠ CAUTION For 3-Phase pumps, check for proper rotation before installing pump into basin (see Fig. 1).



Check three phase pumps for proper rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump. Code the wires for reconnection after installation.

Fig. 1 – Proper impeller rotation, three phase models

Liberty pre-assembled sewage systems come with the pump(s) already pre-mounted in the basin. The discharge pipe(s) already exit through the cover, ready to be connected to the remaining discharge line. If you have purchased a pre-assembled system, disregard steps A and B below.

A. **Simplex (One Pump) Systems (see Fig. 2):** Set the pump in place making sure the float has adequate clearance to the side wall of the basin. If an optional control device or float is used, follow the directions for mounting that accompany the optional control. Minimum pump turn off level should not be set below 6". Connect the discharge pipe to the pump's threaded discharge. **IMPORTANT: Do not reduce the discharge pipe size below that which is provided on the pump.** Sewage pumps should not be smaller than 2". In some applications, it may be necessary to increase the pipe size to reduce friction losses. Contact Liberty Pumps or other qualified person if you have questions regarding proper pipe sizes and flow rates. Mount the basin cover provided, making sure is properly sealed. (This is a recommended installation. Variations may apply.)

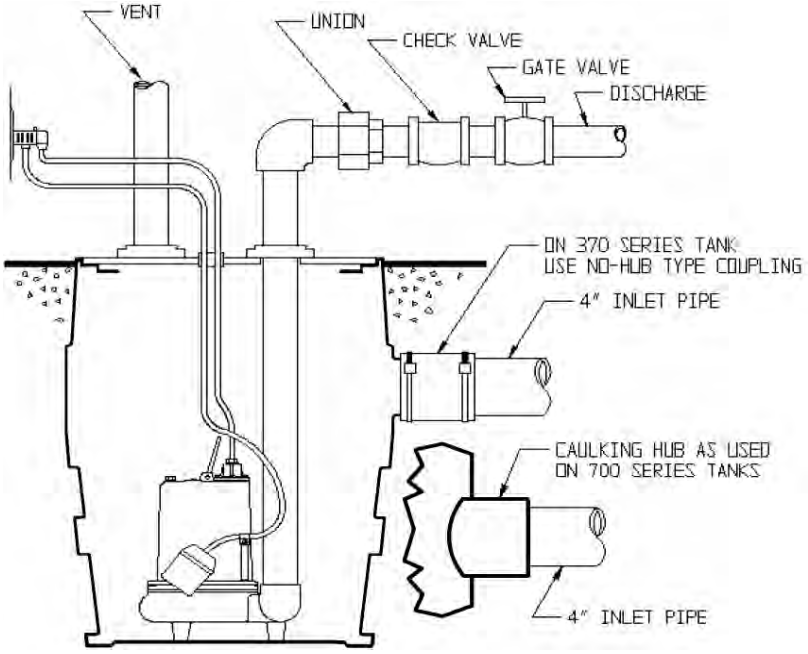


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Fig. 2 – Typical Installation Simplex System
This is a recommended installation only. Variations may apply.

B. **Duplex (Two Pump) Systems (see Fig. 3):** Set both pumps in place in the bottom of the basin. The duplex control used will include 3 or 4 floats that will either be tethered to one of the discharge pipes or to an independent rod hung from the cover. Follow the instructions provided with your duplex control device. Minimum pump turn off level should not be set below 6". Make sure all floats move freely. Connect an individual discharge pipe to each pump. **IMPORTANT: Do not reduce the discharge pipe size below that which is provided on the pump.** Sewage pumps should not be reduced below 2". In some applications, it may be necessary to increase the pipe size to reduce friction losses. Contact Liberty Pumps or other qualified person if you have any questions regarding proper pipe sizes and flow rates. To eliminate fluid recycling in duplex installations, it is necessary to have a check valve on each discharge line prior to tying the two discharges into one common line. Depending on the height of your basin, the check valves may either be installed inside or outside the basin. Mount the basin covers, making sure they are properly sealed.

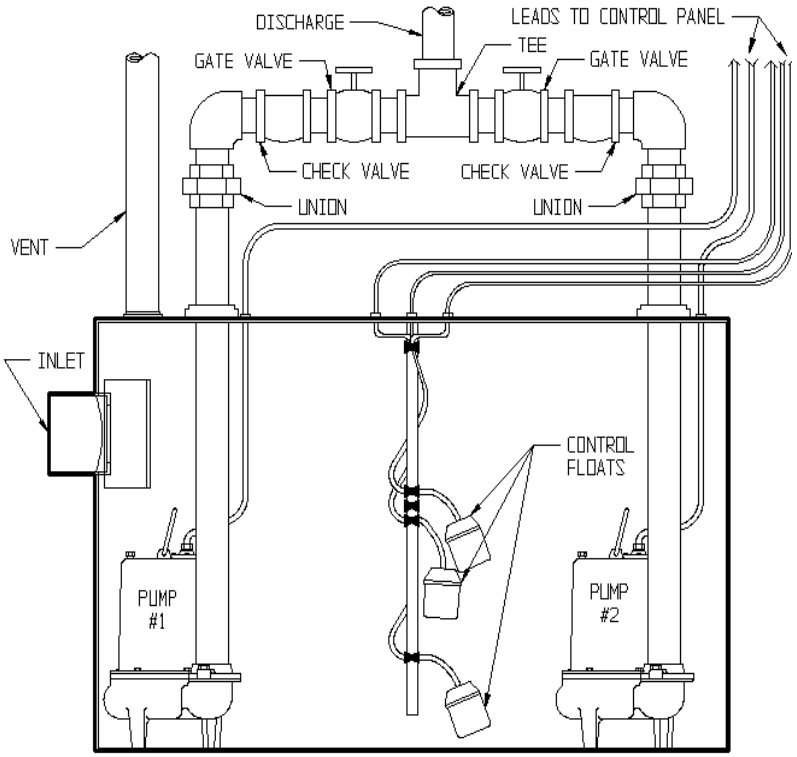


Fig. 3 – Typical Installation Duplex System
This is a recommended installation only. Variations may apply.

C. **Installation of Remaining Discharge (Simplex):** After the pump has been mounted and the cover sealed, install the remaining discharge line. A union should be installed just above the cover to facilitate pump removal if necessary. A check valve is recommended after the union to prevent the backflow of liquid after each pumping cycle. A gate valve should follow the check valve to allow periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns, to minimize friction head loss. Do not restrict the discharge to below 2" in sewage applications. Larger pipe sizes may be required to eliminate friction head loss over long runs. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size and flow rates. **Vent:** A connection is provided on top of the cover which must be piped to the existing building vent, or extended outside on its own standpipe. The vent size should be in accordance with applicable codes, but not less than the discharge size. **Some LE and LEH-Series pumps come equipped with an air bleed hole to help prevent air lock. A small spray of water from this hole is normal while pump is running.**

D. **Installation of Remaining Discharge (Duplex):** Unions or flexible connectors should be installed just above the cover on each discharge to facilitate removal of the pump if necessary. Free-flow swing check valves should be installed on each discharge after the union and prior to the gate valve to prevent the back flow of liquid or gas. A check valve on each discharge line, prior to tying into one common line, is necessary to prevent the recycling of fluid from one pump to the other. A gate valve is recommended after the check valve to allow for periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns to minimize friction head loss. Do not reduce the discharge to below 2" in sewage applications. Larger pipe sizes may be required to minimize friction head loss of longer runs. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size or flow rates.

Vent: A connection is provided on top of the unit for connection of the vent pipe. This pipe should be tied into the existing building vent stack, or extended outside on its own standpipe. The vent size should be in accordance with local codes, but not less than the discharge size. **Some LE and LEH-Series pumps come equipped with an air bleed hole to help prevent air lock. A small spray of water from this hole is normal while pump is running.**

4. Electrical Service & Operation

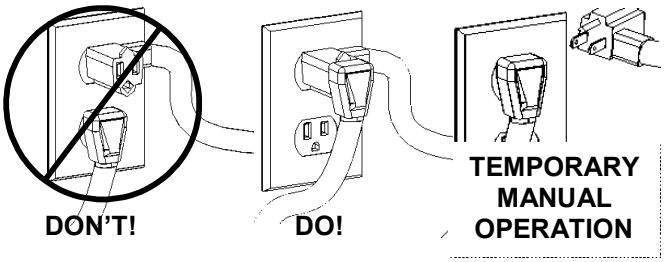
⚠ WARNING

- **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor or a grounding type attachment plug. To reduce the risk of electric shock, be certain that the grounding conductor is connected only to a properly grounded control panel or, if equipped with a grounding type plug that it is connected to a properly grounded, grounding type receptacle.
- DO NOT bypass grounding wires or remove ground prongs from attachment plugs.
- DO NOT remove cord and strain relief and DO NOT connect conduit to pump.
- DO NOT use an extension cord.
- This pump requires separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the motor, as noted on the pump nameplate.
- The electrical outlet or panel shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code and all applicable local codes and ordinances.

⚠ CAUTION When the risk of property damage from high water levels exists, an independent high water alarm or back up pump system should be installed.

All LE-Series "A" models (automatic pumps) come factory-equipped with a float switch mounted to the pump. These models come with two cords - one to the float switch and the other to the pump motor. The switch cord has a series (piggyback) plug enabling the pump (motor) cord to be plugged into the back of it (see Fig. 4). The purpose of this design is to allow manual operation of the pump.

Fig. 4 Piggyback plug installation.



For automatic operation using Liberty's supplied switch, the two cords should be interconnected and plugged into a separately fused, grounded outlet of proper amp capacity for your selected pump model. (See Section 1, General Information, or the pump nameplate for electrical specifications of your model.) Both cords are equipped with 3-prong plugs and must be plugged into a properly grounded 3-wire receptacle. DO NOT REMOVE THE GROUND PRONGS.

For manual operation, or in the event of switch failure, the pump cord can be separated and plugged into the electrical outlet, directly bypassing the switch. 208-230V single phase pumps should only be operated without the float switch by using the circuit breaker or panel disconnect. Do not let the pump run dry for extended periods.

The turn-on level of LE-Series "A" models is approximately 12" to 16" above the bottom of the basin. The turn-off level is approximately 6" above the bottom of the basin. Other pumping differentials may be obtained by tethering the switch cord to the discharge pipe.

NOTE: A minimum cord length of 3.5" from the tether point to the top surface of the float is required for proper switch operation. If using a differential other than the factory setting, be sure when the pump shuts off at least 6" of fluid is left in the basin so the impeller remains submerged.

NOTE: If the factory-mounted float is removed from the pump for relocation to the discharge pipe, be sure to replace and properly tighten the mounting bracket bolt in the pump as it is also used to secure the volute.

LE-Series pump models with an "M" designation are manual models with no switch. They are intended to be run using an approved liquid level control or approved motor control with correct rating that matches motor input in full load amperes. 3-phase models require the use of an approved motor control that matches motor input in full load amperes with overload element(s) selected or adjusted in accordance with control instructions.

Automatic operation with optional control devices: If the pump(s) are to be operated by either a simplex or duplex control panel, or other optional control device, follow the installation instructions provided with your specific control and make the power connections per those instructions. If necessary, certain models may be run without a separate control. 208-230V single-phase pumps should only be operated without the float switch by using the circuit breaker or panel disconnect. Do not let the pump run dry for extended periods.

LE-Series "A" and "M" models: If the pump is to be wired directly into a control device or junction box, and it is necessary to remove the plugs, have a certified electrician do the wiring in accordance with the National Electric Code and applicable local codes. See Fig. 5 for direct wire installation of single phase, automatic pumps.

⚠ WARNING

In 208-230V installations, one side on the line going to the pump is always "hot", whether the float switch is on or off. To avoid hazards, install a double pole disconnect near the pump installation.

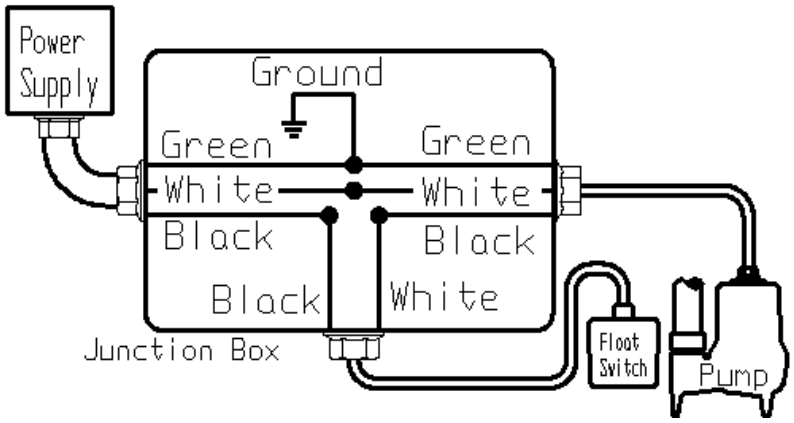


Fig. 5 – Direct Wiring of 115V or 208-230V, Single Phase, Automatic Pumps

5. Maintenance and Troubleshooting

⚠ WARNING **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.

Problem	Cause	Correction
Pump will not run.	• Blown fuse or other interruption of power; improper voltage.	• Check that the unit is securely plugged in. Have an electrician check all wiring for proper connections and adequate voltage and capacity.
	• Switch is unable to move to the "turn on" position due to interference with the side of basin or other obstruction	• Position the pump or switch so that it has adequate clearance for free operation.
	• Insufficient liquid level.	• Make sure the liquid level is allowed to rise enough to activate switch(s).
	• Defective switch.	• Remove and replace switch.
Pump will not turn off.	• Switch(s) unable to move to the "turn off" position due to interference with the side of basin or other obstacle.	• Position the pump or switch so that it has adequate clearance for free operation.
	• Defective switch.	• Remove and replace switch.
Pump runs or hums, but does not pump.	• Discharge is blocked or restricted.	• Check the discharge line for foreign material, including ice if the discharge line passes through or into cold areas.
	• Check valve is stuck closed or installed backwards.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Gate or ball valve is closed.	• Open gate or ball valve.
	• Total lift is beyond pump's capability.	• Try to route piping to a lower level. If not possible, a larger pump may be required. **Consult the factory.**
	• Pump impeller is jammed or volute casing is plugged.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
Pump runs periodically when fixtures are not in use.	• Check valve was not installed, is stuck open or is leaking.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Fixtures are leaking.	• Repair fixtures as required to eliminate leakage.
Pump operates noisily.	• Foreign objects in the impeller cavity.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
	• Broken impeller.	• Consult the factory for information regarding replacement of impeller.
	• Worn bearings.	• Return pump to the factory or authorized repair station for repair.
	• Piping attachments to building are too rigid.	• Replace a portion of the discharge line with rubber hose or connector.

6. 3 Year Limited Warranty

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Liberty Pumps, Inc. warrants that pumps of its manufacture are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident.

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase.

This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

Liberty Pumps®

7000 Apple Tree Avenue
Bergen, NY 14416
Phone: (800) 543-2550
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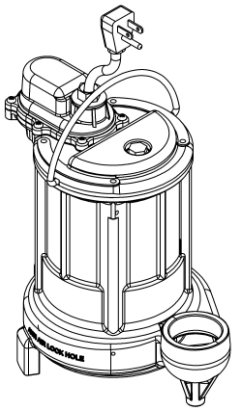
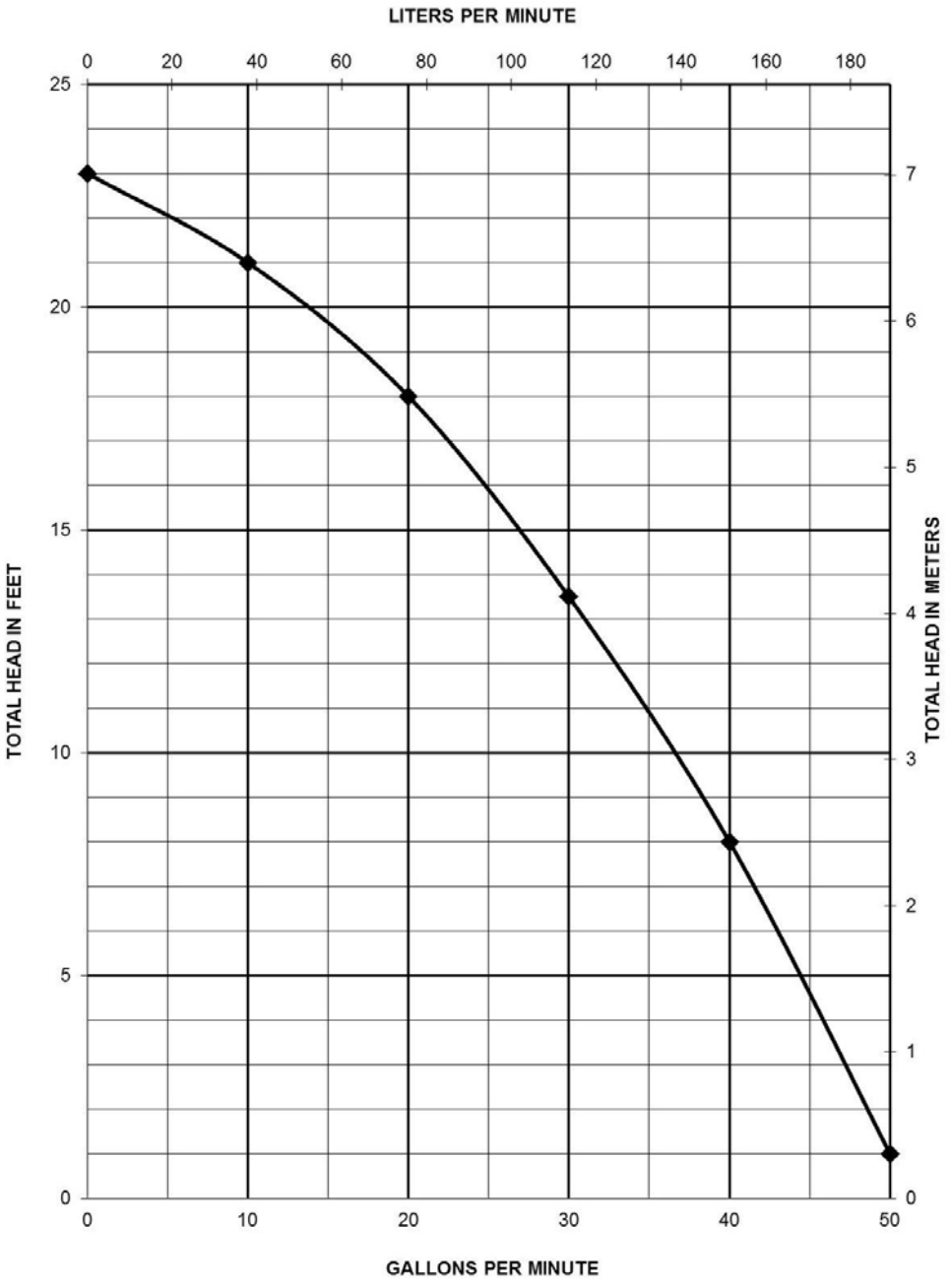
Attachment B

Liberty Pumps Series 250 Pump
Information Sheet and Installation Manual

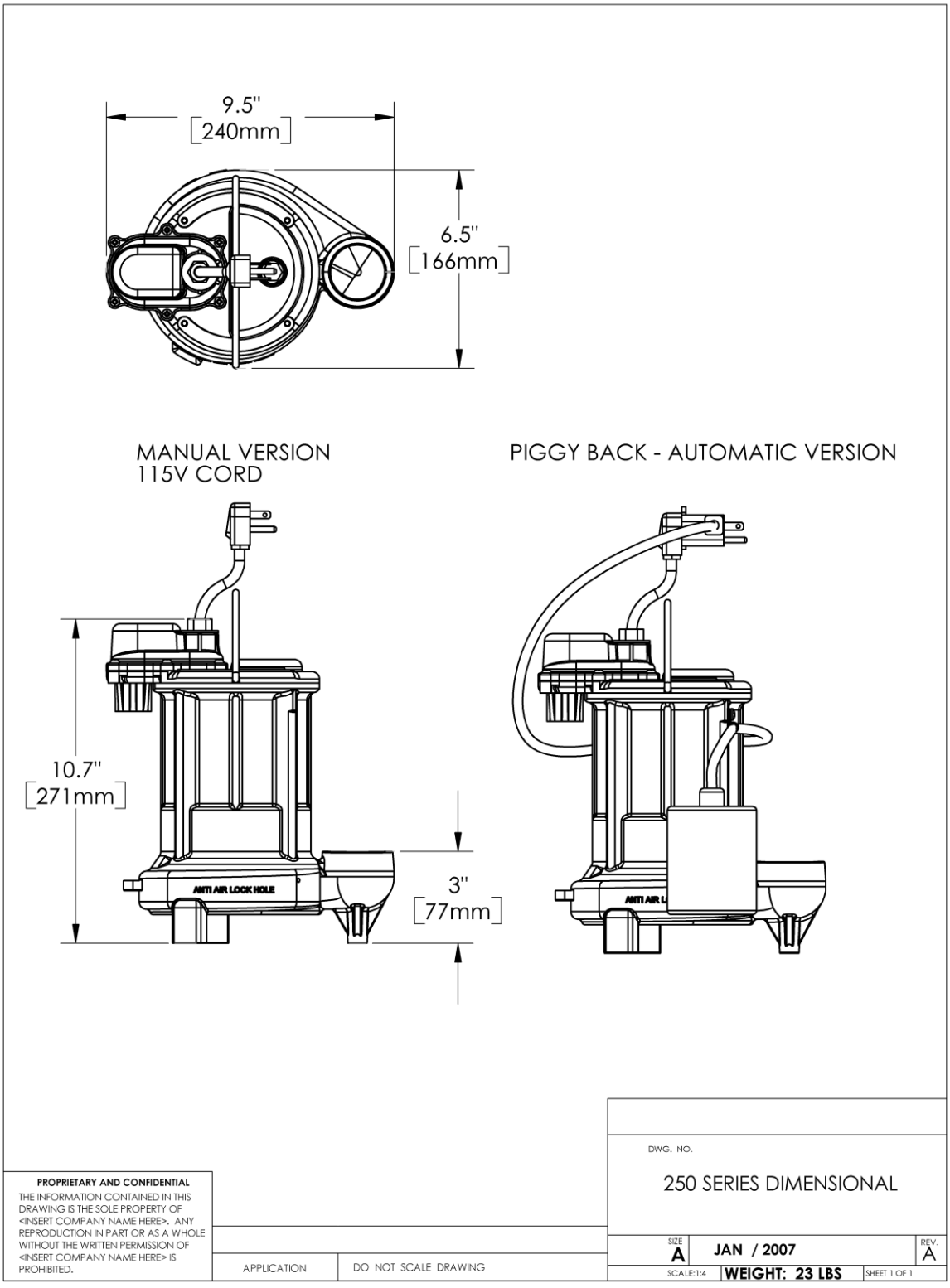
Pump Specifications

250 Series Submersible Sump / Effluent Pump





250-Series Dimensional Data



250-Series Electrical Data

MODEL	HP	VOLTAGE	PHASE	FULL LOAD AMPS	LOCKED ROTOR AMPS	THERMAL OVERLOAD TEMP	STATOR WINDING CLASS	CORD LENGTH FT	DISCHARGE	AUTOMATIC
250	1/3	115	1	5.2	8	105˚C / 221°F	B	10	1 1/2	NO MANUAL
~~251~~	~~1/3~~	~~115~~	~~1~~	~~5.2~~	~~8~~	~~105˚C / 221°F~~	~~B~~	~~10~~	~~1 1/2~~	YES ~~INTEGRAL~~ FLOAT
~~253~~	~~1/3~~	~~115~~	~~1~~	~~5.2~~	~~8~~	~~105˚C / 221°F~~	~~B~~	~~10~~	~~1 1/2~~	YES ~~PIGGY BACK~~ FLOAT
~~257~~	~~1/3~~	~~115~~	~~1~~	~~5.2~~	~~8~~	~~105˚C / 221°F~~	~~B~~	~~10~~	~~1 1/2~~	YES INTEGRAL VERTICLE FLOAT

250-Series Cord Length Options*

Model	~~10'~~	25'(-2)	~~35'(-3)~~	~~50'(-5)~~
250	~~Standard~~	Optional	~~Optional~~	~~Optional~~
~~251~~	Standard	Optional	Optional	~~Optional~~
~~253~~	Standard	Optional	Optional	~~N/A~~
~~257~~	Standard	Optional	N/A	~~N/A~~

10' cord length standard on all models. For optional lengths, add "-2, -3 or -5" suffix to model number.
Example: for model 250 with 35' cord. Order 250-3

WARNING: *Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.

250-Series Technical Data

IMPELLER	VORTEX ENGINEERED POLYMER
SOLIDS HANDLING SIZE	½"
PAINT	POWDER COAT
MAX LIQUID TEMP	60˚C 140˚C
MAX STATOR TEMP	CLASS B 130˚C/ 266˚F
THERMAL OVERLOAD	105˚C / 221˚F
POWER CORD TYPE	SJTW (10ft & 25ft models) SJTOOW (35ft & 50ft models)
MOTOR HOUSING / VOLUTE	CLASS 25 CAST IRON
SHAFT	STAINLESS
HARDWARE	STAINLESS
ORINGS	BUNA N
SEAL	ENGINEERED DOUBLE LIP SEAL WITH STAINLESS STEEL SPRINGS
WEIGHT	23 LBS

250-Series Specifications

1.01 GENERAL:

The contractor shall provide labor, material, equipment, and incidentals required to provide_____(QTY) centrifugal pumps as specified herein. The pump models covered in this specification are Series 250 single phase pumps. The pump furnished for this application shall be model _____as manufactured by Liberty pumps.

2.01 OPERATING CONDITIONS:

Each submersible pump shall be rated at 1/3 hp, 115 volts, single phase, 60 Hz., 3450 RPM. The unit shall produce _____G.P.M. at_____ feet of total dynamic head.

The submersible pump shall be capable of handling effluent with 1/2" solid handling capability. The submersible pump shall have a shut-off head of 23 feet and a maximum flow of 44 GPM @ 5 feet of total dynamic head.

The pump shall be controlled with:

_____A piggy back style on/off float switch.

_____An integrally wired on/off float switch.

_____A Vertical Mechanical Float (VMF) type on/off switch.

_____A NEMA 4X outdoor simplex control panel with three float switches and a high water alarm.

_____A NEMA 1 indoor simplex control panel with three float switches and a high water alarm.

_____A NEMA 4X outdoor simplex control panel with four float switches and a high water alarm.

_____A NEMA 1 indoor simplex control panel with four float switches and a high water alarm.

_____A NEMA 4X outdoor duplex control panel with three float switches and a high water alarm.

_____A NEMA 1 indoor duplex control panel with three float switches and a high water alarm.
_____A NEMA 4X outdoor duplex control panel with four float switches and a high water alarm.
_____A NEMA 1 indoor duplex control panel with four float switches and a high water alarm.

3.01 CONSTRUCTION:

Each centrifugal effluent pump shall be equal to the C US certified Series 250 SERIES pumps as manufactured by Liberty Pumps, Bergen NY. The castings shall be constructed of class 25 cast iron. The motor housing shall be oil filled to dissipate heat. Air filled motors shall not be considered equal since they do not properly dissipate heat from the motor. All mating parts shall be machined and sealed with a Buna-N o-ring. All fasteners exposed to the liquid shall be stainless steel. The motor shall be protected on the top side with sealed cord entry plate with molded pins to conduct electricity eliminating the ability of water to enter internally through the cord. The motor shall be protected on the lower side with an engineered double lip seal with stainless steel springs. The pump shall be furnished with stainless steel handle.

4.01 ELECTRICAL POWER CORD

The submersible pump shall be supplied with 10, 25, 35, or 50 feet of multiconductor power cord. It shall be cord type SJTW, or SJTOOW capable of continued exposure to the pumped liquid. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code. The power cable shall not enter the motor housing directly but will conduct electricity to the motor by means of a water tight compression fitting cord plate assembly, with molded pins to conduct electricity. This will eliminate the ability of water to enter internally through the cord, by means of a damaged or wicking cord.

5.01 MOTORS

Single phase motors shall be oil filled, permanent split capacitor, class B insulated NEMA B design, rated for continuous duty. At maximum load the winding temperature shall not exceed 130 degrees C unsubmerged. Since air filled motors are not capable of dissipating heat they shall not be considered equal. The pump motor shall have an integral thermal overload switch in the windings for protecting the motor. The capacitor circuit shall be mounted internally in the pump.

6.01 BEARINGS AND SHAFT

Upper and lower ball bearings shall be required. The bearings shall be a single ball / race type bearing. Both bearings shall be permanently lubricated by the oil, which fills the motor housing. The motor shaft shall be made of 300 or 400 series stainless steel and have a minimum diameter of .311".

7.01 SEALS

The pump shall have an engineered double lip seal with stainless steel springs. The motor plate / housing interface shall be sealed with a Buna-N o-ring.

8.01 IMPELLER

The impeller shall be engineered polymer, with pump out vanes on the back shroud to keep debris away from the seal area. It shall be threaded to the motor shaft.

9.01 CONTROLS

All pumps can be supplied with a CSA and UL approved VMF type switch, an integrally wired wide angle tilt float switch, or piggy back type wide angle tilt float switches. The piggy back style switches are equipped with a plug that allows the pump to be operated manually without the removal of the pump in the event that a switch becomes inoperable. Manual pumps are operable by means of a pump control panel.

10.01 PAINT

The exterior of the casting shall be protected with Powder Coat paint.

11.01 SUPPORT

The pump shall have cast iron support legs, enabling it to be a free standing unit.

12.01 SERVICEABILTY

Components required for the repair of the pump shall be shipped within a period of 24 hours.

13.01 FACTORY ASSEMBLED TANK SYSTEMS WITH GUIDE RAIL AND QUICK DISCONNECT DISCHARGE

_____Guide factory mounted rail system with pump suspended by means of bolt on quick disconnect which is sealed by means of nitrile grommets or o-rings. Discharge piping shall be schedule 80 PVC and furnished with a PVC shut-off ball valve. The Tank shall be wound fiberglass or roto-molded plastic. An inlet hub shall be provided with the fiberglass systems.

_____Stainless steel Guide Rail

_____Zinc plated steel Guide Rail

_____"diameter of basin size

_____"height of basin size

_____"distance from top of tank to discharge pipe outlet

_____Fiberglass cover

_____Structural foam polymer cover

_____Steel cover

_____Simplex System with Outdoor panel and alarm

_____Duplex System with Outdoor panel and alarm

_____Separate Outdoor Alarm

_____Remote Outdoor Alarm

14.01 TESTING

The pump shall have a ground continuity check and the motor chamber shall be Hi-potted to test for electrical integrity, moisture content and insulation defects. The motor and volute housing shall be pressurized, and an air leak decay test is performed to ensure integrity of the motor housing. The pump shall be run, voltage current monitored, and the tester checks for noise or other malfunction.

15.01 QUALITY CONTROL

The pump shall be manufactured in an ISO 9001 certified Facility.

16.01 WARRANTY

Standard limited warranty shall be 3 years.

Installation Manual

7035000K

Heavy Duty Submersible Effluent/Dewatering Pumps

***Do not throw away or lose this manual.**

Models

250-Series	1/3 HP
~~280-Series~~	~~1/2 HP~~
~~290-Series~~	~~3/4 HP~~
~~FL30-Series~~	~~1/3 HP~~
~~FL50-Series~~	~~1/2 HP~~
~~FL60-Series~~	~~6/10 HP~~
~~FL70-Series~~	~~3/4 HP~~
~~FL100-Series~~	~~1 HP~~
~~FL150-Series~~	~~1-1/2 HP~~
~~FL200-Series~~	~~2 HP~~

Contents

IMPORTANT:

Prior to installation, record Model, Serial Number, and Code Number from pump nameplate for future reference.

MODEL _____

SERIAL _____

CODE _____

INSTALLATION DATE _____

7000 Apple Tree Avenue
Bergen, NY 14416
Phone: (800) 543-2550
Fax: (585) 494-1839
www.libertypumps.com

1. General Information

Before Installation, read the following instructions carefully. Each Liberty pump is individually factory tested to assure proper performance. By closely following these instructions, potential operating problems should be eliminated, providing years of trouble-free service.

⚠ WARNING

- **Risk of electric shock**. Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded receptacle.
- Always wear rubber boots when water is on the floor and you must unplug the pump.
- DO NOT bypass grounding wires or remove ground prong from attachment plugs.
- DO NOT use an extension cord.
- Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.
- This pump requires a separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the pump, as noted on the nameplate.
- The electrical outlet shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code, Uniform Plumbing Code, International Plumbing Code, as well as all applicable local codes and ordinances.
- Sump and sewage pumps often handle materials which could cause illness or disease. Wear adequate protective clothing when working on a used pump or piping.
- Never enter a pump basin after it has been used. Sewage and effluent can emit several gases which are poisonous.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into pump while it is plugged in.
- DO NOT use this product for flammable or corrosive liquid.
- DO NOT use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, etc.)
- NEVER dispose of materials such as paint thinner or other chemicals down drains, as they can chemically attack and damage pump components, potentially causing product malfunction or failure.

⚠ CAUTION

- **DO NOT use pumps in water over 140°F (60°C).**
- DO NOT use pumps in mud, sand, cement, oil or chemicals.
- DO NOT modify the pump in any way.
- DO NOT lift or carry pump by power cord.
- DO NOT remove any tags from pump or cords.
- If pump is installed during construction before power is available, it must be protected from the environment to prevent water from entering through the cord plug end, etc.

Tools Required:

- Pipe wrench
- Regular screw driver
- Hacksaw (For replacement or removal of existing rigid piping.)

Removal of old pump

⚠ WARNING Disconnect old pump from power source before handling.

Separate the discharge pipe at either the check valve or at the union. If neither a check valve nor a union is part of the existing discharge pipe, cut the pipe with a hacksaw and remove the pump (A union or check valve will need to be installed at this cut).

MODEL SPECIFICATIONS

Model	HP	Volts	Full Load Amps	Solids Handling	Automatic or Manual	Shut-off Head	Factory Switch Setting	
							Turn-on	Turn-off
250*	1/3	115	5.2	1/2"	Manual*	22 ft.	*	*
251	1/3	115	5.2	1/2"	Automatic	22 ft.	11"	4-1/2"
253	1/3	115	5.2	1/2"	Automatic	22 ft.	11"	4-1/2"
257	1/3	115	5.2	1/2"	Automatic	22 ft.	7"	3-1/2"
250HV*	1/3	230	2.6	1/2"	Manual*	22 ft.	*	*
251HV	1/3	230	2.6	1/2"	Automatic	22 ft.	11"	4-1/2"
257HV	1/3	230	2.6	1/2"	Automatic	22 ft.	7"	3-1/2"
280*	1/2	115	8.5	3/4"	Manual*	37 ft.	*	*
281	1/2	115	8.5	3/4"	Automatic	37 ft.	13"	7"
283	1/2	115	8.5	3/4"	Automatic	37 ft.	13"	7"
287	1/2	115	8.5	3/4"	Automatic	37 ft.	9-1/2"	4"
280HV*	1/2	208-230	4.6	3/4"	Manual*	37 ft.	*	*
281HV	1/2	208-230	4.6	3/4"	Automatic	37 ft.	13"	7"
283HV	1/2	208-230	4.6	3/4"	Automatic	37 ft.	13"	7"
287HV	1/2	208-230	4.6	3/4"	Automatic	37 ft.	9-1/2"	4"
290*	3/4	115	10.4	3/4"	Manual*	48 ft.	*	*
291	3/4	115	10.4	3/4"	Automatic	48 ft.	13"	7"
293	3/4	115	10.4	3/4"	Automatic	48 ft.	13"	7"
297	3/4	115	10.4	3/4"	Automatic	48 ft.	9-1/2"	4"
290HV*	3/4	208-230	5.3	3/4"	Manual*	48 ft.	*	*
291HV	3/4	208-230	5.3	3/4"	Automatic	48 ft.	13"	7"
293HV	3/4	208-230	5.3	3/4"	Automatic	48 ft.	13"	7"
297HV	3/4	208-230	5.3	3/4"	Automatic	48 ft.	9-1/2"	4"
FL31M*	1/3	115	13	3/4"	Manual*	19 ft.	*	*
FL31A	1/3	115	13	3/4"	Automatic	19 ft.	12"	5"
FL32M*	1/3	208-230	7	3/4"	Manual*	19 ft.	*	*
FL32A	1/3	208-230	7	3/4"	Automatic	19 ft.	12"	5"
FL51M*	1/2	115	12	3/4"	Manual*	55 ft.	*	*
FL51A	1/2	115	12	3/4"	Automatic	55 ft.	13"	6"
FL52M*	1/2	208-230	6.5	3/4"	Manual*	55 ft.	*	*
FL52A	1/2	208-230	6.5	3/4"	Automatic	55 ft.	13"	6"
FL62M*	6/10	208-230	8.2	3/4"	Manual*	65 ft.	*	*
FL62A	6/10	208-230	8.2	3/4"	Automatic	65 ft.	13"	6"
FL63M*	6/10	208-230 3PH	5.6	3/4"	Manual*	65 ft.	*	*
FL64M*	6/10	440-480 3PH	2.8	3/4"	Manual*	65 ft.	*	*
FL72M*	3/4	208-230	10.5	3/4"	Manual*	77 ft.	*	*
FL72A	3/4	208-230	10.5	3/4"	Automatic	77 ft.	13"	6"
FL73M*	3/4	208-230 3PH	7.5	3/4"	Manual*	77 ft.	*	*
FL74M*	3/4	440-480 3PH	3.5	3/4"	Manual*	77 ft.	*	*
FL102M*	1	208-230	12	3/4"	Manual*	90 ft.	*	*
FL102A	1	208-230	12	3/4"	Automatic	90 ft.	15"	8"
FL103M*	1	208-230 3PH	9	3/4"	Manual*	90 ft.	*	*
FL104M*	1	440-480 3PH	4.5	3/4"	Manual*	90 ft.	*	*
FL105M*	1	575 3PH	3.3	3/4"	Manual*	90 ft.	*	*
FL152M*	1-1/2	208-230	15	3/4"	Manual*	110 ft.	*	*
FL152A	1-1/2	208-230	15	3/4"	Automatic	110 ft.	15"	8"
FL153M*	1-1/2	208-230 3PH	10.6	3/4"	Manual*	110 ft.	*	*
FL154M*	1-1/2	440-480 3PH	5.3	3/4"	Manual*	110 ft.	*	*
FL155M*	1-1/2	575 3PH	4.9	3/4"	Manual*	110 ft.	*	*
FL202M*	2	208-230	15	3/4"	Manual*	130 ft.	*	*
FL202A	2	208-230	15	3/4"	Automatic	130 ft.	15"	8"
FL203M*	2	208-230 3PH	10.6	3/4"	Manual*	130 ft.	*	*
FL204M*	2	440-480 3PH	5.3	3/4"	Manual*	130 ft.	*	*
FL205M*	2	575 3PH	4.9	3/4"	Manual*	130 ft.	*	*

* **Note:** Manual models ("M" suffix) and 3 phase models, as designated above, require a separate approved pump control device or panel for automatic operation. Operation of these models will be according to the control selected. Make sure the electrical specifications of the control selected properly match the electrical specifications of the pump. 3 phase models require overload elements selected or adjusted in accordance with the control or panel instructions.

WARNING:
Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.

2. Dewatering / Sump Applications

1. For ordinary ground water pumping applications, a sump pit of not less than 14" in diameter is recommended. Vertical float (VMF) models (257, 287 and 297) may be used in a minimum 10" diameter sump; however, a larger diameter pit is preferred as it allows for a longer pump cycle and reduced switch cycling. The minimum depth of the pit should be 18".

2. If the pit is not already enclosed on the bottom, provide a hard level bottom of bricks or concrete. DO NOT place the pump directly on earth, gravel or debris since this can cause excessive wear of the impeller and possible jamming. ***"The Brick"*** (sold by Liberty Pumps as part # 4445000) is a pre-molded stable platform designed to fit your submersible pump. It raises the pump 2.5" off the bottom of the pit, reducing the potential for jamming from rocks and debris. Contact your local distributor to order. Remove all debris from the bottom of the sump pit before installation of the pump. A sump pit cover is suggested for safety and to prevent foreign objects from entering the pit.

3. Set the pump in the pit making sure the switch has adequate clearance and will not hang-up on the pit wall. The float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. A 1-1/2" threaded discharge is provided for connection of the discharge pipe. Do not reduce the discharge size to below 1-1/2". Schedule 40 PVC pipe is recommended; however, flexible discharge hose kits may be used for temporary installations.

4. Connect the pipe or the discharge hose to the discharge of the pump. HAND TIGHTEN ONLY. Over tightening may cause the pump housing to crack. Install a union or other means of separating the discharge line just above the floor to facilitate removal of the pump if necessary. A check valve is recommended just above or in place of the union to prevent the backflow of water after each pump cycle. (All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

5. Connect additional piping as needed to direct the discharge to the desired location. Discharge should be kept as short as possible with a minimum number of turns. Check all connections for security.

