Safeguard Storage Baldwin Site

NASSAU, NEW YORK

Site Management Plan

NYSDEC Site Number: V00523

Prepared for:

Safeguard Properties LLC

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

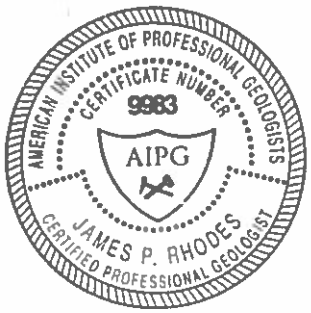
APRIL 2015

CERTIFICATION STATEMENT

I, James P. Rhodes, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

James Rhodes, CPG
QEP

9/18/2015
DATE



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1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at Safeguard Storage Baldwin Site (hereinafter referred to as the "Site") under the New York State (NYS) Voluntary Cleanup Program (VCP) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with Voluntary Cleanup Agreement (VCA) Index # D1-0001-04-02, Site # V00523, which was executed on May 10, 2002.

1.1.1 General

Safeguard Properties LLC entered into a VCA with the NYSDEC to remediate a 2.7 acre property located in Baldwin, Nassau County, New York. A Site Vicinity Map is included as **Figure 1**. This VCA required the Remedial Party, Safeguard Properties LLC, to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of this 2.7-acre Site is provided in **Figure 2**. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Declaration of Covenants and Restrictions (**Appendix B**).

After completion of the remedial work described in the Remedial Action Work Plan, some contamination was left in the subsurface at this site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Declaration of Covenants and Restrictions is extinguished. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by P.W. Grosser Consulting, Inc. (PWGC), on behalf of Safeguard Properties LLC, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) that are required by the Declaration of Covenants and Restrictions for the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. A Declaration of Covenants and Restrictions granted to the NYSDEC, and recorded with the Nassau County Clerk, will require compliance with this SMP and all ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ICs. This SMP specifies the methods necessary to ensure compliance with all ICs required by the Declaration of Covenants and Restrictions for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Declaration of Covenants and Restrictions and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site, including: (1) implementation and management of all Institutional Controls; (2) media monitoring; (3) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (4) defining criteria for termination of media monitoring.

To address these needs, this SMP includes two plans: (1) an Institutional Control Plan for implementation and management of ICs; (2) a Monitoring Plan for implementation of Site Monitoring.

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

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

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the VCA (Index #D1-0001-04-02; Site #V00523) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Declaration of Covenants and Restrictions 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.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the Hamlet of Baldwin, County of Nassau, New York and is identified as Block 46, Lot 62 on the Nassau County Tax Map. The site is an approximately 2.7-acre area bounded by Atlantic Avenue to the north, and by Milburn Creek to the south, east, and west (see **Figure 2**). The boundaries of the site are more fully described in the metes and bounds that is part of the Declaration of Covenants and Restrictions (**Appendix B**).

1.2.2 Site History

The site was reportedly built up from the Milburn Creek streambed. The creek was rerouted around the resulting peninsula. The site is bounded on four sides by bulkheads, except for the site's access driveway at the northeast corner of the property. The property's soil is apparently comprised of dredge spoils from the stream bed of Milburn Creek.

The site was used as a boat storage and repair yard dating back to at least 1941. In 1974, the currently-existing building was constructed and used as an indoor tennis facility. The site usage of the building changed in 1983 (according to building department records), as Lightalarms Electronics Corporation (LEC) took over the site. LEC manufactured emergency lighting equipment at this facility until the operation moved in 1998. LEC was known to have used paints and solvents in their operation. LEC's operations included the use of a spray booth, with a permitted exhaust to the outside, to spray paint light fixtures and other components. Prior to painting, the facility

utilized a solvent dip tank containing 1,1,1-trichloroethane to clean metal parts in preparation for paint.

ATC Associates Inc. (ATC) performed a Limited Subsurface Investigation in 1997 and a Focused Subsurface Investigation in 2001 which documented the on-site contamination including chlorinated volatile organic compounds (VOCs) in the drywell located to the east of the subject building and in the soil and groundwater. The prospective buyer of the property (Safeguard Properties LLC) entered into the subject VCA in 2002, agreeing to address environmental contamination at the site. ATC subsequently performed a remediation and closure of the drywell.

1.2.3 Geologic Conditions

The depth to water at the site ranges from 2 to 5 feet below the surface, and is affected by the tides. This groundwater is saline and is not drinkable. The uppermost soils from grade to 12 feet below the surface are a mix of dredge spoils (fill) from when the land was constructed, creek bottom sediments, buried marsh, and sands.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following reports:

- *Remedial Investigation Results and Supplemental Workplan***,** PWGC**,** January 2007
- *Sub-Slab Vapor and Indoor Air Sampling Report*, PWGC, April 2007
- *Supplemental Remedial Investigation Report*, PWGC, June 2008
- *Deep Groundwater Sampling Report*, PWGC, June 2009
- *Monitoring Well Sampling Report*, January 2010
- *Monitoring Well Sampling Report*, PWGC, October 2010
- *Remedial Action Work Plan*, PWGC, September 2014

Generally, the RI determined that contaminants of concern, including 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA), and chloroethane, exist in the subsurface of the site. Based on the investigation results, comparison to the Standards,

Criteria, and Guidance (SCGs), and the potential public health and environmental exposure routes, certain media and areas of the site required remediation.

Below is a summary of site conditions when the RI was performed, prior to the implementation of the Interim Remedial Measure (IRM) in 2011:

Soil

In 2004 the drywell of concern and its contents were removed by ATC. A reported six tons of material was disposed. PWGC performed soil borings in the vicinity of the former drywell in October 2007 to address Nassau County Department of Health (NCDH) concerns that the soils adjacent to the former drywell were impacted by improper discharge, despite ATC's remedial effort. At each of four boring locations, the 7.5' to 10' interval was submitted for analysis.

Analytical results of the drywell investigation indicated that detected concentrations of VOCs were within NYSDEC 6 NYCRR Part 375 Commercial Use Cleanup Objectives (SCOs). Analytical data from the 2007 drywell soil investigation are summarized on **Table 1**.

Results of a site investigation conducted by ATC in March 2005 indicated elevated concentrations of semi-volatile organic compounds (SVOCs) and metals in surface soil samples collected from locations surrounding the site's building. The NYSDEC determined that SVOC and/or mercury concentrations at three locations warranted further investigation.

To address surface soil quality at the selected areas, PWGC collected additional surface samples in October 2007 from these locations.

Detected concentrations of mercury were well within Commercial Use SCOs.

Surface soil sampling analytical data indicated concentrations of the SVOC benzo(a)pyrene above Commercial Use SCOs in 2 of the 12 samples collected from the asphalt-paved area to the north of the building, and in the grass area to the east of the building. The site soils are comprised of dredged material from Milburn Creek (the surrounding waterway). The SVOCs detected in these soils may be traced to biological decay inherent in stream beds, and/or diesel fuel from boat traffic in the waterway.

The surface soils at the site are either capped with asphalt pavement, or stabilized with grass. There are no unstabilized surface soils observed at the subject site. Based on this, the risk of airborne exposure to the SVOCs appears to be low.

The grass areas of the site are not regularly utilized by facility customers or employees, as regular access to the building is through paved areas. Furthermore, access to the site is restricted to employees and customers with fencing and a gate. Based on this, exposures from soil contact is limited.

Site-Related Groundwater

The last round of groundwater sampling prior to the implementation of the IRM was performed in October 2010. Four samples were collected from monitoring wells MW-3, MW-4, MW-5, and MW-6. These results are indicated on **Table 2**. The monitoring wells are indicated on **Figure 2**.

The most elevated concentrations were detected in MW-5, located adjacent to the former drywell of concern, with a 1,1,1-TCA concentration of 14.7 µg/L, a 1,1-DCA concentration of 1,270 µg/L, and a chloroethane concentration of 701 µg/L.

VOCs were not detected in MW-6, located south of the former drywell of concern.

VOCs were also not detected in MW-4, located north of the area of concern. Historical results indicate that MW-4 has remained consistently outside the impacted area.

MW-3 is located in the southern portion of the property. Significant VOC concentrations included 1,1-DCA at 7.08 µg/L and chloroethane at 139 µg/L. The parent compound, 1,1,1-TCA, was not detected in MW-3 indicating a process of natural attenuation at this location away from the former drywell of concern.

Monitoring wells MW-1 and MW-2 were last sampled in April 2008. VOCs have not been detected in these two wells, indicating that the locations are outside the impacted area. Accordingly, these wells have not been included in subsequent sampling rounds.

Site-Related Soil Vapor Intrusion

In February 2007, PWGC performed a sampling of the sub-slab vapor and indoor air at the subject building. The work was performed pursuant to the requirements of the NYSDEC, as detailed in the NYSDEC-approved "Sub-Slab Vapor and Indoor Air Sampling Plan," which was previously submitted under separate cover by PWGC in

October 2006. The sampling was performed in accordance with the New York State Department of Health (NYSDOH) "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," October 2006.

Four sub-slab vapor samples, four corresponding indoor air samples, and one outdoor air samples were collected. The highest concentrations of chlorinated VOCs detected in the sub-slab vapor samples included 1,1,1-TCA at 16 µg/m^3, 1,1-DCA at 13 µg/m^3, PCE at 36 µg/m^3, and TCE at 12 µg/m^3. These VOCs were not detected in the indoor air samples.

Analytical results were evaluated utilizing the Soil Vapor / Indoor Air Matrices contained in the NYSDOH Vapor Intrusion Guidance document. The recommendation derived from the matrices, given the analytical results, was no further action.

1.4 SUMMARY OF REMEDIAL ACTIONS

The site was remediated in accordance with the NYSDEC-approved *Interim Remedial Measure Work Plan* dated August 2011 and *Remedial Action Work Plan* dated September 2014.

The following is a summary of the Remedial Actions performed at the site:

1.4.1 Removal of Contaminated Materials from the Site

1. Excavation of soil and in-situ chemical reduction (ISCR): As part of the IRM, soils in the area of the former drywell of concern which were apparently impacting groundwater, were excavated and transported off-site for disposal. Approximately 42 tons of soil were removed to a depth of approximately eight feet bgs. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) for commercial use was brought in to complete the backfilling of the excavation. As part of this IRM, ISCR was implemented to treat contaminants in groundwater. Prior to backfilling the excavation, Hydrogen Release Compound (HRC®) was applied in the excavation to reduce the residual VOCs in the groundwater. The excavation work and the application of HRC® have been effective in reducing groundwater contamination in the area of the former drywell. In 2004 the drywell of concern and its contents were removed by ATC. A reported six tons of material was disposed. The removal of the drywell structure was confirmed during the 2011 IRM excavation;

2. Execution and recording of Declaration of Covenants and Restrictions to restrict land use and prevent future exposure to any contamination remaining at the site. Elements of the Declaration of Covenants and Restrictions include a requirement of the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional controls and a restriction on groundwater use for potable or process water without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health (NCDH);
3. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Declaration of Covenants and Restrictions, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

Remedial activities were completed at the site in September 2014 upon approval of the RAWP.

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs) and applicable land use (Commercial) for this site is included in **Table 3**.

A figure showing areas where excavation was performed is shown in **Figure 3**.

1.4.2 Remaining Contamination

Following the completion of the IRM excavation, confirmatory endpoint samples were collected from the sidewalls and bottom. Analytical results of these samples indicated residual concentrations of VOCs well within Commercial Use SCOs. The endpoint sampling locations are indicated on **Figure 3**. Endpoint sampling data is summarized on **Table 3**.

Results of a site investigation conducted by ATC in March 2005 indicated elevated concentrations of semi-volatile organic compounds (SVOCs) and metals in surface soil samples collected from locations surrounding the site's building. The NYSDEC determined that SVOC and/or mercury concentrations at three locations warranted further investigation.

To address surface soil quality at the selected areas, PWGC collected additional surface samples in October 2007 from these locations. These locations are indicated on **Figure 4**. Analytical Results are summarized on **Table 4**.

Detected concentrations of mercury were well within Commercial Use SCOs.

Surface soil sampling analytical data indicated concentrations of the SVOC benzo(a)pyrene above the Commercial Use SCO in 2 of the 12 samples collected from the asphalt-paved area to the north of the building, and in the grass area to the east of the building. The site soils are comprised of dredged material from Milburn Creek (the surrounding waterway). The SVOCs detected in these soils may be traced to biological decay inherent in stream beds, and/or diesel fuel from boat traffic in the waterway.

The surface soils at the site are either capped with asphalt pavement, or stabilized with grass. There are no unstabilized surface soils observed at the subject site. Based on this, the risk of airborne exposure to the SVOCs appears to be low.

The most recent round of groundwater sampling was conducted at the site in July 2013. Samples were collected from four groundwater monitoring wells. The analytical results indicated residual VOC concentrations above NYSDEC Groundwater Standards in monitoring wells MW-3, MW-5, and MW-6A. VOCs were not detected in MW-4, located to the north of the area of concern. Monitoring well locations are indicated on **Figure 2**. Residual VOCs are located in the shallow groundwater in the area of the former drywell of concern and at the southern area of the site in the area of MW-3. The water table in these areas of residual groundwater impact is between two and five feet bgs. The July 2013 groundwater sampling results are indicated on **Table 2** and **Figure 5**.

1.4.3 Contingency Action

The levels of contamination at the subject site have substantially decreased through remediation and natural attenuation. The primary components of the residual contamination are the daughter compounds of the VOCs previously utilized on site. As such, further remediation of the residual contamination is not warranted. However, in the event of a substantial and sustained increase in the chlorinated VOC concentrations above threshold criteria, chemical injection treatment has been selected as a contingency action to remediate the groundwater.