6. Install a union or other means of separating the discharge pipe just above the floor to facilitate removal of the pump if necessary. **A check valve is recommended just above, or in place of, the union to prevent the backflow of water after each pump cycle.**

7. If a check valve is used, **a 1/8" anti-airlock hole should be drilled in the discharge pipe just above the pump's discharge outlet to prevent pump "airlock" (see Fig. 1)**

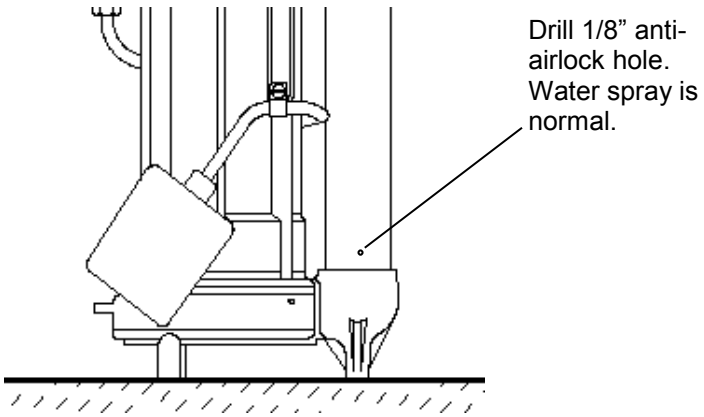


Fig. 1 – Anti-airlock hole position

8. For added protection, consider the addition of a back-up pump such as ***Liberty's SJ10 SumpJet***, as well as an alarm such as ***Liberty's ALM-2*** in applications where loss of pump function could result in property damage. If an alarm is used, it must be connected to a separate electrical circuit.

3. Effluent Applications

Vertical Magnetic Float (VMF) models (257, 287 and 297) are not recommended for effluent applications due to their short On/Off cycle. Wide angle float models are better suited for effluent applications and are easily adjustable for different On/Off levels.

The basin required for effluent applications must be sealed and vented to meet health and plumbing code requirements. Proper basin size and basin materials for effluent applications vary depending on the type of effluent system and local codes. Check with your local codes official prior to purchasing and installing the basin. Follow the manufacturer's recommended guidelines for installation of your specific basin. A minimum diameter of 18" and depth of 24" is required for proper pump operation, but larger basins are preferred for longer pump cycles and increased switch life. Installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, delete the check valve and size the basin and/or adjust the pump differential to accommodate the additional backflow.

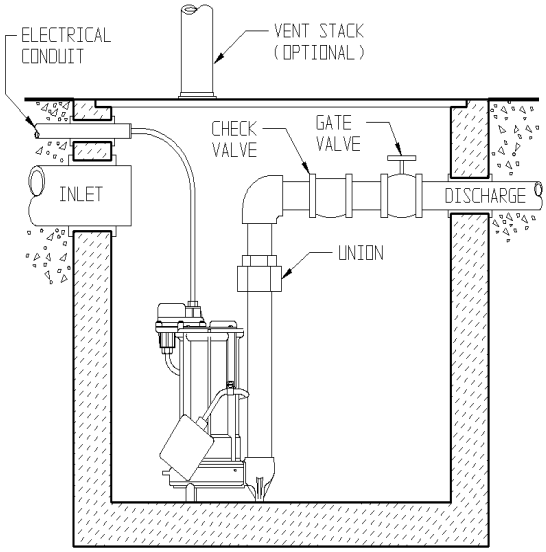


Fig. 2 – Typical Installation Simplex System
This is a recommended installation only. Variations may apply.

⚠ WARNING These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70, or where prohibited by local codes.

A. **Simplex (One Pump) Systems (see Fig. 2):** Set the pump in place making sure the float has adequate clearance to the side wall of the basin. The float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. If an optional control device or float is used, follow the directions for mounting that accompany the optional control. Connect the discharge pipe to the pump's threaded discharge. IMPORTANT: DO NOT REDUCE THE DISCHARGE PIPE SIZE BELOW THAT WHICH IS PROVIDED ON THE PUMP. Contact Liberty Pumps or other qualified person if you have questions regarding proper pipe sizes and flow rates. Mount the basin cover making sure it is properly sealed.

Installation of Discharge: After the pump has been mounted, install the discharge line. A union should be installed to facilitate pump removal if necessary. A free-flow swing check valve is recommended after the union to prevent the backflow of liquid after each pumping cycle. A gate valve should follow the check valve to allow periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns, to minimize friction head loss. Contact Liberty Pumps or other qualified person if you have questions regarding proper pipe sizes and flow rates.

(All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

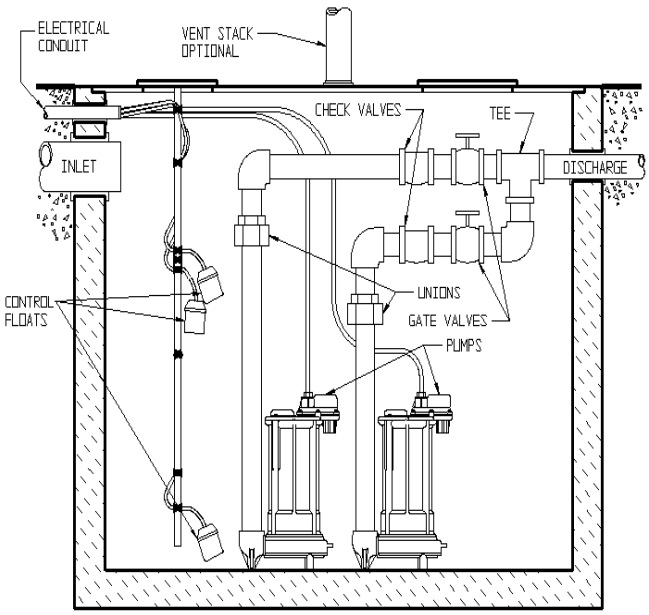


Fig. 3 – Typical Installation Duplex System
This is a recommended installation only. Variations may apply.

B. **Duplex (Two Pump) Systems (see Fig. 3):** Set both pumps in place in the bottom of the basin. The duplex control used will include 3 or 4 floats that will either be tethered to one of the discharge pipes or to an independent rod or bracket.

Follow the instructions provided with your duplex control device. Each float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. Connect an individual discharge pipe to each pump. IMPORTANT: DO NOT REDUCE THE DISCHARGE PIPE SIZE BELOW THAT WHICH IS PROVIDED ON THE PUMP. Contact Liberty Pumps or other qualified person if you have any questions regarding proper pipe sizes and flow rates. To eliminate fluid recycling in duplex installations, it is necessary to have a check valve on each discharge line prior to tying the two discharges into one common line. Depending on the height of your basin, the check valves may either be installed inside the basin or outside the basin. Mount the basin cover(s) making sure they are properly sealed.

Installation of Remaining Discharge: Unions or flexible connectors should be installed to facilitate removal of the pump if necessary. Free-flow swing check valves should be installed on each discharge after the union and prior to the gate valve to prevent the back flow of liquid or gas. A check valve on each discharge line, prior to tying into one common line, is necessary to prevent the recycling of fluid from one pump to the other. A gate valve is recommended after the check valve to allow for periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns to minimize friction head loss. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size or flow rates. (All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

4. Electrical Service and Operation

⚠ WARNING

- **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor or a grounding type attachment plug. To reduce the risk of electric shock, be certain that the grounding conductor is connected only to a properly grounded control panel or, if equipped with a grounding type plug that it is connected to a properly grounded, grounding type receptacle.
- DO NOT bypass grounding wires or remove ground prongs from attachment plugs.
- DO NOT use an extension cord.
- This pump requires separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the motor, as noted on the pump nameplate.
- The electrical outlet or panel shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code and all applicable local codes and ordinances.

⚠ CAUTION When the risk of property damage from high water levels exists, an independent high water alarm or back up pump system should be installed.

All FL-Series automatic models (designated with the letter "A") and Models 253, 283 and 293, come factory-equipped with a float switch mounted to the pump. These models come with two cords - one to the float switch and the other to the pump motor. The switch cord has a series (piggyback) plug enabling the pump (motor) cord to be plugged into the back of it. The purpose of this design is to allow manual operation of the pump.

For manual operation, or in the event of switch failure, the pump cord can be separated and plugged into the electrical outlet, directly bypassing the switch **(see Fig. 4).**

Fig. 1 Piggyback plug installation.

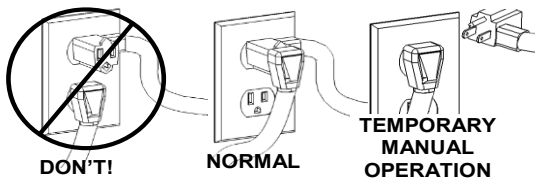


Fig. 4 – Temporary manual operation

For automatic operation using Liberty's supplied switch, the two cords should be interconnected and plugged into a separately fused grounded outlet of proper amp capacity for your selected pump model. (See Section 1, General Information or the pump nameplate for electrical specifications of your model.) Both cords are equipped with 3-prong plugs and must be plugged into a properly grounded 3-wire receptacle. DO NOT REMOVE THE GROUND PRONGS.

⚠ WARNING 208-230V single phase pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

⚠ CAUTION Do not let the pump run dry.

The turn-on/turn-off levels vary depending on model. (See model specifications chart on page 3 for the "factory" preset level of your specific model.) Other pumping differentials may be obtained by tethering the switch cord to the discharge pipe. NOTE: A minimum cord length of 3-1/2" from the tether point to the top surface of the float is required for proper switch operation. If using a differential other than the factory setting, be sure that when the pump shuts off, at least 3-1/2" of fluid is left in the basin so the impeller remains submerged. **(Models 251, 257, 281, 287, 291, and 297 have factory-preset switches that are not adjustable.)**

Manual pumps with no switch are intended to be run using an approved liquid level control or approved motor control with correct rating that matches motor input in full load amperes. Regardless of the control type, be sure that when the pump shuts off, at least 3-1/2" of fluid is left in the basin so the impeller remains submerged.

NOTE: For automatic operation with optional control devices: If the pump(s) are to be operated by either a simplex or duplex control panel or other optional control device, follow the installation instructions provided with the control and make the power connections per those instructions. If necessary, certain models may be run without a separate control.

⚠ WARNING 208-230V single phase pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

⚠ CAUTION Do not let the pump run dry.

3 Phase Pump Models (FL63, FL64, FL73, FL74, FL103, FL104, FL105, FL153, FL154, FL155, FL203, FL204, FL205)

⚠ CAUTION For 3-Phase pumps, check for proper rotation before installing pump into basin **(see Fig. 5).**

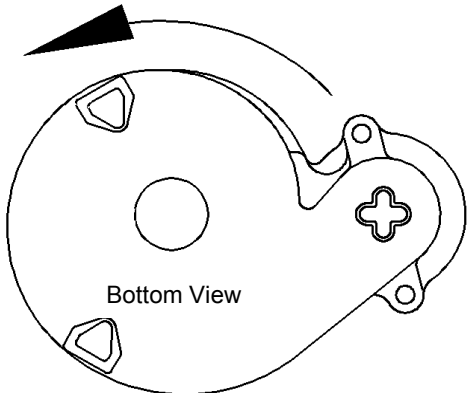


Fig. 5 – Proper impeller rotation, three phase models

Check three phase pumps for proper rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump. Code the wires for reconnection after installation.

If a single phase pump is to be wired directly into a control device or junction box, and it is necessary to remove the plugs, have a certified electrician do the wiring in accordance with the National Electric Code and applicable local codes. See **Fig. 6** for direct wire installation of single phase, automatic pumps.

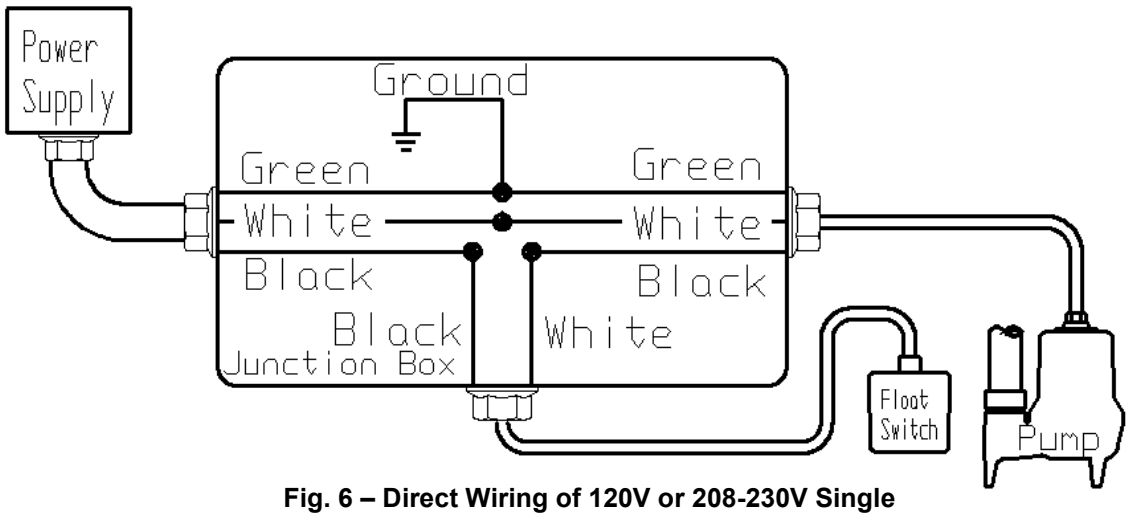


Fig. 6 – Direct Wiring of 120V or 208-230V Single Phase, Automatic Pumps

⚠ WARNING **For 208-230V installations:** Install a double pole disconnect near the pump installation. One side of the line going to the pump is always "hot", whether the float switch is in the "On" or the "Off" position. Use of a double pole disconnect will allow both hot legs to be de-energized.

5. Maintenance

⚠ WARNING **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.

⚠ WARNING **Always disconnect the pump from power source before handling.** This guide is designed to help identify reasons for potential operating problems. It is not a service guide. **Dismantling of pump voids warranty.** Servicing of pump other than simple cleaning of pump inlet or impeller should be referred to the factory or its authorized service centers.

1. **Submersible Models:** Submersible pump models have sealed permanently lubricated bearings and require no additional lubrication.

2. **Pump should be <u>checked frequently</u> for debris and/or build up which may interfere with pump or float switch operation.** The float must be able to move freely through its complete travel without any restrictions. Pour enough water into the sump to activate the pump periodically (at least every 3 months) when not normally in use to verify proper function.

NOTE: The manufacturer assumes no responsibility for damage or injury due to disassembly in the field.

6. Troubleshooting

Problem	Cause	Correction
Pump will not run.	• Blown fuse or other interruption of power; improper voltage.	• Check that the unit is securely plugged in. Have an electrician check all wiring for proper connections and adequate voltage and capacity.
	• Switch is unable to move to the "turn on" position due to interference with the side of basin or other obstruction	• Position the pump or switch so that it has adequate clearance for free operation.
	• Insufficient liquid level.	• Make sure the liquid level is allowed to rise enough to activate switch(s).
	• Defective switch.	• Remove and replace switch.
Pump will not turn off.	• Switch(s) unable to move to the "turn off" position due to interference with the side of basin or other obstacle.	• Position the pump or switch so that it has adequate clearance for free operation.
	• Defective switch.	• Remove and replace switch.
Pump runs or hums, but does not pump.	• Discharge is blocked or restricted.	• Check the discharge line for foreign material, including ice if the discharge line passes through or into cold areas.
	• Check valve is stuck closed or installed backwards.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Gate or ball valve is closed.	• Open gate or ball valve.
	• Total lift is beyond pump's capability.	• Try to route piping to a lower level. If not possible, a larger pump may be required. **Consult the factory.**
	• Pump impeller is jammed or volute casing is plugged.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
Pump runs periodically when fixtures are not in use.	• Check valve was not installed, is stuck open or is leaking.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Fixtures are leaking.	• Repair fixtures as required to eliminate leakage.
Pump operates noisily.	• Foreign objects in the impeller cavity.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
	• Broken impeller.	• Consult the factory for information regarding replacement of impeller.
	• Worn bearings.	• Return pump to the factory or authorized repair station for repair.
	• Piping attachments to building are too rigid.	• Replace a portion of the discharge line with rubber hose or connector.

7. 3 Year Limited Warranty

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Liberty Pumps, Inc. warrants that pumps of its manufacture are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident.

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase.

This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

Liberty Pumps®

7000 Apple Tree Avenue
Bergen, NY 14416
Phone: (800) 543-2550
Fax: (585) 494-1839
www.libertypumps.com

Attachment C

Liberty Pumps AE-Series
Duplex Pump Controls Information Sheet
And Installation Manual

Liberty Pumps®

AE-Series

Duplex Pump Controls

Provides reliable alternating operation of two pumps with automatic override control in residential or commercial installations. Common applications include sump basins, effluent or sewage pump chambers and lift stations.

NEMA 1

NEMA 4X

Standard Features:

- Magnetic Motor Contactors
- HOA switches (internal)
- Green pump run indicators (internal)
- Control ON/OFF switch (internal)
- Control/Alarm power-on indicator (internal)
- Circuit breakers
- Easy wiring terminal blocks
- Visual and audible alarm
- Auxiliary Contacts

Other Available Options:

- Alarm bell
- Redundant off
- Cycle counter
- Dead front
- Main disconnect
- Flasher
- Manual alarm reset
- Power on light
- Lockable latch
- Overload protection
- Alternate beacon color
- High and low level indicators
- Seal fail indicator
- Anti-condensation heater
- Pilot breaker
- Overload reset, thru-door
- Beacon guard
- Thermal cutout
- Elapsed time meter
- Delay timer
- Lightning arrestor
- GFI convenience receptacle
- Start/Run Capacitor

All AE-series panels are shipped complete with floats. Standard cord length is 20 feet.

innovate. evolve.

AE-SERIES DUPLEX PUMP CONTROLS

STANDARD FEATURES

ENCLOSURE*: 10" x 10" x 6"; NEMA 4X – ultraviolet stabilized thermoplastic for outdoor; NEMA 1 – metal for indoor use. Certain options may increase enclosure size.

MAGNETIC MOTOR CONTACTOR: Controls pump by switching hot electrical lines.

HOA SWITCHES: Offer manual operation of pump on circuit board.

GREEN PUMP RUN INDICATORS: mounted on circuit board.

CONTROL ON/OFF SWITCH: mounted on circuit board.

FLOAT SWITCH TERMINAL BLOCK: mounted on circuit board.

* Three phase panels measure 14" x 12" x 6". Multi-tap transformer (208/240/480 VAC primary) provides 120V. control voltage. Motor protective switch provides adustable overload, branch circuit protection and pump disconnect.

CONTROL/ALARM FUSE

CONTROL/ALARM POWER ON INDICATOR: mounted on circuit board.

FLOAT STATUS INDICATORS: stop, lead, lag/alarm, alarm mounted on circuit board.

CIRCUIT BREAKERS: provide pump disconnect and branch circuit protection

PUMP INPUT POWER AND PUMP CONNECTION TERMINAL BLOCK

AUXILIARY CONTACTS

GROUND LUG

ALARM PACKAGE: NEMA 4X = red beacon and horn (83 to 85 db), exterior test/normal/silence switch.

NEMA 1: Door mounted red indicator and buzzer mounted internally (83 to 85 db), exterior test/normal/silence switch.

MODEL SPECIFICATIONS

MODEL	VOLTS	PHASE	FULL LOAD AMPS (Must match pump)	ENCLOSURE TYPE	FLOATS
Single Phase					
AE21L=3	120/208/240	1	0 - 14.9 amps	NEMA 1	3
AE21H=3	120/208/240	1	15 - 20 amps	NEMA 1	3
AE21L=4	120/208/240	1	0 - 14.9 amps	NEMA 1	4
AE21H=4	120/208/240	1	15 - 20 amps	NEMA 1	4
AE24L=3	120/208/240	1	0 - 14.9 amps	NEMA 4X	3
AE24H=3	120/208/240	1	15 - 20 amps	NEMA 4X	3
**AE24HC=3	120/208/240	1	15 - 20 amps	NEMA 4X	3
AE24L=4	120/208/240	1	0 - 14.9 amps	NEMA 4X	4
AE24H=4	120/208/240	1	15 - 20 amps	NEMA 4X	4
Three Phase*					
AE34=3-131	208/240/480	3	1.6 - 2.5 amps	NEMA 4X	3
AE34=3-141	208/240/480	3	2.5 - 4.0 amps	NEMA 4X	3
AE34=3-171	208/240/480	3	4.0 - 6.3 amps	NEMA 4X	3
AE34=3-191	208/240/480	3	6 - 10 amps	NEMA 4X	3
AE34=3-511	208/240/480	3	9-14 amps	NEMA 4X	3
AE34=4-131	208/240/480	3	1.6 - 2.5 amps	NEMA 4X	4
AE34=4-141	208/240/480	3	2.5 - 4.0 amps	NEMA 4X	4
AE34=4-171	208/240/480	3	4.0 - 6.3 amps	NEMA 4X	4
AE34=4-191	208/240/480	3	6 - 10 amps	NEMA 4X	4
AE34=4-511	208/240/480	3	9-14 amps	NEMA 4X	4
AE54=3-121	575	3	1.6 - 2.5 amps	NEMA 4X	3
AE54=4-121	575	3	1.6 - 2.5 amps	NEMA 4X	4
AE54=3-151	575	3	2.5 - 4.0 amps	NEMA 4X	3
AE54=3-161	575	3	4.0 - 6.3 amps	NEMA 4X	3
AE54=4-151	575	3	2.5 - 4.0 amps	NEMA 4X	4
AE54=4-161	575	3	4.0 - 6.3 amps	NEMA 4X	4

NOTE: *AE-Series panels come with variable amp ranges and must be ordered with the correct matching full load amperage to that of the pump(s) being used. Use the chart above to select the proper amp range or consult the factory for technical assistance.*

** Three phase panels come equipped with thermal overload protection that must be properly sized to the pump's full-load run amps. Please consult factory for proper panel selection. All three phase "standard" panels come with NEMA 4X enclosure.*

*** AE24HC=3 includes start/run capacitors and start relay for use with LSG202M-C and LSGX202M-C models.*

SWITCH SPECIFICATIONS

All standard duplex panels come equipped with (3) or (4) mercury-free pilot-duty float switches (depending on model). 20' cord standard. Optional lengths available. External weights or pipe clamp mounts required.

CABLE: flexible 18 gauge, 2 conductor

ELECTRICAL: 5 amp, 120/230VAC, 50/60Hz

FLOAT: High impact PVC

140 degrees F. maximum fluid temperature

c UL us LISTED

Dual safety certification for the United States and Canada.

Specifications subject to change without notice.

***Liberty can customize a panel to your specific pump needs. Please contact us for available options and ordering information.* 800-543-2550**

Liberty Pumps • 7000 Apple Tree Avenue • Bergen, New York 14416 • Phone 800-543-2550 Fax (585) 494-1839
www.libertypumps.com

Single Phase Duplex

AE21L=3, ~~AE21H=3, AE21L=4, AE21H=4~~

~~AE24L=3, AE24H=3, AE24L=4, and AE24H=4~~

Manufactured by SJE-Rhombus®

Installation Instructions and Operation/Troubleshooting Manual

7000 Apple Tree Avenue
Bergen, New York 14416
Phone: 1-800-543-2550
Email: liberty@libertypumps.com
www.libertypumps.com

This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes.

All conduit running from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. **NEMA 1 enclosures are for indoor use only,** primarily to provide a degree of protection against contact with enclosed equipment. Cable connectors are not required to be liquid-tight in NEMA 1 enclosures. **Do not use NEMA 1 enclosures if subjected to rain, splashing water or hose-directed water. NEMA 4X enclosures are for indoor or outdoor use,** primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water. **Cable connectors must be liquid-tight in NEMA 4X enclosures.**

⚠WARNING	ELECTRICAL SHOCK HAZARD	⚠WARNING	EXPLOSION OR FIRE HAZARD
	Disconnect power before installing or servicing this product. A qualified service person must install and service this product according to applicable electrical and plumbing codes.		Do not use this product with flamable liquids Do not install in hazardous locations as defined by National Electrical Code, ANSI/NFPA 70.

Failure to follow these precautions could result in serious injury or death. Replace product immediately if switch cable becomes damaged or severed. Keep these instructions with warranty after installation. This product must be installed in accordance with National Electric Code, ANSI/NFPA 70 so as to prevent moisture from entering or accumulating within boxes, conduit bodies, fittings, float housing, or cable.

Warranty void if panel is modified.

Call factory with servicing questions:

1-800-543-2550

7249000B

Installation Instructions

Most single phase duplex panels are designed to operate as three or four float systems. The three float system is standard performing the common pump stop, lead pump start, and lag pump start/high level alarm functions. The four float system utilizes separate floats for lag pump start and high level alarm.

NOTE: Options ordered may affect the number of floats and their functions. Please reference the schematic provided with the control panel for proper installation.

Installation of Floats

CAUTION: If control switch cables are not wired and mounted in the correct location, the pump system will not function properly.

WARNING: Turn off all power before installing floats in pump chamber. Failure to do so could result in serious or fatal electrical shock.

1. Use float label kit to identify and label cables on both float and stripped ends (stop, lead, lag, alarm, etc.). See schematic for float options.

2. Determine your normal operating level, as illustrated in **Figures 1-2**.

3. Mount float switches at appropriate levels as illustrated in **Figures 3-5**. Be sure that floats have free range of motion without touching each other, or other equipment in the basin.

If using the mounting clamp; follow steps 4-6.

4. Place the cord into the clamp as shown in **Figure 5**.

5. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in **Figure 5**.

   NOTE: Do not install cord under hose clamp.

6. Tighten the hose clamp using a screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.

   NOTE: All hose clamp components are made of 18-8 stainless steel material. See your SJE-Rhombus® supplier for replacements.

FIGURE 1: Three float duplex

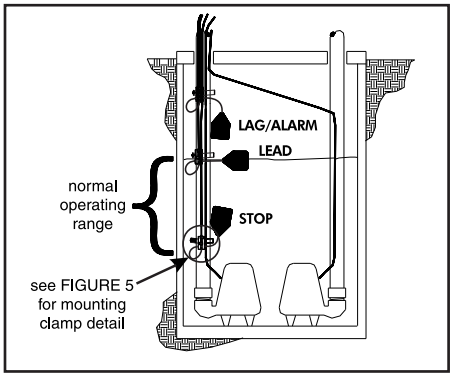


FIGURE 2: Four float duplex

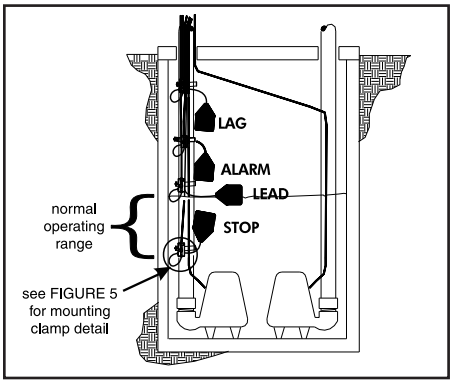


FIGURE 3: Internally weighted float

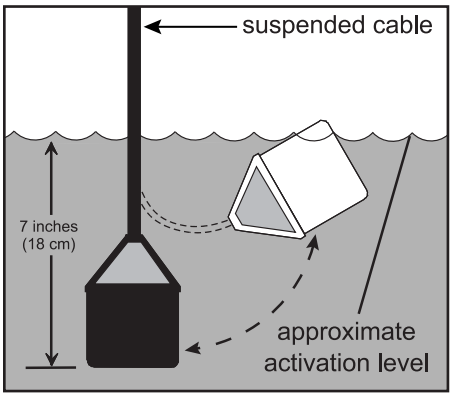


FIGURE 4: Float with cable weight

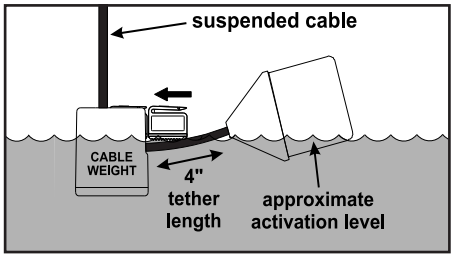
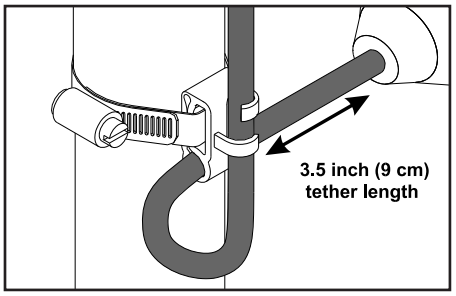


FIGURE 5: Mounting clamp detail



Installation Instructions

Mounting the control panel

1. Determine mounting location for panel. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation, we recommend the use of a SJE-Rhombus® liquid-tight junction box with liquid-tight connectors to make required connections. **You must use conduit sealant to prevent moisture or gases from entering the panel.**

2. Mount control panel with mounting flanges furnished with control panel.

3. Determine conduit entrance locations on control panel. Check local codes and schematic for the number of power circuits required.

NOTE: Be sure the incoming power, voltage, amperage, and phase meet the requirements of the pump motors being installed. If in doubt, see the pump identification plate for electrical requirements.

4. Drill proper size holes for type of connectors being used.

NOTE: If using conduit, be sure that it is of adequate size to pull the pump and switch cables through. **You must use conduit sealant to prevent moisture or gases from entering the panel.**

5. Attach cable connectors and/or conduit connectors to control panel.

FOR INSTALLATION REQUIRING A SPLICE, FOLLOW STEPS 6-10;
FOR INSTALLATION WITHOUT A SPLICE, GO TO STEP 11.

6. Determine location for mounting junction box according to local code requirements. **Do not** mount the junction box inside the sump or basin.

7. Mount junction box to proper support.

8. Run conduit to junction box. Drill proper size holes for the type of conduit used. Attach liquid-tight connectors to junction box.

9. Identify and label each wire before pulling through conduit into control panel and junction box. Pull pump power cables and control switch cables through connectors into junction box. Make wire splice connections at junction box.

10. Firmly tighten and seal all fittings on junction box. Insure all cable connectors are liquid-tight and sealed.

11. If a junction box is not required, connect pump and float wires to proper position on terminals. See schematic inside control panel for terminal layouts.

12. Connect control/alarm and pump power conductors to proper position on terminals. See schematic inside control panel for terminal connections.

NOTE: It is the recommendation of the factory to use separate pump and control/alarm power sources.

VERIFY CORRECT OPERATION OF CONTROL PANEL AFTER INSTALLATION IS COMPLETE.

Operations

Single phase duplex panels are designed to operate with three or four floats for pump sequencing. The standard float functions are common pump stop, lead pump start, lag pump start/alarm (three floats), or separate lag and alarm floats (four floats).

Three Float Operation: As the liquid level rises to the stop float and tips it to the ON (closed) position, the panel will remain inactive. As the liquid level tips the lead float, the lead pump will start. If the liquid level tips the lag/alarm float, the lag pump will start and the audio/visual alarm will activate. Both pumps and the alarm will remain active until the liquid level drops and the lag float is in the OFF (open) position. At this time the alarm will silence. Both pumps will remain on until the liquid level drops to normal and all three floats are in the OFF (open) position. When both pumps have stopped running, the alternator will switch the lead pump and lag pump operating functions in the next sequence.

Four Float Operation: The alarm will activate and remain on only if the alarm float is tipped to the ON (closed) position.

Alarm System (Horn and Indicator - standard)

When an alarm condition occurs, a red light and a horn will be activated. If the test/normal/silence switch is moved to the silence position, the horn will be silenced. When the alarm condition is cleared, the alarm system is reset. The alarm system can be tested by moving the test/normal/silence switch to the test position.

HOA Switch

A hand-off-automatic switch is provided for each pump. In the hand mode, the pump will turn on unless other safety features are employed. In the automatic mode, the pump will turn on from commands by the float switch(es).

Pump Run Lights

The run light will be ON in either the hand or the automatic mode when the pump is called to run.

Control and Alarm Fusing

The control circuit and alarm circuit are fused separately.

Control and Alarm Lights

Lights will illuminate when control/alarm power is supplied.

Float Status Lights

Lights will illuminate when the respective float is in the closed position.

Circuit Breaker (optional)

The pump circuit has a thermal-magnetic circuit breaker which provides pump disconnect and branch circuit protection.

Dry Auxiliary Contacts (standard feature)

Normally open - Contacts are open under normal conditions and closed when alarm condition is present.

Normally closed - Contacts are closed under normal conditions and open when alarm condition is present. Both types automatically reset once alarm condition is cleared.

NOTE: Some options ordered may not be included in this manual. Certain options will require alternative circuitry not including float status and control/alarm indicators.

For information regarding the operations of options not listed here or servicing questions, please call a Liberty Pumps customer service technician at

1-800-543-2550

Warranty void if panel is modified.

Troubleshooting

Control/Alarm Circuit Board Power

If the green power status indicators are not illuminated:

1. Check to see if the fuses on the circuit board are blown.

2. Check to see if the incoming control/alarm power is present at TB1-1 and TB1-2.

If voltage is present and fuse is not blown, please call factory for assistance.

Circuit Breaker (optional)

Check each pole of the circuit breaker for proper resistance reading using the following procedure: **Warning: Disconnect all incoming power to control panel. Failure to do so could result in serious or fatal electrical shock.**

1. Isolate the circuit breaker by disconnecting either the line side or load side wires.

2. Place the ohmmeter leads across the corresponding line and load terminals of each pole.

3. With the ohmmeter on the R X 1 scale and the breaker in the OFF position, the reading should be infinity (very high resistance). With the breaker in the ON position, the reading should be nearly zero ohms (very low resistance). If the readings are not as stated, replace the circuit breaker with one of the same ratings.

Alarm Horn

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm horn. If the horn does not sound, replace horn with same type.

Alarm Light

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm light. If the light does not activate, replace with bulb of same type.

Float Controls

Check the floats during their entire range of operation. Clean, adjust, or replace damaged floats.

Checking the float resistance - The float resistance can be measured to determine if the float is operating correctly or is defective. Use the following procedure to measure the float resistance. **Warning: Disconnect all incoming power to panel. Failure to do so could result in serious or fatal electrical shock.**

1. Isolate the float by disconnecting one or both of the float leads from the float terminals.

2. Place one ohmmeter lead on one of the float wires, and the other ohmmeter lead on the other float wire.

3. Place the ohmmeter dial to read ohms and place on the R X 1 scale. With the float in the "off" position, the scale should read infinity (high resistance). Replace the float if you do not get this reading. With the float in the ON position, the scale should read nearly zero (very low resistance). Replace the float if you do not get this reading.

NOTE: Readings may vary depending on the length of wire and accuracy of the measuring device.

Fuses

Check the continuity of each fuse. With power OFF, pull the fuses out of the fuse blocks. With the ohmmeter on the R X 1 scale, measure resistance. A reading of infinity indicates a blown fuse and must be replaced. Replace fuse with same type, voltage and amp rating.

Magnetic Contactor Coil

Warning: Disconnect all incoming power to panel. Failure to do so could result in serious or fatal electrical shock. Check the coil by disconnecting one of the coil leads. Measure the coil resistance by setting the ohmmeter on the R X 1 scale. A defective coil will read zero or infinity, indicating a short or opened coil respectively. Replace defective contactor with same type.

Liberty Pumps Three-Year Limited Warranty

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Liberty Pumps, Inc. warrants that pumps of its manufacture are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident.

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase.

This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

Liberty Pumps®

7000 Apple Tree Avenue
Bergen, New York 14416
Phone: 1-800-543-2550
Email: liberty@libertypumps.com
www.libertypumps.com

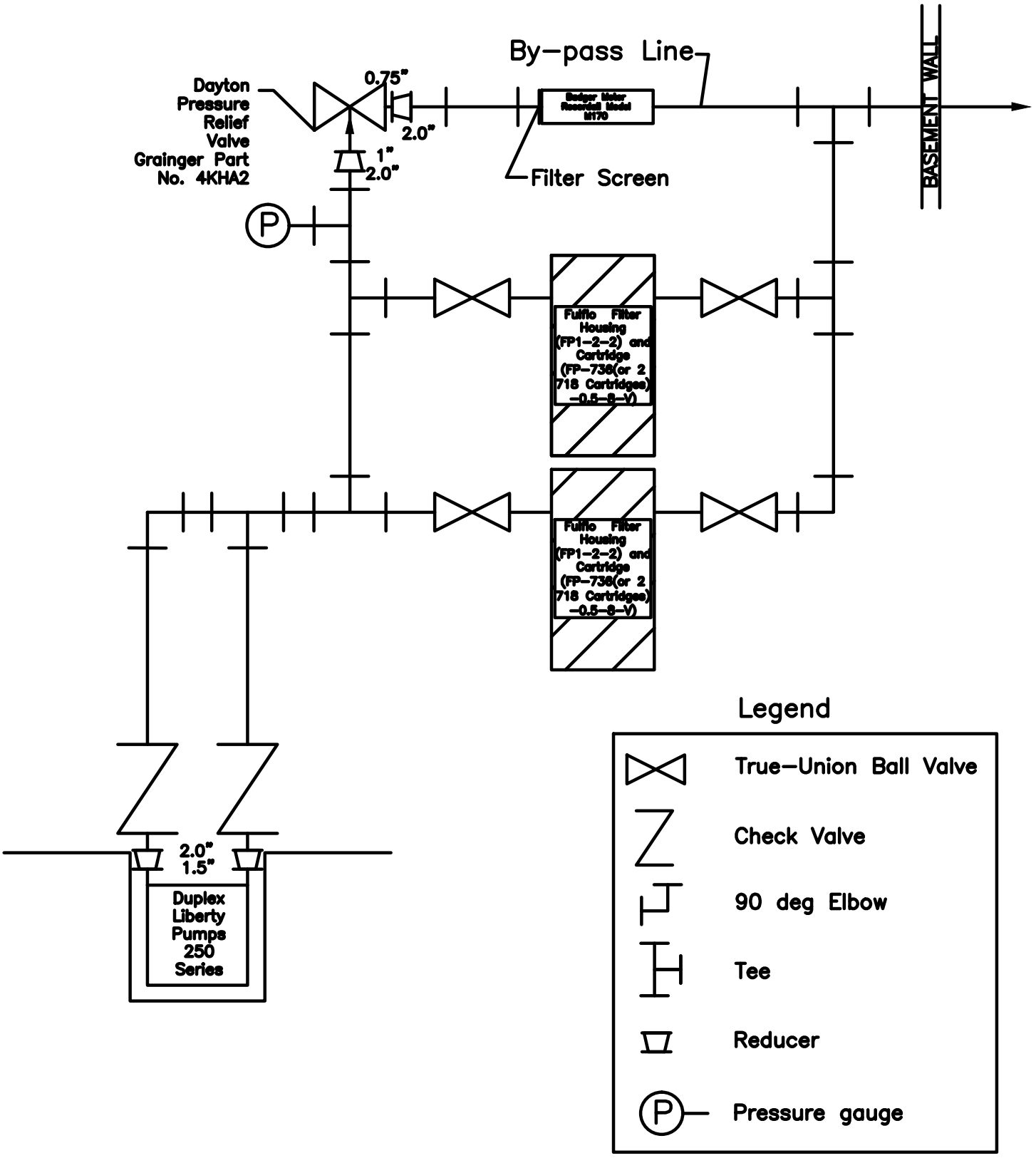
PN1025047B • Rev 06/12

Attachment D

Process Flow Diagram

PROCESS FLOW DIAGRAM

BIANCHI–WEISS GREENHOUSES SITE (NO. 152209) BASEMENT WATER FILTER SYSTEM



Attachment E

Fulflo® Flo-Pac® Filter Cartridge & FP Series Filter Vessels Information Sheets

Fulflo® Flo-Pac® Filter Cartridges

Superior Industrial Filtration From a Pleated Cartridge Design

Parker Fulflo® Flo-Pac® Cartridges are the perfect choice for many industrial filtration requirements. Flo-Pac pleated cartridges contain premium grade, phenolic impregnated cellulosic filter media. Parker's line of pleated cartridges is designed for critical filtration applications, providing long service life, high flow rate and low pressure drop.

Flo-Pac Pleated Cartridges are available in 0.5µm, 1µm, 5µm, 10µm, 20µm, 30µm, and 60µm pore sizes (95% removal; ß = 20).

Benefits

- Pleated cellulosic media allow high flow capacity at low pressure drop
- Available in a variety of sizes and configurations to fit most industrial vessels
- Phenolic resin impregnated to provide strength, integrity and high contaminant capacity
- High strength spiral core withstands pressure surges to 100 psid
- Suitable for operating temperatures to 250°F (121°C)
- Outer sleeve protects the media from damage
- ETP (Electro-tin-plated) steel metal components for both aqueous and oil-based applications
- Buna-N gaskets are standard, other materials are available

Applications

- Water Soluble
- Coolants
- Quench Oils
- Fuels
- Lubricating Oils
- Hydraulic Oils
- EDM Dielectrics
- Rolling Mill Oils
- Processing Liquids
- Gasoline

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Fulflo® Flo-Pac® Filter Cartridges

Specifications

Materials of Construction:

Filter Media: Phenolic impregnated cellulose
Cores ETP steel
End Caps: ETP steel
Sleeve: 300 series - polypropylene
600 & 700 series - ETP steel
Adhesive: Thermosetting PVC
End Seals: 300 & 700 Series–Buna-N gaskets, 600 Series–Buna-N gaskets/grommets, 500 Series–fiber gaskets,

Packaging:

300 Series:
310–24/carton (12 lb ≈ shipping wt)
320–12/carton (12 lb ≈ shipping wt)
330–12/carton (18 lb ≈ shipping wt)
340–12/carton (24 lb ≈ shipping wt)

500 Series:
518–6/carton (14 lb ≈ shipping wt)

600 Series:
614–6/carton (20 lb ≈ shipping wt)
629–4/carton (26 lb ≈ shipping wt)
644–4/carton (40 lb ≈ shipping wt)

700 Series:
718–6/carton (20 lb ≈ shipping wt)
736–4/carton (26 lb ≈ shipping wt)
754–4/carton (39 lb ≈ shipping wt)

Maximum Recommended Operating Conditions:

Temperature: 250°F (121°C)
Differential Pressure: 70 psi (4.8 bar)
Change Out ΔP: 35 psid (2.4 bar)
Flow Rate per Single Length Cartridge:

300 Series	7 gpm
500 Series	50 gpm
600 Series (3-1/2 in ID)	50 gpm
600 Series (1-9/16 in ID)	35 gpm
700 Series	50 gpm

Dimensions:

300 Series
2-1/2 in OD x 1 in ID x 9-5/8 in, 19-3/4 in, 29-1/4 in, 29-5/8 in, 40 in
500 Series
4-1/2 in OD x 1-3/4 in ID x 18 in
600 Series
6-1/4 in OD x 3-1/12, 1-9/16 in or 1-1/4 in ID x 14-3/8, 29 or 43-3/8 in long
700 Series
6-1/4 in OD x 2-5/8 in or 2-1/8 in ID x 18, 36, or 54 in long

Filtration Ratings:

95% at 0.5µm, 1µm, 5µm, 10µm, 20µm, 30µm, and 60µm pore sizes

Liquid Particle Retention Ratings (µm) at Removal Efficiencies of:

Cartridge	β=5000 Absolute	β=1000 99.9%	β=100 99%	β=20 95%	β=10 90%
FP-0.5	12	10	3	0.5	<0.5
FP-1	15	12	6	1	<1.0
FP-5	30	20	9	5	3.5
FP-10	50	35	18	10	7
FP-20	90	70	40	20	12
FP-30	100	85	50	30	21
FP-60	200	150	90	60	45

Flow Rate and Pressure Drop Formulas

$$\text{Flow Rate (gpm)} = \frac{\text{Clean } \Delta P \times \text{Length Factor}}{\text{Viscosity} \times \text{Flow Factor}}$$

$$\text{Clean DP} = \frac{\text{Flow Rate} \times \text{Viscosity} \times \text{Flow Factor}}{\text{Length Factor}}$$

1. Clean ΔP is PSI differential at start.
2. Viscosity is centistokes. Use Conversion Tables for other units.
3. Flow Factor is ΔP/GPM at 1 cks for 10 in (or single).
4. Length Factors convert flow or ΔP from 10 in (single length) to required cartridge length.