The criteria for implementation of the contingency in the area of MW-3, where the highest total VOC concentration has been detected (5,700 µg/L in July 2013), will be a total VOC concentration of greater than 5,700 µg/L for two consecutive sampling events.

The criteria for implementation of the contingency at each of the other monitoring well locations will be a total VOC increase of greater than 2,000 µg/L above the total

VOC concentrations detected in the July 2013 sampling event, for two consecutive sampling events.

It is anticipated that chemical injection treatment would include the injection of Hydrogen Release Compound (HRC®) through temporary wells installed in the area of the impacted monitoring well utilizing a Geoprobe® direct-push apparatus. HRC® was previously utilized as part of the site's IRM in the contaminant source area (the area of the former drywell). Post-IRM analytical results indicate the success of the HRC® application.

HRC® is an electron donor material that, when hydrated, produces lactic acid. The lactic acid is made available for fermentation by microbes that generate hydrogen. The hydrogen degrades the 1,1,1-TCA, 1,1-DCA, and chloroethane to ethane through a process of reductive dechlorination. HRC® can produce lactic acid up to 24 months after its application.

The HRC® would arrive at the site as a viscous liquid contained in 30-pound buckets. Regenesis®, the manufacturer of HRC®, would perform an evaluation of site subsurface conditions prior to the implementation of the contingency action, if applicable, to determine an appropriate amount of HRC® to reduce VOC concentrations in the area of concern to within Groundwater Standards.

Post-injection groundwater monitoring would include the collection of groundwater samples from monitoring wells in the area of concern. The first round of post-injection sampling would occur three months after the injection treatment.

Upon receipt of analytical results, PWGC will prepare a groundwater monitoring report which will present the monitoring results and the laboratory data with appropriate figures and tables. The data will be compared to pre-injection results to determine the effectiveness of the treatment, and to determine if additional treatment is warranted. The groundwater monitoring report will be submitted for NYSDEC review and approval.

2.0 INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

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

2.1.2 Purpose

This plan provides:

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

2.2 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the Decision Document to: (1) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (2) limit the use and development of the site to commercial uses only. Adherence to these Institutional Controls on the site is required

by the Declaration of Covenants and Restrictions and will be implemented under this SMP. These Institutional Controls are:

- Compliance with the Declaration of Covenants and Restrictions and this SMP by the Grantor and the Grantor's successors and assigns;
- Groundwater monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

Institutional Controls identified in the Declaration of Covenants and Restrictions may not be discontinued without an amendment to or extinguishment of the Declaration of Covenants and Restrictions.

The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Declaration of Covenants and Restrictions. Site restrictions that apply to the Controlled Property are:

- The property may only be used for commercial use provided that the long-term Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted or restricted residential use without amendment of the Declaration of Covenants and Restrictions, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health;
- The potential for vapor intrusion must be evaluated for any buildings developed on the subject site, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has

occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted every eighteen months, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.2.1 Excavation Work Plan

The site has been remediated for commercial use. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover will be performed in compliance with the Excavation Work Plan (EWP) that is attached as **Appendix A** to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A HASP and CAMP are attached as **Appendix C** to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.2.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been

identified, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.3 INSPECTIONS AND NOTIFICATIONS

2.3.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted every 18 months, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Compliance with requirements of this SMP and the Declaration of Covenants and Restrictions;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster, occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the ICs (i.e., monitoring wells) implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.3.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Voluntary Cleanup Agreement (VCA), 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the groundwater monitoring system that reduces or has the potential to reduce the effectiveness of the system 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 groundwater monitoring system 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 shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the groundwater monitoring system.

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 has been provided with a copy of the Voluntary Cleanup Agreement (VCA), 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.

2.4 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. Personnel involved in on-site operations related to environmental monitoring and maintenance must be trained in the proper use of the equipment utilized and must be familiar with and adhere to the protocols specified in the HASP. In the event of an emergency, site personnel are to contact the appropriate emergency services.

2.4.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to PWGC. These emergency contact lists must be maintained in an easily accessible location at the site.

Table 4: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 5: Contact Numbers

PWGC	(631) 589-6353

* Note: Contact numbers subject to change and should be updated as necessary

2.4.2 Map and Directions to Nearest Health Facility

Site Location: 1170 Atlantic Avenue, Baldwin, New York

Nearest Hospital Name: South Nassau Communities Hospital

Hospital Location: 1 Healthy Way, Oceanside, New York

Hospital Telephone: (516) 632-3000

Directions to the Hospital:

1. Left on Atlantic Avenue; proceed 0.1 mile
2. Right on Eastern Blvd.; proceed 0.1 mile
3. Proceed straight on to Fox Rd.; proceed 0.4 mile
4. Left on Field Pl.; proceed 0.2 mile
5. Right on Milburn Ave.; proceed 0.2 mile
6. Left on Clinton Pl.; proceed 0.3 mile
7. Right on Harrison Ave.; proceed 0.2 mile
8. Left on Merrick Rd.; proceed 1.6 miles
9. Left on Oceanside Rd.; proceed 0.2 mile to destination

Total Distance: 3.3 miles

Total Estimated Time: 10 minutes

Map Showing Route from the site to the Hospital: See Figure 6

2.4.3 Response Procedures

As appropriate, the fire department and other emergency response groups will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (**Table 5**). The list will also be posted prominently at the site and made readily available to all personnel at all times.

The potential exists for spills of chemical oxidants during injection events. Such spills will be immediately recovered by injection personnel following procedures and utilizing equipment specified by the manufacturer of the chemical oxidant. Injection personnel will be trained on such procedures and on the use of such equipment prior to the implementation of the injection event.

If a condition exists at the Site which requires evacuation (i.e. fire), the site will be immediately evacuated and emergency services will be contacted by telephone.

Proposed amendments to the contingency plan will be submitted to the NYSDEC for approval prior to implementation.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site and all affected site media identified below. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of groundwater;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria;
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for monitoring activities.

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

- Sampling locations, protocol, and frequency;
- Information on the monitoring system (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- 18-Month inspection and periodic certification.

Monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted on an 18-month basis. The monitoring frequency

may be amended based on contaminant trends and is subject to the approval of NYSDEC. Trends in contaminant levels in groundwater in the affected area will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in **Table 7** and outlined in detail in Sections 3.2 and 3.3 below.

Table 7: Monitoring/Inspection Schedule

Monitoring Program	**Frequency***	**Matrix**	**Analysis**
Groundwater Monitoring Wells	18 months	Groundwater	VOCs by USEPA Method 8260

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 MEDIA MONITORING PROGRAM

3.2.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy.

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

Four monitoring wells (MW-3, MW-4, MW-5, and MW-6A) are utilized at the Site to monitor the area of residual groundwater contamination. Monitoring well locations are indicated on **Figure 2**. The wells are screened at the water table. MW-6A is at the location of the former drywell of concern, and monitors groundwater quality in the former source area. MW-5 is located adjacent to the former source area and adjacent to the bulkhead. MW-3 is located at the southern end of the property, and monitors groundwater quality at the southern extent. MW-4 is located to the north of the area of the former drywell of concern, and will be monitored to confirm that residual impact is not migrating toward the north.

Each of the monitoring wells will be sampled on an 18-month basis for the presence of VOCs by USEPA Method 8260. The sampling frequency may be modified with the approval of NYSDEC.

Each of the monitoring wells is constructed of PVC, closed with a fitted j-plug, and protected with flush-mounted road boxes. Monitoring well construction logs are included as **Appendix D**.

The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

3.2.1.1 Sampling Protocol

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

The monitoring wells will be sampled by a low stress (low flow) method to collect representative samples while producing a minimal amount of purge water. Sampling will be performed with dedicated instruments to prevent cross-contamination between well locations. Purging of each well will continue until the turbidity is less than or equal to 50 Nephelometric Turbidity Units (NTUs), and when pH, temperature, and conductivity measurements stabilize. Stabilization will be considered achieved when three consecutive readings within five percent of each other are collected in five minutes. Portable field instruments will be used to collect measurements. If turbidity cannot be reduced to 50 NTUs, but other parameters stabilize, the well will be considered properly evacuated. Samples will be collected directly from the polyethylene tubing into laboratory-supplied glassware upon stabilization of field parameters.

During the sampling event, depth to bottom and depth to water measurements will be collected at each monitoring well. Water level measurements will be obtained with an electronic water level probe relative to the marked measuring point. Measurements will be recorded in a dedicated bound project field notebook along with the time collected. Measuring equipment will be decontaminated between wells using a laboratory-grade detergent and water solution and tap water rinse.

Collected groundwater samples will be placed in laboratory supplied glassware and stored in a cooler packed with ice for transport to the laboratory. Sample analysis will be provided by an NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified environmental laboratory and will consist of VOCs by EPA Method 8260B in accordance with NYSDEC Analytical Sampling Protocol with Category-B deliverables (ASP-B) and third party data validation. The QA/QC program will include the preparation and analysis of field and laboratory QA/QC samples such as trip blanks and matrix spike duplicates.

3.2.1.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), 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 monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once every 18 months. Site-wide inspections will also be performed after all severe weather conditions that may affect the monitoring system. During these inspections, an inspection form will be completed (**Appendix F**). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- 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;

- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirmation that site records are up to date.

3.4 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (**Appendix G**). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.5 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file on-site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., groundwater, sub-slab vapor, indoor air, outdoor air, etc.);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in **Table 8** below.

Table 8: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater Monitoring Report	18 Months

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

4.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

4.1 SITE INSPECTIONS

4.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan of this SMP. At a minimum, a site-wide inspection will be conducted every eighteen months. Inspections of monitoring components will also be conducted when a breakdown of any system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the system.

4.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections will be recorded on the site-wide inspection form (see **Appendix F**). The form is subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

4.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the IC certification to confirm that the:

- ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP.

4.2 CERTIFICATION OF INSTITUTIONAL CONTROLS

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

- The institutional 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 Declaration of Covenants and Restrictions.
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] [and I have been authorized and designated by all site owners to sign this certification] for the site.
- No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and

  Every five years the following certification will be added:

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

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

4.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every eighteen months, beginning fifteen months after the Certificate of Completion is issued. In the event that the site is subdivided into separate parcels with different ownership, a single

Periodic Review Report will be prepared that addresses the site described in the Metes and Bounds included in **Appendix B**. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

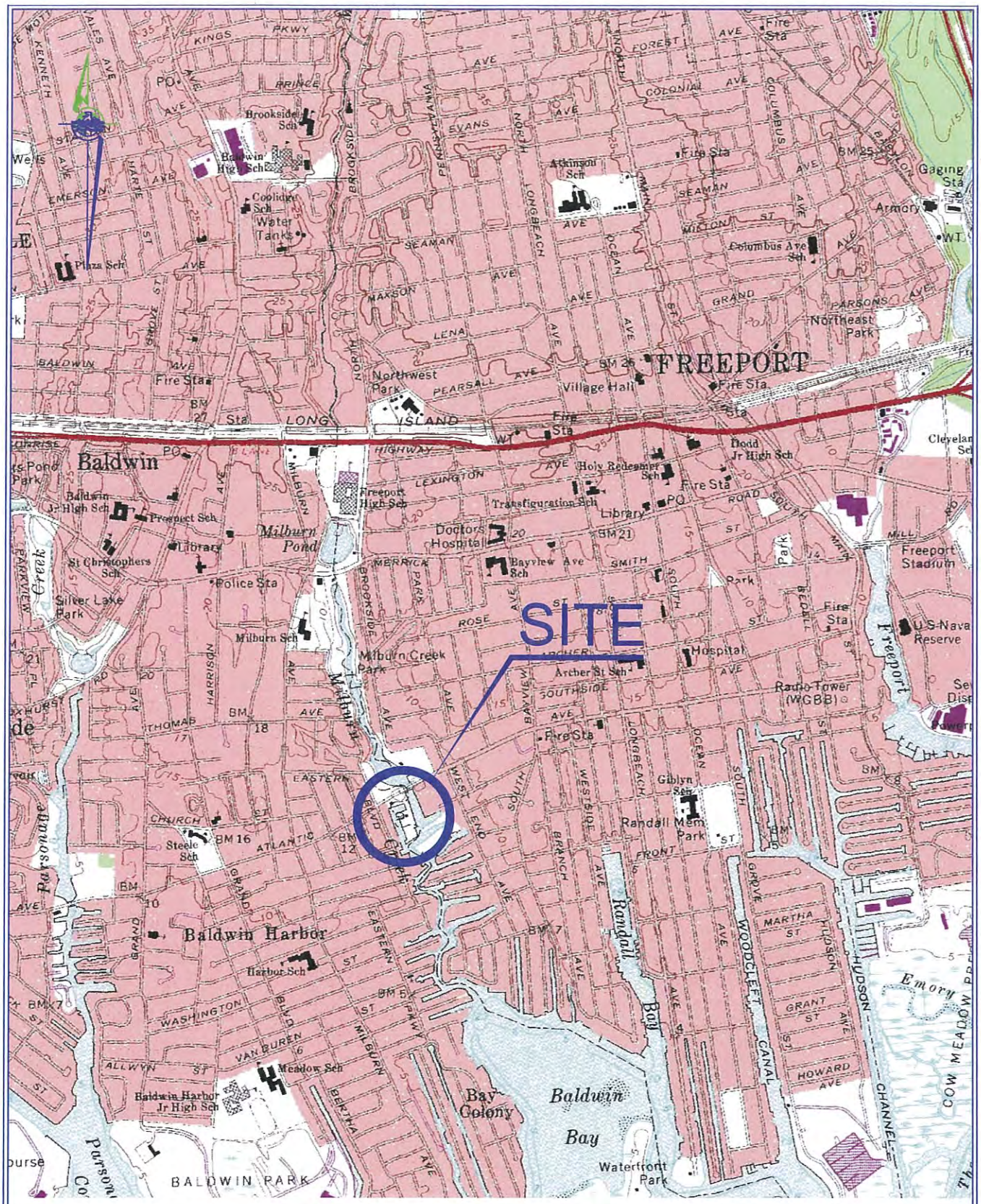
- Identification, assessment and certification of all ICs required by the remedy for the site;
- Results of the required site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- 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), 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, submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific RAWP and Decision Document;
    - The operation and the effectiveness of the monitoring system, 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 Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.