FP Flow Factors (psid/gpm @ 1 cks)

Rating (µm)	Flow Factor
0.5	0.0260
1	0.0170
5	0.0020
10	0.0018
20	0.0010
30	0.0009
60	0.0005

FP Length Factors

Style	Length Factor
FP310	1.0
FP320	2.0
FP330	3.0
FP340	4.0
FP518	3.3
FP614	3.6
FP629	7.2
FP644	10.8
FP718	6.5
FP736	13.0
FP754	19.5

Ordering Information

FP — ☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

Cartridge Code	Outside Diameter	Length (code)	Length (in)	Length (series)	Micron Rating (µm)	Inside Diameter	Seal Material	Body
FP = Flo-Pac	3 = 2-1/2 in (300 Series) 5 = 4-1/2 in (500 Series) 6 = 6-1/4 in (600 Series) 7 = 6-1/4 in (700 Series)	10	9-5/8	300	0.5	None = 1 in (300 Series) None = 1-3/4 in (500 Series) None = 3-1/2 in (600 Series) None = 2-5/8 in (700 Series) 1 = 1-9/16 in (600 Series) 8 = 2-1/8 in (700 Series)	None = Buna-N Gaskets A = Vellumoid (300, 600, 700 Series) B = Fiber (500 Series Only) C = Cork (700 Series Only) G = Buna-N Grommets (600 Series 1-9/16 in ID) V = Viton*	None = Metal (500, 600 700 series) 1 = Polypro (300 series) M = Metal (300 series) N = No Body
		14	14-3/8	600	1			
		18	18	500,700	5			
		20	19-3/4	300	10			
		29	29	600	20			
		29	29-1/4	300	30			
		30	29-5/8	300	60			
		36	36	700				
		40	40	300				
		44	43-3/8	600				
		54	54	700				

Specifications are subject to change without notification.
*Viton is a registered trademark of E.I. DuPont de Nemours & Co., Inc.

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Fulflo® FP Filter Vessels

Fulflo® FP Model Cartridge Filter Vessels Designed for Economical Liquid Filtration

The FP Filter Vessel Series is designed for use with the Fulflo® Flo-Pac® 718 and 736 Pleated Filter Cartridge Series.

Benefits

- Single O-ring design closure assures quick, positive cover sealing.
- Swing bolts with eyenuts for fast, easy opening and closing of cover
- Maximum design pressure is 150 psi (10.3 bar) at 450°F* (232°C) and 200 psig at 100°F (38°C) plus full vacuum
- Buna-N O-ring standard with EPR, Viton** and fluoropolymer available
- ASME Code UM stamp is standard (U stamp is optional)
- Threaded vent and drain connections
- Adjustable leg height
- Threaded or flanged inlet and outlet options
- Side inlet, bottom outlet and crevice-free welded design provide a smooth interior for easy wash-out and cleaning

Applications

- Process Water
- Coatings
- Lubricants
- Coolants
- Cutting Oils
- Solvents
- EDM

ENGINEERING YOUR SUCCESS.

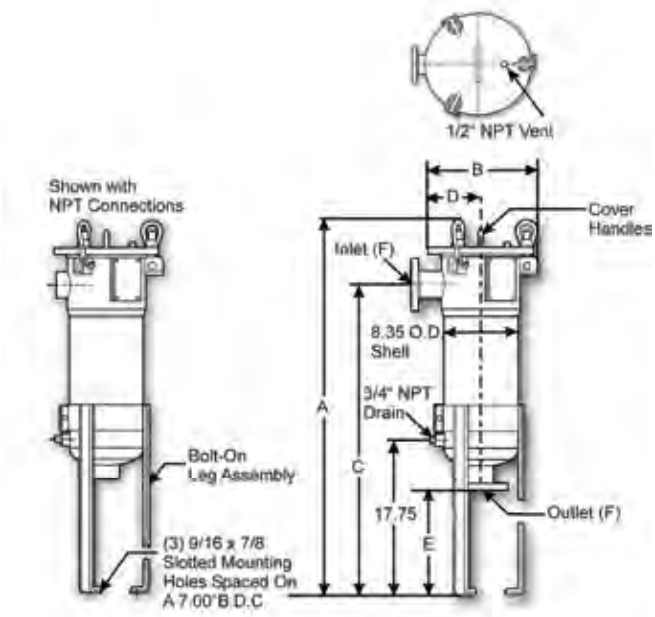
Fulflo® FP Filter Vessels

Design Specifications

Model Volume	No. & Length of Cartridges (in)	Typical Aqueous Flow † (gpm)	Dimensions (in) A	B	C	D	E	F	Shipping Weight (lbs) (gal)
FP1-1-2	(1) 18	50	42.56	12.25	35.13	5.75	13.19	2 NPT	112 5.5
FP1-1-2F	(1) 18	50	42.56	14.50	35.13	8.00	12.00	2 NPS	120 5.5
FP1-2-2	(2) 18	100	60.56	12.25	53.13	5.75	13.19	2 NPT	132 9.6
FP1-2-2F	(2) 18	100	60.56	14.50	53.13	8.00	12.00	2 NPS	140 9.6
FP1-2-3F	(2) 18	100	60.56	14.50	53.13	8.00	11.75	2 NPS	150 9.6

(F) NPS - ANSI Class 150# Slip-On Flanges
(F) NPT - ANSI Class 300# Threaded Couplings

†Actual rate is dependent on fluid viscosity, micron rating, contaminant and media type. Consult flow charts for each application.



* Operating temperature limited to 250°C (121°F) by standard Buna-N O-Ring and exterior paint on carbon steel models. Optional O-Ring materials are available.

Ordering Information

	FP	1		
Material		Model Number of Columns	Number of 18 in Cartridges/Column	Inlet/Outlet Flange Size
None = Carbon Steel 4L = 304L Stainless Steel		1	1 2	2 3 No F = NPT

Specifications are subject to change without notification.
** Viton is a registered trademark of E.I. DuPont de Nemours & Co., Inc.

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Attachment F

Dayton Pressure Relief Valve Cut Sheet

GRAINGER
FOR THE ONES WHO GET IT DONE

Relief Valve, 40 GPM, 1 NPT x 3/4 NPT

DAYTON

Price: $182.75 / each

Auto-Reorder Every 1 Month(s)

Typically in Stock

Item # **4KHA2**
Catalog Page # **4143**
Mfr. Model # **4KHA2**
Shipping Weight **2.828 lbs.**
UNSPSC # **40141606**

Country of Origin **India** Country of Origin is subject to change.

Technical Specs

Item	**Valve**
Type	**Pressure Relief**
Max. Flow GPM	**40**
Pressure Range (PSI)	**0 to 400**
Max. Fluid Temp. (F)	**180**
Body Material	**Bronze**

Wetted Materials	**SS**
Inlet Port (In.)	**1 (M)NPT**
Outlet Port (In.)	**3/4 (F)NPT**
Max. Pressure (PSI)	**650**
Application	**For Prevention of Damage to Positive Displacement Pumps**
For Use With	**Postive Displacement Pumps**

Customers Also Viewed

1 of 1 Prev | Next

Relief Valve, 25 GPM, 3/4 NPT x 3/4 NPT
Item # 4KHA1
DAYTON

Insert, Buna-N
Item # 1X407
LOVEJOY

Shaft Coupler Body
Item # 6X072
LOVEJOY

Penetrating Solvent, HD, Size 11 Oz
Item # 4LRF8
BLASTE´ SHOW

You Recently Viewed:

Pric $4.84

1

Category Top Sellers

Prev | Next

Valve, Regulating, 0-8 GPM

Item # 1MDA3
DAYTON

Price: $85.00

1

Valve, Regulating, 3-5.5 GPM

Item # 1MDA2
DAYTON

Price: $151.50

1

Valve, Regulating, 2-3 GPM

Item # 1MDA1
DAYTON

Price: $120.80

1

Valve, Regulating, 0-9 GPM

Item # 1MDA5
DAYTON

Price: $248.25

1

0 Reviews | 0 out of 5

This Product has no Reviews. Be the first to Write a Review.

Product Reviews Disclaimer:
Grainger is neither responsible for, nor does it endorse, the content of any product review or statement posted. Any statements posted constitute the statements of the poster and are not the statements of Grainger. The statements posted by Grainger employees with the Grainger employee badge represent the views of such employees and are not the statements of Grainger. Grainger makes no representations as to the appropriateness, accuracy, completeness, correctness, currentness, suitability, or validity of any product review or statements posted, including those posted by employees with the Grainger employee badge, and is not liable for any losses, injuries or damages which may result from any such product review or statements. Use of any linked web site provided in a product review or post is at the user's own risk.

Ask & Answer

0 Questions | **0** Answers |

This Product has no Q&A. Be the first to

Ask and Answer Disclaimer:
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Attachment G

Badger Meter Recordall
Information Sheet

Badger Meter

Recordall® Industrial Meters

Nutating Disc Meter, Bronze and Thermoplastic

DESCRIPTION

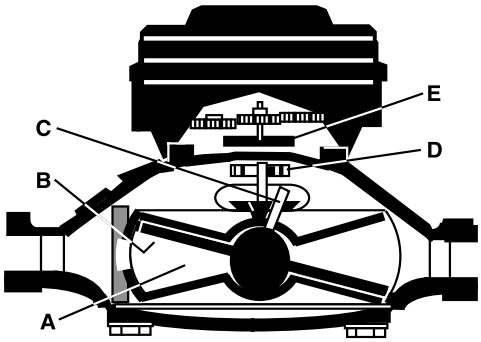
The Badger Meter Recordall (RCDL) positive displacement meters are one of the most cost effective methods in metering industrial fluids. The RCDL meter has a simple, efficient design for high accuracy and repeatability over the entire meter flow range.

Available in five sizes, 1/2" through 2" for flows up to 170 gpm, these meters are extremely rugged and reliable. Maintenance is seldom required, but if necessary, takes only a few minutes. All parts are designed and built of materials that meet your application requirements and provide an enduring and a trouble-free, precision flow meter.

To complement the RCDL meter line, Badger Meter offers a complete line of accessories that includes totalizers, electromechanical and electronic transmitters, rate of flow indicators and batch/process controllers.

OPERATION

The metering principle, known as positive displacement, is based on the continuous filling and discharging of the measuring chamber. Controlled clearances between the disc and the chamber provide precise measurement of each volume cycle. As the disc nutates, the center spindle rotates a magnet. The movement of the magnet is sensed through the meter wall by a follower magnet or by various sensors. Each revolution of the magnet is equivalent to a fixed volume of fluid, which is converted to any engineering unit of measure for totalization, indication or process control.



Liquid flowing through the meter chamber (A) causes a disc (B) to nutate or wobble. This motion, in turn, results in the rotation of a spindle (C) and drive magnet (D). Rotation is transmitted through the wall of the meter to a second magnet (E) or varied style of sensor pickup.

FEATURES

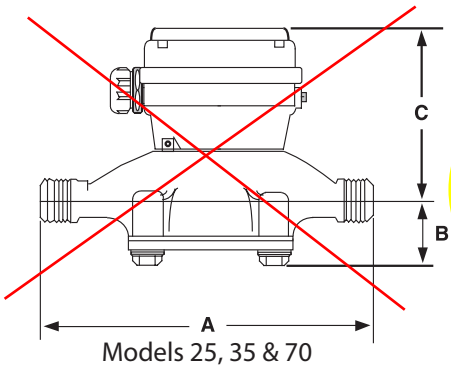
- Wide flow range
- Rugged bronze or thermoplastic housing
- Models 25 and 70—Bronze: 250° F option
- Easily maintained without removing from line
- Durable components for minimal maintenance
- Wide range of compatible accessories

PERFORMANCE

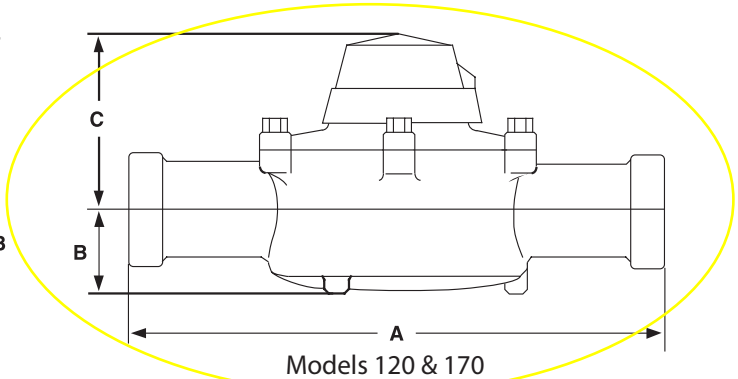
- Accuracy: ± 1.5%
- Repeatability: ± 0.5%
- Max. Operating Pressure: 150 psi
- Maximum Operating Temperature:
  Plastic housing: 100° F
  Bronze housing: 120° F

Product Data Sheet

SPECIFICATIONS



Models 25, 35 & 70



Models 120 & 170

Dimensions in Inches without Register						Flow Rate in Gallons		
Meter Model	**Meter Size**	**Housing Material**	**A Meter Length**	**B Centerline to Base**	**Meter Length with Conn.**	**Cold Liquids 32…120° F**	**Chemicals & Oils 32…250° F (BZ) 32…100° F (PL)**	**Approx. Weight**
M25	5/8"	BZ or PL	7-1/2"	1-3/8"	12-7/16"	1/2…25 gpm	1…25 gpm	5 lb
M25	3/4"	BZ or PL	7-1/2"	1-3/8"	12-5/8"	1/2… 30 gpm	1…30 gpm	5 lb
M35	3/4"	BZ	9"	1-3/4"	14-1/8"	3/4… 35 gpm	N/A	6 lb
M40	1"	PL	10-3/4"	2-1/4"	16-3/16"	3/4… 50 gpm	N/A	5 lb
M70	1"	BZ	10-3/4"	2-1/4"	16-5/8"	1…70 gpm	5…70 gpm	12 lb
M120	1-1/2"	BZ	12-5/8"	2-5/8"	19-3/4"	2…120 gpm	*See **Note**	20 lb
M170	2"	BZ	15-1/4"	3-3/8"	22-7/8"	2…170 gpm	N/A	30 lb
BZ = Bronze; PL = Plastic NPT connection set assemblies available.						N/A = Not available in high temperature/chemical option. ***Note**: Available for chemicals or fluids not to exceed 110° F (43° C)		

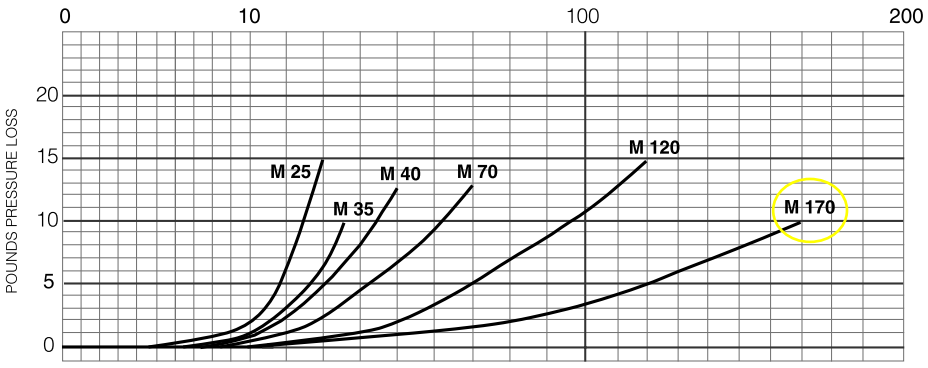
Height Dimensions in Inches with Register and Accessories						
Meter Size	**With Non Resettable Register**	**With Transmitter**	**With MS-ER1 Transmitter**	**With ECA Transmitter**	**With 258 Register**	**With Series 76 Register**
5/8" & 5/8 x 3/4"	5-3/4"	7-3/8"	11-1/4"	9-3/8"	8"	15-1/4"
3/4"	6-1/8"	7-3/4"	11-5/8"	9-3/8"	8-3/8"	15-5/8"
1"	7-1/2"	9-1/8"	13"	11-3/16"	9-3/4"	17"
1-1/2"	9-1/8"	10-3/8"	14-1/4"	12-3/4"	11"	18-1/4"
2"	10-3/4"	12-1/4"	16-1/8"	14-3/8"	12-7/8"	20-1/8"

MATERIALS OF CONSTRUCTION

	Cold Liquid Units	High Temp. and/or Chemical Units Models 25 & 70
Housing	BZ or PL	BZ: 250° F, PL: 100° F
Chamber	Noryl	LCP
Disc	SAN	LCP
Crossbar	Nylon	Ultem
Magnetic Assembly	Nylon	Ultem
Chamber Retainer	Polyethylene	Metal Clip
Screen	Polypropylene	None

PRESSURE LOSS CHART

Rate of Flow in Gallons Per Minute



www.badgermeter.com

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Legacy Document Number: ITB-072

Attachment H

Polygem Liquid Concrete Repair (LCR) Epoxy

LCR MV

MEDIUM VISCOSITY INJECTION EPOXY

Data Sheet C11

1. PRODUCT NAME

LCR MV
MAXIMUM PENETRATING INJECTION EPOXY

2. MANUFACTURER

Polygem, Inc.
1105 Carolina Drive
West Chicago, IL 60185
Telephone: (630) 231-5600
FAX: (630) 231-5604
Internet: www.polygem.com

3. PRODUCT DESCRIPTION

LCR MV is a 100% solids, two-component, moisture insensitive epoxy designed to permanently restore structure and design strength to cracked concrete structures. Unique wetting properties allow maximum penetration of LCR MV into cracks above .005". The LCR MV can be used on wet or dry surfaces, as well as underwater.

Outstanding Features

- Meets ASTM C881, Types I, II, IV & V, Grades 1 & 2, Class B & C..
- No VOC's or Solvents
- 100% solids
- Chemical and Solvent Resistant
- Restores Structural Strength
- Excellent Adhesion to concrete, wood, fiberglass and metal surfaces.

Uses

For permanently repair cracks in concrete such as:

- Basement foundation crack repair.*
- Industrial warehouse and residential floors
- Patios and sidewalks
- Balcony, pool and parking decks
- Reservoir, tank and pool leak repair.*

*See LCR MV recommended concrete crack repair data sheet for additional instructions.

4. APPLICATION INSTRUCTIONS

1) Mix entire contents of cartridge according to mixing instructions.
2) Place cartridge into standard caulking gun.
3) Dispense mixed material and use up entire contents within 15 minutes.
4) Do not exceed a "firm handshake" pressure when dispensing with caulk gun.
5) Clean up any uncured epoxy with solvent.

Packaging

LCR MV is available 10 fl. oz. single caulk style cartridges and Low, High and Extra High Viscosities.

Shelf Life

Factory sealed containers of this product are guaranteed to be of first quality for min. 24 months.

Limitations

- Not for use on contaminated or oily surfaces.
- Do not install when surface temperature is below 40°F or above 90°F.
- During damp and/or cool conditions epoxy will cure slower and protect finished work from traffic until fully cured.

Cautions

- Wear chemical goggles, NIOSH approved respirator, proper protective clothing and gloves to prevent direct contact of resins. Consult Material Safety Data Sheet for full listing protective requirements.
- LCR MV may irritate eyes and skin. Avoid contact with eyes or prolonged contact with skin.
- Any remaining contents of cartridge can get very hot.
- Keep out of reach of children.

5. TECHNICAL DATA

Performance Properties with Test/Test Method Results

Pot Life @ 77°F (100 grams)		30 mins.
Work life for entire cartridge @ 77°F		20 mins.
Thin Film Set-Time @ 77°F		3-5 hours
Full Cure time @ 77°F		24 hours
Compressive Strength ASTM D-695		14.480 p.s.i.
Tensile Strength		8.315 p.s.i.
Tensile Elongation ASTM D-638		8.9% min.
Linear Coefficient of Shrinkage		<0.001
Heat Deflection Temperature		>120°F
Shore D Hardness		80-75
Water Absorption, 24 hours		0.1989%
Mixed Viscosity	LV	150 cps
	MV	650 cps
	HV	7,000 cps
Color Mixed		Amber
Mix Ratio		2:1
Packaging:		

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Appendix H

Quality Assurance Project Plan

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Bianchi/Weiss Greenhouses Site, Suffolk County
East Patchogue, New York

Quality Assurance Project Plan

NYSDEC Site Number: 152209
USEPA ID # NYR000209486

Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway
Albany, New York 12207

Prepared by

EA Engineering, P.C. and its Affiliate
EA Science and Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
(315) 431-4610

Revisions to Final Approved Quality Assurance Project Plan

Revision Number	Date Submitted	Summary of Revision	New York State Department of Environmental Conservation Approval Date

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JUNE 2019

CERTIFICATION STATEMENT

I Donald Conan certify that I am currently a NYS registered professional engineer and that this Quality Assurance Project 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).

Donald Conan P.E.

6/18/19 DATE

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TABLE OF CONTENTS

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LIST OF TABLES

LIST OF ACRONYMS/ABBREVIATIONS

°C	Degrees Celsius
ASP	Analytical Services Protocol
CLP	Contract Laboratory Program
DER	Division of Environmental Remediation
DQO	Daily Quality control Objectives
EDD	Electronic Data Deliverables
ft	Foot (feet)
HASP	Health and Safety Plan
IDL	Instrument Detection Limit
MDL	Method Detection Limit
mg/L	Milligram per Liter
mS/cm	Millisiemens per Centimeter
No.	Number
NTU	Nephelometric Turbidity Units
NYSDEC	New York State Department of Environmental Conservation
pH	Potential of Hydrogen
ppm	Parts per Million
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SMP	Site Management Plan
SOP	Standard Operating Procedures
SVOC	Semi-volatile Organic Compound
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

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1. INTRODUCTION

1.1 PURPOSE AND OBJECTIVES

1.1.1 PURPOSE

This Quality Assurance Project Plan (QAPP) has been prepared to specify quality assurance (QA)/quality control (QC) procedures for the collection, analysis, and evaluation of data that will be legally and scientifically defensible for site management activities at the Bianchi/Weiss Greenhouses Site in East Patchogue, New York (New York State Department of Environmental Conservation [NYSDEC] Site Number [No.] 1-52-209).

1.1.2 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

The QAPP provides general information and references standard operating procedures (SOPs) applicable to the analytical sampling program detailed in the Site Management Plan (SMP). This information includes definitions and generic goals for data quality and required types and quantities of QA/QC samples. The procedures address field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA reporting specific to the analyses performed by the laboratories.

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2. PROJECT ORGANIZATION AND RESPONSIBILITIES

While all personnel involved in site monitoring and generation of data are implicitly a part of the overall project management and QA/QC program, certain members of the Project Team have specifically designated responsibilities. Project personnel responsibilities are summarized below.

2.1 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION OR REPRESENTATIVE

NYSDEC or its representative will provide oversight, coordination, health and safety, field support, and evaluation of analytical data. Field support will be provided during groundwater sampling. NYSDEC or its representative will also will be responsible for evaluation of analytical test results. The roles of the team to be involved in this project are as follows:

- ***Project QA/QC Officer***—The Project QA/QC Officer will provide guidance on technical matters and review technical documents relating to the project. They will assess the effectiveness of the QA/QC program and recommend modifications when applicable. Additionally, the QA/QC Officer may delegate technical guidance to specially trained individuals under his direction.

- ***Project Manager***—The Project Manager provides overall coordination and preparation of the project, coordination with the New York State Department of Health, budget control, subcontractor performance, implementation of the QAPP, and allocation of resources and staffing to implement both the QA/QC program and the site Health and Safety Plan. If the project is to be managed by a representative consultant, responsibilities include coordination with NYSDEC.

- ***Project QA/QC Coordinator***—The Project QA/QC Coordinator is responsible for project-specific supervision and monitoring of the QA/QC program. They will ensure that field personnel are familiar with and adhere to proper sampling procedures, field measurement techniques, sample identification, and chain-of-custody procedures. They will coordinate with the analytical laboratory for the receipt of samples and reporting of analytical results, and will recommend actions to correct deficiencies in the analytical protocol or sampling. Additionally, they will prepare QA/QC reports for management review.

- ***Site Manager***—The Site Manager will serve as the onsite contact person for field activities. They will be responsible for coordinating the field activities, including inspecting and replacing equipment, preparing daily and interim reports, scheduling sampling, and coordinating shipment and receipt of samples and containers.

2.2 LABORATORY

A laboratory certified by the New York State Department of Health Environmental Laboratory Approval Program will perform chemical analyses of environmental samples collected for site monitoring, as necessary. The laboratory will have its own provisions for conducting an internal QA/QC review of the data before they are released to NYSDEC. The Laboratory Project Managers will contact NYSDEC's Project Managers with any sample discrepancies or data concerns. Hardcopy and electronic data deliverables (EDDs) formatted QA/QC reports will be filed by the analytical laboratories when data are submitted to NYSDEC. Corrective actions will be reported to the Project Managers along with the QA/QC reports.

3. QUALITY ASSURANCE/QUALITY CONTROL OBJECTIVES FOR DATA MEASUREMENT

3.1 INTRODUCTION

This section discusses QA objectives for this Site. QA objectives are requirements specifying the quality of environmental data needed to support the decision-making process. The uncertainty must be maintained at levels that will allow the resultant data to be used for its intended purposes.

Data collected during work assignments typically will include field measurements and laboratory analytical data. This section reviews the type of data anticipated, and presents QA objectives for data collected for this Site.

3.1 DATA QUALITY CONTROL OBJECTIVES

Data quality control objectives (DQOs) are qualitative and quantitative statements, which specify the quality of data required to support the decision making process. DQOs are developed to achieve the level of data quality required for anticipated data use. DQOs are implemented so that, for each task, the data are legally and scientifically defensible. The development of DQOs for a specific site and measurement takes into account work assignment goals; data uses, types, and needs; and data collection. These factors determine whether the quality and quantity of data are adequate for its end use. Sampling protocols have been developed and sampling documentation and handling procedures have been identified to realize the required data quality.

DQOs are established prior to data collection and are not considered a separate deliverable. The DQO process results in an effective plan, which details the chosen sampling and analysis options, and the statements of confidence in decisions made during the corrective action process. Confidence statements are possible through the application of statistical techniques to the data.

3.2 LABORATORY QUALITY ASSURANCE OBJECTIVES

The fundamental mechanisms that will be employed to achieve these quality goals in laboratory analyses can be categorized as prevention, assessment, and correction. These include:

- Prevention of defects in the quality through planning and design; documented instructions and procedures; and careful selection of skilled, qualified personnel.

- Quality assessment through a program of regular audits and inspections to supplement continual informal review.

- Permanent correction of conditions adverse to quality through a closed-loop corrective action system.

Overall compliance with laboratory QC procedures will be evaluated against the criteria specified for each method. Deviations will be reported in the narrative, which contains comments or problems encountered during fractional analyses of the samples. The narrative includes the laboratory's assessment of the impact on data usability and will address QC issues related to the following:

- ***Laboratory Method Performance*—**QC criteria for method performance must be met for target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, surrogates, and laboratory control samples.

- ***Sample Matrix Effects*—**QC samples are analyzed to determine measurement bias due to the sample, and may include surrogates, matrix spikes, matrix spike duplicates, and laboratory duplicates. If criteria are not met, matrix interferences are confirmed either by reanalysis or by inspection of the laboratory control sample results to verify that laboratory method performance is in control. Data are reported with appropriate qualifiers or discussion.

3.3 FIELD PARAMETERS AND QUALITY ASSURANCE OBJECTIVES

Water quality parameters consisting of potential of Hydrogen (pH), conductivity, dissolved oxygen, salinity, temperature, and turbidity will be measured to provide general surface water and groundwater quality information. These parameters will also be monitored for stability during purging of groundwater monitoring wells. Field test methods that will be utilized to measure these specific parameters are presented in detail in the Field Sampling Plan (Appendix K of the SMP). Field screening of soil samples using a photoionization detector will be performed to assess the presence and relative concentrations of volatile organic vapors.

Soil vapor, indoor/outdoor air, and soil/sediment sampling locations and monitoring wells will be surveyed. Ground surface and top-of-casing elevations for each newly installed monitoring well will be measured to the nearest 0.01 ft as referenced to the National Geodetic Vertical Datum of 1929.

For field QC data, no QA objectives have been determined by the NYSDEC. Field QC data will be maintained primarily for descriptive purposes and data variability. The Site Manager will be responsible for reviewing and evaluating the field QC data.

Similar samples will be collected using consistent sampling methods, analyzed using consistent analytical procedures, and reported in conventional units (e.g., microgram per liter [µg/L], milligram per kilogram [mg/kg], and microgram per cubic meter [$\mu g/m^3$] for analytical results). Therefore, the data will be comparable throughout the project.

3.4 DETECTION AND QUANTITATION LEVELS

In addition, analytical sensitivity is an important component of data quality, and is evaluated using analyte detection and quantitation levels.

3.4.1 Detection Limits

A detection limit has been defined by the Committee on Environmental Improvement of the American Chemical Society (Analytical Chemistry 55:2210-2218 [1983]) as "the lowest concentration that can be determined to be statistically different from a blank." Various methods are available for determining detection limits, most of which are based on the standard deviation of measurements in the region near the blank responses. The following detection limits are determined routinely in the laboratory.

Instrument Detection Limits (IDLs) are determined using the protocols given in the inorganic and organic statements of work for the USEPA Contract Laboratory Program (CLP). A standard deviation is calculated from replicate measurements of a low-level standard and multiplied by 3 to give the IDL. IDLs are used as an index of instrument performance that does not include sample effects, and therefore, represent the lowest detection limit achievable. IDLs can vary between instruments of the same type and can change when re-determined.

Method Detection Limits (MDLs) are determined using the USEPA procedure published in 40 Code of Federal Regulations 136 Appendix B. The MDL is defined as "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte." This procedure requires that "sample processing steps of the analytical method be included in the determination of the method detection limit." Therefore, the sample matrix and sample preparation process, as well as the analytical instrumentation, influence MDLs. A minimum of seven replicate spikes at 1–5 times the expected MDL are analyzed. The MDL is calculated by multiplying the standard deviation of the measurements by the Student t-value for a 99 percent confidence level. Because of the wide variety of matrix types analyzed by the laboratory, MDLs are routinely determined in reagent water or standard solid matrix. These MDLs represent, therefore, the optimum values, and the MDLs for actual sample matrices are likely to be higher. MDLs can be determined for specific matrices when requested by NYSDEC.

Unless superseded by other program, work assignment, or NYSDEC requirements, IDLs, and MDLs are determined annually by the laboratories. In addition, IDLs and MDLs are re-determined after an instrument is moved or modified, and MDLs are re-determined after a method has been significantly changed. Where more than one instrument is used in sample analyses by a given technique (e.g., gas chromatograph/mass spectrometry, gas chromatograph, graphite furnace atomic absorption, or inductively coupled plasma), detection limit studies are performed for each instrument. A standard laboratory-reporting limit is determined for each analyte based on the highest detection limit determined. Data for instruments are maintained for use in reporting data when project-specific requirements dictate lower detection limits.

A detection limit measured at a given time is an estimate of the true detection limit because the measured standard deviation used to calculate the detection limit is subject to random error and is an estimate of the population standard deviation. The confidence limits on the standard deviation and, hence the detection limit, can be determined using the chi-square (X^2) distribution

(40 Code of Federal Regulations 136 Appendix B). The 95 percent confidence limits for an MDL determined from seven replicates are 0.64 MDL and 2.20 MDL. A re-determination of the detection limit could produce a value between the chi-square limits, even if the conditions remain the same. Day-to-day changes in instrument performance can further produce changes in the measured detection limit.

When interpreting data and detection limits, it is important to remember that, when a measured concentration is greater than the detection limit, the analyte has the specified probability of actually being present (i.e., of having a true concentration greater than zero); however, the detection limit cannot be used to say anything about the presence or absence of an analyte that has a measured concentration less than the detection limit. From the definition of the MDL, there is a 1 percent chance that a sample with no analyte will produce a concentration greater than or equal to the MDL (false positive). The probability is 50 percent; however, that a sample with a concentration at the MDL will be measured at less than the MDL (false negative).

3.4.2 Quantitation Levels

To ensure better precision in low-level data and to reduce the false-negative error rate, quantitation limits have been proposed as the minimum concentration at which an analyte can be quantified with an acceptable degree of confidence. The American Chemical Society Committee on Environmental Improvement has recommended that quantitation limits be calculated by multiplying 10 times the standard deviation, giving a relative standard deviation of 10 percent. The Committee further advised that quantitative interpretation, decision-making and regulatory actions should be limited to data at or above the limit of quantitation. The laboratories will use the term “Reporting Limit” for the laboratory quantitation limit.

3.4.3 Quality Control and Reporting Limits

Reporting limits applicable to work assignments are presented in Tables 1A-1E. The relevant tables were prepared based on 6 New York Code of Rules and Regulations Part 375 Soil Cleanup Objectives, and NYSDEC Groundwater Criteria, which will be reviewed by the contracting laboratories.

4. SAMPLING AND SAMPLE CUSTODY PROCEDURES

4.1 FIELD SAMPLING OPERATIONS

The collection and subsequent laboratory analyses of environmental samples will provide the majority of the data collected during the site monitoring activities. The number and types of analyses to be performed and the matrix of each of the samples is detailed in this SMP.

4.1.1 Sample Bottle Preparation

Chain-of-custody procedures begin with preparation of sample containers and preservatives to be used in sample collection. The contract laboratories will provide cleaned sample containers. Sample kits (coolers containing chain-of-custody forms, custody seals, sample containers, preservatives, and packing materials) will be prepared by the contract laboratories in response to receipt of the analytical task order submitted by the Project Manager.

4.1.2 Sampling Procedures

Sampling protocols are presented in the Field Sampling Plan (Appendix K). The protocols include standard sampling procedures for sample collection, accurate sample identification, and packing of samples for shipment. Each sample container is provided with a sample label, which is filled out at the time of sample collection. During sample collection, a chain-of-custody form is initiated, which accompanies the samples during shipment to the analytical laboratory.

4.2 LABORATORY SAMPLE RECEIPT

Upon receipt at the laboratory, a laboratory representative inspects the samples for integrity and checks the shipment against the chain-of-custody/analytical task order form. Discrepancies are addressed at this point and documented on the chain-of-custody form and the cooler checklist. Discrepancies are reported to the Laboratory Project Manager who contacts the Project Manager for resolution.

When the shipment and the chain-of-custody are in agreement, the custodian enters the samples into the Laboratory Information Management System and assigns each sample a unique laboratory number. This number is affixed to each sample bottle. The custodian then enters the sample and analysis information into the laboratory computer system.

4.2.1 Laboratory Sample Custody

The laboratory must satisfy the sample chain-of-custody requirements by implementing the following SOPs for laboratory/sample security:

- Samples are stored in a secure area
- Access to the laboratory is through a monitored area
- Visitors sign a visitor's log and are escorted while in the laboratory

- Only the designated sample custodians have keys to sample storage area(s)
- Transfers of samples in and out of storage are documented.

4.2.2 Sample Storage, Security, and Disposal

While in the laboratory, the samples and aliquots that require storage at 4°C ± 2°C are maintained in a locked refrigerator unless they are being used for analysis. The laboratory is responsible for sample storage and security to ensure that:

- Samples and extracts are stored for 60 days after the final analytical data report has been forwarded to the client. The samples, extracts, and digestates are then discarded in accordance with Occupational Safety and Health Administration guidance.

- Samples are not stored with standards or sample extracts.

5. CALIBRATION PROCEDURES AND FREQUENCY

Instruments and equipment used for analytical procedures are controlled by a formal calibration program, which verifies that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. Instruments and equipment that measure a quantity, or whose performance is expected at a stated level, are subject to calibration. Calibration is performed using reference standards or externally by calibration agencies or equipment manufacturers.

5.1 CALIBRATION SYSTEM

The following sections contain a discussion of the elements comprising the calibration system.

5.1.1 Calibration Procedures

Written procedures are used for all instruments and equipment subject to calibration. Whenever possible, recognized procedures, such as those published by the American Society of Testing and Materials or USEPA, or procedures provided by manufacturers, are adopted. If established procedures are not available, a procedure is developed considering the type of equipment, stability characteristics of the equipment, required accuracy, and the effect of operational error on the quantities measured.

5.1.2 Calibration Frequency

Calibration frequency is based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended data use, specified analytical methods, effect of error upon the measurement process, and prior experience.

5.1.3 Calibration Reference Standards

Two types of reference standards will be used by the contract laboratories for calibration.

- ***Physical standards***, such as weights for calibrating balances and certified thermometers for calibrating working thermometers, refrigerators, and ovens, are generally used for periodic calibration.

- ***Chemical standards***, such as Standard Reference Materials provided by the National Institute of Standards and Technology or USEPA. These may include vendor-certified materials traceable to National Institute of Standards and Technology or USEPA Standard Reference Materials. These are primarily used for operational calibration.

5.1.4 Calibration Failure

Equipment that cannot be calibrated or becomes inoperable is removed from service. Such equipment must be repaired and satisfactorily recalibrated before re-use. For laboratory

equipment that fails calibration, analysis cannot proceed until appropriate corrective action is taken and the analyst achieves an acceptable calibration.

Laboratory managers are responsible for development and implementation of a contingency plan for major equipment failure. The plan includes guidelines on waiting for repairs, use of other instrumentation, subcontracting analyses, and evaluating scheduled priorities.

5.1.5 Calibration Records

Records are prepared and maintained for each piece of equipment subject to calibration. Records demonstrating accuracy of preparation, stability, and proof of continuity of reference standards are also maintained. Copies of the raw calibration data are kept with the analytical sample data.

5.2 OPERATIONAL CALIBRATION

Operational calibration is generally performed as part of the analytical procedure and refers to those operations in which instrument response (in its broadest interpretation) is related to analyte concentration. Included are the preparation of standard response (calibration) curves and often the analysis of blanks.

5.2.1 Preparation of Calibration Curve

Preparation of a standard calibration curve is accomplished by the analysis of calibration standards, which are prepared by adding the analyte(s) of interest to the solvent that is introduced into the instrument. The concentrations of the calibration standards are chosen to cover the working range of the instrument or method. Sample measurements are made within this working range. The calibration curve is prepared by plotting or regressing the instrument responses versus the analyte concentrations. Concentrations of the analyzed samples are back calculated from the calibration curve.

5.2.2 Blanks

Reagent and/or solvent blanks are analyzed to assess if the materials used to prepare the standards are free from interfering substances that could affect the analysis. A method blank is prepared whenever samples are processed through steps that are not applied to the calibration standards.

5.3 PERIODIC CALIBRATION

Periodic calibrations are performed for equipment (e.g., balances, thermometers) that is required in the analytical method, but that is not routinely calibrated as part of the analytical procedure.

5.4 FIELD EQUIPMENT CALIBRATION

The procedures and frequencies for the calibration of field equipment are provided in the respective equipment's manual, typically provided with rented equipment.

6. ANALYTICAL PROCEDURES

6.1 FIELD ANALYTICAL PROCEDURES

Field analytical procedures include the measurement of temperature, conductivity, dissolved oxygen, pH, turbidity, organic vapors, and groundwater levels. Field measurement QC limits in terms of precision and accuracy are presented in the following tables.