The Periodic Review Report 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.

4.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional control, a corrective measures 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 plan until it is approved by the NYSDEC.

FIGURES



Mapped, edited, and published by the Geological Survey
Revised in cooperation with New York
Department of Transportation
Control by USGS, USC&GS, and New Jersey Geodetic Survey

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VICINITY MAP

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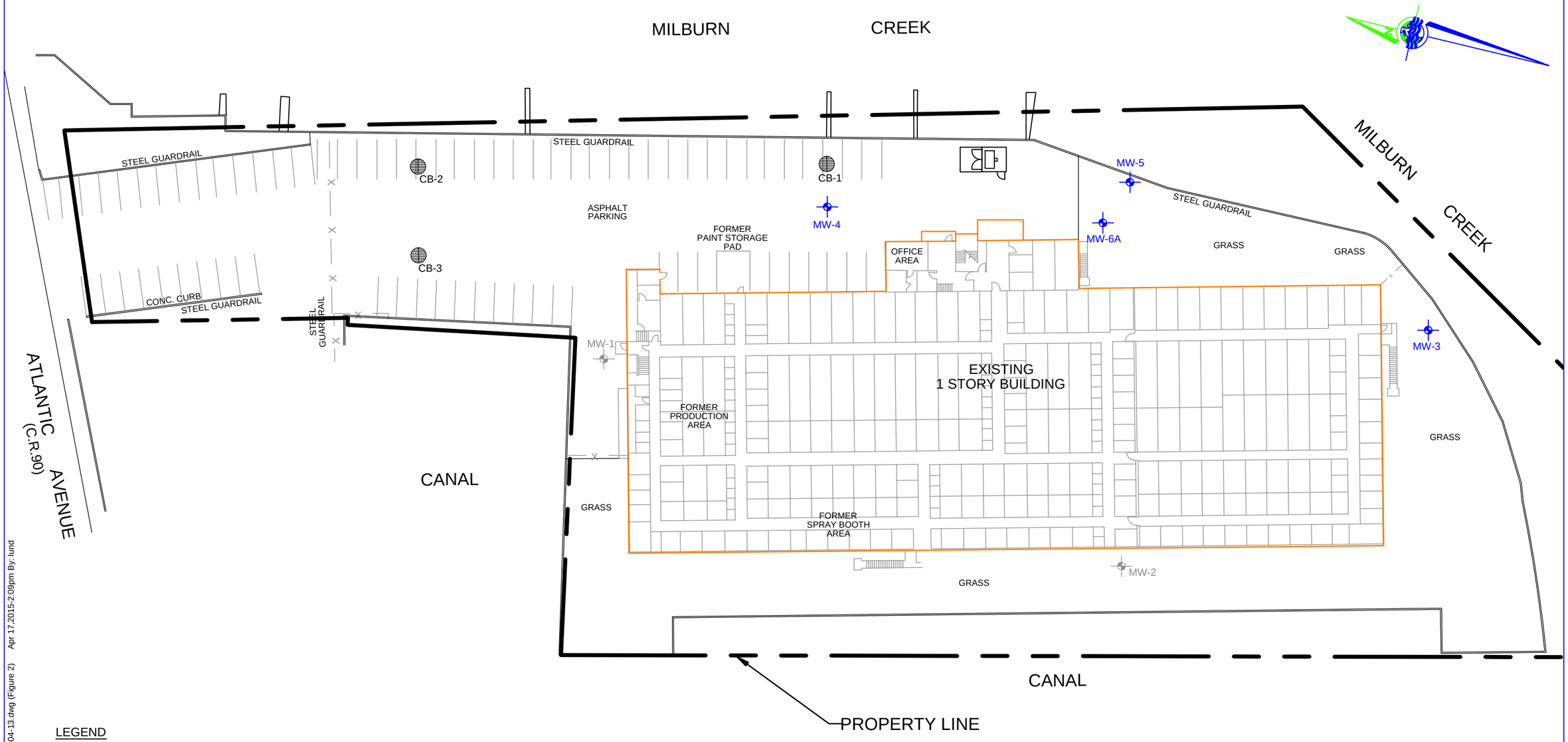
1170 ATLANTIC AVENUE
BALDWIN, NY 11510

Project	SSS0601
Designed by	JPR
Approved by	PWG
Drawn by	LLG
Figure No.	1
Date	10/05/06



LEGEND

- MONITORING WELL
- MONITORING WELL (NOT IN USE)
- CATCH BASIN
- CHAIN LINK FENCE
- STORAGE UNIT

BASEMAP PROVIDED BY:
ATC ASSOCIATES INC.
ENVIRONMENTAL, GEOTECHNICAL AND
MATERIALS PROFESSIONALS
104 E.25th ST. 10th FLOOR
NEW YORK, NY 10010

0 40 80
SCALE: 1" = 40'

SITE PLAN
1170 ATLANTIC AVENUE
BALDWIN, NY 11510

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Project: SSS1101	Designed By: JE	Figure No: 2
CADD Operator: DCS	Approved By: PWG	Date: 11/4/13

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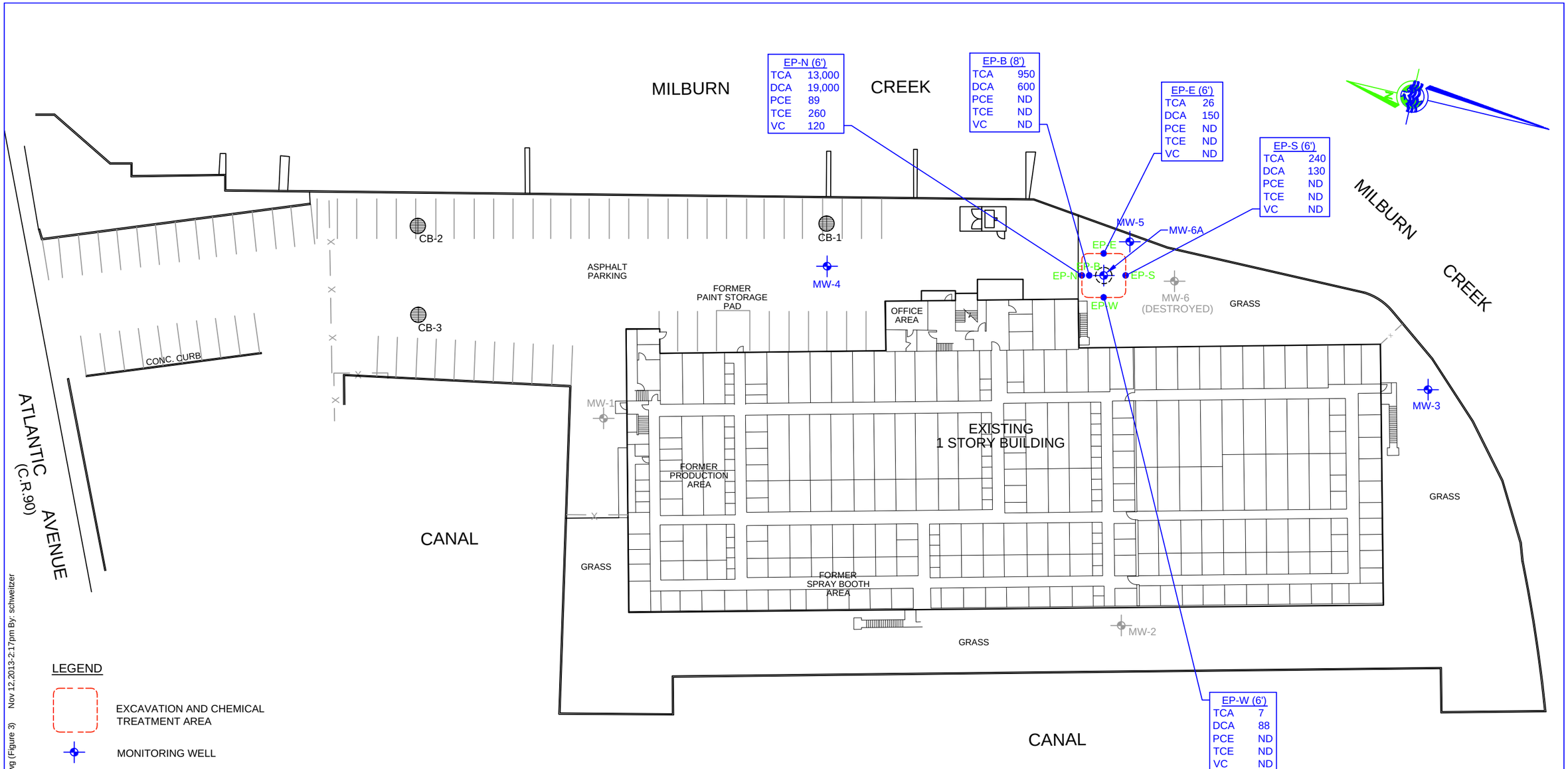

LEGEND

- EXCAVATION AND CHEMICAL TREATMENT AREA
- MONITORING WELL
- MONITORING WELL (NOT IN USE)
- FORMER LOCATION OF DRYWELL OF CONCERN
- CATCH BASIN
- CHAIN LINK FENCE
- STORAGE UNIT
- EP-N ENDPOINT SAMPLE LOCATION

Data Units = µg/kg
TCA = 1,1,1-Trichloroethane
DCA = 1,1-Dichloroethane
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

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NEW YORK, NY 10010

0 40 80
SCALE: 1" = 40'

IRM SOIL ENDPOINT RESULTS
1170 ATLANTIC AVENUE
BALDWIN, NY 11510

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Project:	Designed By:	Figure No:
SSS1101	JE	3
CADD Operator: DCS	Approved By: PWG	Date: 11/01/2013

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MILBURN CREEK

MILBURN CREEK

STEEL GUARDRAIL

STEEL GUARDRAIL

CB-2

CB-1

MW-4

ASPHALT PARKING

SS-12
SS-13
SS-11
SS-14

MW-5

GP-1
GP-2A
GP-2
GP-4
GP-3

STEEL GUARDRAIL

MW-6
SS-16
SS-17
SS-15
SS-18

GRASS

GRASS

OFFICE AREA

CB-3

CONC. CURB
STEEL GUARDRAIL

STEEL GUARDRAIL

MW-1

SS-10
SS-9
SS-8
SS-7

EXISTING
1 STORY BUILDING

MW-3

GRASS

ATLANTIC AVENUE
(C.R.90)

CANAL

GRASS

FORMER
GASOLINE UST AREA

GRASS

MW-2

CANAL

LEGEND

- SURFACE SOIL SAMPLE LOCATION
- MONITORING WELL
- SOIL BORING LOCATION
- DRY WELL OF CONCERN
- CATCH BASIN
- CHAIN LINK FENCE
- STORAGE UNIT

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40 0 40 80

SCALE: 1"=40'

SITE PLAN
1170 ATLANTIC AVENUE
BALDWIN, NY 11510

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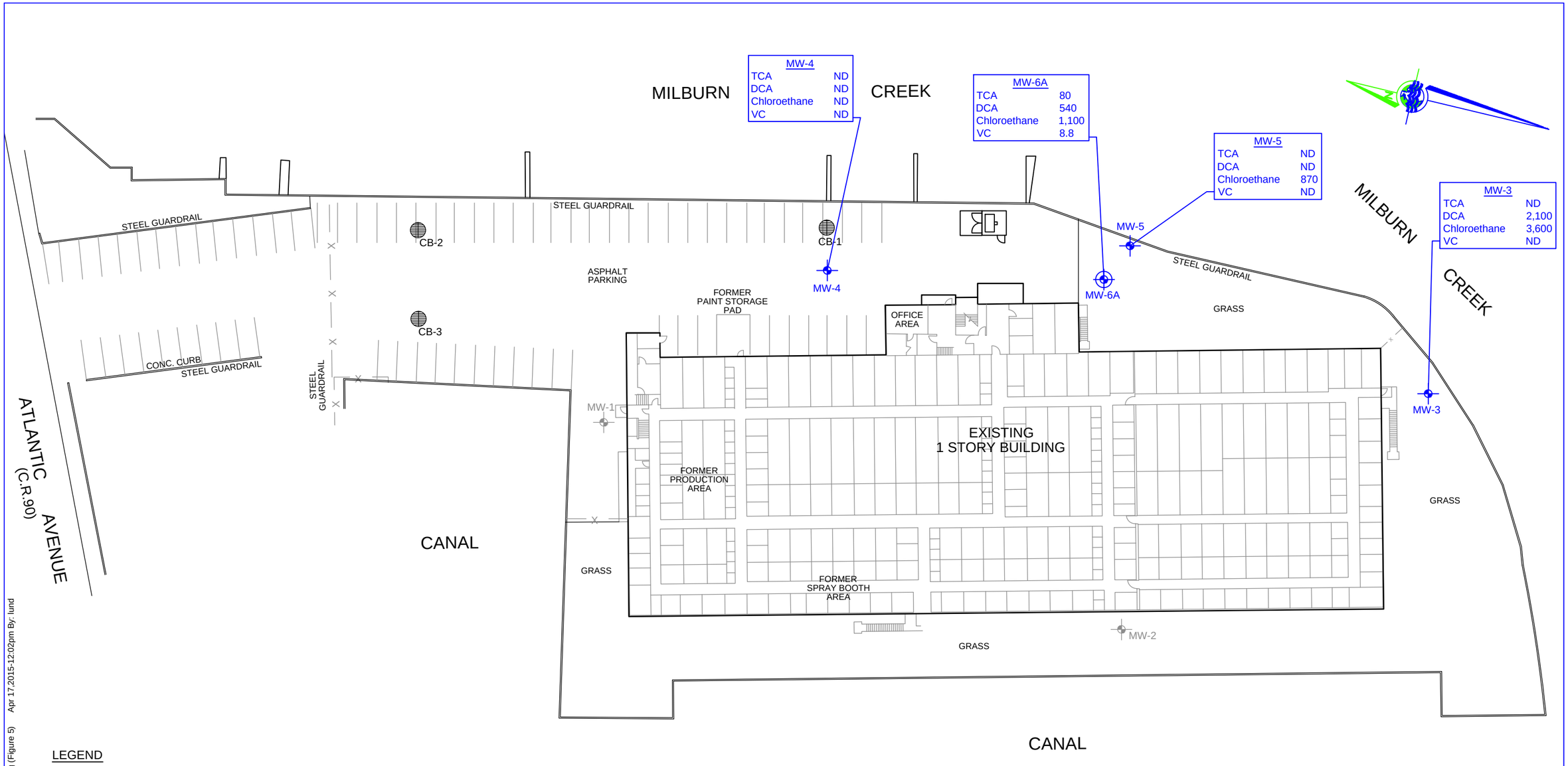
Project:	Designed By:	Figure No:
SSS0601	JPR	4
CADD Operator:	Approved By:	Date:
LLG	PWG	5/16/08



LEGEND

- EXISTING MONITORING WELL
- MONITORING WELL (NOT IN USE)
- DRYWELL OF CONCERN
- CATCH BASIN
- CHAIN LINK FENCE
- STORAGE UNIT

Data Units = µg/L
TCA = 1,1,1-Trichloroethane
DCA = 1,1-Dichloroethane
VC = Vinyl Chloride

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0 40 80
SCALE: 1" = 40'

MONITORING WELL RESULTS
JULY 2013
1170 ATLANTIC AVENUE
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Project: SSS1101	Designed By: JE	Figure No: 5
CADD Operator: DCS	Approved By: PWG	Date: 11/1/13

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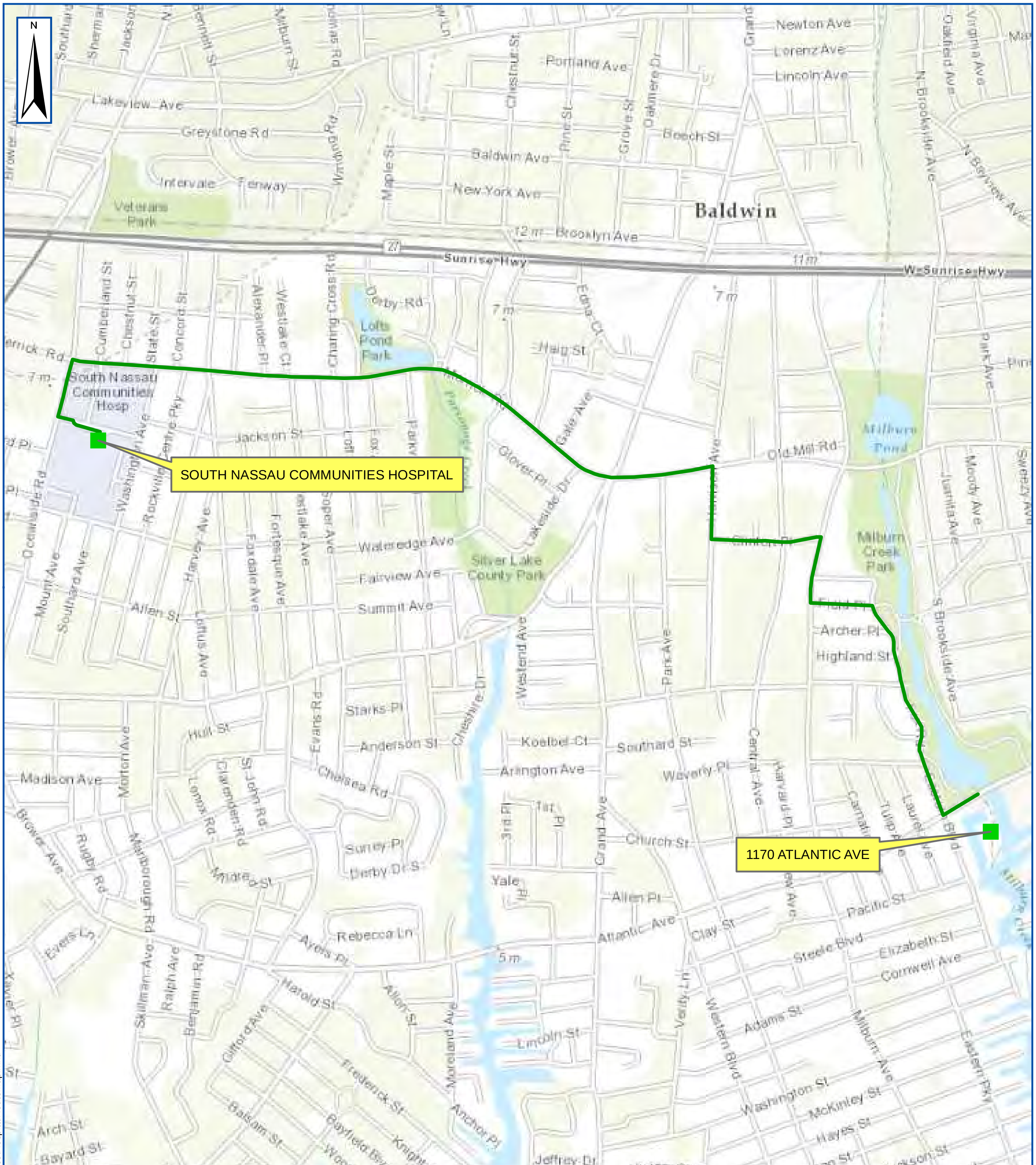

HOSPITAL ROUTE MAP

1170 ATLANTIC AVE
BALDWIN, NY

0 ¼ ½ ¾ 1 Miles

Project:	SSS1101
Date:	4/17/2015
Designed by:	JE
Drawn by:	JCG
Approved by:	JE
Figure No:	6

PWGC
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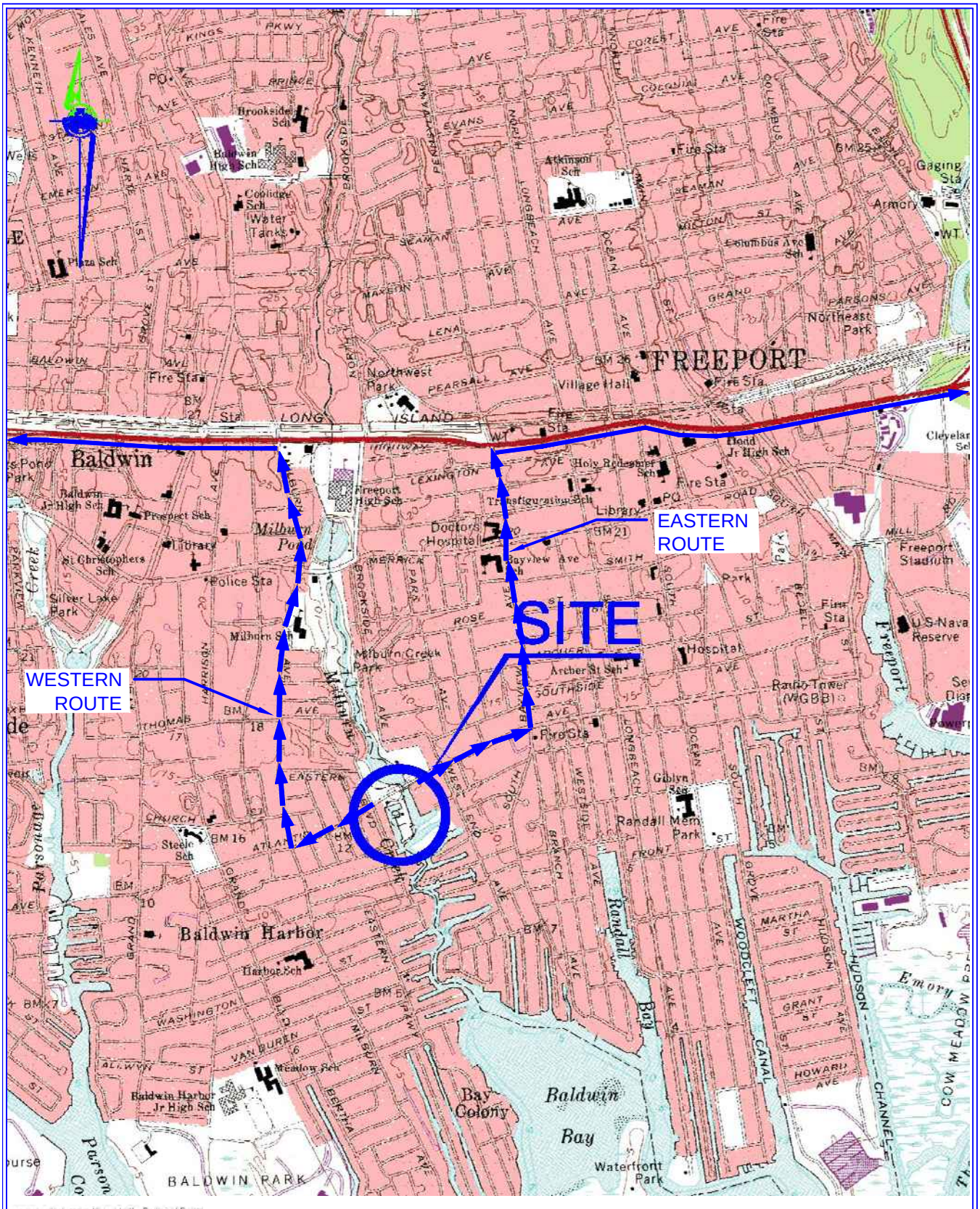

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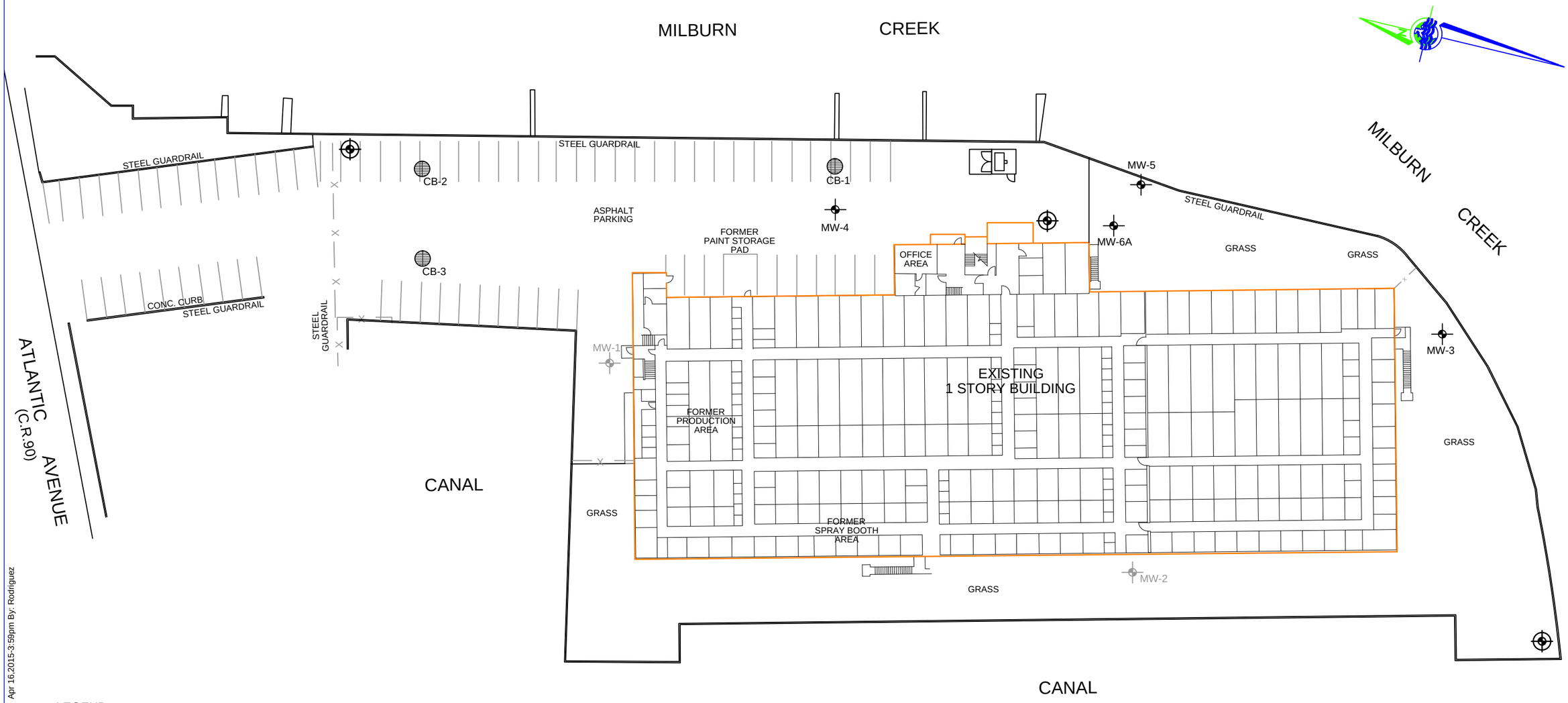
TRUCK ROUTE MAP
1170 ATLANTIC AVENUE, BALDWIN