Field Instrumentation Calibration Frequency

Instrument	Frequency of Calibration Check	Calibration Standard
pH Meter	Prior to use – daily	Commercially prepared pH buffer solutions (4.01, 7.00, 10.00)
Conductivity Meter	Prior to use – daily	Commercially prepared saline solution (12.9 mS/cm)
Water Level Meter	Prior to initiating field work	100-ft engineer's tape
Dissolved Oxygen Meter	Per sampling event	Saturation
Photoionization Detector	Prior to use – daily	100 ppm isobutylene
Turbidity	Prior to use – daily	10 NTU, 200 NTU

Note:
NTU = Nephelometric turbidity units
pH = Potential of hydrogen
mS/cm = Millisiemens per centimeter
ft = Foot (feet)
ppm = Parts per million

Field Measurement Quality Control Objectives

Field Parameter	Precision[(a)]	Accuracy
Water Temperature	±1°C	±1°C (instrument capability)
pH	±1 pH Standard Unit	±1 pH Standard Unit (instrument capability)
Conductivity	±1 mS/cm	±5% standard
Dissolved Oxygen	±0.02 mg/L	±5%
Turbidity	±1.0 NTU	±2% standard
Water Level	±0.1 ft	±0.01 ft

(a) Precision units presented in applicable significant figures.
°C = Degree Celsius
NTU = Nephelometric turbidity units
pH = Potential of hydrogen
mS/cm = Millisiemens per centimeter
ft = Foot (feet)
ppm = Parts per million
mg/L = Milligram per liter

6.2 LABORATORY ANALYTICAL PROCEDURES

Laboratory analytical requirements presented in the subsections below include a general summary of requirements related to each sample matrix to be analyzed.

Concentrations of target compounds and analytes will be analyzed according to the laboratory-specific method SOPs approved by the NYSDEC Analytical Services Protocol (ASP) (2001, as revised), and USEPA SW-846 Methods listed in the table below. Additional information regarding the number and types of samples to be collected at each area of concern are presented in the SMP and Excavation Work Plan (Appendix F of the SMP).

Analytical Methods and Holding Times

Analyte List	Matrices	Method No.	Holding Times
USEPA CLP Target Compound List organics (VOCs/semi-volatile organic compounds [SVOCs])(1)	Subsurface soil surrounding USTs	USEPA SW-846 Method 8260 for VOCs USEPA SW-846 Method 8270 for SVOCs	VOCs – 7 days SVOCs – 14 days
USEPA CLP Target Analyte List metals	Surface and subsurface soil	CLP Method ILM05.3 or USEPA SW-846 Method 6010 Mercury by USEPA SW-846 Method 7470	6 months
Pesticides	Groundwater, surface water, surface and subsurface soil	USEPA Method 608	Extract within 14 days (7 days for water), analyze within 40 days of extraction

Note:
USEPA = United States Environmental Protection Agency
CLP = Contract Laboratory Program
VOC = Volatile organic compound
SVOC = Semi-volatile organic compound
UST = Underground storage tank
No. = Number

Samples will be analyzed by the laboratory within the holding times presented on a standard turnaround schedule.

6.3 SAMPLE MATRICES

6.3.1 Water

No filtering of groundwater samples will be performed unless pre-approved under the Field Sampling Plan. Analytical results for analyses will be reported in units identified in Tables 1-5.

6.3.2 Soil

Analytical results of soil samples will be reported in terms of dry weight in the units identified in Tables 1-5.

6.4 STANDARD OPERATING PROCEDURES

The contract laboratories will maintain a manual of procedures other than laboratory-specific analytical methods in a document controlled SOP Manual. Laboratory Method SOPs will be maintained as controlled documents in the laboratory's Methods Manuals.

6.5 RECORDKEEPING

The requirements for laboratory recordkeeping are given in the laboratory's SOP Manual. Data entries are made in indelible, water-resistant ink. The date of the entry and the observer are clear on each entry. The observer uses his/her full name or initials. An initial and signature log is maintained so that the recorder of every entry can be identified. Information is recorded in a notebook or on other records at the time, which include the observations made. Recording information on loose pieces of paper is not allowed.

When a mistake is made, the wrong entry is crossed out with a single line initialed and dated by the person making the entry, and the correct information recorded. Obliteration of an incorrect entry or writing over it is not allowed; neither is the use of correction tape or fluid on any laboratory records.

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7. FIELD AND LABORATORY QUALITY CONTROL CHECKS AND FREQUENCY

QC measurements for analytical protocols are designed to evaluate laboratory performance and measurement biases resulting from the sample matrix and field performance.

- ***Laboratory Method Performance*—**QC criteria for method performance must be met for all target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, laboratory control samples, and Standard Reference Materials.

- ***Sample Performance*—**The accuracy and precision of sample analyses are influenced by both internal and external factors. Internal factors are those associated with sample preparation and analysis. Internal factors are monitored by the use of laboratory QC samples. QC field samples are analyzed to determine any measurement bias due to the sample matrix based on evaluation of matrix spikes, matrix spike duplicates, and laboratory duplicates.

- ***Field Performance*—**QC samples are used to evaluate the effectiveness of the sampling program to obtain representative samples, eliminating any cross contamination.

7.1 LABORATORY QUALITY CONTROL SAMPLES

Laboratory QC samples are included in each analysis to provide information on both method performance and sample measurement bias, and are included in each analytical batch. A batch is defined as a group of field samples of similar matrix, not to exceed 20, which are processed as a unit using the same method and the same lots of standards and reagents. The laboratory QC samples discussed in the following sections are not counted in the maximum batch size of 20.

7.1.1 Method Blank

The method blank is used to monitor laboratory contamination. This is usually a sample of laboratory reagent water, or a standard solid matrix, processed through the same analytical procedure as the sample (i.e., digested, extracted, distilled). One method blank is prepared and analyzed with each analytical batch.

7.1.2 Laboratory Control Sample

A fortified method blank is analyzed with each analysis. These samples generally consist of a standard solid matrix fortified with the analytes of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. The analyte recovery from each is used to monitor analytical accuracy and precision.

7.1.3 Matrix Spike

A matrix spike is an aliquot of a field sample, which is fortified with the analyte(s) of interest and analyzed to monitor measurement bias associated with the sample matrix. A matrix spike duplicate will be performed for every analytical batch.

7.1.4 Surrogates

Surrogates are organic compounds that are similar to analytes of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. Surrogates are added to field and QC samples in every batch. These compounds are used to monitor system performance, as well as sample measurement bias. Percent recoveries are calculated for each surrogate and evaluated against acceptance criteria.

7.2 FIELD QUALITY CONTROL SAMPLES

These samples are not included specifically as laboratory QC samples, but are analyzed when submitted. Data for these QC samples are reported with associated samples.

7.2.1 Field/Rinsate Blanks

Field/rinsate blanks will be collected to evaluate the cleanliness of aqueous sampling equipment and sampling bottles, and the potential for cross-contamination of samples due to equipment handling and/or contaminants in the air. Field blanks will be collected at a frequency of one per 20 decontamination events for each type of sampling equipment (e.g., a groundwater bailer for groundwater), and at a minimum, one per equipment type and/or media per day.

Field/rinsate blanks will be collected prior to the occurrence of any analytical field-sampling event by pouring deionized or potable water over a particular piece of sampling equipment and into a sample container. The analytical laboratory will provide field blank water and sample jars with preservatives for the collection of all field blanks. Glass jars will be used for organic blanks. The field blanks, as well as the trip blanks, will accompany field personnel to the sampling location. The field blanks will be analyzed for the same analytes as the environmental samples being collected that day and shipped with the samples taken.

Field blanks will be collected in accordance with the procedures described below:

- Decontaminate sampler using the procedures specified in this QAPP.
- Pour distilled/deionized water over the sampling equipment, and collect the rinsate water in the appropriate bottles.
- Immediately place sample in a cooler and maintain a temperature of 4ºC until receipt by the laboratory.

- Fill out sample log, labels, and chain-of-custody forms, and record in field logbook.

7.2.2 Trip Blanks

The trip blank will be used to determine if any volatile organic cross-contamination occurs between aqueous samples during shipment. They are only appropriate for volatile organic samples. Trip blanks will be supplied by the analytical laboratory as aliquots of distilled, deionized water that will be sealed in a sample bottle prior to initiation of each day of fieldwork. Glass vials (40 milliliters) with Teflon®-lined lids will be used for trip blanks. The sealed trip blank bottles will be placed in a cooler with the empty sample bottles and shipped to the Site by laboratory personnel. If multiple coolers are necessary to store and transport aqueous VOC samples, then each cooler must contain an individual trip blank.

7.2.3 Field Duplicates

Field duplicates are two samples of the same matrix, which are collected, to the extent possible, from the same location at the same time using the same techniques. Field duplicates provide information on the precision of the sampling and analysis process. Field duplicates will be collected at a frequency of 1 duplicate per 20 sample media. Separate duplicate samples will be collected for the following media: surface and subsurface soil, surface water, and groundwater.

7.2.4 Temperature Blanks

Either laboratory will use an infrared instrument to measure the temperature of liquid samples or a temperature blank will be used to measure the temperature of liquid samples. If used, temperature blanks will be supplied by the analytical laboratory. If multiple coolers are necessary to store and transport aqueous samples, then each cooler must contain an individual temperature blank (if used).

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8. PREVENTIVE MAINTENANCE

Periodic preventive maintenance is required for all sensitive equipment. Instrument manuals will be kept on file for reference if equipment needs repair. The troubleshooting chapter of factory manuals may be used in assisting personnel in performing maintenance tasks. The frequency of preventive maintenance for field equipment is indicated in each operating instruction manual. Field equipment is checked by field personnel under the supervision of the Site Manager.

Major instruments in the laboratory are covered by annual service contracts with manufacturers. Under these agreements, regular preventive maintenance visits will be made by trained service personnel. Maintenance is documented and maintained in permanent records by the individual responsible for each instrument.

Laboratory management is responsible for preparation and documentation of the program. Section Chiefs and QC Chemists implement the program, and the Quality Services Manager reviews implementation to verify compliance. For each operational group, the preventive maintenance program includes the following:

- Listing of the instruments and equipment that are included in the program
- Frequency of maintenance considering manufacturer's recommendations and/or previous experience with equipment
- For each instrument in the program, a file is maintained for the following information:
  - List of spare parts maintained by the laboratory
  - External service contracts
  - Items to be checked and/or serviced during maintenance and directions for performing maintenance (if external service is not provided or if not stated in manufacturer's instrument manuals).

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9. QUALITY ASSURANCE PERFORMANCE AND SYSTEM AUDITS

Audits are systematic checks to determine the quality of operation of some activity or function in the field or laboratory. One field audit will be conducted to assure adherence to proper field and sampling procedures. Audits are of two types:

- ***Performance audits*** are independent safety and health, procedure, and/or sample checks made by a supervisor or auditor to arrive at a **quantitative** measure of the quality of the data produced by one section or the entire measurement process.

- ***System audits*** are onsite **qualitative** inspections and reviews of the QA system used by some part of or the entire measurement system. The audits are performed against the QAPP. A checklist is typically generated from the requirements and becomes the basis for the audit. The results of any deficiencies noted during the audit are summarized in an audit report.

Laboratory performance and system audits are performed by the QA staff to assess the effectiveness of the quality system. These internal audits are performed on a routine basis. Audits are also performed by certifying agencies. Audit reports and corrective actions are available to NYSDEC for review.

9.1 RESPONSIBILITY, AUTHORITY, AND TIMING

QA audits to be conducted for the project may include system, performance, and data audits. The Project QA Officer will keep a tentative schedule on record that details the number and types of audits.

9.2 FIELD AUDITS

Field performance audits will be conducted on an ongoing basis during a work assignment, as field data are generated, reduced, and analyzed. Numerical manipulations, including manual calculations, will be documented. Records of numerical analyses will be legible, of reproduction quality, and sufficiently complete to permit logical reconstruction by a qualified individual other than the originator.

Indicators of the level of field performance include the analytical results of the blank and replicate samples. Each blank analysis will be considered an indirect audit of the effectiveness of measures taken in the field to ensure sample integrity (e.g., field decontamination procedures). The results of the field replicate analyses are an indirect audit of the ability of each field team to collect representative sample portions of each matrix type.

System audits of site activities will be accomplished by an inspection of all field site activities. During this audit, the auditor(s) will compare current field practices with standard procedures.

The following elements will be evaluated during a field system audit:

- Activities conducted in accordance with this SMP
- Procedures and analyses conducted according to procedures outlined in the QAPP
- Sample documentation
- Working order of instruments and equipment
- Level of QA conducted per each field team
- Contingency plans in case of equipment failure or other event preventing the planned activity from proceeding
- Decontamination procedures
- Level of efficiency with which each team conducts planned activities at one site and proceeds to the next
- Sample packaging and shipment.

After completion of the audit, any deficiencies will be discussed with the field staff and corrections identified. If any of these deficiencies could affect the integrity of the samples being collected, the auditor(s) will inform the field staff and corrections will be implemented immediately. The audit will be performed by the Project QA/QC Coordinator or the Site Manager.

9.3 LABORATORY PERFORMANCE AND SYSTEM AUDITS

The New York State Department of Health Environmental Laboratory Analytical Program CLP-certified laboratory that has satisfactorily completed performance audits and performance evaluation samples will be used for all sample analyses. The results of the most recent performance audits and performance evaluations will be made available upon request.

9.4 AUDIT PROCEDURES

Prior to an audit, the designated lead auditor prepares an audit checklist. During an audit and upon its completion, the auditor(s) will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. The auditor will then prepare and submit an audit report to the manager of the audited group and the project manager.

The manager of the audited group will then prepare and submit, to the Project QA Officer and the Project Manager, a plan for implementing the corrective action to be taken on

non-conformances indicated in the audit report, the date by which such corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation should be attached to the reply. The auditor will ascertain (by re-audit or other means) if appropriate and timely corrective action has been implemented.

Records of audits will be maintained in the project files.

9.5 DOCUMENTATION

To ensure that the previously defined scope of the individual audits is accomplished and that the audits follow established procedures, a checklist will be completed during each audit. The checklist will detail the activities executed and ensure that the auditing plan is accurate. Audit checklists will be prepared in advance and will be available for review. Following each system, performance, and data audit, the Quality Services Manager will prepare a report to document the findings of the specific audit.

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10. DATA REDUCTION, VALIDATION, AND REPORTING

10.1 DATA REDUCTION

10.1.1 Field and Technical Data Reduction

Field personnel will record field data in bound field logbooks and on standard forms. After checking the validity of the data in the field notes, the Site Manager or his/her designee will reduce the data to tabular form, when possible, by entering the data into data files. Where appropriate, the data files will be set up for direct input into a work assignment database. Subjective data will be filed as hard copies for later review by the Project Manager and incorporation into technical reports, as appropriate.

10.1.2 Laboratory Data Reduction

Data reduction is the process by which raw analytical data generated from laboratory instrument systems is converted into usable concentrations. The raw data, which may take the form of area counts, instrument responses, or observations, are processed by the laboratory and converted into concentrations expressed in the parts per million or parts per billion range. Raw data from these systems include compound identifications, concentrations, retention times, and data system print-outs. Raw data are usually reported in graphic form, bar graph form, or tabular form. The laboratory will follow SOPs consistent with the data handling requirements of the applicable methods.

The laboratory reporting limits for each site must be less than or equal to those stipulated by this work assignment.

10.2 VALIDATION

10.2.1 Field and Technical Data Validation

Validation of objective field and technical data will be performed at two different levels. The first level of data validation will be performed at the time of collection by following standard procedures and QC checks. The Site Manager, who will review the data to ensure that the correct codes and units have been included, will complete the second level of data validation. After data reduction into tables and arrays is complete, the Site Manager will review data sets for anomalous values. The Project Manager, who will review field reports for reasonableness and completeness, will validate subjective field and technical data. In addition, the Site Manager will conduct random checks of sampling and field conditions.

10.2.2 Analytical Data Validation

If a work assignment requires the validation of analytical data, data validation will be performed to establish the data quality for work assignment data that are to be considered when making project decisions. Laboratories will submit results that are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of the data. The

laboratory will review data prior to its release from the laboratory. The laboratory is required to evaluate their ability to meet QA/QC objectives. Outlying data will be flagged in accordance with laboratory SOPs and corrective action will be taken to rectify the problem.

A NYSDEC-approved qualified independent third party data validator will review the private well groundwater analytical data package to determine completeness and compliance.

A narrative describing how the data did or did not meet the validation criteria is part of the data validation procedure. The validation assessment will describe the overall quality of the data and the data validation report will provide a written statement upon completion of the validation indicating whether or not the data are valid and usable, and include a percent completeness value of usable data.

10.3 REPORTING

10.3.1 Field Measurements

Any field analysis results will be recorded in a dedicated field logbook or on approved field forms (Appendix J to the SMP) at the time the results are available. The results will be tabulated and plotted in the office as part of the reporting tasks. Reports also will consist of the field logbook, required standard forms, photographic documentation, and Daily QC Reports.

10.3.2 Analytical Data

The content of analytical laboratory data packages designed for work conducted during a work assignment are site-specific and will include the following information:

- Pertinent physical data presented in concise, easy to follow formats (i.e., sample, number, client, date of sample preparation, date analyzed, percent moisture, etc.)
- Reference for analytical methodology used
- General discussion including a description of sample types, tests performed, any problems encountered, and general comments
- Data from each discrete sample reported using cross-referencing between normal samples and QC samples and including all pertinent dates, information, and reporting limits
- Reported data to include associated QC samples such as blanks, spikes and spike duplicates, laboratory duplicates, field duplicates, and appropriate check standards
- EDD that meet the NYSDEC EDD requirements
- Copies of chain-of-custody sheets
- Raw data.

11. CORRECTIVE ACTION PROCEDURE DESCRIPTION

11.1 OBJECTIVES

The objectives of the corrective action procedures presented below are to ensure that recognized errors in performance of sample and data acquisition lead to effective site monitoring and that those steps are documented to provide assurance that any data quality deficiencies are recognized in later interpretation and are not recurrent.

11.2 RATIONALE

Many times corrective measures are undertaken in a timely and effective fashion, but go undocumented. In other cases, corrective actions are of a complex nature and may require scheduled interactions between departmental groups. In either case, documentation in a formal or informal sense can reinforce the effectiveness and duration of the corrective measures taken.

11.3 CORRECTIVE ACTION METHODS

11.3.1 Immediate Corrective Actions

Immediate corrective actions are of a minor or routine nature such as correcting malfunctioning equipment, correction of data transcription errors, and other such activities routinely made in the field, laboratory, or office by technicians, analysts, and other project staff.

11.3.2 Long-Term Corrective Actions

Long-term corrective action will be used to identify and eliminate causes of non-conformances which are of a complex nature and that are formally reported between management groups.

11.3.3 Corrective Action Steps

For long-term corrective actions, steps comprising closed-loop corrective action systems are as follows:

- Define the problem
- Assign responsibility for investigating the problem
- Investigate and determine the cause of the problem
- Determine a corrective action to eliminate the problem
- Assign and accept responsibility for implementing the corrective action
- Verify that the corrective action has eliminated the problem.

Non-conformance events associated with analytical work are documented by the laboratories' Non-Conformance Records, which are reviewed and approved by the Quality Services Manager.

11.3.4 Audit-Based Non-Conformances

Following audits, corrective action is initiated by documenting the audit finding and recommended corrective action on an Audit Finding Report.

11.4 CORRECTIVE ACTION REPORT REVIEW AND FILING

Immediate and long-term corrective actions require review to assure that, during the time of non-conformance, erroneous data were not generated or that, if possible, correct data were acquired instead. Such confirmation and review is the responsibility of the supervisor of the staff implementing the corrective action. Confirmation will be acknowledged by notation and dated signature on the affected data record or appropriate form or by memorandum to cognizant project management.

11.5 CORRECTIVE ACTION REPORTS TO MANAGEMENT

The Project QA Officer will provide project management with corrective action reports. The Project Manager is informed verbally of non-conformance events as soon as possible and decisions made after evaluation are documented in the Non-Conformance Records. A copy of each Non-Conformance Record is maintained in the report.

12. QUALITY ASSURANCE REPORTS

Fundamental to the success of this QA/QC is the active participation of the Project Manager and the Project QA Officer. The Program QA Officer will be advised of work assignment activities and will participate in development, review, and operation of the project. Project management will be informed of QA activities through the receipt, review, and/or approval of:

- Corrective action notices
- Non-conformance records.

Periodic assessment of field and laboratory QA/QC activities and data accuracy, precision, and completeness will be conducted and reported by the laboratory. Items to be included in the QA reports are the summary of results for the performance or the system audit and, where applicable:

- Assessment of adherence to work scope and schedule for the audited task
- Assessment of the precision, accuracy, and completeness of sample batches and subsequent status of data processing and analyses
- Significant QC problems and the status of any ongoing corrective actions
- Changes to the SMP
- Status of implementation of the SMP.

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Tables

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Table 1 Analytical Reporting Limits
USEPA Method 608 (Soil) and 8081 (Water) Pesticides

Analyte	Reporting Limit	
	608 water (µg/L)	8081 soil (µg/kg)
4,4'-DDD	0.005	1.7
4,4'-DDE	0.005	1.7
4,4'-DDT	0.005	1.7
Aldrin	0.005	1.7
alpha-BHC	0.005	1.7
alpha-Chlordane	0.005	1.7
beta-BHC	0.005	1.7
Chlordane	0.05	17
delta-BHC	0.005	1.7
Dieldrin	0.005	1.7
Endosulfan I	0.005	1.7
Endosulfan II	0.005	1.7
Endosulfan sulfate	0.005	1.7
Endrin	0.005	1.7
Endrin aldehyde	0.005	1.7
Endrin ketone	0.005	1.7
gamma-BHC (Lindane)	0.005	1.7
gamma-Chlordane	0.005	1.7
Heptachlor	0.005	1.7
Heptachlor epoxide	0.005	1.7
Methoxychlor	0.005	1.7
Toxaphene	0.05	17

Note:
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
BHC = Benzene hexachloride
µg/L = Microgram(s) per liter
µg/kg = Microgram(s) per kilogram

Table 2 Analytical Reporting Limits
USEPA Method 8260b Volatile Organic Compounds: Water and Soil

Analyte	Reporting Limit	
	Groundwater (µg/L)	Soil (ppm)
1,1,1,2-Tetrachloroethane	0.5	0.005
1,1,1-Trichloroethane	0.5	0.005
1,1,2,2-Tetrachloroethane	0.5	0.005
1,1,2-Trichloroethane	0.5	0.005
1,1-Dichloroethane	0.5	0.005
1,1-Dichloroethene	0.5	0.005
1,1-Dichloropropene	0.5	0.005
1,2,3-Trichloropropane	0.04	0.005
1,2-Dibromo-3-chloropropane	0.04	0.005
1,2-Dibromoethane	0.5	0.005
1,2-Dichlorobenzene	0.5	0.005
1,2-Dichloroethane	0.5	0.005
1,2-Dichloropropane	0.5	0.005
1,3-Dichlorobenzene	0.5	0.005
1,3-Dichloropropane	0.5	0.005
1,4-Dichlorobenzene	0.5	0.005
2,2-Dichloropropane	0.5	0.005
2-Butanone	10	0.01
2-Chlorotoulene	0.5	0.005
2-Hexanone	10	0.01
4-Chlorotoulene	0.5	0.005
4-Methyl-2-pentanone	0.5	0.005
Acetone	10	0.02
Benzene	0.5	0.005
Bromobenzene	0.5	0.005
Bromochloromethene	0.5	0.01
Bromodichloromethane	0.5	0.005
Bromoform	1	0.005
Bromomethane	1	0.01
Carbon disulfide	0.5	0.005
Carbon tetrachloride	0.5	0.005
Chlorobenzene	0.5	0.005
Chloroethane	1	0.01
Chloroform	0.5	0.005
Chloromethane	1	0.01
cis-1,2-dichloroethene	0.5	0.005
cis-1,3-dichloropropene	0.5	0.005
Dibromochloromethane	0.5	0.005
Dibromomethane	0.5	0.005
Dichlorodifluoromethane	0.5	0.005
Ethylbenzene	0.5	0.005
Isopropylbenzene	0.5	0.005
Methlyene chloride	5	0.02

Note: ppm = Parts per million
µg/L = Microgram per liter
USEPA = United States Environmental Protection Agency

Table 2 Analytical Reporting Limits (continued)
USEPA Method 8260B Volatile Organic Compounds: Water and Soil

Analyte	Reporting Limit	
	Groundwater (µg/L)	Soil (ppm)
n-Propylbenzene	0.5	0.005
Styrene	0.5	0.005
Tetrachloroethene	0.5	0.005
Toluene	0.5	0.005
trans-1,2-dichloroethene	0.5	0.005
trans-1,3-dichloropropene	0.5	0.005
Trichloroethene	0.5	0.005
Vinyl chloride	0.5	0.01
Xylene (Total)	0.5	0.005

Note:
ppm = Parts per million
µg/L = Microgram per liter
USEPA = United States Environmental Protection Agency

Table 3 Analytical Reporting Limits
USEPA Method 8270C Semi-volatile Organic Compounds: Water and Soil

Analyte	Reporting Limit ppb	
	Groundwater (µg/L)	Soil (ppm)
1,2,4-Trichlorobenzene	5	0.067
1,2-Dichlorobenzene	3	0.33
1,3-Dichlorobenzene	3	0.33
1,4-Dichlorobenzene	3	0.33
2,2-oxybis(1-Chloropropane)	10	0.33
2,4,5-Trichlorophenol	10	0.33
2,4,6-Trichlorophenol	10	0.33
2,4-Dichlorophenol	5	0.33
2,4-Dimethylphenol	10	0.33
2,4-Dinitrophenol	10	0.67
2,4-Dinitrotoulene	5	0.33
2,6-Dinitrotoulene	5	0.33
2-Chloronapthalene	10	0.33
2-Chlorophenol	10	0.33
2-Methylnapthalene	10	0.33
2-Methylphenol	10	0.33
2-Nitroaniline	5	0.67
2-Nitrophenol	20	0.67
3,3-Dichlorobenzidine	5	0.67
3-Nitroaniline	5	0.67
4,6-Dinitro-2-methylphenol	20	0.67
4-Bromophenyl phenyl ether	10	0.33
4-Chloroaniline	5	0.33
4-Chlorophenyl phenyl ether	10	0.33
4-Cholor-3-methylphenol	10	0.33
4-Methylphenol	10	0.33
4-Nitroaniline	5	0.67
4-Nitrophenol	20	0.67
Acenaphthene	10	0.067
Acenaphthylene	10	0.067
Anthracene	10	0.067
Benzo(a)anthracene	0.002	0.33
Benzo(a)pyrene	10	0.067
Benzo(b)fluoranthene	0.002	0.067
Benzo(g,h,I)perylene	10	0.067
Benzo(k)fluoranthene	0.002	0.067
Bis(2-Chloroethoxy)methane	5	0.33
Bis(2-chloroethyl)ether	1	0.33
Bis(2-Ethylhexyl)phthalate	5	0.33
Butyl benzyl phthalate	10	0.33
Carbazole	10	0.067
Chrysene	0.002	0.067
Dibenz(a,h)anthracene	10	0.33

Note:
ppm = Parts per million
µg/L = Microgram per liter
USEPA = United States Environmental Protection Agency

Table 3 Analytical Reporting Limits (continued)
USEPA Method 8270C Semi-volatile Organic Compounds: Water and Soil

Analyte	Reporting Limit ppb	
	Groundwater (µg/L)	Soil (ppm)
Dibenzofuran	10	0.33
Diethyl phthalate	10	0.33
Dimethyl phthalate	10	0.33
Di-n-butyl phthalate	10	0.33
Di-n-octyl phthalate	10	0.33
Fluoranthene	10	0.067
Fluorene	10	0.067
Hexachlorobenzene	0.04	0.33
Hexachlorobutadiene	0.5	0.33
Hexachlorocyclopentadiene	5	0.67
Hexachloroethane	5	0.33
Indeno[1,2,3-cd]pyrene	0.002	0.067
Isophorone	10	0.33
Naphthalene	10	0.067
N-Nitroso-di-n-propylamine	10	0.33
Pentachorophenol	1	0.67
Phenanthrene	10	0.067
Phenol	1	0.33
Pyrene	10	0.067

Note:
ppm = Parts per million
µg/L = Microgram per liter
USEPA = United States Environmental Protection Agency

Table 4 Analytical Reporting Limits
USEPA Method 6010 (Target Analyte List Metals) and
USEPA Method 7470 (Mercury): Water and Soil

Analyte	Reporting Limit ppm	
	Groundwater (µg/L)	Soil (ppm)
Aluminum	2,000	2.0
Antimony	3	0.6
Arsenic	25	0.1
Barium	1,000	2.0
Beryllium	3	0.05
Cadmium	5	0.05
Calcium	50,000	50.0
Chromium	50	0.1
Cobalt	500	0.5
Copper	200	0.25
Iron	300	1.0
Lead	25	0.03
Magnesium	35,000	50.0
Manganese	300	0.15
Mercury (Method 7470)	0.7	0.002
Nickel	100	0.4
Potassium	50,000	50.0
Selenium	10	0.05
Silver	50	0.1
Sodium	20,000	50.0
Thallium	0.5	0.1
Vanadium	500	0.5
Zinc	5,000	0.2

Note:
ppm = Parts per million
µg/L = Microgram per liter
USEPA = United States Environmental Protection Agency

Table 5 Analytical Reporting Limits
USEPA Method 8082
Polychlorinated Biphenyl Compounds Water, Soil, and Sediment

Constituent	Reporting Limits[a]	
	Water (µg/L)	Soil, Sediment, Debris (ppm)
Aroclor 1016	0.1	0.1
Aroclor 1221	0.1	0.1
Aroclor 1232	0.1	0.1
Aroclor 1242	0.1	0.1
Aroclor 1248	0.1	0.1
Aroclor 1254	0.1	0.1
Aroclor 1260	0.1	0.1
Total polychlorinated biphenyls [b]	0.7	0.1

(a) Reporting limits shown are based on NYSDEC 2000 Analytical Services Protocol contract required quantitation limits and are for guidance purposes. The quantitation limits calculated by the laboratory for soil, sediment, and debris, calculated on a dry-weight basis, will be higher.

(b) Reporting limits shown for total polychlorinated biphenyls are the summation of the reporting limits for each Aroclor listed.

Note:
ppm = Parts per million
µg/L = Microgram per liter
NYSDEC = New York State Department of Environmental Conservation
USEPA = United States Environmental Protection Agency

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Appendix I

Health and Safety Plan

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Bianchi/Weiss Greenhouses Site, Suffolk County
East Patchogue, New York

Health and Safety Plan

NYSDEC Site Number: 152209
USEPA ID # NYR000209486

Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
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Revisions to Final Approved Health and Safety Plan

Revision Number	Date Submitted	Summary of Revision	New York State Department of Environmental Conservation Approval Date

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JUNE 2019

CERTIFICATION STATEMENT

I Donald Conan certify that I am currently a NYS registered professional engineer and that this Health and Safety Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

Donald Conan P.E.

6/18/19 DATE

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LIST OF ATTACHMENTS

LIST OF ACRONYMS/ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
$\mu g/m^3$	Microgram(s) per cubic meter
CFR	Code of Federal Regulation
CPR	Cardio pulmonary resuscitation
DER	Division of Environmental Remediation
EA	EA Engineering, P.C. and its affiliate EA Science and Technology
ft	Feet
HASP	Health and Safety Plan
kV	Kilovolt
L	Liter
MSDS	Material Data Safety Sheets
NIOSH	National Institute for Occupational Health and Safety
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
oz	Ounce(s)
PPE	Personal protective equipment
ppm	Parts per million
USEPA	United States Environmental Protection Agency

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1. INTRODUCTION

1.1 OBJECTIVE

The objective of this Health and Safety Plan (HASP) is to provide personnel with protection standards and mandatory safety practices, procedures, and contingencies to be followed while performing field activities for the Bianchi/Weiss Greenhouses. The typical work activities addressed within this HASP include the following onsite field activities:

- Groundwater gauging and sampling
- Surface water sampling
- Monitoring well installation and development

The safety organization, procedures, and protective equipment for this HASP have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential for accident or injury. One copy of this HASP will be maintained for use during scheduled field activities. The copy will be made available for Site use/employee review.

The HASP describes the procedures that must be followed during referenced Site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager and the Program Health and Safety Officer. This document will be periodically reviewed to ensure that it is current and technically correct. Changes in Site conditions and/or the scope of work will involve a review and modification to the HASP. Such changes will be completed in the form of a numbered revision.

The provisions of this HASP are mandatory for the personnel and subcontractors assigned to the NYSDEC work assignments. Visitors to a work site must abide by the requirements of the HASP. It should be acknowledged that the employees of other consulting and/or contracted companies might work in accordance with their own independent HASP. Subcontractors' HASPs must meet the requirements of this HASP.

1.2 SITE AND FACILITY DESCRIPTION

The subject Site is located at 25 Orchard Road, in East Patchogue, Suffolk County, New York. The property is an irregularly-shaped parcel that has main access to the site on South Country Road, County Route 36. Second and third access roads are located on Orchard Road to the west of the property and on Hedges Road to the north of the property. Both entrances are blocked with gates and vegetation. Residential properties are located to the north, south, east, and west of the property.

1.3 POLICY STATEMENT

Site management field crew will be familiar with the HASP for site management activities that they are involved in. Prior to entering a Site, this HASP will be reviewed, and the agreement to comply with the requirements will be signed by field crew, subcontractors, and visitors and be maintained in the HASP Review Record (Attachment A).

Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval from NYSDEC, the Project Manager and the Health and Safety Representative. This document will be periodically reviewed to ensure that it is current and technically correct. Changes in site conditions and/or the scope of work will require a review and modification to the HASP. Such changes will be completed in the form of a revision of the site-specific HASP Addendum.

By signing a site-specific HASP Review Record, the subcontractors and visitors acknowledge their responsibility to comply with the occupational health and safety requirements defined in this HASP. Site management field crew and subcontractor personnel onsite will be informed of site emergency response procedures and potential safety or health hazards associated with the operations conducted in support of work assignments.

1.4 REFERENCES

This HASP addresses the following regulations and guidance documents:

- Quick Selection Guide to Chemical Protective Clothing, K. Forsberg and S.Z. Mansdorf, 3rd Ed. (1997)
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute (NOISH) for Occupational Safety and Health, Occupational Safety and Health Administration (OSHA), U.S. Coast Guard, U.S. Environmental Protection Agency (USEPA) (86-116, October 1985)
- Occupational Safety and Health Administration Standards for General Industry, 29 Code of Federal Regulations (CFR) 1910
- OSHA Standards for Hazard Communication, 29 CFR 1910.1200/1926.59
- OSHA Standard for Respiratory Protection, 29 CFR 1910.134
- OSHA Standards for Construction Industry, 29 CFR 1926
- NIOSH for Pocket Guide to Chemical Hazards, Department of Health and Human Services, PHS, Center for Disease Control, NIOSH (2005).

- Threshold Limit Values, American Conference of Government Industrial Hygienists (2011).

1.5 DEFINITIONS

The following definitions are applicable to this HASP:

- ***Site*—**The area where field activities are to be performed.

- ***Project*—**Onsite work performed under the scope of site management for the Bianchi/Weiss Greenhouses Site.

- ***Project Manager*—**The individual(s) who will have overall responsibility for site management. The Project Manager will provide services associated with the implementation of the Site Management Plan.

- ***Subcontractor*—**Includes third-party personnel hired for onsite services.

- ***Onsite Personnel*—**All personnel involved with a work assignment.

- ***Visitor*—**Personnel, except the onsite personnel. Visitors must receive approval to enter the site.

- ***Exclusion Zone*—**Portion of the Site where hazardous substances are, or are reasonably suspected to be, present in the air, water, or soil.

- ***Contamination Reduction Zone*—**Area between the Exclusion Zone and Clean Zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.

- ***Clean/Support Zone*—**The rest of the Site. Support equipment is located in this zone.

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2. ROLES AND RESPONSIBILITIES

2.1 PERSONNEL

Field crew and subcontractor employees are responsible for reading, understanding, and meeting the health and safety requirements contained in this HASP. A HASP Review Record sign-off sheet is provided as Attachment A. Employees are required to implement these procedures when carrying out daily operations and site-specific field activities. This will include receiving appropriate training and medical monitoring and using health and safety equipment (to include personal protective equipment [PPE]) to safely conduct site operations. This may include maintaining appropriate grooming standards (removal or proper trimming of beards, mustaches, and sideburns) to ensure the proper fit of respiratory protection. Employees will review each field activity prior to commencement to consider the potential health and safety hazards and the measures to be taken in the event of an emergency. Employees will know where material safety data sheets (MSDS) (Attachment B), first aid supplies, and emergency equipment are maintained. The Site Manager or Program Health and Safety Officer will be notified of potential health and safety hazards, near-miss conditions, or incidents present on the job site or unusual effects believed to be related to hazardous chemical exposures. Failure to follow established health and safety procedures could result in immediate dismissal from the Site and, if repeated, a potential loss of employment.

2.1.1 Responsibilities

Clear lines of authority will be established for enforcing compliance with the safety, health, and contingency procedures consistent with industry policies and procedures. Designated personnel will be responsible for implementation of the HASP during field activities. This includes field supervision; implementing and directing emergency operations; coordinating with onsite and offsite emergency responders; enforcing safe work practices and decontamination procedures (if needed); ensuring proper use of PPE; communicating site safety program modifications and requirements to site personnel; proper reporting of injuries, illnesses, and incidents to the appropriate internal and external organizations; and containing and controlling the loss of potentially hazardous materials to soil, air, and surface/groundwater during field operations.

In the event of an onsite injury, occupational illness, near-miss, or environmental contamination incident, the following organizations/individuals will be notified as appropriate (Section 11):

- Site Manager
- Site Health and Safety Officer
- Project Manager
- Program Health and Safety Officer

- EA Engineering, P.C. and its affiliate EA Science and Technology (EA) Syracuse Branch Manager
- Corporate Health and Safety Officer
- NYSDEC representatives
- Other organizations or persons as appropriate.

2.2 SITE HEALTH AND SAFETY OFFICER

The Site Health and Safety Officer is responsible for coordination of onsite contingency operations and the Site Health and Safety Program. The Site Health and Safety Officer will be onsite at all times during work assignment field activities and will be responsible for daily compliance with site health and safety requirements. The Site Health and Safety Officer's responsibilities include:

- Conducting visual inspections of the work site
- Stopping work when imminent safety or health risks exist or as outlined in this HASP
- Authorization for personnel to perform field activities onsite (i.e., relative to medical examinations and training)
- Implementing the use of forms
- Implementing the guidance within this HASP
- Providing an initial health and safety briefing to site workers and visitors.
- Evaluating reported hazardous conditions and recommending corrective actions
- Conducting necessary health and safety monitoring
- Identifying, investigating, and preparing incident reports as necessary
- Consulting with the Program Health and Safety Officer or Project Manager for guidance on occupational health and safety and contingency issues affecting a specific work assignment
- Providing technical support and guidance in the modification of HASP requirements
- Evaluating onsite environmental monitoring results and providing reporting requirements to the Project Manager.

During an emergency, the Site Manager (or the Alternate in the absence of the Site Manager) will be responsible for initiating and coordinating emergency responses/contingency operations.

The Site Health and Safety Officer will have the authority to make on-the-spot corrections dealing with safety, health, and environmental pollution infractions. If it is determined that the infraction cannot be remedied immediately and is of such a nature that continuance of the field activity could result in significant illness, injury, environmental contamination, and violations, the Site Health and Safety Officer will have the authority to order a cessation of the activity until such time as the problem can be remedied.

2.3 PROJECT MANAGER

The Project Manager will have overall responsibility for site field activities and will be the primary contact during the work assignment field activities. The primary responsibilities of the Project Manager include:

- Assuring compliance with this HASP
- Coordinating field activities with the Site Manager
- Approving HASP Addendums and revisions
- Reviewing individual training and medical records prior to work start
- Providing overall supervisory control for health and safety protocols in effect for a work assignment
- Assigning the Site Manager and Site Health and Safety Officer
- Assuring adequate resources are available for carrying out this HASP
- Preparing and submitting project reports.

2.4 SITE MANAGER

The Site Manager's responsibilities include but are not limited to:

- Providing technical support to the Site Health and Safety Officer
- Evaluating onsite environmental monitoring results and reporting to the Project Manager and Program Health and Safety Officer

- Being responsible for initiating the evacuation of the work site when needed, communicating with offsite emergency responders, and coordinating activities of onsite and offsite emergency responders

- Determining if the abatement of hazardous conditions is sufficient prior to allowing resumption of field activities after an emergency.

2.4.1 SUBCONTRACTORS

Responsibilities of field crew and subcontractor personnel include:

- Following this HASP, and applicable health and safety rules, regulations, and procedures

- Understanding and complying with 29 CFR 1910 and 29 CFR 1926 rules and regulations applicable to the operations they are conducting to ensure the health and safety of their personnel

- Using required controls, procedures, and safety devices, including PPE

- Notifying his/her supervisor of identified or suspected emergencies and safety or health hazards

- Complying with training and medical requirements.

2.5 VISITORS

Visitors entering the onsite work areas will be required to sign the Entry/Exit Log (Attachment D) (found in each site-specific HASP) and to read and verify their understanding and willingness to comply with this HASP. Visitors will remain in an observation area and will not be allowed in the Exclusion Zone or Support Zone unless they have met the appropriate OSHA training and medical requirements, and have received clearance by the Project Manager and the Site Health and Safety Officer.

3. RISK ANALYSIS

3.1 PROJECT SCOPE OF WORK

Based on the field activities detailed in the Site Management Plan, the following potential hazard conditions may be anticipated:

- Personnel may be injured during physical lifting and handling of heavy equipment, construction materials, or containers. Additionally, personnel may encounter slip, trip, and fall hazards associated with sampling within the structures. Precautionary measures should be taken in accordance with this HASP.

- The use of mechanical equipment such as drill rigs, front loaders, dump trucks, backhoes, and bobcats can create a potential for crushing and pinching hazards due to movement and positioning of the equipment. In addition, the ambient noise levels around heavy equipment can cause for disorientation and reduced awareness levels. Hard hats are required when working around this type of equipment.