Project: SSS1101	Figure No: 7
Designed by: PR	
Approved by: JE	
Drawn by: PR	Date: 4/17/15



LEGEND

- AIR MONITORING LOCATION
- MONITORING WELL
- MONITORING WELL (NOT IN USE)
- CATCH BASIN
- CHAIN LINK FENCE
- STORAGE UNIT

PREVAILING WIND DIRECTION

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0 40 80
SCALE: 1" = 40'

CAMP MONITORING LOCATIONS
1170 ATLANTIC AVENUE
BALDWIN, NY 11510

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Project:	Designed By:	Figure No:
SSS1101	JE	8
CADD Operator: DCS	Approved By: PWG	Date: 1/28/15

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TABLES

TABLE 1
SOIL ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS
EPA METHOD 8260B

1170 Atlantic Avenue - Baldwin, New York

Compound	NYSDEC Part 375 Commercial (1)	GP-1 (7.5' - 10')		GP-2A (7.5' - 10')		GP-3 (7.5' - 10')		GP-4 (7.5' - 10')	
Volatile Organic Compounds by 8260B - µg/Kg									
1,1,1-Trichloroethane	500,000	5	U	5.1	U	110	U	9.8	U
1,1,2,2-Tetrachloroethane	NS	5	U	5.1	U	110	U	9.8	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	NS	100	U	100	U	2,200	U	200	U
1,1-Dichloroethane	240,000	970		7.6	U	10,000		1,800	
1,1-Dichloroethene	500,000	5	U	5.1	U	110	U	9.8	U
1,2,3-Trichloropropane	NS	50	U	51	U	1,100	U	98	U
1,2,4-Trichlorobenzene	NS	25	U	26	U	560	U	49	U
1,2,4-Trimethylbenzene	NS	25	U	26	U	560	U	49	U
1,2-Dichlorobenzene	500,000	25	U	26	U	560	U	49	U
1,2-Dichloroethane	30,000	5	U	5.1	U	110	U	10	U
1,3,5-Trimethylbenzene	NS	25	U	26	U	560	U	49	U
1,3-Dichlorobenzene	280,000	25	U	26	U	560	U	49	U
1,3-Dichloropropane	NS	25	U	26	U	560	U	49	U
1,4-Dichlorobenzene	130,000	25	U	26	U	560	U	49	U
2-Butanone	500,000	50	U	51	U	1,100	U	98	U
4-Methyl-2-pentanone	NS	50	U	51	U	1,100	U	98	U
Acetone	500,000	50	U	190		1,100	U	220	
Benzene	44,000	5	U	5.1	U	110	U	10	U
Carbon disulfide	NS	50	U	61		1,100	U	98	U
Carbon tetrachloride	22,000	5	U	5.1	U	110	U	10	U
Chlorobenzene	500,000	5	U	5.1	U	110	U	10	U
Chloroethane	NS	410		10	U	5,200		440	
Chloroform	350,000	8	U	7.6	U	170	U	15	U
Dibromochloromethane	NS	5	U	5.1	U	110	U	9.8	U
Ethylbenzene	390,000	5	U	5.1	U	110	U	9.8	U
Isopropylbenzene	NS	5	U	5.1	U	110	U	9.8	U
Methyl tert butyl ether	500,000	10	U	10	U	220	U	20	U
Methylene chloride	500,000	50	U	51	U	1,100	U	98	U
n-Butylbenzene	500,000	5	U	5.1	U	110	U	9.8	U
n-Propylbenzene	500,000	5	U	5.1	U	110	U	9.8	U
Naphthalene	NS	25	U	26	U	560	U	49	U
o-Xylene	500,000	10	U	10	U	220	U	20	U
p-Isopropyltoluene	NS	5	U	5.1	U	110	U	9.8	U
p/m-Xylene	500,000	10	U	10	U	220	U	20	U
sec-Butylbenzene	500,000	5	U	5.1	U	110	U	9.8	U
tert-Butylbenzene	500,000	25	U	26	U	560	U	49	U
Tetrachloroethene	150,000	5	U	5.1	U	110	U	9.8	U
Toluene	500,000	8	U	7.6	U	730		15	U
trans-1,2-Dichloroethene	500,000	8	U	7.6	U	170	U	15	U
Trichloroethene	200,000	5	U	5.1	U	110	U	9.8	U
Vinyl chloride	13,000	10	U	10	U	220	U	20	U

Notes:
(1) NYSDEC 6 NYCRR Environmental Remediation Program Part 375 Commercial Soil Cleanup Objectives
NS - Not Specified
U - Analyte not detected
Highlighted - indicated exceedance of the NYSDEC Part 375 Commercial Cleanup Objective

TABLE 2
HISTORICAL GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS
EPA METHOD 8260

1170 Atlantic Avenue - Baldwin, New York

Compound	NYSDEC	MW-1	MW-2	MW-3							MW-4						
	Standards	4/9/08	4/9/08	4/9/08	7/20/10	10/25/10	5/30/12	8/29/12	12/3/12	7/12/13	4/9/08	7/20/10	10/25/10	5/30/12	8/29/12	12/3/12	7/12/13
VOCs by 8260 - ug/L																	
1112Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
111 Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1122Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
112 Trichloro-122 trifluoroe	5	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
112 Trichloroethane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 Dichloroethane	4	ND	ND	**680**	**43.9**	**7.08**	**2300**	**460**	**180**	**2100**	2.3	ND	ND	ND	ND	ND	ND
1,1 Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
123-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
123-Trichloropropane	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1245 Tetramethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
124-Trichlorobenzene (v)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
124-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12 Dibromo 3 chloropropan	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dibromoethane	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77 J	ND	ND	ND
1,2 Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND
1,2 Dichloropropane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
135-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	NS	ND	ND	ND	ND	ND	ND	28 J	ND	68 J	ND	ND	ND	ND	ND	1.3 J	ND
2-Chloroethyl vinyl ether	NS	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
2-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
2-Hexanone	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
4-Isopropyltoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
4-Methyl-2-pentanone	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50*	ND	ND	ND	ND	ND	22 J	37 J	ND	ND	ND	ND	ND	3.0 J	3.6 J	14	ND
Acrylonitrile	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	60***	ND	ND	ND	ND	ND	ND	31 J	ND	ND	ND	ND	ND	ND	1.4 J	ND	ND
Carbon Tetrachloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	NS	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
Chloroethane	5	ND	ND	ND	**417**	**139**	**2200**	**730**	**2400**	**3600**	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
c-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	20 J	ND	ND	44 J	ND	ND	ND	ND	ND	ND	ND
c-1,3Dichloropropene	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlordifluoromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m + p Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
ter.ButylMethylEther	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.74 J	ND
Methylene Chloride	5	4.5 B	4.1 B	4.6 B	ND	ND	ND	ND	ND	ND	4.3 B	ND	ND	ND	ND	ND	ND
Naphthalene(v)	10*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 J	ND
n-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p Diethylbenzene	NS	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
p-Ethyltoluene	NS	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
sec-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
TAME		ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
t-Butyl alcohol	NS	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
tert-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-1,3Dichloropropene	0.4 [(1)]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	13 J	ND	ND	24 J	ND	ND	ND	ND	ND	ND	ND

Notes:
** - NYSDEC Ambient Water Quality Standards and Guidance Values 6/1998
*** - NYSDEC Ambient Water Quality Standards and Guidance Values, Addendum April 2000
* - Guidance Value
< - Indicates the compound was analyzed but not detected
NS - No Standard
Bold/shaded- Indicated exceedance of the NYSDEC Groundwater Standard
[(1)] Applies to sum of cis and trans 1,3
J - Estimated Value
B - Estimated Value
NA - Not Analyzed

TABLE 2
HISTORICAL GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS
EPA METHOD 8260

1170 Atlantic Avenue - Baldwin, New York

Compound	NYSDEC	MW-5								MW-6			MW-6A			
	Standards	4/9/08	5/7/09	7/20/10	10/25/10	5/30/12	8/29/12	12/3/12	7/12/13	4/9/08	7/20/10	10/25/10	5/30/12	8/29/12	12/3/12	7/12/13
VOCs by 8260 - ug/L																
1112Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
111 Trichloroethane	5	**390**	**250**	2.23	**14.7**	ND	ND	ND	ND	1.1	ND	ND	**87**	**62**	**18**	**80**
1122Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
112 Trichloro-122 trifluoroe	5	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
112 Trichloroethane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 Dichloroethane	4	**1800**	**2100**	**2450**	**1270**	24 J	ND	ND	ND	**6.5**	ND	ND	**500**	**430**	**210**	**540**
1,1 Dichloroethene	5	11	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	ND	1.2 J	ND
1,1-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
123-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
123-Trichloropropane	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1245 Tetramethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
124-Trichlorobenzene (v)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
124-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12 Dibromo 3 chloropropan	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dibromoethane	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichloroethane	0.6	ND	ND	ND	ND	ND	**1.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichloropropane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
135-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4 Dichlorobenzene (v)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	NS	ND	ND	ND	ND	26 J	ND	ND	16 J	ND	ND	ND	ND	31 J	ND	ND
2-Chloroethyl vinyl ether	NS	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
2-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
2-Hexanone	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
4-Isopropyltoluene	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
4-Methyl-2-pentanone	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50*	ND	ND	ND	ND	ND	2.3 J	ND	ND	ND	ND	ND	ND	25 J	ND	ND
Acrylonitrile	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	0.61 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22 J
Bromobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	60***	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane	NS	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
Chloroethane	5	**560**	**970**	**1420**	**701**	**2200**	**2200**	**1700**	**870**	ND	ND	ND	**940**	**580**	**1100**	**1100**
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
c-1,2-Dichloroethene	5	4.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.8 J	ND	ND	ND
c-1,3Dichloropropene	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlordifluoromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m + p Xylene	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
ter.ButylMethylEther	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	4.6 B	7.3 B	ND	ND	ND	ND	ND	ND	3.8 B	<0.39	<0.39	ND	ND	ND	ND
Naphthalene(v)	10*	ND	ND	ND	ND	**80**	2.4 J	ND	ND	ND	ND	ND	**13**	ND	ND	ND
n-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p Diethylbenzene	NS	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
p-Ethyltoluene	NS	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
sec-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA
TAME		ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
t-Butyl alcohol	NS	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	NA
tert-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-1,3Dichloropropene	0.4 (1)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	2.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27 J
Trichlorofluoromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	**31**	**19.6**	ND	ND	ND	ND	ND	ND	ND	ND	**5.4**	8.0 J	3.9 J	**8.8**

Table 3

Analytical Results for IRM Endpoint Soil Samples - Volatile Organic Compounds (EPA Method 8260)

1170 Atlantic Avenue, Baldwin, New York

Client Sample ID: Sample Depth: Laboratory ID: Sampling Date:	Unrestricted Use SCO (2)	Residential SCO(3)	Restricted Residential SCO(3)	Commercial SCO(3)	Industrial SCO(3)	EP-N 6' 10/25/2011	EP-S 6' 10/25/2011	EP-E 6' 10/25/2011	EP-W 6' 10/25/2011	EP-B 8' 10/25/2011
Volatile Organic Compounds - USEPA Method 8260 - ug/kg										
1,1,1-Trichloroethane	680	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	**13000**	240	26	6.6	**950**
1,1,1,2 Tetrachloroethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	NS	35,000	NS	NS	NS	ND	ND	ND	ND	ND
1,1,2 Trichloroethane	NS	NS	NS	NS	NS	8	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,1 Dichloroethane	270	19,000	26,000	240,000	480,000	**19000**	130	150	88	**600**
1,1 Dichloroethene	330	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	**520**	13	ND	ND	58
1,1 Dichloropropene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2,3 Trichlorobenzene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2,3 Trichloropropane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2,4,5 Tetramethylbenzene	NS	NS	NS	NS	NS	8.4J	ND	ND	ND	ND
1,2,4-Trichlorobenzene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2 Dibromo 3 chloropropane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2 Dibromoethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,2 Dichlorobenzene	1,100	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	1.6J	ND	ND	ND	ND
1,2 Dichloroethane	20[c]	2,300	3,100	30,000	60,000	ND	ND	ND	ND	ND
1,2 Dichloropropane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,3 Dichlorobenzene	2,400	17,000	49,000	280,000	560,000	ND	ND	ND	ND	ND
1,3 Dichloropropane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
1,4 Dichlorobenzene	1,800	9,800	13,000	130,000	250,000	ND	ND	ND	ND	ND
1,4 Diethylbenzene	NS	NS	NS	NS	NS	17	ND	ND	ND	ND
2,2 Dichloropropane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
2-Butanone	120	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	47	ND	ND	ND	ND
2-Hexanone	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
4 Ethyltoluene	NS	NS	NS	NS	NS	17	ND	ND	ND	ND
4-Methyl-2-pentanone	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Acetone	50	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	38	ND	ND	ND	ND
Acrylonitrile	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Benzene	60	2,900	4,800	44,000	89,000	ND	ND	ND	ND	ND
Bromobenzene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Bromochloromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Bromodichloromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Bromoform	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Bromomethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Carbon Disulfide	NS	100,000	NS	NS	NS	48	ND	ND	ND	ND
Carbon Tetrachloride	760	1,400	2,400	22,000	44,000	ND	ND	ND	ND	ND
Chlorobenzene	1,100	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	ND	ND	ND	ND	ND
Chloroethane	NS	NS	NS	NS	NS	450J	2.5J	9.7	14	ND
Chloroform	370	10,000	49,000	350,000	700,000	ND	ND	ND	ND	ND
Chloromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
c-1,2-Dichloroethene	250	59,000	100,000[a]	500,000[b]	1,000,000[c]	33	ND	ND	ND	ND
c-1,3-Dichloropropene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Cyclohexane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Dibromochloromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Dibromomethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Dichlordifluoromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Ethyl Benzene	1,000	30,000	41,000	390,000	780,000	12	ND	ND	ND	ND
Ethyl ether	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Hexachlorobutadiene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Isopropylbenzene	NS	100,000	NS	NS	NS	2.4J	ND	ND	ND	ND
m + p Xylene	260	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	46	ND	ND	ND	ND
Methyl Acetate	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
ter.ButylMethylEther	930	62,000	100,000[a]	500,000[b]	1,000,000[c]	ND	ND	ND	ND	ND
Methylcyclohexane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Methylene Chloride	50	51,000	100,000[a]	500,000[b]	1,000,000[c]	8.2J	6.8J	6.2J	ND	ND
n-Butylbenzene	NS	NS	NS	NS	NS	5.9	ND	ND	ND	ND
n Propylbenzene	3,900	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	4.9	ND	ND	ND	ND
o Chlorotoluene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
o Xylene	260	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	18	ND	ND	ND	ND
p Chlorotoluene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
p Isopropyltoluene	NS	NS	NS	NS	NS	2.9J	ND	ND	ND	ND
sec-Butylbenzene	11,000	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	3.6	ND	ND	ND	ND
Styrene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
t-1,3-Dichloropropene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
tert-Butylbenzene	5,900	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	ND	ND	ND	ND	ND
Tetrachloroethene	1,300	5,500	19,000	150,000	300,000	89	ND	ND	ND	ND
Toluene	700	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	150	0.84J	ND	ND	ND
t-1,2-Dichloroethene	190	100,000[a]	100,000[a]	500,000[b]	1,000,000[c]	ND	ND	ND	ND	ND
t 1,4 Dichloro 2 butene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Trichloroethene	47	10,000	21,000	200,000	400,000	**260**	2.4J	ND	ND	ND
Trichlorofluoromethane	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Vinyl Acetate	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Vinyl Chloride	20	210	900	13,000	27,000	**120**	ND	ND	ND	ND
1,3,5-trimethylbenzene	8400	47000	52000	190000	380000	8.5J	ND	ND	ND	ND
1,2,4-trimethylbenzene	3600	47000	52000	190000	380000	28	ND	ND	ND	ND
Naphthalene	NS	NS	NS	NS	NS	71	4.1J	49	15	350
1,2,4,5-Trimethylbenzene	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
Methylisobutylketone	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND

Notes:

NS - Not Specified

MDL - Method Detection Limit

(1) NYSDEC Recommended Soil Cleanup Objectives (RSCO), Technical and Administrative Guidance Memorandum (TAGM) #4046, 12/00

(2) NYSDEC 6 NYCRR Environmental Remediation Programs Part 375 Unrestriced Use of Soil Cleanup Objective Table 375-6.8a 12/06

(3) NYSDEC 6 NYCRR Environmental Remediation Programs Part 375 Restriced Use of Soil Cleanup Objective Table 375-6.8b 12/06

a - The SCO for residential, restricted residential and ecological resources use were capped at a maximum value of 100 ppm.

b - The SCOs for commercial use were capped at a maximum value of 500 ppm.

c - The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm.

f - For constituents where the calculated SCO was lower than the rural soil background concentration, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

SCOs from DEC Policy CP-51 / Soil Cleanup Guidance, October 2010, included.

J - Estimated Value. Concentration is above the detection limit, but below the reporting limit.

U - The analyte was analyzed for, but was not detected above the reported sample quantification limit. The assocaited numerical value is the sample quantitation limit.

Bold / Shaded text denotes concentrations exceeding NYSDEC Unrestricted Use SCO

TABLE 4
SOIL ANALYTICAL RESULTS FOR
SEMI-VOLATILE ORGANIC COMPOUNDS
EPA METHOD 8270
and
TOTAL MERCURY

Compound	NYSDEC Part 375 Commercial (1)	SS-7 (0-6")	SS-8 (0-6")	SS-8 re-run (0-6")	SS-9 (0-6")	SS-10 (0-6")	SS-11 (0-6")	SS-12 (0-6")	SS-13 (0-6")	SS-14 (0-6")	SS-15 (0-6")	SS-16 (0-6")	SS-17 (0-6")	SS-17 re-run (0-6")	SS-18 (0-6")
Semi-Volatile Organic Compounds by 8270 - µg/Kg															
2,4,5-Trichlorophenol	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
2,4-Dichlorophenol	NS	7,600 U	7,300 U	1,100 U	7,500 U	7,400 U	NA	NA	NA	NA	4,400 U	4,300 U	9,200 U	1400 U	4,300 U
2,4-Dinitrophenol	NS	15,000 U	15,000 U	2,200 U	15,000 U	15,000 U	NA	NA	NA	NA	8,800 U	8,500 U	18,000 U	2800 U	8,500 U
2,6-Dinitrotoluene	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
2-Chlorophenol	NS	4,500 U	4,400 U	660 U	4,500 U	4,400 U	NA	NA	NA	NA	2,600 U	2,600 U	5,600 U	830 U	2,600 U
2-Methylnaphthalene	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
2-Methylphenol	NS	4,500 U	4,400 U	660 U	4,500 U	4,400 U	NA	NA	NA	NA	2,600 U	2,600 U	5,600 U	830 U	2,600 U
2-Nitroaniline	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
2-Nitrophenol	NS	15,000 U	15,000 U	2,200 U	15,000 U	15,000 U	NA	NA	NA	NA	8,800 U	8,500 U	18,000 U	2800 U	8,500 U
3,3'-Dichlorobenzidine	NS	7,600 U	7,300 U	1,100 U	7,500 U	7,400 U	NA	NA	NA	NA	4,400 U	4,300 U	9,200 U	1400 U	4,300 U
3-Methylphenol/4-Methylphenol	NS	4,500 U	4,400 U	660 U	4,500 U	4,400 U	NA	NA	NA	NA	2,600 U	2,600 U	5,600 U	830 U	2,600 U
3-Nitroaniline	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
4-Chloroaniline	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
4-Nitrophenol	NS	7,600 U	7,300 U	1,100 U	7,500 U	7,400 U	NA	NA	NA	NA	4,400 U	4,300 U	9,200 U	1400 U	4,300 U
Acenaphthene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Acenaphthylene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Aniline	NS	7,600 U	7,300 U	NA	7,500 U	7,400 U	NA	NA	NA	NA	4,400 U	4,300 U	9,200 U	NA	4,300 U
Anthracene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Benzo(a)anthracene	5,600	4,200	3,700 U	770	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	2000	2,100 U
Benzo(a)pyrene	1,000	**3,800**	3,700 U	850	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	**2200**	2,100 U
Benzo(b)fluoranthene	5,600	**5,700**	3,700 U	1,100	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	3300	2,100 U
Benzo(ghi)perylene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	720	2,100 U
Benzo(k)fluoranthene	56,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	1100	2,100 U
Bis(2-Ethylhexyl)phthalate	NS	7,600 U	7,300 U	1,100 U	7,500 U	7,400 U	NA	NA	NA	NA	4,400 U	4,300 U	9,200 U	1400 U	4,300 U
Butyl benzyl phthalate	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Chrysene	56,000	4,400	3,700 U	860	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	2400	2,100 U
Di-n-butylphthalate	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Di-n-octylphthalate	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Dibenzo(a,h)anthracene	560	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Dibenzofuran	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Diethyl phthalate	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Dimethyl phthalate	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Fluoranthene	500,000	9,100	3,700 U	1,800	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	5,200	5200	2,100 U
Fluorene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Hexachlorobenzene	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Indeno(1,2,3-cd)Pyrene	5,600	3,800 U	3,700 U	580	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	1500	2,100 U
Isophorone	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Naphthalene	500,000	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Nitrobenzene	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
P-Chloro-M-Cresol	NS	3,800 U	3,700 U	550 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	690 U	2,100 U
Pentachlorophenol	6,700	15,000 U	15,000 U	2,200 U	15,000 U	15,000 U	NA	NA	NA	NA	8,800 U	8,500 U	18,000 U	2800 U	8,500 U
Phenanthrene	500,000	5,200	3,700 U	1,100 U	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	2900	2,100 U
Phenol	500,000	5,300 U	5,100 U	770 U	5,200 U	5,200 U	NA	NA	NA	NA	3,100 U	3,000 U	6,500 U	970 U	3,000 U
Pyrene	500,000	7,200	3,700 U	1,500	3,700 U	3,700 U	NA	NA	NA	NA	2,200 U	2,100 U	4,600 U	3900	2,100 U
Total Mercury - mg/Kg															
Mercury, Total	2.8	0.28	0.09	NA	0.1	0.09 U	0.1	0.21	0.18	0.09 U	NA	NA	NA	NA	NA

Notes:
(1) NYSDEC 6 NYCRR Environmental Remediation Program Part 375 Commercial Soil Cleanup Objectives
NS - Not Specified
U - Analyte not detected
NA - Not Analyzed
Bold/highlighted - indicated exceedance of the NYSDEC Part 375 Commerci

Table 9

Soil Cleanup Objectives for Imported Soils - Volatile Organic Compounds (EPA Method 8260)

1170 Atlantic Avenue, Baldwin, New York

Parameter	Protection of Groundwater SCO (1)	Restricted Commercial SCO(1)
Volatile Organic Compounds - USEPA Method 8260 - ug/kg		
1,1,1-Trichloroethane	680	500,000[b]
1,1,2,2-Tetrachloroethane	600	NS
1,1,2-Trichlorotrifluoroethane	6,000	NS
1,1 Dichloroethane	270	240,000
1,1 Dichloroethene	330	500,000[b]
1,2,3 Trichloropropane	340	NS
1,2,4-Trichlorobenzene	3,400	NS
1,2 Dichlorobenzene	1,100	500,000[b]
1,2 Dichloroethane	20	30,000
1,3 Dichlorobenzene	2,400	280,000
1,3 Dichloropropane	300	NS
1,4 Dichlorobenzene	1,800	130,000
2-Butanone	300	500,000[b]
4-Methyl-2-pentanone	1,000	NS
Acetone	50	500,000[b]
Benzene	60	44,000
Carbon Disulfide	2,700	NS
Carbon Tetrachloride	760	22,000
Chlorobenzene	1,100	500,000[b]
Chloroform	370	350,000
c-1,2-Dichloroethene	250	500,000[b]
Ethyl Benzene	1,000	390,000
Isopropylbenzene	2,300	NS
m + p Xylene	1,600	500,000[b]
ter.ButylMethylEther	930	500,000[b]
Methylene Chloride	50	500,000[b]
n-Butylbenzene	12,000	NS
n Propylbenzene	3,900	500,000[b]
o Xylene	1,600	500,000[b]
p Isopropyltoluene	10,000	NS
sec-Butylbenzene	11,000	500,000[b]
tert-Butylbenzene	5,900	500,000[b]
Tetrachloroethene	1,300	150,000
Toluene	700	500,000[b]
t-1,2-Dichloroethene	190	500,000[b]
Trichloroethene	470	200,000
Vinyl Chloride	20	13,000
1,3,5-trimethylbenzene	8400	190000
1,2,4-trimethylbenzene	3600	190000

Notes:

NS - Not Specified

MDL - Method Detection Limit

(1) NYSDEC 6 NYCRR Environmental Remediation Programs Part 375 Restriced Use of Soil Cleanup Objective Table 375-6.8b 12/06

b - The SCOs for commercial use were capped at a maximum value of 500 ppm.

c - The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm.

SCOs from DEC Policy CP-51 / Soil Cleanup Guidance, October 2010, included.

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Walter Parish, Region 2
Regional Hazardous Waste Remediation Engineer
Division of Hazardous Waste
SUNY Stony Brook
50 Circle Road
Stony Brook, NY 11790-3409

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed, estimated volumes of contaminated soil to be excavated and any work that may impact the monitoring system;
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in **Appendix C** of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

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

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

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

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

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

A-4 MATERIALS EXCAVATION AND LOAD OUT

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

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

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

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

A truck wash will be operated on-site. 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.

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

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

A-5 MATERIALS TRANSPORT OFF-SITE

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

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

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows:

Route #1: Right on to Atlantic Avenue; Left on to South Bayview Avenue; proceed to Sunrise Highway, or

Route #2: Left on to Atlantic Avenue; Right on to Milburn Avenue; Proceed to Sunrise Highway

These routes are indicated on **Figure 7.** All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) prohibiting off-site queuing of trucks entering the facility; (c) limiting total distance to major highways; (d) promoting safety in access to highways; and (e) overall safety in transport.