- Field operations conducted during the winter months can impose excessive heat loss to personnel conducting strenuous activities during cold weather days, and can impose cold-related illness symptoms during cold weather days or when the wind chill is high. In addition, heavy rains, electrical storms, and high winds may create extremely dangerous situations for employees.

- Field activities conducted during the hot summer months can impose excessive heat loading to personnel conducting strenuous activities or activities requiring the additional heat burden created due to the use of PPE.

- Entry into a confined space in support of this project is forbidden. However, it is not anticipated that confined space entry will be required during the completion of the field activities.

  Site management activities intended to monitor remaining contamination often require employees to be in direct proximity or contact with hazardous substances. Groundwater sampling presents low risk and can be minimized through the use of PPE. The majority of site contaminants exceeding the residential use Soil Cleanup Objective in soil have been removed, so risks related to exposure to hazardous substances during general site occupancy is minimal and does not require the use of PPE.

The potential chemicals of concern that may be present at the site include, but are not limited to, chlordane and other pesticides. Material safety data sheets for these chemicals are provided in Attachment B.

3.2 HAZARD COMMUNICATION

A written OSHA Hazard Communication Program for Construction (required by 29 CFR 1910.1200/1926.59) will be maintained onsite during field activities. Employees will be informed of the Hazard Communication Program's existence, contents, and location. This Program will be kept with the MSDS and contain a list of site-specific chemicals present. The list will be cross-referenced with the applicable MSDS for ease in MSDS accessibility.

An MSDS for each chemical brought onsite during field activities will be maintained onsite by the Site Health and Safety Officer. Subcontractors must inform the Site Manager and Site Health and Safety Officer of hazardous substances brought onsite, and provide appropriate MSDS to the Site Health and Safety Officer. Site workers and visitors will be informed of the Hazard Communication Program, their legal rights under the Program, the location of the chemical inventory, and the location of the MSDS. Subcontractors will provide a list of the hazardous materials that will be used onsite in support of their operations. This information will be shared jointly with site employees and visitors to the site.

Employee awareness of chemical identities, health and physical hazards, and characteristics is essential to safely handle chemicals and minimize potential hazards. The Hazard Communication Program must follow the OSHA requirements listed in 29 CFR 1910.1200/1926.59.

3.2.1 Hazard Communication Labeling

In-house containers will be properly labeled so that workers understand the contents of containers. Container labels will contain at least information on the name of the product or container, chemical(s) in the product, manufacturer's name and address, protective equipment required for the safe handling of the product, and first aid procedures in case of overexposure to product contents.

3.2.2 Hazard Communication Training

Site employees and visitors must be informed of the Hazard Communication Program, their legal rights under the program, and location of chemical inventory and MSDS files. The employee's supervisor must describe hazardous substances used and provide information concerning:

- Nature of potential hazards
- Appropriate work practices
- Appropriate control programs
- Appropriate protective measures
- Methods to detect presence or release of hazardous substances
- Emergency procedures.

3.3 CHEMICAL HAZARDS

Field operation precautions and preventive measures for site management activities are described in the following paragraphs:

- ***Installation of Monitoring Wells***—Metals and pesticides may be encountered. PPE is required (Section 5 for specific PPE).

- ***Groundwater Sampling***—Metals and pesticides may be encountered. Potential routes of worker exposure are through dermal contact and ingestion; wear PPE when in contact with groundwater (Section 5 for specific PPE).

Dermal contact is a potential concern during the above tasks due to the possible presence of skin irritants such as pesticides that may be absorbed through the skin. This information is based upon a worst-case scenario. Dermal protection listed in Section 5 must be worn during field activities involving contact with soil and groundwater.

A description of the requirements for the different levels of PPE, as well as upgrade/downgrade requirements, is provided in Section 5. Although ingestion of contaminants is also a primary source of exposure, vigilance by site health and safety personnel will ensure proper use of PPE and personal hygiene to practically eliminate this route of exposure.

3.3.1 Chemicals for Equipment Calibrations and Operations

In addition to the potential compounds detected at a site, the following chemicals are typically used during investigative field activities:

- Isopropyl alcohol
- Alconox®
- Nitric acid.

These chemicals will be used for decontamination of equipment. The anticipated occupational exposures from these operations are considered negligible.

3.4 PHYSICAL HAZARDS

Physical hazards can potentially be present during field activities. These physical hazards may include, but not be limited to:

- Fire/explosion hazards
- Heat stress
- Equipment hazards
- Vehicle and pedestrian hazards

- Noise hazards
- Electrical hazards
- Utilities
- Weather hazards.

Physical hazards are listed below for each field activity.

- ***Surface Soil/Wipe Sampling***—General safety hazards, cold/heat stress, and biological hazards

- ***Surface Water Sampling***—General safety hazards, cold/heat stress, and biological hazards

- ***General Construction Activities***—General safety hazards, heavy equipment hazards, electrical hazards, underground utilities, fire/explosion, noise hazards, cold/heat stress, and biological hazards

- ***Drilling and Installation of Monitoring Wells***—General safety hazards, heavy equipment hazards, electrical hazards, underground utilities, fire/explosion, noise hazards, cold/heat stress, and biological hazards

- ***Groundwater Sampling***—General physical hazards, cold/heat stress, and noise hazards.

The Site will be visually inspected for the presence of general safety hazards (e.g., trip/slip hazards, unstable surfaces or steep grades, sharp objects) prior to beginning work. If hazards are present, these hazards will be recorded and precautionary measures taken to prevent injury.

3.4.1 Fire/Explosion Hazards

The potential for fire and/or explosion emergencies is always present on a site. Substances capable of creating fire and explosion at a site include methane gas, petroleum-contaminated soil, and other flammable vapors. Workers must continuously monitor the work area for combustible or explosive gases when operations have the potential to generate sparks. Employees should always be alert for unexpected events, such as ignition of chemicals or sudden release of materials under pressure, and be prepared to act in these emergencies.

Field vehicles will be equipped with a fire extinguisher. Employees must be trained in the proper use of fire suppression equipment. However, large fires that cannot be controlled with a fire extinguisher should be handled by professionals. The proper authorities should be notified in these instances.

3.4.2 Heat Stress and Heat-Related Illness

The use of protective equipment, if required, may create heat stress. Monitoring of personnel wearing impermeable personal protective clothing should commence when the ambient

temperature is 70°F or above. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring will be performed by a person with a current first-aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature index from the American Conference of Governmental Industrial Hygienist Threshold Limit Value Booklet, can be used.

To monitor the worker:

- Measure heart rate by counting the radial pulse during a 30-second period as early as possible in the rest period.
- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.
- Measure oral temperature using a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).
- If oral temperature exceeds 99.6° F (37.6°C), shorten the next work cycle by one-third without changing the rest period.
- If oral temperature still exceeds 99.6° F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.
- Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6° F (38.1°C).

3.4.2.1 Prevention of Heat Stress

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illness.

To avoid heat stress, the following steps should be taken:

- Adjust work schedules
- Modify work/rest schedules according to monitoring requirements
- Mandate work slow-downs, as needed
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., 8 fluid ounces (oz) (0.23 liter [L]) of water must be ingested for approximately every 8 oz (0.23 kilogram) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

  — Maintain water temperature 50 to 60°F

  — Provide small disposable cups that hold about 4 oz (0.1 L)

    Have workers drink 16 oz (0.5 L) of fluid (preferably water or dilute drinks) before beginning work

  — Urge workers to drink a cup or two every 15 to 20 minutes, or at least each monitoring break. A total of 1 to 1.6 gallons (4 to 6 L) of fluid per day are recommended, but more may be necessary to maintain body weight.

  — Train workers to recognize the symptoms of heat-related illness.

3.4.3 Cold-Related Illness

If work takes place in the winter months, effects of cold exposure are possible during the performance of field activities. Injury from cold exposure may occur in persons working outdoors during a period when temperatures average below freezing. The extremities, such as fingers, toes, and ears, are the most susceptible to frostbite.

3.4.3.1 Prevention of Cold-Related Illness

To avoid cold-related illness, the following steps should be taken:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors
- Assure the availability of an enclosed, heated environment on or adjacent to the Site
- Assure the availability of dry changes of clothing
- Develop the capability for temperature recording at the site
- Assure the availability of warm drinks.

3.4.4 Heavy Equipment Hazards

The use of heavy equipment (e.g., drill rigs, generators, compressors, etc.) may pose safety hazards to site workers. Heavy equipment work must be conducted only by trained, experienced personnel. If possible, personnel must remain outside the turning radius of large, moving equipment. At a minimum, personnel must maintain visual contact with the equipment operator. No guards, safety appliances, or other devices may be removed or made ineffective unless repairs or maintenance are required, and then only after power has been shut off and locked out. Safety devices must be replaced once repair or maintenance is complete. Exhaust from equipment must be directed so that it does not endanger workers or obstruct the view of the operator. When not operational, equipment must be set and locked so that it cannot be activated, released, dropped, etc.

3.4.5 Vehicle and Pedestrian Hazards

Vehicle traffic or pedestrians, particularly in busy areas, may be susceptible to site hazards or may present a hazard to site workers. Equipment must be located in an area that does not present a hazard to bystanders. Barriers must be used to separate the work areas from both vehicular and pedestrian traffic areas and to prevent inadvertent entry into the work area. When possible, work in high traffic areas will be performed when traffic is minimal. Safety cones (with a minimum height of 28 inches) will be placed around the work area to create a buffer zone. Workers should wear safety vests or reflective material to enhance visibility in these areas. The buffer zone will be maintained even when work is not being performed in the area to prevent unauthorized access and to make the work site visible.

3.4.6 Noise Hazards

Work around large equipment often creates excessive noise. Noise can cause workers to be startled, annoyed, or distracted; can cause physical damage to the ear, pain, and temporary and/or permanent hearing loss; and can interfere with communication. If workers are subjected to noise exceeding an 8-hour time-weighted average sound level of 85 dBA (A-weighted decibels), hearing protection will be selected with an appropriate noise reduction rating to comply with 29 CFR 1910.95 and to reduce noise levels below levels of concern.

3.4.7 Electrical Hazards

Overhead power lines, electrical wiring, electrical equipment, and buried cables pose risks to workers of electric shock, burns, heart fibrillation, and other physical injuries, as well as fire and explosion hazards. Workers will take appropriate protective measures when working near live electrical parts, including inspection of work areas to identify potential spark/ignition sources, maintenance of a safe distance, proper illumination of work areas, provision of barriers to prevent inadvertent contact, and use of nonconductive equipment. If wiring or other electrical work is needed, it must be performed by a qualified electrician. General electrical safety requirements include:

- Electrical wiring and equipment must be a type listed by UL, Factory Mutual Engineering Corporation, or other recognized testing or listing agency.

- Installations must comply with the National Electrical Safety Code or the National Electrical Code regulations.

- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.

- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.

- Live parts or wiring or equipment must be guarded to prevent persons or objects from touching them.

- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.

- Circuits must be protected from overload.

- Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.

- Plugs and receptacles must be kept out of water unless equipped with approved submersible construction.

- Extension outlets must be equipped with ground fault circuit interrupters.

- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.

- Extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.

- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

3.4.7.1 High Voltage Hazards

Employees may be required to work around sources of high voltage at the Site. Caution should be exercised to minimize contact with high voltage equipment, including contact between sampling equipment and potentially charged items. The minimum working distances from power transmission and distribution lines and equipment that will be allowed at the Site are presented in the table below:

High Voltage Clearances

Nominal System Voltage	Minimum Required Clearance
0-50 kV	10 ft
51-100 kV	12 ft
101-200 kV	15 ft
201-300 kV	20 ft
301-500 kV	25 ft
501-750 kV	35 ft
751-1,000 kV	45 ft

Note:
ft = Feet
kV = Kilovolt

To minimize the dangers presented by underground high voltage electric lines, the Project Manager will review existing underground utility maps to determine if underground utilities are present at the proposed test pit, soil boring, and monitoring well locations prior to intrusive activities. Subcontractor personnel performing ground intrusive activities will provide grounding cables that will be attached to equipment and a grounding source (i.e., ground grid cable) during subsurface excavation and drilling. Use of the grounding cables will reduce the potential for worker injury in the event that underground utilities are encountered during intrusive activities.

To minimize the dangers presented by backhoe or drill rig contact with aboveground high voltage electric lines, personnel will locate test pits and monitoring wells to maintain an adequate working distance from power transmission and distribution lines.

3.4.8 Utilities

Underground utilities pose hazards to workers involved in drilling and other invasive operations. These hazards include electrical hazards, explosion, and asphyxiation, as well as costly and annoying hazards associated with damaging communication, sewer, and water lines. Prior to commencement of invasive operations, Dig Safely New York will be contacted to inspect and flag the area of investigation. Personnel should be aware that although an area may be cleared, it does not mean that unanticipated hazards will not appear. Workers should always be alert for unanticipated events such as snapping cables, drilling into unmarked underground utilities, drilling into a heavily contaminated zone, etc. Such occurrences should prompt involved individuals to halt work immediately and take appropriate corrective measures to gain control of the situation.

3.4.9 Weather Hazards

Weather conditions should always be taken into consideration. Heavy rains, electrical storms, high winds, and extreme temperatures, for example, may create extremely dangerous situations for employees. Equipment performance may also be impaired because of inclement weather. Whenever unfavorable conditions arise, the Site Manager and Site Health and Safety Officer will evaluate both the safety hazards and ability of the employees to effectively perform given tasks under such conditions. Activities will be halted at their discretion.

Wind direction should be accounted for when positioning equipment at sampling locations. If exposure to organic vapors is anticipated, workers should locate upwind of the sampling point. Wind direction often changes abruptly and without warning, so personnel should always be prepared to reposition, if necessary.

3.5 BIOLOGICAL HAZARDS

Potential hazards may be present at the site due to bites from stray domestic and wild animals (to include rodents), spiders, bees, and other venomous arthropods, ticks may be encountered during field operations potentially resulting in Lyme disease, rabies, or punctures from sharp objects presenting a possible hazard from tetanus. In the case of an animal or insect bite that can be serious or fatal, workers must seek immediate medical attention and report the incident to the Site Health and Safety Officer prior to leaving the Site. An employee known to be allergic or sensitive to poisonous insects should alert the Site Manager and Site Health and Safety Officer. Prompt medical attention procedures, as outlined in Section 11.2 of this HASP will be followed in the event of animal bites (since many animals carry rabies or other diseases/viruses).

3.5.1 Bloodborne Pathogens

During the conduct of site operations, field crew may be exposed to blood and body secretions in support of emergency response operations where site personnel have been injured, and require first aid and/or cardio pulmonary resuscitation (CPR). Due to the potential that blood and body secretions may contain disease causing organisms such as Hepatitis B virus and Human

Immunodeficiency virus, in an emergency response situation employees electing to provide first aid and CPR support, until the arrival of a competent onsite medical responder, should take appropriate measures to reduce or eliminate their potential for contact and exposure. The concept of "Universal Precautions" will be followed, assuming a potential hazard is present. Employees providing first aid support should wear the appropriate PPE to prevent or reduce their potential for contact and exposure. This will typically be accomplished through the use of rubber gloves, splash-proof eye protection, and the use of mouth-to-mouth guards and proper cleanup (good sanitation and hygiene) following an incident. Hands and face should be thoroughly washed with water and an antiseptic soap or cleanser following an incident, or antiseptic containing disposable towelettes used in the absence of appropriate field washing facilities. The Program Health and Safety Officer should be notified of potential employee exposures to blood and body fluids while conducting work in support of this project.

3.5.2 West Nile Virus

West Nile virus is a member of the Japanese encephalitis complex of flaviviruses, transmissible by mosquitoes, and can cause febrile, sometimes fatal human illness. Until 1999, this virus had never been reported in the Western Hemisphere. Mosquitoes, primarily bird-feeding species, are the primary vectors of West Nile virus, although the virus has been isolated from other bird-feeding arthropods, including some tick species. The natural transmission cycle of the virus involves a bird-mosquito cycle, but may include a tick-bird cycle where soft ticks (argasidaes) or hard ticks (ixodidaes) are found feeding on reservoir birds. The urban cycle of the disease requires species of mosquitoes that will feed on free-ranging or domestic birds and people. The unprecedented introduction of West Nile virus into the metropolitan area of New York City in the late-Summer of 1999 has resulted in a large-scale review of existing programs and required resources to address this threat. Representatives of several local health units and state and federal agencies met to address each of the significant surveillance and response issues associated with this mosquito-borne disease. As a result of these discussions and consultation with community groups, the New York State Department of Health has developed a set of complementary action plans to prevent a further episode of West Nile virus infections.

According to New York State Department of Health, outdoor workers should take the following precautions to minimize potential exposure to the West Nile virus from adult mosquito bites:

- It is not necessary to change standard work health and safety practices outdoors, unless there is evidence of the mosquito-borne disease.

- If the West Nile virus is identified in an area, workers should be advised of the precautions that they may choose to take to try to reduce the risk of mosquito bites:

  — Wear shoes, socks, long pants, and a long-sleeved shirt when outdoors for long periods of time or when mosquitoes are most active (between dusk and dawn). Maintain body fluids to avoid heat stress.

— Consider the use of mosquito repellent, according to directions, when it is necessary to be outdoors for long periods or at times when mosquitoes are most active.

3.5.3 Lyme Disease

Lyme disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota and Wisconsin. Few cases have been identified in other states. Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have a headache, weakness, fever, a stiff neck, swilling and pain in the joints, and eventually, arthritis.

Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pants legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gently and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

3.6 CONFINED SPACE

A confined space is a space which is large enough and so configured that an employee can bodily enter and perform work, has limited or restricted means for entry or exit, is not designed for continuous employee occupancy, and requires a permit if it has one or more of the following characteristics:

- Contains a potentially hazardous atmosphere due to accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere
- Contains a material with the potential for suffocation of an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor that slopes downward and tapers to a smaller cross-section
- Contains other recognized safety or health hazard.

Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 ft in depth such as pits, tubs, vaults, and vessels.

Based on the definition of a confined space, it is not anticipated that confined space entry will be required during field investigations at Standby Contract sites. Although test pit excavations may be required at certain sites, no personnel will be allowed to enter a test pit where excavation exceeds 4 ft in depth.

Entry into a confined space is forbidden until the potential confined space is thoroughly assessed by the Program Health and Safety Officer. Only those personnel properly trained and certified will be allowed to conduct confined space entries.

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4. GENERAL SAFETY PRACTICES

4.1 SAFETY PROCEDURES

Safe work practices, which must be followed by site workers, include:

- At least one copy of this HASP must be at the project site, in a location readily available to personnel, and reviewed by project personnel prior to starting work.

- Site personnel must use the buddy system.

- Potentially contaminated PPE must not be removed from the work area before being cleaned or properly packaged and labeled.

- Potentially contaminated waste, debris, and clothing must be properly contained, and legible and understandable precautionary labels affixed to each container to define its content.

- Removing potentially contaminated soil or debris from protective clothing or equipment with compressed air, shaking, or any other means that may re-suspend contaminants into the air is prohibited.

- Eat, drink, and smoke only in those areas designated by the Site Manager/Site Health and Safety Officer. These activities will not take place within any work zone.

- Large bulk containers, such as 55-gallon drums, must only be moved with the proper equipment, and must be secured to prevent dropping or loss of control during transport.

- Emergency equipment such as eyewash, fire extinguishers, portable shower, etc. must be staged in readily-accessible locations.

- Employees must be aware, and inform their partners or fellow team members, of the potential non-visible effects of exposure to toxic materials. The symptoms of such exposures may include:

  — Headaches
  — Dizziness
  — Nausea
  — Blurred vision
  — Cramps
  — Irritation of eyes, skin, or respiratory tract.

- Visitors to the Site must adhere to the following:

  — Visitors must be instructed to stay outside the Exclusion Zone and Contaminant Reduction Zone, and remain within the Support Zone during the extent of their stay. Visitors must be cautioned to avoid skin contact with surfaces that are contaminated or suspected to be contaminated.

  — Visitors requesting to observe work in the Exclusion Zone must don appropriate PPE prior to entry into that zone, and must be cleared for hazardous site work as evidenced by a complete physical examination; must also have 40 hours of hazardous waste operators training and 8 hours refresher training within the past 12 months. If respiratory protective devices are necessary, visitors who wish to enter the Contaminant Reduction Zone, must be respirator-trained and fit tested for a respirator within the past 12 months.

  — Visitor inspection or access of the Exclusion Zone will be made at the discretion of the Field Manager. Only those personnel fully qualified may access the Exclusion Zone as defined by 29 CFR 1926.65.

Each employee required to take prescription drugs will notify the Site Health and Safety Officer prior to the start of work, and upon approval, may take prescription drugs in the Support Zone only. Controlled or unauthorized drugs will **not** be permitted onsite at any time.

4.2 BUDDY SYSTEM

Onsite personnel must use the buddy system. Visual contact must be maintained between crew members, and crew members must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration
- Changes in coordination
- Changes in demeanor
- Excessive salivation and pupillary response
- Changes in speech pattern.

Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures.

If protective equipment or noise levels impair communications, pre-arranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

4.3 EMERGENCY EQUIPMENT

Adequate emergency equipment for the activities conducted onsite and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 must be maintained onsite. Personnel will be provided with access to emergency equipment including, but not limited to, the following:

- Emergency eyewash unit(s) and showers meeting American Nation Standards Institute Z358.1-1990
- Fire extinguishers of adequate size, class, number, and location (one in each EA vehicle) as required by applicable sections of 29 CFR 1910 and 29 CFR 1926.
- First aid kit of adequate size for the number of personnel onsite.

4.4 PERSONAL HYGIENE AND SANITATION

4.4.1 Break Area

Breaks will be taken in the Support Zone, away from the active work area after site personnel complete decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in the area other than the Support Zone.

4.4.2 Potable Water

The following rules apply for project field operations:

- An adequate supply of potable water will be provided at the work site. Potable water must be kept away from hazardous materials, contaminated clothing, and contaminated equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be consumed directly from the container, nor dipped from the container.
- Containers used for drinking water must be clearly marked and not used for any other purpose.
- Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups must be provided.

4.4.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking will be provided. Personnel are required to wash off exposed skin surfaces prior to eating, smoking, or drinking following site operations and work activities.

4.4.4 Lavatory

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided.

4.4.5 Trash Collection

Trash from the Contaminant Reduction Zone will be inspected, and if considered a hazardous waste, disposed of as a hazardous waste. Trash collected in the Support Zone and break areas disposed of as non-hazardous waste. Labeled trash receptacles will be set up in the Contaminant Reduction Zone and the Support Zone.

4.5 SPILL CONTROL PLAN

Personnel must take every necessary precaution to minimize the potential for spills during site operations. Onsite personnel are obligated to report immediately any discharge, no matter how small, to the Project Manager. In the event of a significant spill, containment, control, and cleanup procedures will adhere to NYSDEC Technical Procedural Guidance document for personnel health and safety protection.

Spill control apparatus will be located onsite at locations that the Site Manager foresees with the potential for discharge to the ground. Sorbent materials used for the cleanup will be containerized and labeled separately from other wastes. In the event of a spill, the Project Manager will follow the provisions outlined in the site-specific HASP for each site to contain and control released materials and to prevent the spread to off-site areas.

4.6 LOCKOUT/TAGOUT PROCEDURES

Maintenance procedures will only be performed by fully qualified and trained individuals. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means such as a lock to hold an energy or material isolating device or system ensuring that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system will be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controlled may not be operated until the tag is removed. Only personnel properly trained in lockout/tagout procedures, and having knowledge of the system requiring maintenance, will conduct these activities. Lockout/tagout procedures will be reviewed and assessed by the Site Health and Safety Officer prior to maintenance being conducted on the system.

5. PERSONAL PROTECTIVE EQUIPMENT

5.1 LEVELS OF PROTECTION

Based upon currently available information, the Site is considered non-hazardous and will require Level D protection for currently anticipated conditions and activities. Site monitoring does not include intrusive activities, so unknown chemical hazards will not be encountered. Level D protection is sufficient for the monitoring activities covered by this HASP.

5.1.1 Level D Personal Protective Equipment

Level D will be worn for initial entry onsite and initially for all activities and will consist of the following:

- Coveralls or appropriate work clothing
- Steel-toe, steel-shank safety boots/shoes
- Hard hats (when overhead hazards are present or as required by the Site Health and Safety Officer)
- Chemical resistant gloves (nitrile/neoprene) when contact with potentially contaminated soil or water is expected
- Safety glasses with side shields
- Hearing protectors (during drilling or other operations producing excessive noise)
- Boot covers (optional unless in contact with potentially contaminated soil or water)
- Poly coated coveralls (when contact with contaminated soil and water is anticipated, e.g., when surging/pumping wells and pressure-washing equipment).

Insulated clothing, hats, etc. must be worn when temperatures or wind chill fall below 40°F.

5.2 HEARING PROTECTION

Hearing protection must be available and properly worn whenever noise levels exceed 85 dBA (noise level at which a normal conversation cannot be carried on at a 3-ft distance). When the Site Health and Safety Officer determines that a potential excessive noise exposure exists, a sound level meter will be used for measurements. Two types of hearing protection will be available onsite – foam earplugs and ear muffs. The hearing protectors will have a Noise Reduction Rating sufficient to reduce the sound level to below 85 dBA.

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6. EMPLOYEE TRAINING

6.1 SITE WORKERS

Personnel who will be performing non-hazardous onsite tasks are not required to have been trained according to United States Department of Labor OSHA Standard, 29 CFR 1910.120/29 CFR 1926.65 *Hazardous Waste Operations and Emergency Response*. These workers will have appropriate health and safety training based upon their specific job tasks and activities.

The Site Manager, Site Health and Safety Officer, and personnel conducting the site monitoring activities (e.g., groundwater monitoring) will be trained as required to meet the United States Department of Labor OSHA Standard, 29 CFR 1910.120/29 CFR 1926.65, *Hazardous Waste Operations and Emergency Response* to qualify as a hazardous waste site worker and supervisor. Training will include:

- A minimum of 40 hours of initial offsite instruction
- A minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor
- An 8-hour "refresher" training period annually
- Additional training that addresses unique or special hazards/operational requirements
- First aid and CPR.

Onsite management and supervisors who are directly responsible for or who supervise employees will receive at least 8 additional hours of specialized management training. Copies of training certificates and dates of attendance will be available through the Site Health and Safety Officer upon request.

6.1.1 Subcontractor Training

Prior to start of work operations, the Project Manager will obtain a written list of subcontractor personnel to be onsite, and written certification from subcontractor management that these workers meet the training requirements for their assigned tasks.

6.2 SITE-SPECIFIC TRAINING

The Site Health and Safety Officer will be responsible for developing a site-specific occupational hazard training program and providing training to personnel who are to work at the Site. At a minimum, this training will consist of the following topics:

- Names of personnel responsible for site health and safety
- Safety, health, and other hazards at the Site

- Proper use of PPE
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the Site
- Acute effects of compounds at the Site
- Decontamination procedures.

7. MEDICAL SURVEILLANCE

7.1 MEDICAL EXAMINATIONS

Site workers potentially involved with the field sampling operations must have satisfactorily completed a comprehensive medical examination by a licensed occupational physician within 12 months (or 24 months with the approval of the consulting physician) prior to the start of site operations. The date of medical examination of each qualified person will be maintained onsite with the project field team. Medical surveillance protocols must comply with 29 CFR 1910.120/29 CFR 1926.65.

Medical examinations and consultations must be provided for employees covered by this program on the following schedule:

- Prior to assignment
- At least annually for employees covered by the program
- At termination of employment or reassignment to an area where the employee would not be covered if the employee has not been examined within the past 6 months
- As soon as possible upon the development of signs or symptoms that may indicate an overexposure to hazardous substances or health hazards
- More frequently if the physician deems such examination necessary to maintain employee health.

7.2 RECORDS

An accurate record of the medical surveillance and exposure will be maintained for each employee for a period of no less than 30 years after the termination of employment, as per 29 CFR 1910.1020. Records must include at least the following information about the employee:

- Name and social security number
- Physician's written opinions, recommendations, limitations, and test results
- Employee medical complaints related to hazardous waste operations
- Information provided to the physician by the employee concerning possible exposures, accidents, etc.

Subcontractors must provide medical surveillance information in writing to the Project Manager for their workers prior to mobilization onsite.

7.3 FIRST AID AND MEDICAL TREATMENT

Persons onsite must report a near-miss incident, accident, injury, or illness to their immediate supervisor or the Site Manager. First aid will be provided by the designated site first aider. Injuries and illnesses requiring medical treatment must be documented. The Site Manager must conduct an accident investigation as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The accident/incident report must be completed and submitted to the Corporate Health and Safety Officer within 24 hours after the incident.

If first aid treatment is required, first aid kits are kept at the Contaminant Reduction Zone. If treatment beyond first aid is required, the injured individual(s) should be transported to the medical facility. If the injured is not ambulatory, or shows signs of not being in a comfortable or stable condition for transport, then an ambulance/paramedics should be summoned. If there is a doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

8. ACCIDENT PREVENTION AND CONTINGENCY PLAN

8.1 ACCIDENT PREVENTION

Field personnel will receive health and safety training prior to the initiation of site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, regular meetings should be held. Discussion should include:

- Tasks to be performed
- Time constraints (e.g., rest periods, cartridge changes)
- Hazards that may be encountered, including their effects, how to recognize symptoms and monitor them, concentration limits, or other danger signals
- Emergency procedures.

8.1.1 Drilling

Prior to drilling activity, efforts will be made to determine whether underground installations will be encountered and, if so, where these installations are located. Hard hats, safety glasses, and safety boots must be worn as a minimum, within 25 ft of the drill rig. The drill rig cannot be operated within 10 ft of overhead power lines. The Site Manager or Site Health and Safety Officer will provide constant onsite supervision of the drilling subcontractor to ensure that they are meeting the health and safety requirements. If deficiencies are noted, work will be stopped and corrective action will be taken (e.g., retrain, purchase additional safety equipment). Reports of health and safety deficiencies and the corrective action taken will be forwarded to the Project Manager.

8.1.2 Vehicles and Heavy Equipment

Working with large motor vehicles and heavy equipment could be a major hazard at a site. Injuries can result from equipment hitting or running over personnel, impacts from flying objects, or overturning of vehicles. Vehicle and heavy equipment design and operation will be in accordance with 29 CFR, Subpart O, 1926.600 through 1926.602. In particular, the following precautions will be utilized to help prevent injuries/accidents:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked at the beginning of each shift by the equipment operator.

- Large construction motor vehicles will not be backed up unless the vehicle has a reverse signal alarm audible above the surrounding noise level, or the vehicle is backed up only when an observer signals that it is safe to do so.

- Heavy equipment or motor vehicle cabs will be kept free of all non-essential items, and loose items will be secured.

- Large construction motor vehicles and heavy equipment will be provided with necessary safety equipment (seat belts, rollover protection, emergency shut-off in case of rollover, backup warning lights, and audible alarms).

- Blades and buckets will be lowered to the ground and parking brakes will be set before shutting off heavy equipment or vehicles.

8.2 CONTINGENCY PLAN

8.2.1 Emergency Recognition

Prior to work startup, personnel must be familiar with emergency condition identification, notification, and response procedures. **The emergency telephone numbers for local emergency response and reporting organizations and directions and map to the nearest hospital are included in Attachment E. NOTE: The HASP will be left open to the emergency contacts page at all times during Site activities.** The Site Manager and Site Health and Safety Officer will rehearse/review emergency procedures and/or applicable Site contingencies initially during site orientation and as part of the ongoing site safety program. Onsite emergencies will ultimately be handled by offsite emergency personnel. Initial response and first-aid treatment; however, will be provided onsite.

Person(s) identifying an accident, injury, emergency condition, or a scenario requiring implementation of a response in support of this Plan will immediately take actions to report the situation to the Site Manager. Notification may take place by runner, hand-held radio, or telephone. The Site Manager/Site Health and Safety Officer will initiate the required response based upon the type of incident, following the procedures contained in this HASP. A chain-of-command and sign-in sheets for personnel on the site will be established at the beginning of each work day to ensure personnel are accounted for and who will take control should the Site Manager or Site Health and Safety Officer become injured. The following items constitute those site conditions requiring an emergency response or contingency action in accordance with this HASP:

- Fire/Explosion

  — The potential for human injury exists

  — Toxic fumes or vapors are released

- The fire could spread onsite or offsite, and possibly ignite other flammable materials or cause heat-induced explosions
- The use of water and/or chemical fire suppressants could result in contaminated runoff
- An imminent danger of explosion exists.

- Heavy Equipment Accident
  - Onsite traffic accident where personal injury has occurred.

- Natural Disaster
  - A rain storm exceeds the flash flood level
  - The facility is in a projected tornado/hurricane path or a tornado/hurricane has damaged facility property
  - Severe wind gusts are forecasted or have occurred and have caused damage to the facility.

- Medical Emergency
  - Overexposure to hazardous materials
  - Trauma injuries (broken bones, severe lacerations/bleeding, burns, animal bites)
  - Eye or significant skin contact with hazardous materials
  - Loss of consciousness
  - Heat stress (heat stroke)
  - Heart attack
  - Respiratory failure
  - Allergic reaction.

- Discovery of Unanticipated Hazards (e.g., unmarked utility lines, heavily contaminated material).

Follow-up operations to evaluate and control the source of fire, explosions, and hazardous materials incidents will occur only after discussion with the Project Manager and Site Manager. The Site Manager will act as the Emergency Coordinator at the Site to coordinate onsite activities and contingencies until the arrival of outside response organizations. If the Site Manager is unable to act as the Emergency Coordinator, then the authority to take action will be transferred to the Site Health and Safety Officer, or other designee, as indicated in the daily updated chain-of-command.

8.2.2 Emergency Procedures

In the event of an emergency, the information available at that time must be properly evaluated and the appropriate steps taken to implement the Emergency Response Plan. The Site Manager (or Site Health and Safety Officer if the Site Manager is part of the emergency) will assume command of the situation. He/she will alert the emergency management system and evacuate personnel to the pre-designated evacuation location. In a site emergency, the Site Manager (or the Site Health and Safety Officer if the Site Manager is not available) must sound an emergency alarm (designated as an air horn or car horn) repeatedly several times, upon hearing work must stop, and personnel must move to the pre-designated evacuation location. If the emergency situation cannot be conveyed by word of mouth, a whistle or other horn will be sounded. Three short blasts, separated by a 2-second silence, will be used as the emergency signal. First aid will be administered only to limit further injury and stabilize the victim. The local Emergency Medical Services must be notified immediately if needed. The routes to the nearest hospital are shown in Attachment E. The Site Manager/Site Health and Safety Officer will make required notifications to include, but not be limited to, the NYSDEC representative and Project Manager, as defined in Section 2.2 and the appropriate federal and state agencies.

Site personnel will have the capability of notifying emergency responders directly from the Site using the phone in the company vehicle or in the site support office. In the event of an accident/incident, the Project Manager should be immediately notified of a reportable accident/incident or contingency. The Project Manager will complete and submit to the Corporate Health and Safety Officer, an Accident/Loss and Incident Report using the format provided in Attachment F.

The following information will be provided when reporting an emergency:

1. Name and location of person reporting
2. Location of accident/incident
3. Name and affiliation of injured party
4. Description of injuries, fire, spill, or explosion
5. Status of medical aid and/or other emergency control efforts
6. Details of chemicals involved
7. Summary of accident, including suspected cause and time it occurred
8. Temporary control measures taken to minimize further risk.

This information is not to be released to parties other than those listed in this section and emergency response team members. Once emergency response agencies have been notified, the Project Manager will be notified immediately.

8.2.3 Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Site Manager (via voice and hand signals) of the chemical exposure. The Site Manager should contact the appropriate emergency response agency.

- Precautions should be taken to avoid exposure of other individuals to the chemical.

- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so, or the clothing should be removed and bagged.

- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.

- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.

Chemical exposure incidents must be reported in writing to the program Health and Safety Officer. The Site Health and Safety Officer or Site Manager is responsible for completing the accident report provided in Attachment F.

8.2.4 Personal Injury

Personnel should always be alert for signs and symptoms of illnesses related to chemical, physical, and onsite health hazards. Severe injuries resulting from accidents must be recognized as emergencies and treated as such. If feasible, in the field, at least two people currently trained in first aid/CPR must be present onsite. This will normally be the Field Manager and Site Health and Safety Officer.

In a medical emergency, the Site Manager (or the Site Health and Safety Officer if the Field Manager is not available) must sound the emergency air horn or car horn several times, upon which work must stop and personnel must move to the pre-designated evacuation location. If the emergency situation cannot be conveyed by word of mouth, a whistle or other horn will be sounded. Three short blasts, separated by a 2-second silence, will be used as the emergency signal. Personnel currently trained in first aid will evaluate the nature of the injury, decontaminate the victim (if necessary), and initiate first aid assistance immediately and transport if appropriate. First aid will be administered only to limit further injury and stabilize the victim. The local Emergency Medical Services must be notified immediately, if needed. The routes to the nearest hospital are shown in Attachment E. Although not anticipated, victims who are heavily contaminated with toxic or dangerous materials must be decontaminated before being transported from the Site. Decontamination will consist of removal of contaminated coveralls/clothing, and wrapping the victim in a sheet or other cloth like material. No persons will re-enter the Site of injury/illness until the cause of the injury or symptoms has been determined and controlled. At no time will personnel transport victims to emergency medical facilities unless the injury does not pose an immediate threat to life and transport to the

emergency medical facility can be accomplished without the risk of further injury. Emergency Medical Services will be used to transport serious injuries offsite unless deemed otherwise by the Site Manager/Site Health and Safety Officer.

The Site Manager must complete an Accident/Loss and Incident Report provided in Attachment F and submit it to the Project Manager within 24 hours of the following types of incidents:

- Job-related injuries and illnesses
- Accidents resulting in loss or damage to property
- Accidents involving vehicles and/or vessels, whether or not they result in damage to property or personnel
- Accidents in which there may have been no injury or property damage, but which have a high probability of recurring with at least a moderate risk to personnel or property
- Near-miss incidents which could have resulted in any of the conditions defined above.

An accident that results in a fatality or the hospitalization of three or more employees must be reported within 8 hours to the United States Department of Labor through the Project Manager. Subcontractors are responsible for their reporting requirements.

In order to support onsite medical emergencies, first aid/emergency medical equipment will be available at the following locations:

- First-aid kit: Work vehicle
- Eye wash: Work vehicle
- Emergency alarm: Horn on the work vehicle
- Copy of the HASP: Work vehicle
- Telephone: Work vehicle.

The eye wash kit must be portable and capable of supplying at least a 15-minute supply of potable water to the eyes.

8.2.5 Operations Shutdown

The Site Manager, Site Health and Safety Officer, or the Project Manager may mandate operations shutdown. Conditions warranting work stoppage will include (but are not limited to):

- Uncontrolled fire
- Explosion
- Uncovering potentially dangerous buried hazardous materials
- Condition immediately dangerous to life and health or the environment

- Potential for electrical storms
- Treacherous weather-related conditions
- Limited visibility

8.2.6 Evacuation Procedures

In the event the Site must be evacuated, the following procedures should be followed:

- The Site Manager will initiate evacuation procedures by signaling to leave the Site.
- Personnel in the work area should evacuate the area and meet in the common designated area.

- Personnel suspected to be in or near the work area should be accounted for and the whereabouts of missing persons determined immediately.

Further instruction will then be given by the Site Manager.

8.2.7 Procedures Implemented in the Event of a Major Fire, Explosion, or Onsite Health Emergency Crisis

Fire and explosion must be immediately recognized as an emergency. The Site Health and Safety Officer (or Site Manager if Site Health and Safety Officer is not available) must sound an emergency signal, and personnel must be decontaminated (if necessary) and evacuated to the pre-designated evacuation location. The procedures for alerting fire/explosion emergencies will be the same as those defined for medical emergencies (Section 11.2.3).

Only persons properly trained in fire suppression and other emergency response procedures will support control activities. Control activities will consist of the use of onsite portable fire extinguishers for limited fire suppression and employee evacuation. Upon sounding the emergency alarm, personnel will evacuate the hazard location and assemble at the designated site meeting area.

Only those site personnel trained in the use of portable fire extinguisher use will attempt to suppress a site fire. Small multipurpose dry chemical extinguishers will be maintained in each vehicle onsite. Fires not able to be extinguished using onsite extinguishers will require the support of the local fire department.

The Site Manager should take measures to reduce injury and illness by evacuating personnel from the hazard location as quickly as possible. The Site Manager must then notify the local fire department. The Site Manager will determine proper follow-up actions. Site personnel will not resume work during or after a fire/explosion incident until the emergency coordinator has directed that the incident is over and work may resume. During the incident, site personnel will remain outside the incident area and obey the instructions of the Emergency Coordinator.

8.2.8 Emergency Telephone Numbers

Attachment E provides a listing of emergency telephone numbers.

8.3 SPILL CONTAINMENT PROCEDURES

Small incidental spills, (i.e., those which cause no injury to personnel or the public), may be cleaned up quickly and easily. For large spills, (i.e., those that contaminate personnel or the environment), attend to first aid measures first, stop the source of the spill if possible, and then notify appropriate emergency response services. Safety of workers will be managed by adhering to policies and procedures outlined in the NYSDEC Technical Procedural Manual for Personal Health and Safety Protection.

Spills of hazardous materials or wastes which are listed by USEPA as having a reportable quantity value must be reported to appropriate federal, state, and local agencies if a reportable quantity or greater is released. The Site Manager is responsible for determining the appropriate agencies prior to work startup.

ATTACHMENT A

HEALTH AND SAFETY PLAN REVIEW RECORD

I have read the Health and Safety Plan Addendum for this site and have been briefed on the nature, level, and degree of exposure likely as a result of participation in this project. I agree to conform to all the requirements of this Plan.

Site: Bianchi/Weiss Greenhouses, East Patchogue, New York

Name	Signature	Affiliation	Date

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ATTACHMENT B

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CHLORDANE (TECHNICAL PRODUCT)

ICSC: 0740

1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene 1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene $C_{10}H_6Cl_8$ Molecular mass: 409.8 ICSC # 0740 	CAS # 57-74-9 UN # 2996 EC # 602-047-00-8 March 26, 1998 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	Alcohol-resistant foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	(See Ingestion).	Breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Confusion. Convulsions. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: chemical protection suit including self-contained breathing apparatus.	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs , bases and incompatible materials . See Chemical Dangers. Well closed. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. Severe marine pollutant. Xn symbol N symbol R: 21/22-40-50/53 S: 2-36/37-60-61 UN Hazard Class: 6.1 UN Packing Group: III

ICSC: 0740

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

ICSC: 0740

CHLORDANE (TECHNICAL PRODUCT)

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** TECHNICAL: LIGHT YELLOW TO AMBER VISCOUS LIQUID **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning, on contact with bases producing toxic fumes including phosgene , hydrogen chloride . Attacks iron, zinc, plastic, rubber and coatings. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.5 mg/m^3 as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2004). MAK: (Inhalable fraction) 0.5 mg/m^3; Peak limitation category: II(8); skin absorption (H); Carcinogen category: 3B; (DFG 2004). OSHA PEL: TWA 0.5 mg/m^3 skin NIOSH REL: Ca TWA 0.5 mg/m^3 skin See Appendix A NIOSH IDLH: Ca 100 mg/m^3 See: 57749	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation, through the skin and by ingestion. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying. **EFFECTS OF SHORT-TERM EXPOSURE:** Exposure at high levels may result in disorientation, tremors, convulsions, respiratory failure and death. Medical observation is indicated. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the liver and immune system , resulting in tissue lesions and liver impairment. This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point at 0.27kPa: 175°C Relative density (water = 1): 1.59-1.63 Solubility in water: none	Vapour pressure, Pa at 25°C: 0.0013 Octanol/water partition coefficient as log Pow: 2.78
ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to soil organisms, honey bees. It is strongly advised that this substance does not enter the environment. The substance may cause long-term effects in the aquatic environment. 	

NOTES

If the substance is formulated with solvents also consult the ICSCs of these materials. Carrier solvents used in commercial formulations may change physical and toxicological properties. Belt, Chlor Kil, Chlortox, Corodan, Gold Crest, Intox, Kypchlor, Niran, Octachlor, Sydane, Synklor, Termi-Ded, Topiclor, and Toxichlor are trade names. Also consult ICSC 0743 Heptachlor. Card has been partly updated in October 2005. See sections Occupational Exposure Limits, Emergency Response.

Transport Emergency Card: TEC (R)-61GT6-III

ADDITIONAL INFORMATION

ICSC: 0740 **CHLORDANE (TECHNICAL PRODUCT)**

Page last reviewed: July 1, 2014

Page last updated: July 1, 2014

Content source: National Institute for Occupational Safety and Health (http://www.cdc.gov/NIOSH/)

LEAD

ICSC: 0052

Lead metal Plumbum Pb (powder) ICSC # 0052	CAS # 7439-92-1 RTECS # OF7525000 August 10, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•**INHALATION**		Local exhaust or breathing protection.	Fresh air, rest.
•**SKIN**		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•**EYES**		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	Separated from food and feedstuffs and incompatible materials . See Chemical Dangers.	

ICSC: 0052	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR. **PHYSICAL DANGERS:** Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.05 mg/m^3 as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004). MAK: Carcinogen category: 2; Germ cell mutagen group: 3A; (DFG 2006). EU OEL: as TWA 0.15 mg/m^3; (EU 2002). OSHA PEL*: 1910.1025 TWA 0.050 mg/m^3 See Appendix C *Note: The PEL also applies to other lead compounds (as Pb) -- See Appendix C . NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C *Note: The REL also applies to other lead compounds (as Pb) -- See Appendix C . NIOSH IDLH: 100 mg/m^3 (as Pb) See: 7439921	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation and by ingestion. **INHALATION RISK:** A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the blood , bone marrow , central nervous system , peripheral nervous system and kidneys , resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development. This substance is probably carcinogenic to humans. fast track change Oct 06 - IARC 2A.
PHYSICAL PROPERTIES	Boiling point: 1740°C Melting point: 327.5°C	Density: 11.34 g/cm^3 Solubility in water: none
ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment. 	

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. Card has been partly updated in April 2005. See section Occupational Exposure Limits. Card has been partly updated in October 2006: see section Occupational Exposure Limits, Effects Long Tem Exposure.

ADDITIONAL INFORMATION

ICSC: 0052 **LEAD**

Page last reviewed: July 22, 2015

Page last updated: July 1, 2014

Content source: National Institute for Occupational Safety and Health (http://www.cdc.gov/NIOSH/)

ATTACHMENT C

PERSONAL PROTECTIVE EQUIPMENT ACTIVITY RECORD

Site: Bianchi/Weiss Greenhouses, East Patchogue, New York		
Weather Condition:		**Onsite Hours: From** **To**
Changes in Personal Protective Equipment Levels[(a)]	**Work Operations**	**Reasons for Change**
Site Health and Safety Plan Violations	**Corrective Action Specified**	**Corrective Action Taken (yes/no)**
Observations and Comments:		
Completed by: _____ **Site Health and Safety Officer**		**Date**
(a) Only the Site Health and Safety Officer may change personal protective equipment levels, using only criteria specified in the Health and Safety Plan.		

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ATTACHMENT D

SITE ENTRY AND EXIT LOG

Site: Bianchi/Weiss Greenhouses, East Patchogue, New York				
Name	**Date**	**Time of Entry**	**Time of Exit**	**Initials**

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ATTACHMENT E

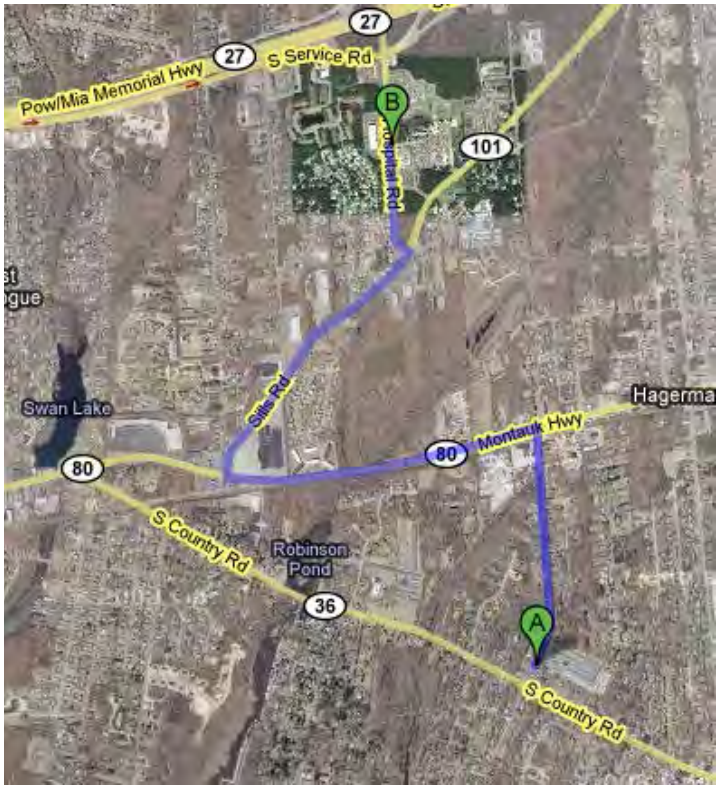
EMERGENCY TELEPHONE NUMBERS AND HOSPITAL DIRECTIONS

SITE: Bianchi/Weiss Greenhouses, East Patchogue, New York	
Police: Suffolk County Police Department	9-1-1
Fire: Patchogue Fire Department	9-1-1
Ambulance: Patchogue Ambulance Company	9-1-1
Hospital: Brookhaven Memorial Hospital	(631) 654-7100
New York Regional Poison Control Center: 259 1st St, Mineola, NY	(516) 542-2323 800-222-1222 (emergency)
Directions to Brookhaven Memorial Hospital, 101 Hospital Road, Patchogue, New York Starting at 24 Orchard Road, travel northeast toward Hedges Road. Turn left at CR-80/Montauk Highway. Turn right at CR-101/Sills Road. Turn left at Hospital Road. Continue on Hospital Road for 0.3 mile to Brookhaven Memorial Hospital (101 Hospital Road). Trip is 2.4 miles. Travel time is approximately 6 minutes.	

MAP TO HOSPITAL

Directions to Brookhaven Memorial Hospital:
Starting at 24 Orchard Road, travel northeast toward Hedges Road. Turn left at CR-80/Montauk Highway. Turn right at CR-101/Sills Road. Turn left at Hospital Road. Continue on Hospital Road for 0.3 mile to Brookhaven Memorial Hospital (101 Hospital Road). Trip is 2.4 miles.

Travel time is approximately 6 minutes.



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ATTACHMENT F

ACCIDENT/LOSS REPORT

This report must be completed by the injured employee or supervisor and faxed to EA corporate human resources within 24 hours of any accident. The fax number is **(410) 771-1780**.

Note: whenever an employee is sent for medical treatment for a work related injury or illness, page 4 of this report must accompany that individual to ensure that all invoices, bills, and correspondence are sent to human resources for timely response.

A. DEMOGRAPHIC INFORMATION:

NAME OF INJURED EMPLOYEE:_____
HOME ADDRESS:_____
HOME PHONE:_____ DATE OF BIRTH:
AGE:_____ SEX: M F

MARITAL STATUS:_____ NAME OF SPOUSE (if applicable):_____
SOCIAL SECURITY NUMBER:_____ DATE OF HIRE:_____

NUMBER OF DEPENDENTS:_____
EMPLOYEES JOB TITLE:_____
DEPT. REGULARLY EMPLOYED:_____
WAS THE EMPLOYEE INJURED ON THE JOB: Y N
PRIMARY LANGUAGE OF THE EMPLOYEE:_____

B. ACCIDENT/INCIDENT INFORMATION:

DATE OF ACCIDENT:_____ TIME OF ACCIDENT:_____
REPORTED TO WHOM:_____ NAME OF SUPERVISOR:_____
EXACT LOCATION WHERE ACCIDENT OCCURRED (including street, city, state and County): _____

_____

_____

EXPLAIN WHAT HAPPENED (include what the employee was doing at the time of the accident and how the accident occurred):_____

_____

_____

_____

_____

DESCRIBE THE INJURY AND THE SPECIFIC PART OF THE BODY AFFECTED (i.e., laceration, right hand, third finger):_____
OBJECT OR SUBSTANCE THAT DIRECTLY INJURED EMPLOYEE:_____

NUMBER OF DAYS AND HOURS EMPLOYEE USUALLY WORKS PER WEEK:_____
IS THE EMPLOYEE EXPECTED TO LOSE AT LEAST ONE FULL DAY OF WORK?_____
DOES THE EMPLOYEE HAVE A PREVIOUS CLAIM? Y N If yes, STATUS Open Closed
WAS THE EMPLOYEE ASSIGNED TO RESTRICTED DUTY?_____

C. ACCIDENT INVESTIGATION INFORMATION

WAS SAFETY EQUIPMENT PROVIDED? Y N If yes, was it used? Y N
WAS AN UNSAFE ACT BEING FORMED ? Y N If yes, describe_____
WAS A MACHINE PART INVOLVED? Y N If yes, describe_____
WAS THE MACHINE PART DEFECTIVE? Y N If yes, in what way_____
WAS A 3RD PARTY RESPONSIBLE FOR THE ACCIDENT/INCIDENT? Y N
If yes, list name, address, and phone number_____

WAS THE ACCIDENT/INCIDENT WITNESSED? Y N
If yes, list name, address, and phone number:_____

D. PROVIDER INFORMATION

WAS FIRST AID GIVEN ONSITE? Y N
If yes, what type of medical treatment was given_____
PHYSICIAN INFORMATION (if medical attention was administered)
NAME:_____
ADDRESS (include city, state, and zip):_____
PHONE:_____

HOSPITAL ADDRESS (include name, address, city, state, zip code, and phone)

WAS THE EMPLOYEE HOSPITALIZED? Y N If yes, on what date_____
WAS THE EMPLOYEE TREATED AS AN OUTPATIENT, RECEIVE EMERGENCY TREATMENT OR AMBULANCE SERVICE?_____

PLEASE ATTACH THE PHYSICIANS WRITTEN RETURN TO WORK SLIP

NOTE: A PHYSICIAN'S RETURN TO WORK SLIP IS REQUIRED PRIOR TO ALLOWING THE WORKER TO RETURN TO WORK.

E. AUTOMOBILE ACCIDENT INFORMATION (complete if applicable)

AUTHORITY CONTACTED AND REPORT #_____
EA EMPLOYEE VEHICLE YEAR, MAKE AND MODEL_____

V.I.N. _____ PLATE/TAG# _____
OWNER'S NAME AND ADDRESS: _____

_____
DRIVER'S NAME AND ADDRESS: _____

_____
RELATION TO INSURED: _____ DRIVER'S LICENSE # _____
DESCRIBE DAMAGE TO YOUR PROPERTY: _____

_____

_____
DESCRIBE DAMAGE TO OTHER VEHICLE OR PROPERTY: _____

_____

_____
OTHER DRIVER'S NAME AND ADDRESS: _____

_____
OTHER DRIVER'S PHONE: _____
OTHER DRIVER'S INSURANCE COMPANY AND PHONE: _____

_____
LOCATION OF OTHER VEHICLE: _____
NAME, ADDRESS, AND PHONE OF OTHER INJURED PARTIES: _____

_____

_____
WITNESSES

NAME: _____ PHONE: _____
ADDRESS: _____
STATEMENT: _____

_____
SIGNATURE: _____

NAME: _____ PHONE: _____
ADDRESS: _____
STATEMENT: _____

_____
SIGNATURE: _____

F. ACKNOWLEDGEMENT

NAME OF SUPERVISOR: _____
DATE OF THIS REPORT: _____ REPORT PREPARED BY: _____

I have read this report and the contents as to how the accident/loss occurred are accurate to the best of my knowledge.

Signature: _____ Date: _____
Injured Employee

I am seeking medical treatment for a work related injury/illness.

Please forward all bills/invoices/correspondence to:

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC
225 Schilling Circle
Suite 400
HUNT VALLEY, MD 21031

ATTENTION: Michele Bailey
HUMAN RESOURCES

(410) 771-1625

Appendix J

Site Management Forms

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GROUNDWATER SAMPLING PURGE FORM

Well I.D.:	**EA Personnel:**	**Client:** NYSDEC; BIANCHI WEISS GREENHOUSES
Location:	**Well Condition:**	**Weather:**
Sounding Method:	**Gauge Date:**	**Measurement Ref:**
	Gauge Time:	
Stick Up/Down (ft):	**PID Headspace Reading:**	**Well Diameter (in):**

Purge Date:	**Purge Time:**
Purge Method:	**Field Technician:**

Well Volume

A. Well Depth (ft):	**D. Well Volume (gal/ft):**	**Depth/Height of Top of PVC:**
B. Depth to Water (ft):	**E. Well Volume (gal) (C*D):**	**Pump Type:**
C. Liquid Depth (ft) (A-B):	**F. Three Well Volumes (gal) (E*3):**	**Pump Intake Depth:**

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)

Total Quantity of Water Removed (gal): _____ **Sampling Time:** _____

Samplers: _____ **Split Sample With:** _____

Sampling Date: _____ **Sample Type:** _____

COMMENTS AND OBSERVATIONS: _____

Volume of Water in Casing (gallons/foot):	1" well: 0.041	2" well: 0.163	4" well: 0.653	6" well: 1.469	
Sample Parameter Stabilization Criteria:	Temp.: ±3%	pH: ±0.1	Cond.: ±3%	ORP: ±10 mV	DO/NTU: ±10%

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Bianchi/Weiss Greenhouses Site
NYSDEC Site #152209
East Patchogue, New York
Sump Pump Filtration System Inspection Checklist

Inspector_____ Date of Inspection_____

General			Yes	No	Notes
Are there visible signs of water on the basement floor?					
Has basement sealant been scuffed or worn away?					
Are there any abnormal sounds coming from the system?					
Does system appear to be intact (pumps plugged in, filters in place, etc.)?					
Components					
Duplex System	Pumps (Liberty model 250-2)	Do pumps operate when sump filled to "on" level?			See pump troubleshooting guide if pumps do not turn on
	PVC piping	Are any leaks observed when pumps are running?			
	Filter Housings Simplex pump (Liberty model 250-2)	Does bypass flow meter register flow when pumps are operating?			Bypass flow indicates filters require change out
Simplex System	Pumps (Liberty model 250-2)	Does pump operate when sump filled to "on" level?			See pump troubleshooting guide if pumps do not turn on
	PVC piping	Are any leaks observed when pump is running?			
	Filter Housings Simplex pump (Liberty model 250-2)	Does bypass flow meter register flow when pump is operating?			Bypass flow indicates filters require change out

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SITE-WIDE INSPECTION **Day: _____ Date: _____**

NYSDEC		Temperature: (F)	F	(am)	F	(pm)
Site Owner: _____ **Current Site Use: _____**		Wind Direction/Speed:		(am)		(pm)
BIANCHI/WEISS GREENHOUSES SITE **NYSDEC Site # 152209**		Weather:	(am) (pm)			
East Patchogue, New York		Arrive at site		(am)		
		Leave site:		(pm)		

Site Security

Evidence of vandalism (fence, gate, wells):

Evidence of digging:

General site condition (fence, gate, wells, vegetative cover):

Additional Comments:

SITE-WIDE INSPECTION **Day: _____ Date: _____**

Vegetative Cover

Evidence of vegetation mortality:

Evidence of erosion/dust:

Additional Comments:

Site Drainage

Evidence of ponding within retention area:

Evidence of site runoff:

Additional Comments:
Site Monitoring Wells
Are there any new cracks in the concrete collars of the site related MWs?
Are monitoring wells locked?
Do monitoring wells have caps?
Are the private wells operational?

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Appendix K

Field Sampling Plan

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Bianchi/Weiss Greenhouses Site, Suffolk County
East Patchogue, New York

Field Sampling Plan

NYSDEC Site Number: 152209
USEPA ID # NYR000209486

Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway
Albany, New York 12207

Prepared by

EA Engineering, P.C. and its Affiliate
EA Science and Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
(315) 431-4610

Revisions to Final Approved Field Sampling Plan

Revision Number	Date Submitted	Summary of Revision	New York State Department of Environmental Conservation Approval Date

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JUNE 2019

CERTIFICATION STATEMENT

I Donald Conan certify that I am currently a NYS registered professional engineer and that this Field Sampling 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).

Donald Conan P.E.

6/18/19 DATE

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LIST OF ACRONYMS/ABBREVIATIONS

°C	Degrees Celsius
No.	Number
pH	Potential of Hydrogen
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

The field-sampling program consists of the following activities:

- Gauge all locatable/functioning monitoring wells and piezometers associated with the Site
- Collect groundwater samples from three onsite shallow piezometers replaced during remedial action
- Collect groundwater samples from 17 offsite monitoring wells
- Collect groundwater samples from up to three offsite private wells (final count will depend on permission from homeowners
- Collect one surface water sample from Abets Creek.

Each groundwater sample is to be analyzed for chlordane by United States Environmental Protection Agency (USEPA) Method 608. Category A deliverables are to be requested for samples collected from monitoring wells and surface water, and Category B deliverables are to be requested for samples collected from private wells.

1.1 GROUNDWATER MONITORING

The objectives of the post-remedial action groundwater-sampling event is to provide updated groundwater monitoring data of site-related contamination. A summary of the monitoring locations to be gauged and sampled as part of the site groundwater monitoring program are listed in Section 4.4 of the Site Management Plan.

1.1.1 Monitoring Well Gauging

Prior to the start of the groundwater sampling event, a complete round of static water level measurements will be taken from each monitoring well to prepare a groundwater contour map and evaluate groundwater flow patterns.

1.1.2 Monitoring Well Purging and Sampling

Groundwater samples will be collected from each well indicated in Section 4.4 of the Site Management Plan using low-flow sampling procedures. During each groundwater-sampling event, groundwater samples will be analyzed by an approved Environmental Laboratory Accreditation Program-certified laboratory in accordance with New York State Department of Environmental Conservation Analytical Services Protocol.

The following procedures will be used for monitoring well groundwater sampling:

- Wear appropriate personal protective equipment as specified in the Health and Safety Plan (HASP) The HASP is provided in Appendix I of the Site Management Plan. In addition, samplers will use new sampling gloves for the collection of each sample.

- Unlock and remove the well cap.

- Measure the static water level in the well with an electronic water level indicator. The water level indicator will be washed with Alconox detergent and water, then rinsed with deionized water between individual wells to prevent cross-contamination.

  Calculate the volume of water in the well.
- Purge water from the well with a peristaltic pump using new polyethylene tubing and silicone flex tubing within the pump housing dedicated to each well. Several wells have 5 ft sumps; well construction logs, provided as Appendix D of the SMP, are to be brought to the field to verify that the tubing intake is set within the screened interval of the monitoring well. Purge at a rate no higher than 250 milliliters per minute.

- During purging of the well, monitor the water quality indicator parameters, including potential of hydrogen (pH), temperature, salinity, specific conductance, oxidation-reduction potential, dissolved oxygen, and turbidity. Record purge rate, volume purged, depth to water, water quality indicator parameters values, and clock time at 3- to 5-minute intervals on the purging/sampling form provided in Appendix J of the Site Management Plan.

- Allow field parameters of pH, oxidation/reduction potential (Eh), dissolved oxygen, specific conductivity, and turbidity stabilize before sampling.

- Purging will be complete if the following conditions are met:

  — Three consecutive pH readings are ±0.1 pH units of each other
  — Three consecutive measured specific conductance is ±10 percent of each other
  — Three consecutive measured redox potential is ± 10 millivolts of each other
  — Three consecutive measured dissolved oxygen is ±10 percent of each other
  — Three consecutive measured turbidity readings are ±10 percent of each other and below 50 nephelometric turbidity units.

- If these parameters are not met after purging a volume equal to 3–5 times the volume of standing water in the well, the department's Project Manager or representative will be contacted to determine the appropriate action(s).

- If the well goes dry before the required volumes are removed, the well may be sampled when it recovers (recovery period up to 24 hours).

- Remove the tubing from the flow through cell prior to collecting the sample.

- Collect the sample aliquot for specified analysis, and carefully pour directly into the appropriate sample bottle(s). Appropriate sample bottles will be obtained from the laboratory.

- Obtain field measurement of pH, dissolved oxygen, temperature, redox potential, specific conductivity, and turbidity, and record on the purging and sampling form. The instruments will be decontaminated between wells to prevent cross-contamination.

- Place analytical samples in cooler and chill to 4°C. Samples will be shipped to the analytical laboratories within 24 hours.

- If a centrifugal or submersible pump is used, it will be decontaminated with an Alconox and water flush followed by a potable water rinse, and the polyethylene suction/discharge line will be properly discarded.

- Re-lock well cap.

- Fill out field logbook, sample log sheet, labels, custody seals, and chain-of-custody forms.

Groundwater samples will be placed in appropriate sample containers, sealed, and submitted to the laboratory for chlordane analysis by USEPA Method 608 within 48 hours of collection. Water produced from purging will be filtered using a 0.5-micron filter onsite prior to discharge.

1.1.3 Surface Water Sampling

A surface water sample (SW-01) from Abet Creek, next to stream gauge SG-03, will also be collected during the groundwater-sampling event. Obtain field measurement of pH, dissolved oxygen, temperature, redox potential, specific conductivity, and turbidity, and record on the sampling form prior to filling appropriate glassware obtained from the laboratory.

1.1.4 Private Well Sampling

Private well spigots will be turned on for 15 minutes prior to collection of field parameters using a Horiba U-52 and sampling.
All groundwater and surface water samples will be placed in appropriate sample containers, sealed, and submitted to the laboratory for chlordane analysis by USEPA Method 608.

1.1.5 Quality Assurance/Quality Control

All samples will be labeled using the following terminology:

152209-LOCATIONID-DATE(XXXXXX)

Sample jars will be packaged with bubble wrap and double-bagged ice in coolers prior to shipment. Two duplicates and three field blanks will be collected submitted for analysis to meet the requirements of the Quality Assurance Project Plan. Category B deliverables will be requested for private well sample results, and Category A deliverables will be requested for all other samples.

A matrix spike and matrix spike duplicate sample will be collected from a private well location. Analytical data for private well samples will be sent to a third party validator, and data usability summary reports will be prepared for the analytical package.

Appendix L

Sump Pump Filtration System O&M Manual

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OPERATION & MAINTENANCE MANUAL FOR BASEMENT SUMP PUMP SYSTEMS AT 547 S. COUNTRY ROAD

BIANCHI-WEISS GREENHOUSES

EAST PATCHOGUE, NEW YORK

SITE#: 1-52-209

Prepared For:

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

New York State - Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233

Prepared By:

ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

Environmental Assessment & Remediations
225 Atlantic Avenue
Patchogue, NY 11772

TABLE OF CONTENTS

1.0 INTRODUCTION

This document represents the Operation & Maintenance (O&M) Manual for the basement sump pump systems at 547 S. Country Road, East Patchogue, NY. 547 South Country Road is a residence located to the south of (and adjacent to) the Bianchi-Weiss Greenhouses Site (Site No. 152209). This site is a New York State Department of Conservation Class 2 Inactive hazardous waste disposal site.

There are two sump pump systems at this address: System #1 consists of a duplex pump system. System #2 consists of a simplex (single pump) system. Both sumps are fed via below-slab piping from a perimeter drain ("French drain") system.

Figure 1 provides a process and instrumentation diagram for the two systems.

2.0 PROJECT CONTACT DIRECTORY

2.1 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYSDEC
Remedial Bureau A, Section C
Division of Environmental Remediation
625 Broadway, 12th floor
Albany, NY 12233-7017

Project Manager:
Brian Jankauskas
Ph: 518.402.9620

2.2 O&M CONTRACTOR

Environmental Assessment & Remediations
225 Atlantic Avenue
Patchogue, NY 11772
Ph: 631.447.6400
Fax: 631.447.6497

Project Manager:
Ian Hofmann
Cell: 631.241.8741

2.3 CONSULTING ENGINEER

EA Science & Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, NY 13214
Ph: 315.431.1860
Fax: 315.431.4280

Project Manager:
Donald Conan

3.0 SYSTEM DESCRIPTIONS

3.1 SYSTEM #1

System #1 is a "duplex" pump system utilizing two 1/3 horsepower sump pumps (**Liberty model 250-2**) housed in a modified basin. The basin is fed, via sub-slab piping, by a perimeter drain system. The pumps are activated by a three (mercury-free) float switch/alternating control panel system. The control panel (**Liberty Alternating Control Panel model AE21L=3**) alternates operation of each pump such that after "pump A" completes a cycle, "pump B" will be operated for the next cycle. In the event of a high-water level condition in the basin, both pumps will operate simultaneously until water levels drop below the pump activation level. The circuit is protected by a dedicated equipment protection device (**Square D model HOM 120 EPD**).

Effluent from the two pumps is combined and transferred via 2-inch diameter Schedule 40 PVC piping to two particulate filter canisters (**Parker Fulflo Filter Housing model FP1-2-2**), operated in parallel, prior to discharge to the backyard. Ball valves are installed at the influent/effluent piping at each canister such that the canisters can be isolated for filter changeouts.

A bypass line is installed to ensure continued system operation in the event of a high-pressure condition at the filter canisters. In the event of such a condition, a pressure relief valve set to open at 8 psi, will route pump effluent water directly to discharge.

A list of major system components is provided as Appendix A. Component cut sheets and technical data sheets are provided as Appendix B.

3.2 SYSTEM #2

System #2 is a simplex pump system utilizing one 1/3 horsepower sump pump (**Liberty model 250-2**) housed in a pre-existing basin. The basin is fed, via sub-slab piping, by a perimeter drain system. The pump is activated by a single mercury-free float switch. The circuit is protected by a dedicated equipment protection device (**Square D model HOM 120 EPD**).

Effluent from the pump is transferred via 2-inch diameter Schedule 40 PVC piping to two particulate filter canisters (**Parker Fulflo Filter Housing model FP1-2-2**), operated in parallel, prior to discharge to the backyard. Ball valves are installed at the influent/effluent piping at each canister such that the canisters can be isolated for filter changeouts.

A bypass line is installed to ensure continued system operation in the event of a high-pressure condition at the filter canisters. In the event of such a condition, a pressure relief valve set to open at 8 psi, will route pump effluent water directly to discharge.

A list of major system components is provided as Appendix A. Component cut sheets and technical data sheets are provided as Appendix B.

3.3 ELECTRICAL SERVICE

Electrical service at this address consists of a single-phase 208 volt, 100 amp overhead service.

4.0 BASEMENT FLOOR SEALING

On October 28-29, 2015, Environmental Assessment & Remediations (EAR) applied a reactive penetrating concrete sealer (**V-Seal® 101**) to the basement floor.

Prior to the application, the basement floor surface was mildly scarified using an electric grinder to remove any existing finish and prepare for the sealant application. The floor was then thoroughly swept and vacuumed and the sealant was applied to the entirety of the basement floor except underneath fixed appliances (washer, dryer, heater). The surface was confirmed clean and dry prior to sealant application.

The sealed floor requires no routine maintenance, however, damage to the floor, grinding, or scarifying may compromise the integrity of the sealant.

Technical datasheets for the sealant are included in Appendix B.

5.0 SYSTEM MONITORING

During each site visit, monitoring data (collected both before and after any system adjustments) should be recorded on a site data information sheet (SDI). A site specific SDI sheet is provided as Appendix C.

Monitoring data to be logged during each site visit shall consist of the following:

- Before & After totalizer readings (flow meters read in gallons) and flow rates (if any flow at time of visit) from the System#1 & System#2 bypass lines.
- Before & After line pressure readings from the System#1 & System#2 effluent lines.
- Observations, activities, and adjustments.
- Technician's initials
- Date & time

6.0 INSPECTION & MAINTENANCE

Maintenance activities should be conducted as detailed below, implementing any additional safety precautions and following additional guidance as provided in the manufacturer's product data sheets (Appendix B).

Maintenance activities shall be recorded on the SDI sheets, and denote the date and the type of inspection/maintenance item that was conducted.

5.1 VISUAL INSPECTION

During each visit, visually inspect all piping, fitting, basin interiors, and appurtenances for signs of leaking, stress, or other anomalies. Pump floats are to be examined for debris or build-up which may hinder proper operation. Any signs of leaking, stress, fouling or other anomalies shall be recorded in the SDI, photodocumented, and reported to the project manager.

5.2 PUMP MAINTENANCE

Following guidance set forth in the Liberty Pump Manual, pump operation is to be verified (at a frequency not to exceed once every 3 months) when not in normal operation. To verify pump operation, open each basin and pour in enough potable water to activate the float switch. If pump does not activate, or fails to pump water level to below the switch activation point, contact project manager to begin troubleshooting.

5.3 FILTER CHANGEOUTS

The Parker Filter Canisters each house one 36-inch, 0.5 micron filter cartridge (**Parker Flo-Pac Model FP-736-0.5-V**).

Steps for changing out the filter cartridges are as follows:

1. Perform only one canister changeout at a time, such that the remaining canister remains online in the event the pumps are activated.
2. Isolate the filter canister by closing the influent and effluent ball valves for that canister. Close the influent valve before closing the effluent valve. This will help reduce pressure buildup within the vessel.
3. Slowly and carefully loosen the lid bolts as canister contents may be pressurized. Open lid, remove the spent filter cartridge, and replace with a new cartridge (**Model FP-736-0.5-V**).
4. Close lid and tighten lid bolts.
5. Open the influent and effluent ball valves.

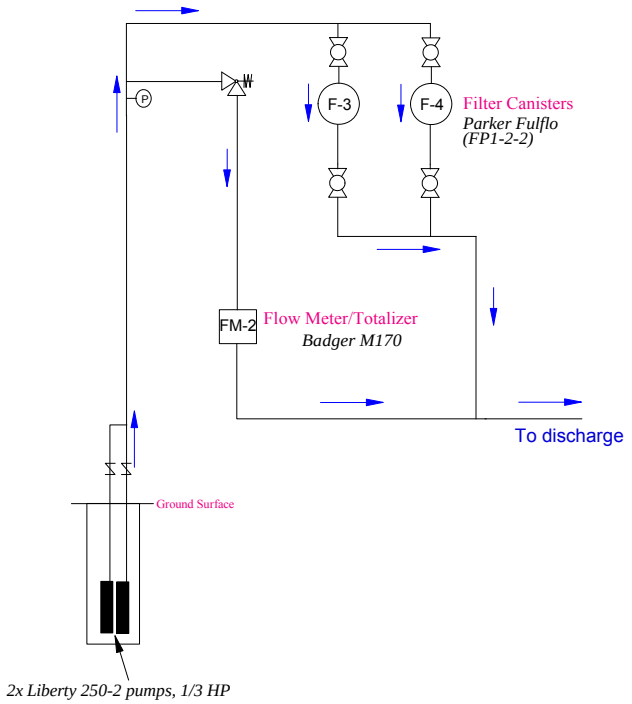
As an alternative, each 36-inch cartridge can be substituted with two 18-inch cartridges (**Parker Flo-Pac FP-718-0.5-V**) stacked one on top of the other. Although use of the 36-inch cartridges is the more economical method, the 18-inch cartridges can be used in the event 36-inch cartridges are not readily available.

FIGURES

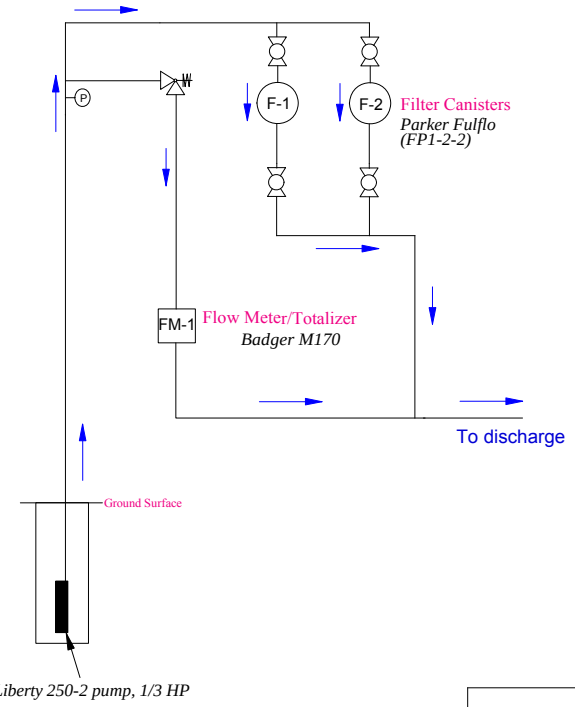
FIGURE 1: PROCESS & INSTRUMENTATION DIAGRAM

Basement Sump Pump Systems
at 547 S. Country Road

System 1



System 2



LEGEND

- CHECK VALVE
- PRESSURE RELIEF VALVE
- BALL VALVE (normally OPEN)
- SAMPLE PORT
- PRESSURE GAUGE
- FM-1 FLOW METER: WATER

ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

Figure 1

PROCESS & INSTRUMENTATION DIAGRAM

Bianchi Weiss Greenhouses
East Patchogue, NY
NYSDEC Site No. 152209

APPENDIX A: SUMMARY OF MAJOR COMPONENTS

System #1			
Quantity	**Item**	**Manufacturer**	**Model**
2	1/3 HP Sump Pump	Liberty Pumps	250-2
1	Single Phase Duplex Control Panel	Liberty Pumps	AE21L=3
2	Filter Vessel	Parker (Fulflo FP®)	FP1-2-2
2	Filter Cartridge	Parker (Flo-Pac®)	FP-736-0.5-V
1	Pressure Relief Valve (0-15 psi)	Dayton	Grainger Part no. 4KHA2
1	Flow Meter	Badger	M170
System #2			
1	1/3 HP Sump Pump	Liberty Pumps	250-2
2	Filter Vessel	Parker (Fulflo FP®)	FP1-2-2
2	Filter Cartridge	Parker (Flo-Pac®)	FP-736-0.5-V
1	Pressure Relief Valve (0-15 psi)	Dayton	Grainger Part no. 4KHA2
1	Flow Meter	Badger	M170

APPENDIX B: COMPONENT CUT SHEETS & TECHNICAL DATA SHEETS

Liberty Pumps®

AE-Series

Duplex Pump Controls

Provides reliable alternating operation of two pumps with automatic override control in residential or commercial installations. Common applications include sump basins, effluent or sewage pump chambers and lift stations.

NEMA 1

NEMA 4X

Standard Features:

- Magnetic Motor Contactors
- HOA switches (internal)
- Green pump run indicators (internal)
- Control ON/OFF switch (internal)
- Control/Alarm power-on indicator (internal)
- Circuit breakers
- Easy wiring terminal blocks
- Visual and audible alarm
- Auxiliary Contacts

Other Available Options:

- Alarm bell
- Redundant off
- Cycle counter
- Dead front
- Main disconnect
- Flasher
- Manual alarm reset
- Power on light
- Lockable latch
- Overload protection
- Alternate beacon color
- High and low level indicators
- Seal fail indicator
- Anti-condensation heater
- Pilot breaker
- Overload reset, thru-door
- Beacon guard
- Thermal cutout
- Elapsed time meter
- Delay timer
- Lightning arrestor
- GFI convenience receptacle
- Start/Run Capacitor

All AE-series panels are shipped complete with floats. Standard cord length is 20 feet.

innovate. evolve.

AE-SERIES DUPLEX PUMP CONTROLS

STANDARD FEATURES

ENCLOSURE*: 10" x 10" x 6"; NEMA 4X – ultraviolet stabilized thermoplastic for outdoor; NEMA 1 – metal for indoor use. Certain options may increase enclosure size.

MAGNETIC MOTOR CONTACTOR: Controls pump by switching hot electrical lines.

HOA SWITCHES: Offer manual operation of pump on circuit board.

GREEN PUMP RUN INDICATORS: mounted on circuit board.

CONTROL ON/OFF SWITCH: mounted on circuit board.

FLOAT SWITCH TERMINAL BLOCK: mounted on circuit board.

* Three phase panels measure 14" x 12" x 6". Multi-tap transformer (208/240/480 VAC primary) provides 120V. control voltage. Motor protective switch provides adustable overload, branch circuit protection and pump disconnect.

CONTROL/ALARM FUSE

CONTROL/ALARM POWER ON INDICATOR: mounted on circuit board.

FLOAT STATUS INDICATORS: stop, lead, lag/alarm, alarm mounted on circuit board.

CIRCUIT BREAKERS: provide pump disconnect and branch circuit protection

PUMP INPUT POWER AND PUMP CONNECTION TERMINAL BLOCK

AUXILIARY CONTACTS

GROUND LUG

ALARM PACKAGE: NEMA 4X = red beacon and horn (83 to 85 db), exterior test/normal/silence switch.

NEMA 1: Door mounted red indicator and buzzer mounted internally (83 to 85 db), exterior test/normal/silence switch.

MODEL SPECIFICATIONS

MODEL	VOLTS	PHASE	FULL LOAD AMPS (Must match pump)	ENCLOSURE TYPE	FLOATS
Single Phase					
AE21L=3	120/208/240	1	0 - 14.9 amps	NEMA 1	3
AE21H=3	120/208/240	1	15 - 20 amps	NEMA 1	3
AE21L=4	120/208/240	1	0 - 14.9 amps	NEMA 1	4
AE21H=4	120/208/240	1	15 - 20 amps	NEMA 1	4
AE24L=3	120/208/240	1	0 - 14.9 amps	NEMA 4X	3
AE24H=3	120/208/240	1	15 - 20 amps	NEMA 4X	3
**AE24HC=3	120/208/240	1	15 - 20 amps	NEMA 4X	3
AE24L=4	120/208/240	1	0 - 14.9 amps	NEMA 4X	4
AE24H=4	120/208/240	1	15 - 20 amps	NEMA 4X	4
Three Phase*					
AE34=3-131	208/240/480	3	1.6 - 2.5 amps	NEMA 4X	3
AE34=3-141	208/240/480	3	2.5 - 4.0 amps	NEMA 4X	3
AE34=3-171	208/240/480	3	4.0 - 6.3 amps	NEMA 4X	3
AE34=3-191	208/240/480	3	6 - 10 amps	NEMA 4X	3
AE34=3-511	208/240/480	3	9-14 amps	NEMA 4X	3
AE34=4-131	208/240/480	3	1.6 - 2.5 amps	NEMA 4X	4
AE34=4-141	208/240/480	3	2.5 - 4.0 amps	NEMA 4X	4
AE34=4-171	208/240/480	3	4.0 - 6.3 amps	NEMA 4X	4
AE34=4-191	208/240/480	3	6 - 10 amps	NEMA 4X	4
AE34=4-511	208/240/480	3	9-14 amps	NEMA 4X	4
AE54=3-121	575	3	1.6 - 2.5 amps	NEMA 4X	3
AE54=4-121	575	3	1.6 - 2.5 amps	NEMA 4X	4
AE54=3-151	575	3	2.5 - 4.0 amps	NEMA 4X	3
AE54=3-161	575	3	4.0 - 6.3 amps	NEMA 4X	3
AE54=4-151	575	3	2.5 - 4.0 amps	NEMA 4X	4
AE54=4-161	575	3	4.0 - 6.3 amps	NEMA 4X	4

NOTE: *AE-Series panels come with variable amp ranges and must be ordered with the correct matching full load amperage to that of the pump(s) being used. Use the chart above to select the proper amp range or consult the factory for technical assistance.*

** Three phase panels come equipped with thermal overload protection that must be properly sized to the pump's full-load run amps. Please consult factory for proper panel selection. All three phase "standard" panels come with NEMA 4X enclosure.*

*** AE24HC=3 includes start/run capacitors and start relay for use with LSG202M-C and LSGX202M-C models.*

SWITCH SPECIFICATIONS

All standard duplex panels come equipped with (3) or (4) mercury-free pilot-duty float switches (depending on model). 20' cord standard. Optional lengths available. External weights or pipe clamp mounts required.