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

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

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

A-6 MATERIALS DISPOSAL OFF-SITE

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

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

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material have been approved by NYSDEC. To determine on-site reuse acceptability, excavated soils will be screened with a PID as specified in Section A-2. Soils which do not exhibit a PID response above background concentrations are acceptable for re-use on-site. Soils which exhibit a PID response above background levels will be staged on plastic sheeting, as specified in Section A-3, and sampled following characterization procedures specified in 6 NYCRR Part 375 and the CP-51 Cleanup Guidance. These soil samples will be analyzed for the presence of VOCs by USEPA Method 8260. Analytical results will be compared to NYSDEC Commercial Use SCOs. The stockpiled soil will be deemed acceptable for reuse on-site if VOC concentrations are below Commercial Use SCOs. Soils with VOC

concentrations above Commercial Use SCOs will be deemed unacceptable for on-site re-use and will be disposed off-site as specified in Section A-6.

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

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

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering 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, but will be managed off-site.

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.

A-9 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

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 (commercial) and protection of groundwater SCOs, the resulting SCOs are listed in **Table 9**. 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.

A-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 and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

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

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

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

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

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

A-11 CONTINGENCY PLAN

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

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

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-12 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (CAMP) provides measures for protection for on-Site workers and the downwind community (i.e., off-Site receptors including residences, businesses, and on-Site workers not directly involved in subsurface activities) from potential airborne contaminant releases resulting from subsurface activities at the Site. The complete CAMP is attached as **Appendix C**.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for VOCs with a PID. **Table 10** lists the Real-Time Air Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a Site log book by the designated Site safety officer. PWGC's Site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be calibrated daily and checked for accuracy and a daily log shall be kept.

Table 10 - Air Monitoring Action Levels

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone	0-25 ppm, non-transient	None	Exposure below established exposure limits
PID	Breathing Zone	25-100 ppm, non-transient	Don APR	Based on potential exposure to VOCs
PID	Breathing Zone	>100 ppm, non-transient	Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM.	Increased exposure to Site contaminants, potential for vapor release to public areas.
PID	Work Area Perimeter	< 5 ppm	None	Exposure below established exposure limits.
PID	Work Area Perimeter	> 5 ppm	Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM.	Increased exposure to Site contaminants, potential for vapor release to public areas
Aerosol Monitor	Work Area Perimeter	>100 but < 150 $\mu g/m^3$ for 15 minutes	Institute dust suppression measures, Notify HSM.	Work to continue if particulate concentrations remain below 150 $\mu g/m^3$
Aerosol Monitor	Work Area Perimeter	>150 $\mu g/m^3$	Don ASR or SCBA, Institute dust suppression measures, Notify HSM.	Stop work and implement dust suppression techniques until readings return to acceptable levels, Notify HSM.

A figure showing the location of air monitoring stations based on generally prevailing wind conditions is shown in **Figure 8**. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

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

A-14 ODOR CONTROL PLAN

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

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

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

A-15 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the use of an on-site water source and equipment for road wetting. The equipment will be capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water sprinkling.

A-16 OTHER NUISANCES

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

APPENDIX B

DECLARATION OF COVENANTS AND RESTRICTIONS

APPENDIX C – HASP and CAMP

1170 ATLANTIC AVENUE
BALDWIN, NEW YORK 11510
VCP SITE #V00523

HEALTH AND SAFETY PLAN

ON BEHALF OF:

Safeguard Self Storage
105 Maxess Road
Melville, NY 11747

PREPARED BY:

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PWGC Project Number: SSS1101

FEBRUARY 2015

PWGC
Strategic Environmental Engineering Solutions

HEALTH AND SAFETY PLAN

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PWGC
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STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to risks from low level contaminated soil during environmental monitoring or remedial activities to be performed at the 1170 Atlantic Avenue in Baldwin, New York project site. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related exposure through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this HASP. PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to persons present at the site actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on review of this document.

It should be noted that this document has been prepared specifically to address potential worker exposure to the contaminants identified at the proposed construction site during the earthwork activities. It is not intended to address the standard health and safety concerns related to general construction practices. Contractors and suppliers are responsible for ensuring the health and safety of their own employees.

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by P.W. Grosser Consulting, Inc. (PWGC) for environmental monitoring and remedial activities to be performed at the 1170 Atlantic Avenue, Baldwin, New York site to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards relating to site operations associated with the excavation and disturbance and is based on the best information available. The HASP may be revised by PWGC at the request of Safeguard Self Storage and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by P.W. Grosser's project superintendent, site safety officer and/or the PWGC health and safety consultant.

1.1 Training Requirements

Personnel entering an area deemed an exclusion zone or decontamination zone must meet the training requirements for hazardous waste site operations and emergency response operations in accordance with OSHA 29 CFR 1910.120(e). The work associated with the proposed construction is not anticipated to require this training.

Each subcontractor and supplier working on the job must provide the site safety officer with training documentation for its personnel. This documentation will be reviewed by the site safety officer to ensure compliance with site-specific health and safety rules. The site safety officer may require modifications to the subcontractor or suppliers safety training documentation if it does not conform to site-specific requirements.

1.2 Medical Monitoring Requirements

PWGC personnel and visitors entering the exclusion zone or decontamination zone (if established) must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

Evidence of compliance with additional medical monitoring requirements for this site must also be included. Subcontractors and suppliers working on the job must provide the site safety officer with documentation on their medical monitoring programs upon request.

1.3 Fit-Testing Requirements

Personnel and visitors entering the exclusion zone or decontamination zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI).

Fit testing documentation is the responsibility of each subcontractor. Documentation of PWGC's personnel fit-testing is maintained on file.

1.4 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (P.W. Grosser employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in Appendix A.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in Appendix B.

1.5 Daily Safety Meetings

Each day, before work begins, the site safety officer will hold safety (tailgate or tool box) meetings to ensure that on-site personnel understand the site conditions and operating procedures and to address safety questions and concerns. Meeting minutes and attendance will be recorded. Personnel eligible to enter the exclusion and decontamination zones must attend the meetings. Project staff will discuss and remedy health and safety issues at these meetings.

1.6 Key Personnel - Roles and Responsibilities

The following PWGC key personnel are planned for this project:

- PWGC Project Director Mr. James Rhodes
- PWGC Project Manager Mr. John Eichler
- PWGC Site Safety Officer Mr. Thomas Fitzpatrick
- PWGC Alternate Safety Officer Ms. Kaitlyn Crosby

The PWGC project manager is responsible for overall project administration and, with guidance from the PWGC site safety officer, for supervising the implementation of this HASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The PWGC site safety officer is also responsible for coordinating and enforcing health and safety activities on-site. The site safety officer must meet the emergency response and hazardous materials training requirements of OSHA 29 CFR Part 1910.120; must have completed OSHA supervisor training, 29 CFR 1910.120 (e) 4; and must have appropriate experience to the related site work. The site safety officer is authorized to suspend the site work based on safety concerns, and is responsible for the following:

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

2.0 SITE BACKGROUND AND SCOPE OF WORK

The subject site consists of a 2.7-acre parcel of land on the south side of Atlantic Avenue in the Hamlet of Baldwin, Town of Hempstead, Nassau County, New York. A Site Vicinity Map is included as Figure 1. The property is identified on Nassau County Tax maps as Section 54, Block 46, Lot 62. The property is improved with a 44,600 square foot two-story steel frame commercial building with sheet metal siding. The building is currently used for self storage. The interior is divided into individual self storage units ranging in size from 25 to 300 square foot spaces. The remainder of the site consists of asphalt-paved driveway/parking areas and grass.

The site was reportedly built up from the Millburn Creek streambed. The creek was rerouted around the resulting peninsula. The site is bounded on four sides by wooden bulkheads, except for the site's access driveway at the northeast corner of the property. The property's soil is apparently comprised of dredge spoils from the stream bed of Milburn Creek. These sediments are subject to impacted runoff from roadway traffic and asphalt pavement as well as impact from boat traffic (i.e. diesel and gasoline). Site sediments are generally characterized as dark brown and black silty sand with a high organic content evidenced by an organic odor.

The property is generally bounded by commercial and residential properties. East of the site, across Milburn Creek, are commercial structures and residential structures which are currently under construction. South of the site, across Milburn Creek, is a boat storage yard. North of the site is a portion of a boat canal connected to Milburn Creek, followed by a commercial building facing Atlantic Avenue. West of the site, across a boat canal connected to Milburn Creek, is a residential area.

3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general site operations which may also be conducted at site, and the standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.1 Activity-Specific Hazards and Standard Operating Procedures

3.1.1 Operation of Heavy Equipment

The operation of heavy equipment is not anticipated for this project. However, if appropriate, Occupational Safety and Health Administration (OSHA) guidelines will be followed for operating heavy equipment as outlined in 29 CFR 1926.602.

3.1.2 Excavation / Earthwork

Excavation activities will follow the OSHA 29 CFR 1926.651 (February 20, 1990) construction industry standards relating to excavation work. These standards include shoring and cutback requirements, equipment specifications, entry requirements, etc. To avoid exposure to site-specific contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply when excavation work is performed:

- Air quality will be tested before employees enter excavations over four feet deep if a hazardous atmosphere exists or is suspected to exist. If the site safety officer determines that excavations are, by OSHA's definition, "confined space," the confined space entry policy (Section 7.0) will be followed.

- Open excavations will be backfilled as soon as practicable. While excavations remain open,

appropriate warnings will be posted and barricades will be erected to protect pedestrian and worker safety. Where possible, excavation side walls will be cut at a gradual slope to maximize egress and access. Workers will not enter excavations unless absolutely required.

- To ensure atmospheric quality, tests shall be conducted as often as necessary as determined by the site safety officer. This includes tests for flammable gas and oxygen deficiency.

- When the site safety officer identifies hazardous atmospheres, emergency rescue equipment and PPE must be on the work site (Level C PPE) and readily accessible to employees (29 CFR 1926.651(g)(2)(I)).

- Daily site safety inspections will be conducted by the site safety officer.

3.1.3 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress. P.W. Grosser follows the heat and cold stress safety protocols described in Appendix C.

3.1.4 Dust Control and Monitoring

Dust generated during work activities may contain contaminants associated with the site characteristics. The PWGC site safety officer will be responsible for monitoring dust levels and requiring action when necessary as described in the following sections.

3.1.5 Dust Control and Monitoring During Earthwork

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 µg/m3 over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site

safety officer will use visible dust as an indicator to implement the dust control plan. The primary sources of dust will be equipment, vehicular traffic, and construction activities.

3.1.6 Drilling and Probing Operations

Additional drilling operations at the site are not anticipated. However, if necessary, PWGC will follow the drill rig/Geoprobe™ operation safety protocols described in Appendix D. In addition, PWGC and/or their subcontractor(s) will follow Geoprobe™ operation and sampling procedures Standard Operating Procedures.

3.2 Chemical Hazards

Soil sample results obtained during the Remedial Investigation (RI) and Interim Remedial Measure (IRM) at the site indicated concentrations of VOCs, SVOCs, and metals above the New York State Department of Environmental Conservation (NYSDEC) Unrestricted Use Soil Clean-up Objectives (SCOs) identified in 6NYCRR Part 375 and the CP-51 Guidance document.

VOCs reported above their respective unrestricted use SCOs include the following:

- 1,1-Dichloroethane
- Acetone
- Chloroethane
- 1,1,1-Trichloroethane

SVOCs reported above their respective unrestricted use SCOs include the following:

- Benzo(a)pyrene
- Benzo(b)fluoranthene

Mercury was the metal detected above the unrestricted use SCO.

Groundwater sample results obtained during site investigations revealed concentrations of VOCs detected above NYSDEC Groundwater Standards. VOCs reported above their respective Groundwater Standards include the following:

- 1,1,1-Trichloroethane
- 1,1-Dichloroethane
- Chloroethane
- Vinyl Chloride

The primary routes of exposure to suspected and identified contaminants in soil are inhalation, ingestion and absorption.

Appendix E includes information sheets for the known and suspected chemicals that may be encountered at the site.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down equipment and allow area to vent. Resume when readings return to background
Sustained readings of 5 ppm or greater that do not subside after venting	Implement Vapor Release Plan (Section 8.6). Re-evaluate respiratory protection as upgrade may be required.

3.2.1 Respirable Dust

Dust may be generated from vehicular traffic and/or other construction activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils will be mitigated with the implementation of nitrile gloves, hand washing, and decontamination exercises when necessary.

3.2.2 Organic Vapors

Excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer

will periodically monitor organic vapors with a photo-ionization detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels shown below.

3.3 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. Work is to be conducted during daylight hours whenever possible.

Electrical power must be provided through a ground fault circuit interrupter. Equipment that will enter an excavation must be suitable and approved (i.e. intrinsically safe) for use in potentially explosive environments. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

Work where there is a fall hazard will be performed using appropriate ladders and/or protection (e.g. body harness and lifeline). All work should be conducted at the ground surface or in trench excavations.

In accordance with 29 CFR 1910.151(c), workers involved in operations where there is the risk of eye injury, (chemical splash, etc.), must have ready access to an approved eye wash unit. Protective eye wear shall be donned in Level D, when directed by the site safety officer.

Operations where there is a potential for fire will be conducted in a manner that minimizes risk. Non sparking tools and fire extinguishers shall be used or available as directed by the site safety officer when work is in potentially explosive atmospheres. Ignition sources shall be removed from work areas. Explosion proof instruments and/or bonding and grounding will be used to prevent fire or explosion when the site safety officer directs their use.