CABLE: flexible 18 gauge, 2 conductor

ELECTRICAL: 5 amp, 120/230VAC, 50/60Hz

FLOAT: High impact PVC

140 degrees F. maximum fluid temperature

c UL us LISTED

Dual safety certification for the United States and Canada.

Specifications subject to change without notice.

***Liberty can customize a panel to your specific pump needs. Please contact us for available options and ordering information.* 800-543-2550**

Liberty Pumps • 7000 Apple Tree Avenue • Bergen, New York 14416 • Phone 800-543-2550 Fax (585) 494-1839
www.libertypumps.com

Single Phase Duplex

AE21L=3, AE21H=3, AE21L=4, AE21H=4
AE24L=3, AE24H=3, AE24L=4, and AE24H=4

Manufactured by SJE-Rhombus®

Installation Instructions and Operation/Troubleshooting Manual

7000 Apple Tree Avenue
Bergen, New York 14416
Phone: 1-800-543-2550
Email: liberty@libertypumps.com
www.libertypumps.com

This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes.

All conduit running from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. **NEMA 1 enclosures are for indoor use only,** primarily to provide a degree of protection against contact with enclosed equipment. Cable connectors are not required to be liquid-tight in NEMA 1 enclosures. **Do not use NEMA 1 enclosures if subjected to rain, splashing water or hose-directed water. NEMA 4X enclosures are for indoor or outdoor use,** primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water. **Cable connectors must be liquid-tight in NEMA 4X enclosures.**

⚠WARNING	ELECTRICAL SHOCK HAZARD	⚠WARNING	EXPLOSION OR FIRE HAZARD
	Disconnect power before installing or servicing this product. A qualified service person must install and service this product according to applicable electrical and plumbing codes.		Do not use this product with flamable liquids Do not install in hazardous locations as defined by National Electrical Code, ANSI/NFPA 70.

Failure to follow these precautions could result in serious injury or death. Replace product immediately if switch cable becomes damaged or severed. Keep these instructions with warranty after installation. This product must be installed in accordance with National Electric Code, ANSI/NFPA 70 so as to prevent moisture from entering or accumulating within boxes, conduit bodies, fittings, float housing, or cable.

Warranty void if panel is modified.

Call factory with servicing questions:

1-800-543-2550

7249000B

Installation Instructions

Most single phase duplex panels are designed to operate as three or four float systems. The three float system is standard performing the common pump stop, lead pump start, and lag pump start/high level alarm functions. The four float system utilizes separate floats for lag pump start and high level alarm.

NOTE: Options ordered may affect the number of floats and their functions. Please reference the schematic provided with the control panel for proper installation.

Installation of Floats

CAUTION: If control switch cables are not wired and mounted in the correct location, the pump system will not function properly.

WARNING: Turn off all power before installing floats in pump chamber. Failure to do so could result in serious or fatal electrical shock.

1. Use float label kit to identify and label cables on both float and stripped ends (stop, lead, lag, alarm, etc.). See schematic for float options.

2. Determine your normal operating level, as illustrated in **Figures 1-2**.

3. Mount float switches at appropriate levels as illustrated in **Figures 3-5**. Be sure that floats have free range of motion without touching each other, or other equipment in the basin.

If using the mounting clamp; follow steps 4-6.

4. Place the cord into the clamp as shown in **Figure 5**.

5. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in **Figure 5**.

   NOTE: Do not install cord under hose clamp.

6. Tighten the hose clamp using a screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.

   NOTE: All hose clamp components are made of 18-8 stainless steel material. See your SJE-Rhombus® supplier for replacements.

FIGURE 1: Three float duplex

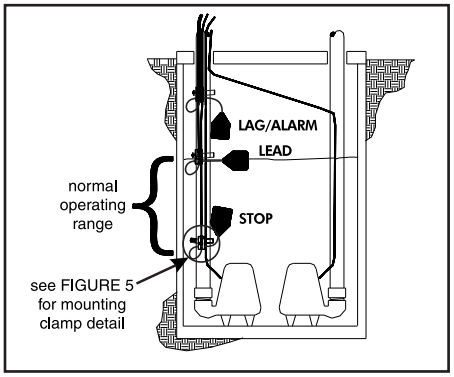


FIGURE 2: Four float duplex

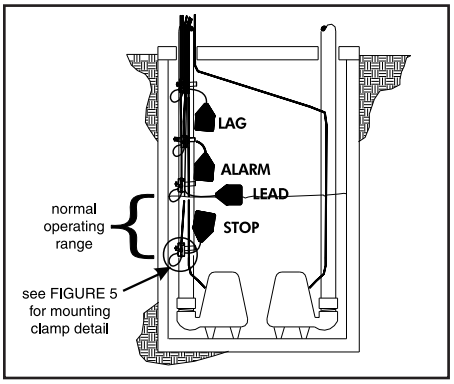


FIGURE 3: Internally weighted float

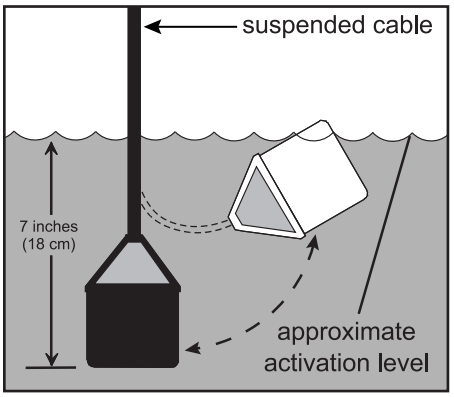


FIGURE 4: Float with cable weight

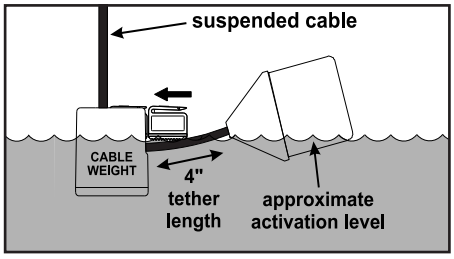
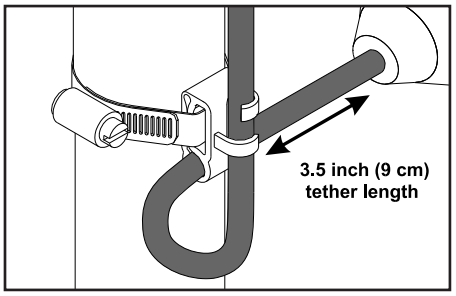


FIGURE 5: Mounting clamp detail



Installation Instructions

Mounting the control panel

1. Determine mounting location for panel. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation, we recommend the use of a SJE-Rhombus® liquid-tight junction box with liquid-tight connectors to make required connections. **You must use conduit sealant to prevent moisture or gases from entering the panel.**

2. Mount control panel with mounting flanges furnished with control panel.

3. Determine conduit entrance locations on control panel. Check local codes and schematic for the number of power circuits required.

NOTE: Be sure the incoming power, voltage, amperage, and phase meet the requirements of the pump motors being installed. If in doubt, see the pump identification plate for electrical requirements.

4. Drill proper size holes for type of connectors being used.

NOTE: If using conduit, be sure that it is of adequate size to pull the pump and switch cables through. **You must use conduit sealant to prevent moisture or gases from entering the panel.**

5. Attach cable connectors and/or conduit connectors to control panel.

FOR INSTALLATION REQUIRING A SPLICE, FOLLOW STEPS 6-10;
FOR INSTALLATION WITHOUT A SPLICE, GO TO STEP 11.

6. Determine location for mounting junction box according to local code requirements. **Do not** mount the junction box inside the sump or basin.

7. Mount junction box to proper support.

8. Run conduit to junction box. Drill proper size holes for the type of conduit used. Attach liquid-tight connectors to junction box.

9. Identify and label each wire before pulling through conduit into control panel and junction box. Pull pump power cables and control switch cables through connectors into junction box. Make wire splice connections at junction box.

10. Firmly tighten and seal all fittings on junction box. Insure all cable connectors are liquid-tight and sealed.

11. If a junction box is not required, connect pump and float wires to proper position on terminals. See schematic inside control panel for terminal layouts.

12. Connect control/alarm and pump power conductors to proper position on terminals. See schematic inside control panel for terminal connections.

NOTE: It is the recommendation of the factory to use separate pump and control/alarm power sources.

VERIFY CORRECT OPERATION OF CONTROL PANEL AFTER INSTALLATION IS COMPLETE.

Operations

Single phase duplex panels are designed to operate with three or four floats for pump sequencing. The standard float functions are common pump stop, lead pump start, lag pump start/alarm (three floats), or separate lag and alarm floats (four floats).

Three Float Operation: As the liquid level rises to the stop float and tips it to the ON (closed) position, the panel will remain inactive. As the liquid level tips the lead float, the lead pump will start. If the liquid level tips the lag/alarm float, the lag pump will start and the audio/visual alarm will activate. Both pumps and the alarm will remain active until the liquid level drops and the lag float is in the OFF (open) position. At this time the alarm will silence. Both pumps will remain on until the liquid level drops to normal and all three floats are in the OFF (open) position. When both pumps have stopped running, the alternator will switch the lead pump and lag pump operating functions in the next sequence.

Four Float Operation: The alarm will activate and remain on only if the alarm float is tipped to the ON (closed) position.

Alarm System (Horn and Indicator - standard)

When an alarm condition occurs, a red light and a horn will be activated. If the test/normal/silence switch is moved to the silence position, the horn will be silenced. When the alarm condition is cleared, the alarm system is reset. The alarm system can be tested by moving the test/normal/silence switch to the test position.

HOA Switch

A hand-off-automatic switch is provided for each pump. In the hand mode, the pump will turn on unless other safety features are employed. In the automatic mode, the pump will turn on from commands by the float switch(es).

Pump Run Lights

The run light will be ON in either the hand or the automatic mode when the pump is called to run.

Control and Alarm Fusing

The control circuit and alarm circuit are fused separately.

Control and Alarm Lights

Lights will illuminate when control/alarm power is supplied.

Float Status Lights

Lights will illuminate when the respective float is in the closed position.

Circuit Breaker (optional)

The pump circuit has a thermal-magnetic circuit breaker which provides pump disconnect and branch circuit protection.

Dry Auxiliary Contacts (standard feature)

Normally open - Contacts are open under normal conditions and closed when alarm condition is present.

Normally closed - Contacts are closed under normal conditions and open when alarm condition is present. Both types automatically reset once alarm condition is cleared.

NOTE: Some options ordered may not be included in this manual. Certain options will require alternative circuitry not including float status and control/alarm indicators.

For information regarding the operations of options not listed here or servicing questions, please call a Liberty Pumps customer service technician at

1-800-543-2550

Warranty void if panel is modified.

Troubleshooting

Control/Alarm Circuit Board Power

If the green power status indicators are not illuminated:

1. Check to see if the fuses on the circuit board are blown.

2. Check to see if the incoming control/alarm power is present at TB1-1 and TB1-2.

If voltage is present and fuse is not blown, please call factory for assistance.

Circuit Breaker (optional)

Check each pole of the circuit breaker for proper resistance reading using the following procedure: **Warning: Disconnect all incoming power to control panel. Failure to do so could result in serious or fatal electrical shock.**

1. Isolate the circuit breaker by disconnecting either the line side or load side wires.

2. Place the ohmmeter leads across the corresponding line and load terminals of each pole.

3. With the ohmmeter on the R X 1 scale and the breaker in the OFF position, the reading should be infinity (very high resistance). With the breaker in the ON position, the reading should be nearly zero ohms (very low resistance). If the readings are not as stated, replace the circuit breaker with one of the same ratings.

Alarm Horn

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm horn. If the horn does not sound, replace horn with same type.

Alarm Light

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm light. If the light does not activate, replace with bulb of same type.

Float Controls

Check the floats during their entire range of operation. Clean, adjust, or replace damaged floats.

Checking the float resistance - The float resistance can be measured to determine if the float is operating correctly or is defective. Use the following procedure to measure the float resistance. **Warning: Disconnect all incoming power to panel. Failure to do so could result in serious or fatal electrical shock.**

1. Isolate the float by disconnecting one or both of the float leads from the float terminals.

2. Place one ohmmeter lead on one of the float wires, and the other ohmmeter lead on the other float wire.

3. Place the ohmmeter dial to read ohms and place on the R X 1 scale. With the float in the "off" position, the scale should read infinity (high resistance). Replace the float if you do not get this reading. With the float in the ON position, the scale should read nearly zero (very low resistance). Replace the float if you do not get this reading.

NOTE: Readings may vary depending on the length of wire and accuracy of the measuring device.

Fuses

Check the continuity of each fuse. With power OFF, pull the fuses out of the fuse blocks. With the ohmmeter on the R X 1 scale, measure resistance. A reading of infinity indicates a blown fuse and must be replaced. Replace fuse with same type, voltage and amp rating.

Magnetic Contactor Coil

Warning: Disconnect all incoming power to panel. Failure to do so could result in serious or fatal electrical shock. Check the coil by disconnecting one of the coil leads. Measure the coil resistance by setting the ohmmeter on the R X 1 scale. A defective coil will read zero or infinity, indicating a short or opened coil respectively. Replace defective contactor with same type.

Liberty Pumps Three-Year Limited Warranty

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Liberty Pumps, Inc. warrants that pumps of its manufacture are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident.

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase.

This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

Liberty Pumps®

7000 Apple Tree Avenue
Bergen, New York 14416
Phone: 1-800-543-2550
Email: liberty@libertypumps.com
www.libertypumps.com

PN1025047B • Rev 06/12

Liberty Pumps®

250-Series

Available with Wide-Angle Switch

Cast Iron Submersible Sump/Effluent Pumps

1/3 hp
1-1/2" Discharge
1/2" Solids Handling

Features:

- Unique one-piece cast body eliminates motor housing seal ring
- Durable epoxy powder coat finish
- Vortex style impeller
- Permanently sealed and lubricated bearings
- Quick-disconnect 10' standard power cord allows replacement of cord in seconds without breaking seals to motor. (other lengths available)
- Heavy duty VMF switch on vertical float models

Models:

250 Manual

251 Wide-Angle Float

253 Wide-Angle Float, Series Plug

257 VMF, Vertical Magnetic Float

Wide-Angle Floats are mercury-free, mechanically activated.

innovate. evolve.

250-SERIES

1/3 hp Sump/Effluent Pumps for Professionals!

ALL MODELS FEATURE:

- Rugged 1/3 hp motor, oil filled with thermal overload protection.
- 1/2" solids handling.
- 1-1/2" discharge.
- Hermetically sealed motor and switch cavities, and permanently lubricated bearings.
- Liberty's UNI-BODY casting – a solid, one-piece housing that eliminates the lower motor seal ring found on other pumps.
- Epoxy powder coat finish
- Vortex style impeller for superior solids-handling. Made of high temperature engineering polymer.
- Fasteners – all non-corrosive stainless steel.
- 416 stainless steel rotor shaft.
- **250-series Cord Lengths**

Model	10'	25'(-2)	35'(-3)	50'(-5)
250	Standard	Optional	Optional	Optional
251	Standard	Optional	Optional	Optional
253	Standard	Optional	Optional	N/A
257	Standard	Optional	N/A	N/A

10' cord length standard on all models. For optional lengths, add "-2, -3 or -5" suffix to model number.
Example: for model 250 with 35' cord, order 250-3

MOTOR SPECIFICATIONS:

1/3 hp 115V 5.2 amps 60Hz
Thermally Protected & Permanently Lubricated

Maximum Fluid Temperature: 140°F

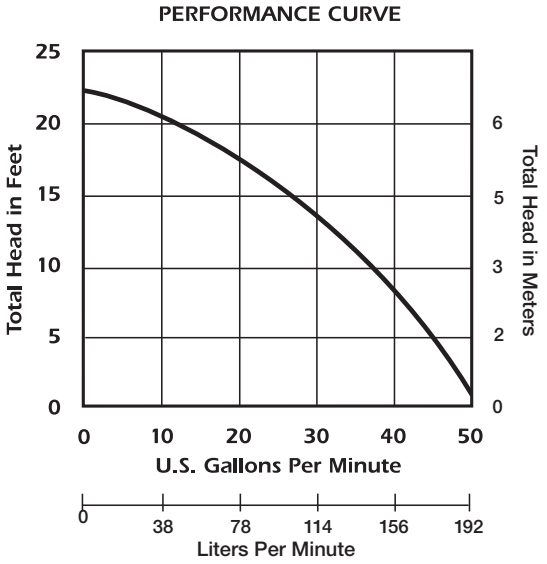
DIMENSIONAL DATA:

Weight: Model 257: 20 lbs.

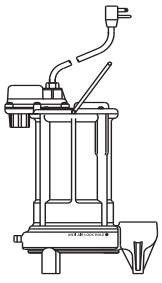
Height: 10.5"

Major Width: 9.6" (manual model 250)

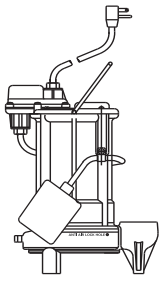
PERFORMANCE CURVE



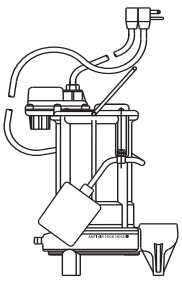
EFFLUENT MODELS



Model 250
Manual, no switch.

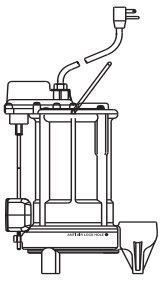


Model 251
Quick-disconnect wide-angle float, mercury-free.



Model 253
Wide-angle float with series (piggy-back) plug, allows manual operation of pump.

SUMP



Model 257 VMF
VMF switch, magnetically operated vertical float – operates in a 10" diameter sump.

SSPMA Certified Pump Member ® C SA US Certified

Dual safety certification for the United States and Canada.

Specifications are subject to change without notice.

Liberty Pumps • 7000 Apple Tree Avenue • Bergen, New York 14416 • Phone 800-543-2550 Fax (585) 494-1839
www.libertypumps.com

Installation Manual

7035000K

Heavy Duty Submersible Effluent/Dewatering Pumps

***Do not throw away or lose this manual.**

Models

250-Series	1/3 HP
280-Series	1/2 HP
290-Series	3/4 HP
FL30-Series	1/3 HP
FL50-Series	1/2 HP
FL60-Series	6/10 HP
FL70-Series	3/4 HP
FL100-Series	1 HP
FL150-Series	1-1/2 HP
FL200-Series	2 HP

Contents

IMPORTANT:

Prior to installation, record Model, Serial Number, and Code Number from pump nameplate for future reference.

MODEL _____

SERIAL _____

CODE _____

INSTALLATION DATE _____

7000 Apple Tree Avenue
Bergen, NY 14416
Phone: (800) 543-2550
Fax: (585) 494-1839
www.libertypumps.com

1. General Information

Before Installation, read the following instructions carefully. Each Liberty pump is individually factory tested to assure proper performance. By closely following these instructions, potential operating problems should be eliminated, providing years of trouble-free service.

⚠ WARNING

- **Risk of electric shock**. Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded receptacle.
- Always wear rubber boots when water is on the floor and you must unplug the pump.
- DO NOT bypass grounding wires or remove ground prong from attachment plugs.
- DO NOT use an extension cord.
- Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.
- This pump requires a separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the pump, as noted on the nameplate.
- The electrical outlet shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code, Uniform Plumbing Code, International Plumbing Code, as well as all applicable local codes and ordinances.
- Sump and sewage pumps often handle materials which could cause illness or disease. Wear adequate protective clothing when working on a used pump or piping.
- Never enter a pump basin after it has been used. Sewage and effluent can emit several gases which are poisonous.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into pump while it is plugged in.
- DO NOT use this product for flammable or corrosive liquid.
- DO NOT use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, etc.)
- NEVER dispose of materials such as paint thinner or other chemicals down drains, as they can chemically attack and damage pump components, potentially causing product malfunction or failure.

⚠ CAUTION

- **DO NOT use pumps in water over 140°F (60°C).**
- DO NOT use pumps in mud, sand, cement, oil or chemicals.
- DO NOT modify the pump in any way.
- DO NOT lift or carry pump by power cord.
- DO NOT remove any tags from pump or cords.
- If pump is installed during construction before power is available, it must be protected from the environment to prevent water from entering through the cord plug end, etc.

Tools Required:

- Pipe wrench
- Regular screw driver
- Hacksaw (For replacement or removal of existing rigid piping.)

Removal of old pump

⚠ WARNING Disconnect old pump from power source before handling.

Separate the discharge pipe at either the check valve or at the union. If neither a check valve nor a union is part of the existing discharge pipe, cut the pipe with a hacksaw and remove the pump (A union or check valve will need to be installed at this cut).

MODEL SPECIFICATIONS

Model	HP	Volts	Full Load Amps	Solids Handling	Automatic or Manual	Shut-off Head	Factory Switch Setting	
							Turn-on	Turn-off
250*	1/3	115	5.2	1/2”	Manual*	22 ft.	*	*
251	1/3	115	5.2	1/2”	Automatic	22 ft.	11”	4-1/2”
253	1/3	115	5.2	1/2”	Automatic	22 ft.	11”	4-1/2”
257	1/3	115	5.2	1/2”	Automatic	22 ft.	7”	3-1/2”
250HV*	1/3	230	2.6	1/2”	Manual*	22 ft.	*	*
251HV	1/3	230	2.6	1/2”	Automatic	22 ft.	11”	4-1/2”
257HV	1/3	230	2.6	1/2”	Automatic	22 ft.	7”	3-1/2”
280*	1/2	115	8.5	3/4”	Manual*	37 ft.	*	*
281	1/2	115	8.5	3/4”	Automatic	37 ft.	13”	7”
283	1/2	115	8.5	3/4”	Automatic	37 ft.	13”	7”
287	1/2	115	8.5	3/4”	Automatic	37 ft.	9-1/2”	4”
280HV*	1/2	208-230	4.6	3/4”	Manual*	37 ft.	*	*
281HV	1/2	208-230	4.6	3/4”	Automatic	37 ft.	13”	7”
283HV	1/2	208-230	4.6	3/4”	Automatic	37 ft.	13”	7”
287HV	1/2	208-230	4.6	3/4”	Automatic	37 ft.	9-1/2”	4”
290*	3/4	115	10.4	3/4”	Manual*	48 ft.	*	*
291	3/4	115	10.4	3/4”	Automatic	48 ft.	13”	7”
293	3/4	115	10.4	3/4”	Automatic	48 ft.	13”	7”
297	3/4	115	10.4	3/4”	Automatic	48 ft.	9-1/2”	4”
290HV*	3/4	208-230	5.3	3/4”	Manual*	48 ft.	*	*
291HV	3/4	208-230	5.3	3/4”	Automatic	48 ft.	13”	7”
293HV	3/4	208-230	5.3	3/4”	Automatic	48 ft.	13”	7”
297HV	3/4	208-230	5.3	3/4”	Automatic	48 ft.	9-1/2”	4”
FL31M*	1/3	115	13	3/4”	Manual*	19 ft.	*	*
FL31A	1/3	115	13	3/4”	Automatic	19 ft.	12”	5”
FL32M*	1/3	208-230	7	3/4”	Manual*	19 ft.	*	*
FL32A	1/3	208-230	7	3/4”	Automatic	19 ft.	12”	5”
FL51M*	1/2	115	12	3/4"	Manual*	55 ft.	*	*
FL51A	1/2	115	12	3/4"	Automatic	55 ft.	13”	6”
FL52M*	1/2	208-230	6.5	3/4"	Manual*	55 ft.	*	*
FL52A	1/2	208-230	6.5	3/4"	Automatic	55 ft.	13”	6”
FL62M*	6/10	208-230	8.2	3/4"	Manual*	65 ft.	*	*
FL62A	6/10	208-230	8.2	3/4"	Automatic	65 ft.	13”	6”
FL63M*	6/10	208-230 3PH	5.6	3/4"	Manual*	65 ft.	*	*
FL64M*	6/10	440-480 3PH	2.8	3/4"	Manual*	65 ft.	*	*
FL72M*	3/4	208-230	10.5	3/4"	Manual*	77 ft.	*	*
FL72A	3/4	208-230	10.5	3/4"	Automatic	77 ft.	13”	6”
FL73M*	3/4	208-230 3PH	7.5	3/4"	Manual*	77 ft.	*	*
FL74M*	3/4	440-480 3PH	3.5	3/4"	Manual*	77 ft.	*	*
FL102M*	1	208-230	12	3/4”	Manual*	90 ft.	*	*
FL102A	1	208-230	12	3/4”	Automatic	90 ft.	15”	8”
FL103M*	1	208-230 3PH	9	3/4”	Manual*	90 ft.	*	*
FL104M*	1	440-480 3PH	4.5	3/4”	Manual*	90 ft.	*	*
FL105M*	1	575 3PH	3.3	3/4”	Manual*	90 ft.	*	*
FL152M*	1-1/2	208-230	15	3/4”	Manual*	110 ft.	*	*
FL152A	1-1/2	208-230	15	3/4”	Automatic	110 ft.	15”	8”
FL153M*	1-1/2	208-230 3PH	10.6	3/4”	Manual*	110 ft.	*	*
FL154M*	1-1/2	440-480 3PH	5.3	3/4”	Manual*	110 ft.	*	*
FL155M*	1-1/2	575 3PH	4.9	3/4”	Manual*	110 ft.	*	*
FL202M*	2	208-230	15	3/4”	Manual*	130 ft.	*	*
FL202A	2	208-230	15	3/4”	Automatic	130 ft.	15”	8”
FL203M*	2	208-230 3PH	10.6	3/4”	Manual*	130 ft.	*	*
FL204M*	2	440-480 3PH	5.3	3/4”	Manual*	130 ft.	*	*
FL205M*	2	575 3PH	4.9	3/4”	Manual*	130 ft.	*	*

* **Note:** Manual models (“M” suffix) and 3 phase models, as designated above, require a separate approved pump control device or panel for automatic operation. Operation of these models will be according to the control selected. Make sure the electrical specifications of the control selected properly match the electrical specifications of the pump. 3 phase models require overload elements selected or adjusted in accordance with the control or panel instructions.

WARNING:
Always use a replacement power cord assembly of the same length and type as originally installed on the Liberty product. Using a cord of improper gauge or length may lead to exceeding the electrical rating of the cord and could result in death, injury, fire or other significant failure.

2. Dewatering / Sump Applications

1. For ordinary ground water pumping applications, a sump pit of not less than 14" in diameter is recommended. Vertical float (VMF) models (257, 287 and 297) may be used in a minimum 10" diameter sump; however, a larger diameter pit is preferred as it allows for a longer pump cycle and reduced switch cycling. The minimum depth of the pit should be 18".

2. If the pit is not already enclosed on the bottom, provide a hard level bottom of bricks or concrete. DO NOT place the pump directly on earth, gravel or debris since this can cause excessive wear of the impeller and possible jamming. ***"The Brick"*** (sold by Liberty Pumps as part # 4445000) is a pre-molded stable platform designed to fit your submersible pump. It raises the pump 2.5" off the bottom of the pit, reducing the potential for jamming from rocks and debris. Contact your local distributor to order. Remove all debris from the bottom of the sump pit before installation of the pump. A sump pit cover is suggested for safety and to prevent foreign objects from entering the pit.

3. Set the pump in the pit making sure the switch has adequate clearance and will not hang-up on the pit wall. The float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. A 1-1/2" threaded discharge is provided for connection of the discharge pipe. Do not reduce the discharge size to below 1-1/2". Schedule 40 PVC pipe is recommended; however, flexible discharge hose kits may be used for temporary installations.

4. Connect the pipe or the discharge hose to the discharge of the pump. HAND TIGHTEN ONLY. Over tightening may cause the pump housing to crack. Install a union or other means of separating the discharge line just above the floor to facilitate removal of the pump if necessary. A check valve is recommended just above or in place of the union to prevent the backflow of water after each pump cycle. (All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

5. Connect additional piping as needed to direct the discharge to the desired location. Discharge should be kept as short as possible with a minimum number of turns. Check all connections for security.

6. Install a union or other means of separating the discharge pipe just above the floor to facilitate removal of the pump if necessary. **A check valve is recommended just above, or in place of, the union to prevent the backflow of water after each pump cycle.**

7. If a check valve is used, **a 1/8" anti-airlock hole should be drilled in the discharge pipe just above the pump's discharge outlet to prevent pump "airlock" (see Fig. 1)**

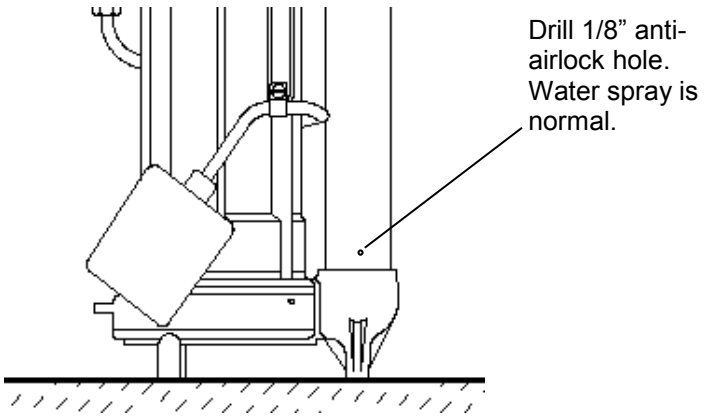


Fig. 1 – Anti-airlock hole position

8. For added protection, consider the addition of a back-up pump such as ***Liberty's SJ10 SumpJet***, as well as an alarm such as ***Liberty's ALM-2*** in applications where loss of pump function could result in property damage. If an alarm is used, it must be connected to a separate electrical circuit.

3. Effluent Applications

Vertical Magnetic Float (VMF) models (257, 287 and 297) are not recommended for effluent applications due to their short On/Off cycle. Wide angle float models are better suited for effluent applications and are easily adjustable for different On/Off levels.

The basin required for effluent applications must be sealed and vented to meet health and plumbing code requirements. Proper basin size and basin materials for effluent applications vary depending on the type of effluent system and local codes. Check with your local codes official prior to purchasing and installing the basin. Follow the manufacturer's recommended guidelines for installation of your specific basin. A minimum diameter of 18" and depth of 24" is required for proper pump operation, but larger basins are preferred for longer pump cycles and increased switch life. Installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, delete the check valve and size the basin and/or adjust the pump differential to accommodate the additional backflow.

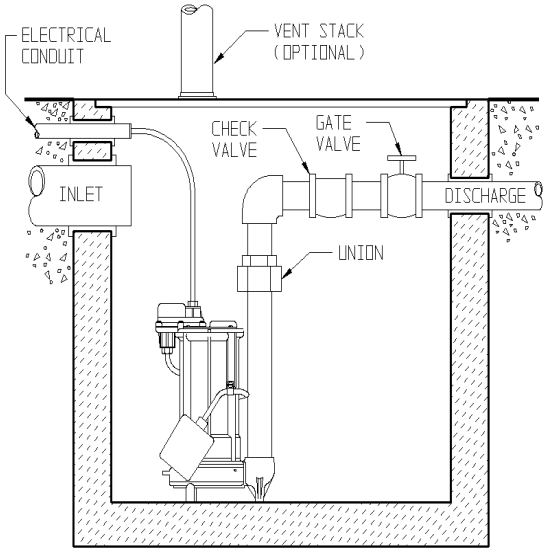


Fig. 2 – Typical Installation Simplex System
This is a recommended installation only. Variations may apply.

⚠ WARNING These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70, or where prohibited by local codes.

A. **Simplex (One Pump) Systems (see Fig. 2):** Set the pump in place making sure the float has adequate clearance to the side wall of the basin. The float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. If an optional control device or float is used, follow the directions for mounting that accompany the optional control. Connect the discharge pipe to the pump's threaded discharge. IMPORTANT: DO NOT REDUCE THE DISCHARGE PIPE SIZE BELOW THAT WHICH IS PROVIDED ON THE PUMP. Contact Liberty Pumps or other qualified person if you have questions regarding proper pipe sizes and flow rates. Mount the basin cover making sure it is properly sealed.

Installation of Discharge: After the pump has been mounted, install the discharge line. A union should be installed to facilitate pump removal if necessary. A free-flow swing check valve is recommended after the union to prevent the backflow of liquid after each pumping cycle. A gate valve should follow the check valve to allow periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns, to minimize friction head loss. Contact Liberty Pumps or other qualified person if you have questions regarding proper pipe sizes and flow rates.

(All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

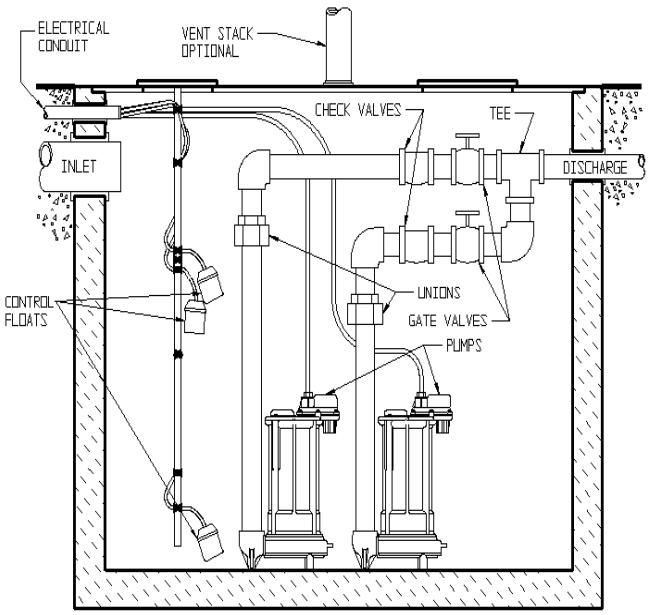


Fig. 3 – Typical Installation Duplex System
This is a recommended installation only. Variations may apply.

B. **Duplex (Two Pump) Systems (see Fig. 3):** Set both pumps in place in the bottom of the basin. The duplex control used will include 3 or 4 floats that will either be tethered to one of the discharge pipes or to an independent rod or bracket.

Follow the instructions provided with your duplex control device. Each float must be **free to move throughout its travel** and not contacting the pump body, piping, or other objects. Connect an individual discharge pipe to each pump. IMPORTANT: DO NOT REDUCE THE DISCHARGE PIPE SIZE BELOW THAT WHICH IS PROVIDED ON THE PUMP. Contact Liberty Pumps or other qualified person if you have any questions regarding proper pipe sizes and flow rates. To eliminate fluid recycling in duplex installations, it is necessary to have a check valve on each discharge line prior to tying the two discharges into one common line. Depending on the height of your basin, the check valves may either be installed inside the basin or outside the basin. Mount the basin cover(s) making sure they are properly sealed.

Installation of Remaining Discharge: Unions or flexible connectors should be installed to facilitate removal of the pump if necessary. Free-flow swing check valves should be installed on each discharge after the union and prior to the gate valve to prevent the back flow of liquid or gas. A check valve on each discharge line, prior to tying into one common line, is necessary to prevent the recycling of fluid from one pump to the other. A gate valve is recommended after the check valve to allow for periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns to minimize friction head loss. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size or flow rates. (All Liberty effluent/dewatering pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.)

4. Electrical Service and Operation

⚠ WARNING

- **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor or a grounding type attachment plug. To reduce the risk of electric shock, be certain that the grounding conductor is connected only to a properly grounded control panel or, if equipped with a grounding type plug that it is connected to a properly grounded, grounding type receptacle.
- DO NOT bypass grounding wires or remove ground prongs from attachment plugs.
- DO NOT use an extension cord.
- This pump requires separate, properly fused and grounded branch circuit. Make sure the power source is properly sized for the voltage and amperage requirements of the motor, as noted on the pump nameplate.
- The electrical outlet or panel shall be within the length limitations of the pump power cord, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code and all applicable local codes and ordinances.

⚠ CAUTION When the risk of property damage from high water levels exists, an independent high water alarm or back up pump system should be installed.

All FL-Series automatic models (designated with the letter "A") and Models 253, 283 and 293, come factory-equipped with a float switch mounted to the pump. These models come with two cords - one to the float switch and the other to the pump motor. The switch cord has a series (piggyback) plug enabling the pump (motor) cord to be plugged into the back of it. The purpose of this design is to allow manual operation of the pump.

For manual operation, or in the event of switch failure, the pump cord can be separated and plugged into the electrical outlet, directly bypassing the switch **(see Fig. 4).**

Fig. 1 Piggyback plug installation.

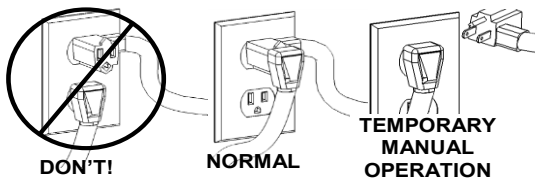


Fig. 4 – Temporary manual operation

For automatic operation using Liberty's supplied switch, the two cords should be interconnected and plugged into a separately fused grounded outlet of proper amp capacity for your selected pump model. (See Section 1, General Information or the pump nameplate for electrical specifications of your model.) Both cords are equipped with 3-prong plugs and must be plugged into a properly grounded 3-wire receptacle. DO NOT REMOVE THE GROUND PRONGS.

⚠ WARNING 208-230V single phase pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

⚠ CAUTION Do not let the pump run dry.

The turn-on/turn-off levels vary depending on model. (See model specifications chart on page 3 for the "factory" preset level of your specific model.) Other pumping differentials may be obtained by tethering the switch cord to the discharge pipe. NOTE: A minimum cord length of 3-1/2" from the tether point to the top surface of the float is required for proper switch operation. If using a differential other than the factory setting, be sure that when the pump shuts off, at least 3-1/2" of fluid is left in the basin so the impeller remains submerged. **(Models 251, 257, 281, 287, 291, and 297 have factory-preset switches that are not adjustable.)**

Manual pumps with no switch are intended to be run using an approved liquid level control or approved motor control with correct rating that matches motor input in full load amperes. Regardless of the control type, be sure that when the pump shuts off, at least 3-1/2" of fluid is left in the basin so the impeller remains submerged.

NOTE: For automatic operation with optional control devices: If the pump(s) are to be operated by either a simplex or duplex control panel or other optional control device, follow the installation instructions provided with the control and make the power connections per those instructions. If necessary, certain models may be run without a separate control.

⚠ WARNING 208-230V single phase pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

⚠ CAUTION Do not let the pump run dry.

3 Phase Pump Models (FL63, FL64, FL73, FL74, FL103, FL104, FL105, FL153, FL154, FL155, FL203, FL204, FL205)

⚠ CAUTION For 3-Phase pumps, check for proper rotation before installing pump into basin **(see Fig. 5).**

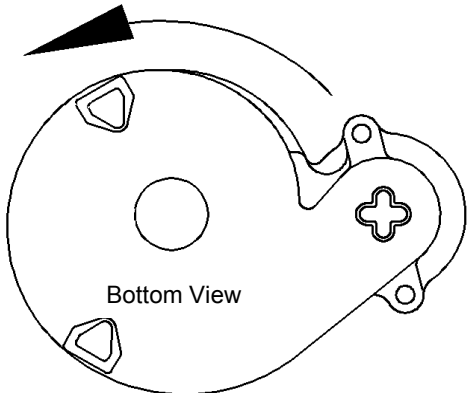


Fig. 5 – Proper impeller rotation, three phase models

Check three phase pumps for proper rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump. Code the wires for reconnection after installation.

If a single phase pump is to be wired directly into a control device or junction box, and it is necessary to remove the plugs, have a certified electrician do the wiring in accordance with the National Electric Code and applicable local codes. See **Fig. 6** for direct wire installation of single phase, automatic pumps.

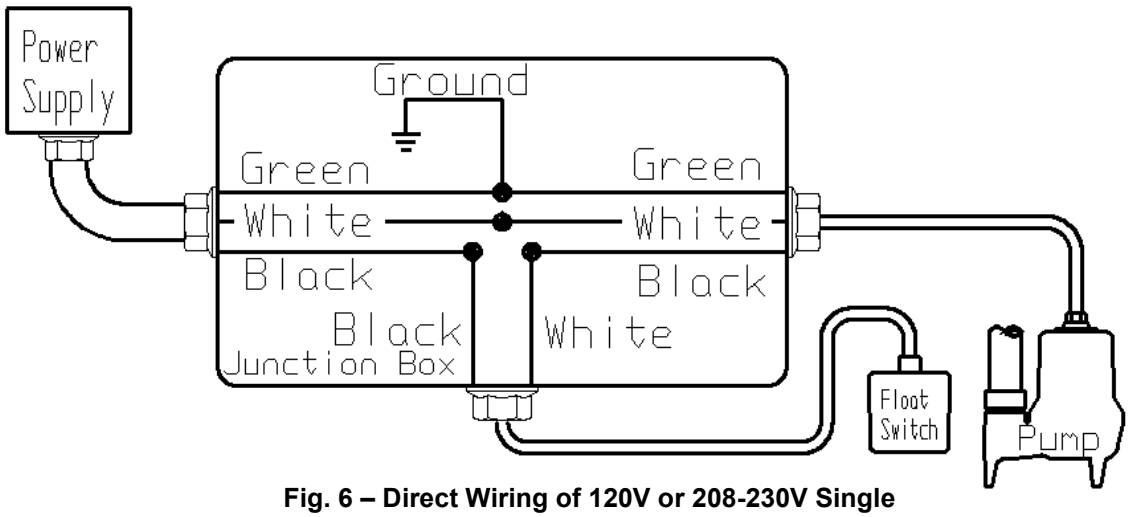


Fig. 6 – Direct Wiring of 120V or 208-230V Single Phase, Automatic Pumps

⚠ WARNING **For 208-230V installations:** Install a double pole disconnect near the pump installation. One side of the line going to the pump is always "hot", whether the float switch is in the "On" or the "Off" position. Use of a double pole disconnect will allow both hot legs to be de-energized.

5. Maintenance

⚠ WARNING **Risk of electric shock.** Always disconnect the pump from the power source before handling or making adjustments.

⚠ WARNING **Always disconnect the pump from power source before handling.** This guide is designed to help identify reasons for potential operating problems. It is not a service guide. **Dismantling of pump voids warranty.** Servicing of pump other than simple cleaning of pump inlet or impeller should be referred to the factory or its authorized service centers.

1. **Submersible Models:** Submersible pump models have sealed permanently lubricated bearings and require no additional lubrication.

2. **Pump should be <u>checked frequently</u> for debris and/or build up which may interfere with pump or float switch operation.** The float must be able to move freely through its complete travel without any restrictions. Pour enough water into the sump to activate the pump periodically (at least every 3 months) when not normally in use to verify proper function.

NOTE: The manufacturer assumes no responsibility for damage or injury due to disassembly in the field.

6. Troubleshooting

Problem	Cause	Correction
Pump will not run.	• Blown fuse or other interruption of power; improper voltage.	• Check that the unit is securely plugged in. Have an electrician check all wiring for proper connections and adequate voltage and capacity.
	• Switch is unable to move to the "turn on" position due to interference with the side of basin or other obstruction	• Position the pump or switch so that it has adequate clearance for free operation.
	• Insufficient liquid level.	• Make sure the liquid level is allowed to rise enough to activate switch(s).
	• Defective switch.	• Remove and replace switch.
Pump will not turn off.	• Switch(s) unable to move to the "turn off" position due to interference with the side of basin or other obstacle.	• Position the pump or switch so that it has adequate clearance for free operation.
	• Defective switch.	• Remove and replace switch.
Pump runs or hums, but does not pump.	• Discharge is blocked or restricted.	• Check the discharge line for foreign material, including ice if the discharge line passes through or into cold areas.
	• Check valve is stuck closed or installed backwards.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Gate or ball valve is closed.	• Open gate or ball valve.
	• Total lift is beyond pump's capability.	• Try to route piping to a lower level. If not possible, a larger pump may be required. **Consult the factory.**
	• Pump impeller is jammed or volute casing is plugged.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
Pump runs periodically when fixtures are not in use.	• Check valve was not installed, is stuck open or is leaking.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Fixtures are leaking.	• Repair fixtures as required to eliminate leakage.
Pump operates noisily.	• Foreign objects in the impeller cavity.	• *Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and reinstall.
	• Broken impeller.	• Consult the factory for information regarding replacement of impeller.
	• Worn bearings.	• Return pump to the factory or authorized repair station for repair.
	• Piping attachments to building are too rigid.	• Replace a portion of the discharge line with rubber hose or connector.

7. 3 Year Limited Warranty

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Liberty Pumps, Inc. warrants that pumps of its manufacture are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident.

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase.

This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

Liberty Pumps®

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Bergen, NY 14416
Phone: (800) 543-2550
Fax: (585) 494-1839
www.libertypumps.com

Fulflo® FP Filter Vessels

Fulflo® FP Model Cartridge Filter Vessels Designed for Economical Liquid Filtration

The FP Filter Vessel Series is designed for use with the Fulflo® Flo-Pac® 718 and 736 Pleated Filter Cartridge Series.

Benefits

- Single O-ring design closure assures quick, positive cover sealing.
- Swing bolts with eyenuts for fast, easy opening and closing of cover
- Maximum design pressure is 150 psi (10.3 bar) at 450°F* (232°C) and 200 psig at 100°F (38°C) plus full vacuum
- Buna-N O-ring standard with EPR, Viton** and fluoropolymer available
- ASME Code UM stamp is standard (U stamp is optional)
- Threaded vent and drain connections
- Adjustable leg height
- Threaded or flanged inlet and outlet options
- Side inlet, bottom outlet and crevice-free welded design provide a smooth interior for easy wash-out and cleaning

Applications

- Process Water
- Coatings
- Lubricants
- Coolants
- Cutting Oils
- Solvents
- EDM

ENGINEERING YOUR SUCCESS.

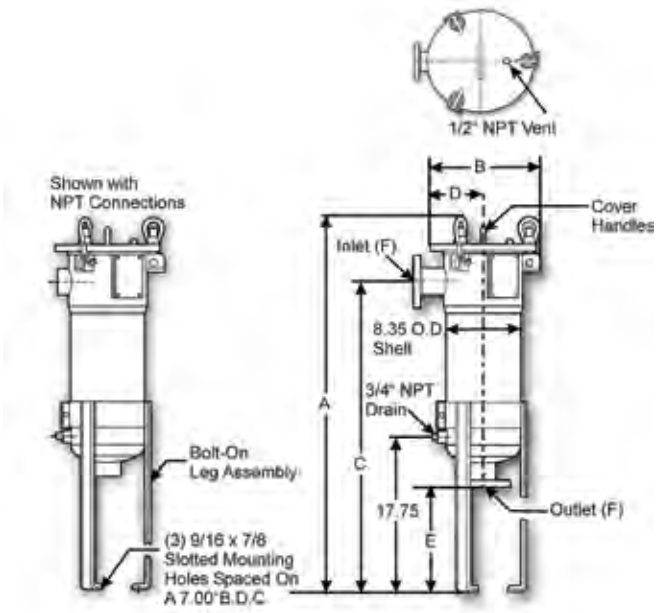
Fulflo® FP Filter Vessels

Design Specifications

Model Volume	No. & Length of Cartridges (in)	Typical Aqueous Flow † (gpm)	Dimensions (in) A	B	C	D	E	F	Shipping Weight (lbs) (gal)
FP1-1-2	(1) 18	50	42.56	12.25	35.13	5.75	13.19	2 NPT	112 5.5
FP1-1-2F	(1) 18	50	42.56	14.50	35.13	8.00	12.00	2 NPS	120 5.5
FP1-2-2	(2) 18	100	60.56	12.25	53.13	5.75	13.19	2 NPT	132 9.6
FP1-2-2F	(2) 18	100	60.56	14.50	53.13	8.00	12.00	2 NPS	140 9.6
FP1-2-3F	(2) 18	100	60.56	14.50	53.13	8.00	11.75	2 NPS	150 9.6

(F) NPS - ANSI Class 150# Slip-On Flanges
(F) NPT - ANSI Class 300# Threaded Couplings

†Actual rate is dependent on fluid viscosity, micron rating, contaminant and media type. Consult flow charts for each application.



* Operating temperature limited to 250°C (121°F) by standard Buna-N O-Ring and exterior paint on carbon steel models. Optional O-Ring materials are available.

Ordering Information

	FP	1		
Material		Model Number of Columns	Number of 18 in Cartridges/Column	Inlet/Outlet Flange Size
None = Carbon Steel 4L = 304L Stainless Steel		1	1 2	2 3 No F = NPT

Specifications are subject to change without notification.
** Viton is a registered trademark of E.I. DuPont de Nemours & Co., Inc.

ENGINEERING YOUR SUCCESS.

Flo-Pac® Filter Cartridges

Pleated cartridges for superior industrial filtration

Parker Fulflo® Flo-Pac® Cartridges are the perfect choice for many industrial filtration requirements. Flo-Pac pleated cartridges contain premium grade, phenolic impregnated cellulosic filter media. Parker's line of pleated cartridges is designed for critical filtration applications, providing long service life, high flow rate and low pressure drop.

Flo-Pac Pleated Cartridges are available in 0.5µm, 1µm, 5µm, 10µm, 20µm, 30µm, and 60µm pore sizes (95% removal; ß = 20).

Contact Information

Parker Hannifin Corporation
domnick hunter
Process Filtration - North America
2340 Eastman Avenue
Oxnard, California, USA 93030

toll free +1 877 784 2234
phone +1 805 604 3400
fax +1 805 604 3401
dhpsales.na@parker.com

www.parker.com/processfiltration

Benefits

- Pleated cellulosic media allow high flow capacity at low pressure drop
- Available in a variety of sizes and configurations to fit most industrial vessels
- Phenolic resin impregnated to provide strength, integrity and high contaminant capacity
- High strength spiral core withstands pressure surges to 100psid
- Suitable for operating temperatures to 250°F (121°C)
- Outer sleeve protects the media from damage
- ETP (Electro-tin-plated) steel metal components for both aqueous and oil-based applications
- Buna-N gaskets are standard, other materials are available

Applications

- Water Soluble
- Coolants
- Quench Oils
- Fuels
- Lubricating Oils
- Hydraulic Oils
- EDM Dielectrics
- Rolling Mill Oils
- Processing Liquids
- Gasoline

Parker domnick hunter

ENGINEERING YOUR SUCCESS.

Flo-Pac® Filter Cartridges

SPECIFICATIONS

Filtration Ratings
95% at 0.5µm, 1µm, 5µm, 10µm, 20µm, 30µm, and 60µm pore sizes

Materials of Construction
Filter Media:
Phenolic impregnated cellulose

Core: ETP steel

End Caps: ETP steel

Sleeve:
300 series - Polypropylene
600 & 700 series - ETP steel

Adhesive: Thermosetting PVC

End Seals:
300 & 700 Series–Buna-N gaskets, 600 Series–Buna-N gaskets/grommets, 500 Series–fiber gaskets

Packaging
300 Series
310–24/carton (12 lb ≈ shipping wt)
320–12/carton (12 lb ≈ shipping wt)
330–12/carton (18 lb ≈ shipping wt)
340–12/carton (24 lb ≈ shipping wt)

500 Series
518–6/carton (14 lb ≈ shipping wt)

600 Series
614–6/carton (20 lb ≈ shipping wt)
629–4/carton (26 lb ≈ shipping wt)
644–4/carton (40 lb ≈ shipping wt)

700 Series
718–6/carton (20 lb ≈ shipping wt)
736–4/carton (26 lb ≈ shipping wt)
754–4/carton (39 lb ≈ shipping wt)

Maximum Recommended Operating Conditions
Temperature: 250°F (121°C)

Differential Pressure: 70psi (4.8bar)

Change Out ΔP: 35psid (2.4bar)

Flow Rate per Single Length Cartridge:

300 Series	7gpm
500 Series	50gpm
600 Series (3 ½ in. ID)	50gpm
600 Series (1 $^{9}/_{16}$ in. ID)	35gpm
700 Series	50gpm

Dimensions
300 Series
2 ½ in. OD x 1 in. ID x 9 $^{5}/_{8}$ in., 19 ¾ in., 29 ¼ in., 29 $^{5}/_{8}$ in, 40 in.
500 Series
4 ½ in. OD x 1 ¾ in. ID x 18 in.
600 Series
6 ¼ in. OD x 3 $^{1}/_{2}$, or 1 $^{9}/_{16}$ in. x 14 $^{3}/_{8}$, 29 or 43 $^{3}/_{8}$ in. long
700 Series
6 ¼ in. OD x 2 $^{5}/_{8}$ in. or 2 $^{1}/_{8}$ in. ID x 18, 36, or 54 in. long

Flow Rate and Pressure Drop Formulas

$$\text{Flow Rate (gpm)} = \frac{\text{Clean}\Delta P \times \text{Length Factor}}{\text{Viscosity} \times \text{Flow Factor}}$$

$$\text{Clean } \Delta P = \frac{\text{Flow Rate} \times \text{Viscosity} \times \text{Flow Factor}}{\text{Length Factor}}$$

FP Flow Factor (psid/gpm @ 1cks)

Rating (µm)	Flow Factor
0.5	0.0260
1	0.0170
5	0.0020
10	0.0018
20	0.0010
30	0.0009
60	0.0005

FP Length Factors

Style	Length Factor
FP310	1.0
FP320	2.0
FP329	3.0
FP330	3.0
FP340	4.0
FP518	3.3
FP614	3.6
FP629	7.2
FP644	10.8
FP718	6.5
FP736	13.0
FP754	19.5

Liquid Particle Retention Ratings (µm) @ Removal Efficiency of:

Cartridge	ß=5000 Absolute	ß=1000 99.9%	ß=100 99%	ß=20 95%	ß=10 90%
FP-0.5	12	10	3	0.5	<.0.5
FP-1	15	12	6	1	<1.0
FP-5	30	20	9	5	3.5
FP-10	50	35	18	10	7
FP-20	90	70	40	20	12
FP-30	100	85	50	30	21
FP-60	200	150	90	60	45

Notes:
1. Clean ΔP is psi differential at start.
2. Viscosity is centistokes. Use Conversion Tables for other units.
3. Flow Factor is ΔP/GPM at 1cks for 10 in. (or single).
4. Length Factors convert flow or ΔP from 10 in. (single length) to required cartridge length.

Ordering Information

FP – [ ] [ ] – [ ] [ ] [ ]

Cartridge Code	
CODE	DESCR.
FP	Flo-Pac

Outside Diameter	
CODE	INCHES (Series)
3	2 ½" (300)
5	4 ½" (500)
6	6 ¼" (600)
7	6 ¼" (700)

Length	
CODE	INCHES (Series)
10	9 $^{5}/_{8}$" (300)
14	14 $^{3}/_{8}$" (600)
18	18" (500, 700)
20	19 ¾" (300)
29	29" (600)
29	29 ¼" (300)
30	29 $^{5}/_{8}$" (300)
36	36 (700)
40	40 (300)
44	43 $^{3}/_{8}$" (600)
54	54 (700)

Micron Rating (µm)
0.5
1
5
10
20
30
60

Inside Diameter	
CODE	INCHES (SERIES)
None	1" (300)
None	1 ¾" (500)
None	3 ½" (600)
None	2 $^{5}/_{8}$" (700)
1	1 $^{9}/_{16}$" (600)
8	2 $^{1}/_{8}$" (700)

Seal Material	
CODE	DESCRIPTION
None	Buna-N Gaskets
A	Vellumoid (300, 600, 700 Series)
B	Fiber (500 Series Only)
C	Cork (700 Series Only)
G	Buna-N Grommets (600 Series 1 $^{9}/_{16}$" ID)
V	Viton®

Body	
CODE	DESCRIPTION
None	Metal (500, 600, 700 Series)
	Polypro (300 Series)
M	Metal (300 Series)
N	No Body

Specifications are subject to change without notification.
For User Responsibility Statement, see www.parker.com/safety

DS_IP_Flo-Pac Rev. A

Recordall® Disc Meters

Lead-Free Bronze Alloy Models 120 & 170, Sizes 1-1/2" (40 mm) & 2" (50 mm), NSF/ANSI Standards 61 and 372 Certified

DESCRIPTION

The Recordall Models 120 and 170 Disc Series meters meet or exceed the most recent revision of AWWA Standard C700 and are available in a lead-free bronze alloy. Both meters comply with the lead-free provisions of the Safe Drinking Water Act, are certified to NSF/ANSI Standards 61 and 372 (Trade Designations: M120-LL and M170LL) and carry the NSF-61 mark on the housing. All components of the lead-free bronze alloy meter (housing, measuring element, seals, and so on) comprise the certified system.

Applications: For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

Operation: Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc, which moves freely, nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train reduces the disc nutations into volume totalization units displayed on the register or encoder face.

Operating Performance: The Recordall Disc Series meters meet or exceed registration accuracy for the low flow rates (95%), normal operating flow rates (100 ± 1.5%), and maximum continuous operation flow rates as specifically stated in AWWA Standard C700.

Construction: Recordall Disc meter construction, which complies with ANSI/AWWA standard C700, consists of three basic components: meter housing, measuring chamber, and permanently sealed register or encoder. The water meter is available in a lead-free bronze alloy. A corrosion-resistant engineered polymer material is used for the measuring chamber.

Magnetic Drive: Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling for straight-reading or AMR/AMI meter reading options.

Tamper-Proof Features: Unauthorized removal of the register or encoder is inhibited by the option of a tamper detection seal wire screw, TORX® tamper-resistant seal screw or the proprietary tamper-resistant keyed seal screw. Each can be installed at the meter site or at the factory.

Maintenance: Badger Meter Recordall Disc Series meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location.

To simplify maintenance, the register, measuring chamber, and strainer can be replaced without removing the meter housing from the installation. No change gears are required for accuracy calibration. Interchangeability of parts among like-sized meters minimizes spare parts inventory investment. The built-in strainer has an effective straining area of twice the inlet size.

Connections: Companion flanges in cast iron or NL bronze are available as options. Straight connection sets are available in NL bronze.

M120

M170

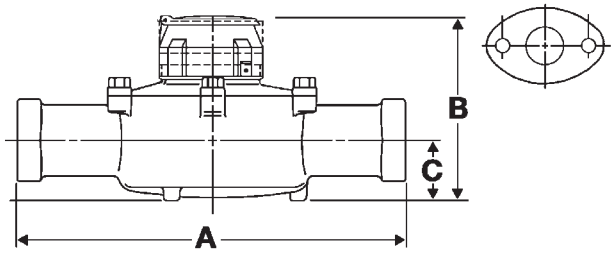
SPECIFICATIONS

Meter Model	M120	M170
Typical Operating Range (100% ± 1.5%)	2.5…120 gpm (0.57…27 m^3/hr)	2.5…170 gpm (0.57…39 m^3/hr)
Low Flow (Min. 95%)	1.25 gpm (0.28 m^3/hr)	1.5 gpm (0.34 m^3/hr)
Maximum Continuous Operation	80 gpm (18 m^3/hr)	100 gpm (23 m^3/hr)
Pressure Loss at Maximum Continuous Operation	4.8 psi at 80 gpm (0.33 bar at 18 m^3/hr)	3.3 psi at 100 gpm (0.23 bar at 23 m^3/hr)
Maximum Operating Temperature	80° F (26° C)	80° F (26° C)
Maximum Operating Pressure	150 psi (10 bar)	150 psi (10 bar)
Measuring Element	Nutating disc, positive displacement	Nutating disc, positive displacement
Meter Connections	1-1/2" AWWA two-bolt elliptical flange, drilled or 1-1/2…11-1/2 NPT internal pipe threads	2" AWWA two-bolt elliptical flange, drilled or 2…11-1/2 NPT internal pipe threads
Test Plugs	Optional 1" NPT test plug (TP)	Optional 1" NPT test plug (TP)

Materials

Meter Housing	Lead-free bronze alloy
Housing Top Plates	Lead-free bronze alloy
Measuring Chamber	Engineered polymer
Disc	Engineered polymer
Trim	Stainless steel
Strainer	Engineered polymer
Disc Spindle	Stainless steel
Magnet	Ceramic
Magnet Spindle	Stainless steel
Register Lid and Shroud	Engineered polymer, bronze

DIMENSIONS



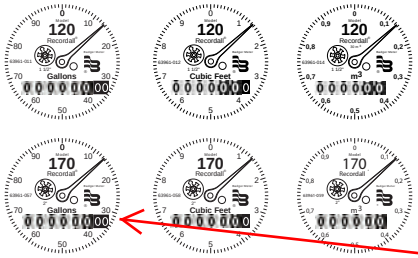
Meter Size	Meter Model	A Laying Length	B Height Reg./RTR	C Centerline Base	Width	Approx. Shipping Weight
1-1/2" (40 mm)	120 EL, Hex 120 EL, TP	12-5/8" (321 mm)	7" (178 mm)	2-3/8" (60 mm)	8-3/4" (222 mm)	19 lb (8.6 kg)
1-1/2" (40 mm)	120 ELL 120 ELL, TP	13" (330 mm)	7" (178 mm)	2-3/8" (60 mm)	8-3/4" (222 mm)	19 lb (8.6 kg)
2" (50 mm)	170 EL, Hex 170 EL, TP	15-1/4" (387 mm)	8" (203 mm)	2-7/8" (73 mm)	9-1/2" (241 mm)	30 lb (13.6 kg)
2" (50 mm)	170 ELL 170 ELL, TP	17" (432 mm)	8" (203 mm)	2-7/8" (73 mm)	8-1/2" (241 mm)	30 lb (13.6 kg)

EL = Elliptical | ELL = Elliptical Long | Hex = Hexagon, 1-1/2…11-1/2" NPT Thread | TP=Test Plug 1"

REGISTERS / ENCODERS

Standard—Sweep-Hand Registration

The standard register is a straight-reading, permanently sealed magnetic drive register. Dirt, moisture, tampering and lens fogging problems are eliminated. The register has a six-odometer wheel totalization display, 360° test circle with center sweep hand, and flow finder to detect leaks. Register gearing is made of self-lubricating engineered polymer, which minimizes friction and provides long life. The multi-position register simplifies meter installation and reading. The register capacity is 10,000,000 gallons (1,000,000 ft³, 100,000 m³).



Meter Model	Gallon	Cubic Feet	Cubic Meter
120	100	10	1/0.1
170	100	10	1

note: meter is read in gallons. Total flow shown on this meter is 13 gallons

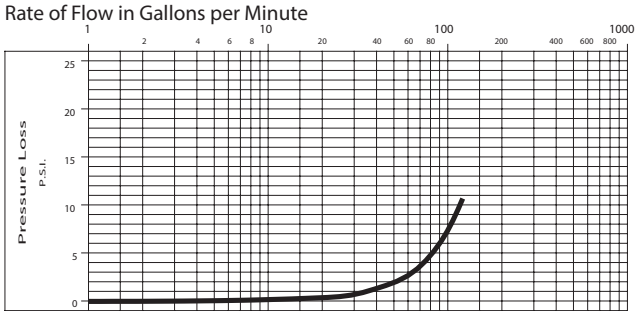
Optional—Encoders for AMR/AMI Reading Solutions

AMR/AMI solutions are available for all Recordall Disc Series meters. All reading options can be removed from the meter without disrupting water service. Badger Meter encoders provide years of reliable, accurate readings for a variety of applications and are also available pre-wired to Badger Meter approved AMR/AMI solutions. See details at **www.badgermeter.com**.

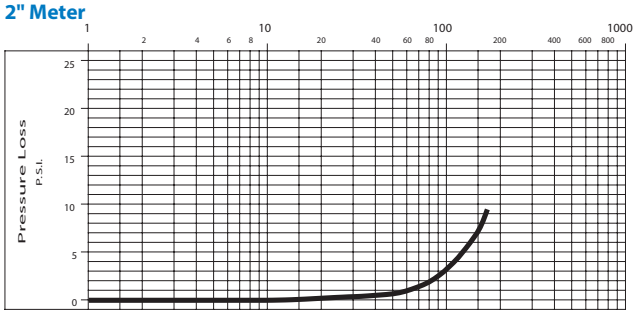
PRESSURE LOSS CHARTS

1-1/2" Meter

Rate of Flow in Gallons per Minute



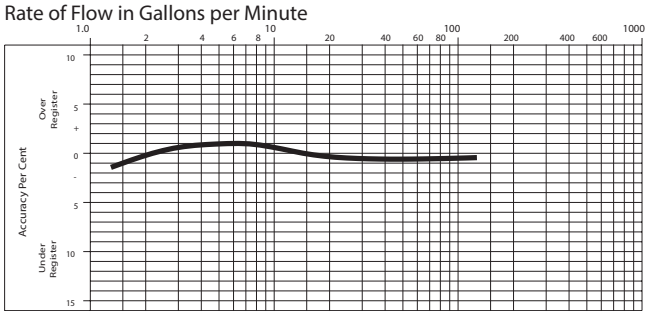
2" Meter



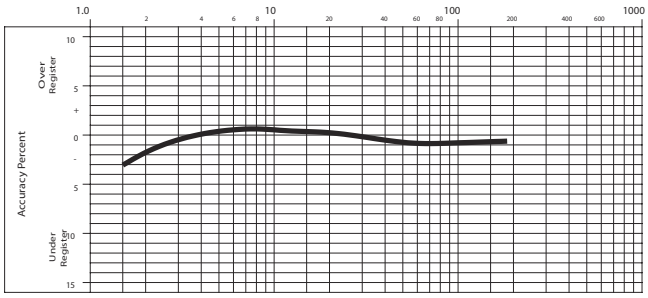
ACCURACY CHARTS

1-1/2" Meter

Rate of Flow in Gallons per Minute



2" Meter



www.badgermeter.com

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360°

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Item # **4KHA2** Mfr. Model # **4KHA2** UNSPSC # **40141606**

Catalog Page # **3783** Shipping Weight **2.828 lbs.**

Country of Origin **India** | *Country of Origin is subject to change.*

Note: Product availability is real-time updated and adjusted continuously. The product will be reserved for you when you complete your order. More

Technical Specs

Item	**Valve**
Type	**Pressure Relief**
Max. Flow GPM	**40**
Pressure Range (PSI)	**0 to 400**
Max. Fluid Temp. (F)	**180**
Body Material	**Bronze**

Wetted Materials	**SS**
Inlet Port (In.)	**1 (M)NPT**
Outlet Port (In.)	**3/4 (F)NPT**
Max. Pressure (PSI)	**650**
Application	**For Prevention of Damage to Positive Displacement Pumps**
For Use With	**Postive Displacement Pumps**

V-SEAL® 101 MULTI-SURFACE

Reactive Penetrating Sealer and Curing Agent for Smooth Concrete, Brick, Stone, Stucco, and Porous Masonry

TECHNICAL DATA SHEET

PRODUCT DESCRIPTION

V-SEAL® 101 is a chemically reactive deep penetrating sealer that permanently fuses within porous substrates of concrete, brick, stone, and mortar to significantly increase surface strength, combat freeze/thaw damage, and limit penetration of stains and damaging impurities such as oil, gas, grease, and salt. V-SEAL® 101 reduces dusting, retards mold and mildew, restricts efflorescence and hydrostatic moisture, and imparts waterproof characteristics. V-SEAL® 101 is breathable with minimal impact to traction coefficient. V-SEAL 101® has excellent moisture retention characteristics and can be used as a curing agent for new machine trowel concrete. V-SEAL 101 creates a cross-linked insoluble internal membrane barrier that will wear away only if the substrate itself wears away below sealer penetration. In addition to being a powerful exterior sealer, V-SEAL® 101 leaves no topical residue and is an ideal primer to protect the appearance and lifespan of topical coatings and floor treatments.

RECOMMENDED USES

Sealing residential and commercial structures such as machine trowel concrete floors, brick walls and chimneys, mortar, stucco, pavers, block, natural stone, artificial stone, roads, driveways, parking decks, sidewalks, patios, and basements. Architectural features such as countertops, mantels, furniture, ponds, fountains, and statues. V-SEAL® 101 is suitable for interior and exterior, horizontal and vertical, above and below grade applications. This product is compatible with most glues, mastics, and topical coatings. V-SEAL® 101 can be used as a curing agent for new machine trowel concrete.

PRODUCT CHARACTERISTICS

MSDS Information/ Physical Data:

Boiling Point:	212° F
Vapor Pressure:	20° C/68° F water
Solubility in Water:	Excellent
Evaporation Rate:	Similar to water
Appearance and Odor:	Clear – slightly amine
Specific Gravity:	(H20-1):1.1 to 1.3 @ 20°C
% Volatile by Volume:	Zero g/L
pH:	11.5
Flashpoint:	N/A
Flammable Limits:	N/A

FINISH

Flat/Clear

*COVERAGE RATE

200-300 sq. ft. per gallon broom finish/rough
300-600 sq. ft. per gallon machine trowel/dense

*Coverage rate is for estimating purposes only. Application rate is based upon porosity and absorption. Always test absorption prior to application. When properly applied product should create a wet surface sheen and absorb within 1 minute without puddles. Immediately disperse puddles. Excessive application may result in white residue which will not affect sealer performance and generally dissipates over time, but may removed immediately with abrasion.

**DRYING TIME

Dry to touch 1-3 hours, traffic 6-12 hours
**Drying time is for estimating purposes only.

PERFORMANCE CHARACTERISTICS

ASTM D2939:	Resistance to water solubility, flexibility, no cracking
ASTM D466:	Resistance to water flow and action. Excellent adhesion. No remulsification.
ASTM E96:	Water vapor transmission 04 grains/sq/ft./hr. Water permeability – .102 perms
ASTM C836:	Film thickness on a vertical scale: Passed.
SS-W-110C:	Water repellence on masonry test: 1.925%
ASTM C672:	Freeze/thaw cycle: 100 day cycle. Passed. No scaling.
AASHTO 259 and T260 90 Day Ponding:	Passed
UV-Testing (modified):	No change. Excellent results
ASTM-Elcometer Pull:	280 lbs/ Concrete failed 1st/no delamination
ASTM C642 Absorption:	Phase 1 48 hr:0.62%-phase 2 50 day: 1.25%
ASTM Scaling Resistance:	No scaling
NCHRP 244, Series IV – 4.1 Southern Exposure:	Absorbed chloride: <7%
NCHRP 244, Series IV – 4.1 Northern Exposure:	Absorbed chloride: <7%
NCHRP 244 Series –11 Cube Test: 3.1:	<12% weight gain
NCHRP 244 Series –11 Cube Test: 3.2:	<9% absorbed chloride
Moisture Vapor Transmission Rate:	2%

PACKAGING

1 gallon jugs
5 gallon pails
55 gallon drums and concentrate kits

SHIPPING

Normal package delivery and trucking.

SHELF LIFE & STORAGE

Two years unopened when stored in a dry area without freezing.

Concrete Sealers & Concrete Coatings

Toll-Free: (877) 738 - 7325
Local: (614) 754 - 4777
Fax: (614) 754 - 4778
Emergency: (800) 424 - 9300

9042 Cotter Street
Green Meadows Commerce Center
Lewis Center, OH 43035
Email: info@vseal.com
www.vseal.com

V-SEAL® 101 MULTI-SURFACE

Reactive Penetrating Sealer and Curing Agent for Smooth Concrete, Brick, Stone, Stucco, and Porous Masonry

TECHNICAL DATA SHEET

APPLICATION

V-SEAL® 101 is a reactive penetrating sealer. Always test porosity prior to application (especially on machine troweled concrete and dark colored surfaces). Surface must be porous and free of loose debris, mildew, topical oil, paint or other surface coatings. Surface should be dry (no standing water). No mixing is required. Substrate and ambient temperatures should not be below 35°F or above 100°F during the application and drying period. Apply uniformly with broom, roller, or low pressure sprayer. Specific coverage rate is based upon substrate porosity. Product should create a wet surface sheen and absorb within 1 minute without puddles. Puddles should be immediately dispersed as excessive application may result in white residue which will not affect sealer performance and generally dissipates over time. Wash application materials with warm water. Generally, only one application is required. For curing new concrete, apply V-SEAL® 101 after all bleed water is gone, finishing is complete, and the concrete will withstand the weight of a person and not be marred. For new concrete, a light secondary application of V-SEAL® 101 or V-SEAL® Phase II Enhancer may be applied any time after 24 hours to enhance beading action and water repellence. Always conduct a small test to assure sealer absorption.

LIMITATIONS

V-SEAL® 101 is designed to work only on porous masonry substrates and is not intended for asphalt. This product may etch glass, vinyl, and metal. Avoid contact with eyes and skin. V-SEAL® 101 may be damaged if frozen prior to use. Not intended to seal cracks of more than 1/16 inch. V-SEAL Concrete Sealers (V-SEAL) solely and expressly warrants that its products shall be free from defects in materials and workmanship. V-SEAL MAKES NO OTHER WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR USE OF ITS PRODUCTS. Product descriptions, illustrations, or demonstrations, if any, are for illustration purposes only and do not constitute a warranty or warranty alteration. Upon purchase, handling, storage, and application of V-SEAL products is beyond control of the company. V-SEAL specifically does not warranty performance results. The purchaser should conduct a test prior to application and shall be solely responsible for determining the suitability of V-SEAL products for the purchaser's intended purposes. V-SEAL shall bear no liability, other than the replacement of the defective product. The purchaser shall have no claim for incidental or consequential damages.

REGULATORY

V-SEAL® 101 complies with EPA, FDA and OSHA requirements, contains no solvents, and 0 g/L Volatile Organic Compounds (VOC). This product is considered a non-hazardous chemical under DOT (49CFR) and OSHA Hazard Communication Standard (29CFR 1910.1200).
Transportation Class: 55.

SAFETY / FIRST AID PRECAUTIONS

Eyes: Flush with water for at least 15 minutes
Skin: Wash thoroughly with soap and water
Inhalation: No TVL established. Move subject to fresh air.
Digestion: If consumed consult physician.

Concrete Sealers & Concrete Coatings

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V-SEAL® 101 Multi-Surface

Penetrating Sealer and Curing Agent
Concrete and Porous Masonry

Product Description

V-SEAL 101 is a reactive penetrating proprietary catalyzed potassium siliconate solution that permanently fuses within porous substrates of concrete, brick, stone, and mortar to significantly increase surface strength; combat freeze/thaw damage, scaling and spalling; and limit penetration of stains and damaging impurities such as oil, gas, grease, and salt. V-SEAL 101 reduces dusting, retards mold and mildew, restricts efflorescence and hydrostatic moisture, and imparts waterproof characteristics. V-SEAL 101 is breathable with minimal impact to traction coefficient. V-SEAL 101 creates a cross-linked insoluble methyl-silicone internal membrane that will wear away only if the substrate itself wears away below sealer penetration. V-SEAL 101 enhances curing of new concrete (generally floors and walls). V-SEAL 101 is an excellent moisture mitigation sealer for slab on grade floors, increasing surface strength; improving stain resistance; and lowering hydrostatic moisture to promote adhesion of floor coatings, glues and mastics.

Recommended Uses

Sealing residential and commercial structures such as roads, driveways, parking decks, sidewalks, patios. Masonry products such as pavers, block, and porous stone. Architectural features such as countertops, mantels, furniture, ponds, fountains, and statues. Horizontal or Vertical. Above or below grade. Compatible with most glues or topical coatings. Enhances curing of new concrete.

Product Characteristics

UMSDS Information/ Physical Data:

Boiling Point:	212° F
Vapor Pressure:	20° C/68° F water
Solubility in Water:	Excellent
Evaporation Rate:	Similar to water
Appearance and Odor:	Clear – slightly amine
Specific Gravity:	(H_20-1):1.1 to 1.3 @ 20°C
% Volatile by Volume:	Zero g/L
pH:	11.5
Flashpoint:	N/A
Flammable Limits:	N/A
Finish:	Flat/Clear
Coverage Rate*:	200-300 sq. ft. broom finish, rough 300-600 sq. ft. machine trowel, dense
Drying Time Hours**:	Dry to touch 1-3, traffic 6-12
Shelf Life:	2 years unopened

*Coverage rate for estimating purposes only. Application rate based upon porosity and absorption. Always test absorption prior to application. When properly applied product should create a slightly white surface sheen and absorb within 1 minute without puddles. Immediately disperse puddles. Excessive application may result in white residue which will not affect sealer performance and generally dissipates over time or power washing.
**Drying time for estimating purposes only.

Performance Characteristics

ASTM D2939:	Resistance to water solubility, flexibility, no cracking
ASTM D466:	Resistance to water flow and action. Excellent adhesion. no remulsification
ASTM E96:	Water vapor transmission 04 grains/sq/ft./hr. Water permeability – 0102 perms
ASTM 836:	Film thickness on a vertical scale
SS-W-110C:	Water repellence on masonry test:1.925%
ASTM C672:	Freeze/thaw cycle – 100 day cycle. Passed. No scaling
AASHTO 259 and T260 90 Day Ponding:	passed
UV-Testing (modified)	No change. Excellent results
ASTM-Elcometer Pull:	280 lbs/ Concrete failed 1st/no delamination
ASTM C642 Absorption:	Phase 1 48 hr:0.62%-phase 2 50 day: 1.25%
ASTM Scaling Resistance:	No scaling

NCHRP 244, Series IV – 4.1 Southern Exposure: Absorbed chloride: <7%
NCHRP 244, Series IV – 4.1 Northern Exposure: Absorbed chloride: <7%
NCHRP 244 Series –11 Cube Test: 3.1: <l2% weight gain
NCHRP 244 Series –11 Cube Test: 3.2: <9% absorbed chloride
Moisture Vapor Transmission Rate: 2%

Color

V-SEAL® 101 has a clear appearance in the bottle. Upon proper application the substrate will have little, or no, noticeable change in appearance when dry. Color tint is available in a selection of colors.

Surface Preparation

V-SEAL® 102 is a reactive penetrating sealer. The surface must be clean and porous enough to allow penetration into the substrate. Surfaces should be clean and free of dirt, debris, mildew, oil, grease and other contaminants.

Ordering/Shipping Information

Packaging:	1 gal. jugs 5 gal. pails 55 gal. drums and concentrate kits
Shipping:	Normal package delivery and trucking

V-Seal Concrete Sealers

Toll-Free	(877) 738-7325
Local	(614) 754-4777
Fax	(614) 754-4778
Emergency	(800) 255-3924

9042 Cotter Street
Green Meadows Commerce Center
Lewis Center, OH 43035
info@vseal.com
www.vseal.com

V-SEAL® 101 – Multi-Surface

Recommended Systems

Existing Concrete: V-SEAL 101 is a reactive penetrating sealer. Always determine porosity prior to application. Surface must be porous and free of loose debris, mildew, topical oil, paint or other surface coatings. Surface should be dry (no standing water). No mixing is required. Do not apply below 40°F or above 100°F. Apply uniformly with roller or low pressure sprayer. Specific coverage rate is based upon substrate porosity. Product should create a wet surface sheen and absorb within 1 minute without puddles. Puddles should be immediately dispersed as excessive application may result in white residue which will not affect sealer performance and generally dissipates over time or power washing. Generally, only one application is required.

Curing New Concrete: For curing new concrete apply V-SEAL 101 after all bleed water is gone, finishing is complete and the concrete will withstand the weight of a person and not be marred. Apply uniformly with low pressure sprayer. Specific coverage rate is based upon substrate porosity. Actual application rate based upon porosity and absorption. Product should create a wet surface sheen and absorb within 1 minute without puddles. Newly poured concrete should not be subjected to rain or other sources of water prior to obtaining surface hardness (surface cannot be marred) which may be highly variable based upon temperature and humidity (2-12 hours or more). For new concrete, a light secondary application of V-SEAL 101 or V-SEAL Phase II Enhancer may be applied any time after 7 days to enhance beading action and water repellence – conduct a small test to assure sealer absorption.

Application

V-SEAL 101 is a penetrating sealer. **Always test porosity prior to application. Surface must be porous and free of loose debris, mildew, topical oil, paint or other surface coatings.** Surface should be dry (no standing water). No mixing is required. Do not apply below 40°F or above 100°F. Apply uniformly with roller or low pressure sprayer. Specific coverage rate is based upon substrate porosity. Product should create a wet surface sheen and absorb within 1 minute without puddles. Puddles should be immediately dispersed as excessive application may result in white residue which will not affect sealer performance and generally dissipates over time or power washing. Wash application materials with warm water. Generally, only one application is required. For curing new concrete apply V-SEAL 101 after all bleed water is gone, finishing is complete and the concrete will withstand the weight of a person and not be marred.

Limitations

V-SEAL 101 is designed to work only on porous masonry substrates and is not intended for asphalt and may etch glass, vinyl, and metal. Avoid contact with eyes and skin. Sealer may be damaged if frozen prior to use. Not intended to seal cracks of more than 1/16 inch. The Company shall bear no liability, other than replacement of defective product. The Company specifically does not warranty specific performance results or compatibility with products manufactured by others. A small test must be conducted prior to application. Based upon this test, the purchaser shall determine for themselves the suitability of this product for the intended use.

Regulatory

V-SEAL 101 complies with EPA, FDA and OSHA strict requirements, and contains no solvents and zero g/L Volatile Organic Compounds (VOC). This product is considered a non-hazardous chemical under OSHA Hazard Communication Standard (29CFR 1910.1200) Transportation Class: 55.

Safety / First Aid Precautions

Eyes: Flush with water for at least 15 minutes
Skin: Wash thoroughly with soap and water.
Inhalation: No TVL established. Move subject to fresh air.
Digestion: If consumed consult physician.

V-Seal Concrete Sealers

Toll-Free	(877) 738-7325
Local	(614) 754-4777
Fax	(614) 754-4778
Emergency	(800) 255-3924

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APPENDIX C: SITE DATA INFORMATION SHEET

Site No. 152209
547 South Country Road
East Patchogue, NY
Basement Sump Systems

SYSTEM#1 - Duplex Pump System

Date	Effluent Pressure (Psi) @ Time of Reading	Bypass Flow Rate (GPM) @ Time of Reading	Bypass Totalizer (gallons) @ Time of Reading	Notes/Maintenance Conducted	Tech Initials
example: 5/19/14	7.2 @ 1115	0 @ 1115	12 @ 1115	replaced filter cartridges. System operating OK.	IH
example: 5/19/14	2.5 @ 1200	0 @ 1200	12 @ 1200	system operating upon departure	IH

Site No. 152209
547 South Country Road
East Patchogue, NY
Basement Sump Systems

SYSTEM#2 - Simplex Pump System

Date	Effluent Pressure (Psi) @ Time of Reading	Bypass Flow Rate (GPM) @ Time of Reading	Bypass Totalizer (gallons) @ Time of Reading	Notes/Maintenance Conducted	Tech Initials
5/19/14	8.5	1.5 @ 1130	20 @ 1130	Replaced filter cartridges. Effluent in bypass upon arrival	IH
5/19/14	2.3	0 @ 1200	22 @ 1200	system operating upon departure	IH

Appendix M

Remedial System Optimization Table of Contents

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APPENDIX N
REMEDIAL SYSTEM OPTIMIZATION FOR BIANCHI WEISS GREENHOUSES SITE

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