Overhead and underground utilities shall be identified and/or inspected and appropriate safety precautions taken before conducting operations where there is potential for contact or interference.

4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. It is anticipated that work will be performed in Level D PPE.

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

4.3 Level B

Level B PPE shall be donned when the contaminants have not been identified and/or the concentrations of unknown measured total organic vapors in the breathing zone exceed 5 ppm (using a portable OVA, or equivalent). Level B PPE shall be donned if the IDLH of a known contaminant is exceeded. If a contaminant is identified or is expected to be encountered for which NIOSH and/or OSHA recommend the use of a positive pressure self-contained breathing apparatus (SCBA) when that contaminant is present, Level B PPE shall be donned even though the total organic vapors in the breathing zone may not exceed 5 ppm. Level B shall be donned for confined space entry, and when the atmosphere is oxygen deficient (oxygen less than 19.5%) or potentially oxygen deficient. If Level B PPE is required for a task, at least three people shall be donned in Level B at any one time during that task. PPE shall only be donned at the direction of the site safety officer. Level B PPE consists of:

- supplied air SCBA or air line system with five minute egress system;
- chemical resistant coveralls;
- steel-toe and steel-shank workboots;

- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the PWGC Health and Safety Officer with the intent to provide the most protective and efficient worker PPE.

4.4 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. It is expected that site work will be performed in Level D. If air monitoring results indicate the necessity to upgrade the level of protection, engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

5.1 Community Air Monitoring Requirements

During excavation work, fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor and air will be monitored for site-related VOCs with MiniRAE 2000 photo-ionization detector (PID) with an 11.7 eV lamp. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work; or
- before and during entry into confined spaces.

Continuous air monitoring will be conducted with a 15 minute running average at the downward site boundary during intrusive site activities as part of the CAMP.

The designated site safety officer will record air monitoring data. P.W. Grosser's site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. A daily log will be kept. Monitoring results will be recorded on the sheets contained in Appendix F.

Below are examples of site specific guidelines and actions which are taken based on routine air monitoring:

PID readings for VOCs sustained at background and 5 ppm over the site specific background in breathing zone: continue.
PID readings for VOCs sustained between 5 ppm and 25 ppm over the site specific background in breathing zone: Level C PPE. (See Note)
PID readings for VOCs sustained >25 ppm over the site specific background in breathing zone: Level B PPE. (See Note)

Total Respirable Dust at 150 mg/m3 in breathing zone:
Level C PPE - HEPA filters. Site safety officer can call for upgrades based on visual dust without metering total respirable dust.

Prior to site work, the P.W. Grosser site safety officer will compile a list of likely site contaminants, select appropriate air monitoring instrumentation and define action levels.

5.2 Perimeter Air Monitoring

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before drilling/excavation activities begin. These points will be monitored periodically in series during the site work. VOCs will be monitored with a Photo-ionization detector, or the equivalent. If appropriate, fugitive dust will be monitored using a MiniRam aerosol monitor.

The specific guidelines for actions to be taken based on air monitoring at the site perimeter are listed below:

PID readings for VOCs less than 5.0 ppm over background: continue.
PID readings for VOCs greater than 5.0 ppm over background: stop work and implement vapor release contingency plan until readings return to acceptable levels.

Total Respirable Dust below 100 µg/m3 : continue.
Total Respirable Dust above 100 µg/m3 in breathing zone: stop work and implement dust control

measures (Section 3.0) until readings return to acceptable levels.

5.3 Activity-Specific Air Monitoring

The monitoring of VOC concentrations present in the employees breathing zone will be periodically monitored during drilling/excavation activities using a PID. Air monitoring results will be recorded in the field log book. If additional monitoring is required, the protocols will be developed and appended to this plan.

6.0 SITE CONTROL

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book. It is expected that for remediation activities, identification of an exclusion zone, decontamination zone, and support zone will not be necessary.

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

6.2 General Field Safety and Standard Operating Procedures

P.W. Grosser's policy is to control hazards at all site areas by limiting entrance to exclusion zones to essential personnel and by implementing the following rules:

- Non-essential (as judged by the site safety officer) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 8.0), site safety locations, first aid and communication equipment, and the location of the map to the hospital and the list of emergency telephone numbers.

- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times.

- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or place equipment on the ground. Protect equipment from contamination.

- Eating, drinking, or smoking is permitted only in designated areas in the support zone.

- Each worker must be supplied with and maintain his/her own personal protective equipment.

6.3 Decontamination Procedures

All equipment and PPE exiting the exclusion zone must be decontaminated or properly discarded upon exit. All personnel must enter and exit the exclusion zone through the decontamination area. The exclusion and decontamination zones may change depending on the nature of the site work. Plastic bags containing personal protective clothing and equipment will be placed in designated receptacles.

All boots and other potentially contaminated garments that have come in contact with hazardous materials will be cleaned in wash tubs with detergent/water solution and rinsed with water and must remain on site. The wash water, rinse water, and residues will be collected and properly stored until sampling results are received and the final method of disposal can be determined. Disposable PPE, including spent respirator cartridges and canisters, will be properly bagged and disposed of. All contaminated boots, clothing, and equipment (e.g. leather boots, equipment carrying straps) that cannot be decontaminated will be disposed of with the disposable garments or left on site in the decontamination trailer.

The *minimum* measures for Level B doffing and decontamination are:

- deposit equipment on plastic drop cloths;
- scrub outer boots and gloves with a water and detergent solution and rinse;
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- remove SCBA and face piece and place on rack provided;
- remove tyvek/outer garment and place in receptacle provided;
- remove inner gloves and deposit in receptacle provided; and,
- shower/wash face and hands.

The *minimum* measures for Level C doffing and decontamination are:

- deposit equipment on plastic drop cloths;
- scrub outer boots and gloves (if worn) with a water and detergent solution and rinse;
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- remove tyvek/outer garment and place in receptacle provided;
- remove first pair of inner gloves;
- remove respirator (using "clean" inner gloves) and place on rack provided;
- remove last pair of inner gloves and deposit in receptacle provided; and,
- shower/wash face and hands.

The second to last item to be removed is the APR, and the last item to be removed is the last of several pairs of surgical gloves. Wearing several pairs of inner gloves permits layers to be removed as needed during various stages of the doffing procedure, and if the APR inadvertently becomes contaminated, inner gloves guard against bare hands contacting the APR.

Equipment that comes into contact with site contaminants is decontaminated according to manufacturer specifications. Decontamination is done in the exclusion or decontamination zones. Rented equipment is photographed after decontamination.

7.0 CONFINED SPACE

OSHA published a Final Rule on permit-required confined spaces on January 14, 1993, for General Industry at 29 CFR 1910.146 et seq., with an implementation date of April 15, 1993. The rule specifically excludes agriculture, construction, or shipyard employment. Confined space entry and work within confined spaces is not anticipated to be performed under the proposed scope of work. However, if confined space work is conducted it will be performed in accordance with the applicable OSHA regulations. OSHA defines confined space as:

1. is large enough and so configured that an employee can bodily enter and perform assigned work;
2. has limited or restricted areas for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited entry); and
3. is not designed for continuous worker occupancy.

OSHA further requires that an "entry supervisor" (the site designated safety officer) decide at the time of entry whether the space is permit-required or non-permit required space. The site safety officer will monitor the space two hours prior to entry and continuously during work to ensure that the atmosphere is not hazardous. OSHA defines as hazardous atmosphere as:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);

2. Airborne combustible dust at a concentration that meets or exceeds its LEL;
   NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z. Toxic

and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;

5. Any other atmospheric condition that is immediately dangerous to life or health.

6. A space is non-permit required if none of the above defined hazardous conditions are present. OSHA requires that an attendant (e.g., an individual stationed outside one or more spaces who monitors the entrants and who performs air monitoring of the space(s)) be assigned to each space. The attendant is not allowed to perform any direct rescue related duties, but is there to communicate with the entrant and call for rescue procedures if required.

The following protocol applies when P.W. Grosser employees must enter a confined space:

- The site safety officer evaluates the space and site conditions to determine whether the space must be considered "confined".

- If so, the site safety officer monitors the space for hazardous atmospheres prior to entry and fills out a pre-entry checklist (Appendix G) to determine whether an entry-permit is required.

- If there is no hazardous atmosphere, the space will be continuously monitored during the entry to assure that the atmosphere remains non-hazardous.

- If the space contains a hazardous atmosphere, an entry permit (Appendix G) will be prepared and the space will only be entered in accordance with 29 CFR 1910.146.

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8.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment. These will be outlined in the site specific HASP.

8.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project manager or site safety officer.

8.2 Emergency Telephone Numbers

General Emergencies	911
Nassau County Police	911
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
Baldwin Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Health and Safety Officer	1-631-589-6353
Alternate Health and Safety Officer	1-631-589-6353

A copy of this page shall be posted in the office and a copy is provided in Appendix H.

8.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager=s on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following PWGC key personnel are planned for this project:

- PWGC Project Director — Mr. James Rhodes (631) 589-6353
- PWGC Project Manager — Mr. John Eichler (631) 589-6353
- PWGC Site Safety Officer — Mr. Thomas Fitzpatrick (516) 351-5787
- Alternate Site Safety Officer — Ms. Kaitlyn Crosby (631) 664-2016

8.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent

possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (Appendix H) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital and information on the chemical(s) to which they may have been exposed (Appendix H).

8.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

8.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.

- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a

safe place.

- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

8.7 Spill Control Procedures

Spills associated with site activities may be attributed to project specific heavy equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

8.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two

successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.

- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

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SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

I have been informed and understand the procedures set forth in the health and safety plan and amendments:

Printed Name	Signature	Representing	Date

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

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SITE SAFETY PLAN AMENDMENT FORM

SITE SAFETY PLAN AMENDMENT # _____: _____

SITE NAME: _____

REASON FOR AMENDMENT: _____

_____

_____

ALTERNATIVE PROCEDURES: _____

_____

_____

REQUIRED CHANGES IN PPE: _____

_____

_____

_____ _____
PROJECT SUPERINTENDENT DATE

_____ _____
HEALTH & SAFETY CONSULTANT DATE

_____ _____
SITE SAFETY OFFICER DATE

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

APPENDIX C

HEAT/COLD STRESS PROTOCOLS

HEAT STRESS

Heat Stress (Hyperthermia)

Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. *Treatment for heat exhaustion*: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. *Treatment of heat stroke*: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

TABLE 1

SYMPTOMS OF HEAT STRESS

Heat cramps are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

Heat exhaustion occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2^{o}
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

Heat stroke is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104^{o} or above
- Coma

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TABLE 2

HEAT STRESS INDICATORS

Heat stress indicator	When to measure	If Exceeds…	Action
Heart rate (pulse)	Beginning of rest period	110 beats per minute	Shorten next work period by 33%
Oral temperature	Beginning of rest period	99°F (after thermometer is under tongue for 3 minutes) 100.6°F	Shorten next work period by 33% Prohibit work in impermeable clothing
Body weight	1. Before workday begins (a.m.) 2. After workday ends (p.m.)		Increase fluid intake

COLD STRESS

Cold stress (Hypothermia)

In hypothermia the core body temperature drops below 95^{o}F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.

Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6^{o}F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20^{o}F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20^{o}F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25^{o}F.

Frostbite

Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

Condition	Skin Surface	Tissue Under Skin	Skin Color
Frostnip	Soft	Soft	Initially red, then white
Frostbite	Hard	Soft	White and waxy
Freezing	Hard	Hard	Blotchy, white to yellow-gray to gray

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100^{o}F to 106^{o}F water bath. Water temperature will

drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

NOTE: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia*: General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

Body Temperature	°C	Symptoms
99-96	37-35.5	Intense, uncontrollable shivering
95-91	35.5-32.7	Violent shivering persists. If victim is conscious, he has difficulty speaking.
90-86	32-30	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings.
85-81	29.4-27.2	Victim becomes irrational, loses contact with his environment, and drifts into a stuporous state. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias.
80-78	26.6-18.5	Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic
Below 78	25.5	Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death.

6. *Treatment of hypothermia*: Keep worker dry. Remove any wet clothing and replace with dry clothes, or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

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TABLE 3[(1)]
COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

Estimated wind Speed (in mph)	Actual Temperature Reading (^{o}F)P											
	50	40	30	20	10	0	10	20	30	40	50	60
	Equivalent Chill Temperature (^{o}F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	15	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-146
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER in < hr with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trench foot and imersion foot may occur at any point on this chart											

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p.01.

APPENDIX D

DRILLING/GEOPROBE™ PROTOCOLS

SAFETY PROCEDURES DURING THE OPERATION OF DRILLING/PROBING MACHINES INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- All site personnel should know the location of the rig emergency shut-off switch prior to beginning operations.
- The rig should be inspected prior to operation to ensure that it is in proper working condition and that all safety devices are functioning.
- Each rig should have a first-aid kit and fire extinguisher which should be inspected to ensure that they are adequate.
- All operators should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required at sites where hazardous conditions are likely. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.
- Work areas should be kept free of materials, debris and obstruction, and substances such as grease or oil that could cause a surface to become slick or otherwise hazardous.
- Prior to drilling, the site must be checked to determine whether it can accommodate the rig and supplies and provide a safe working area.
- The drill rig mast (derrick) must be lowered prior to moving between drilling locations.
- The drill rig masts should not be raised if the rig will not be at least 20 feet away from overhead utilities.
- The location of underground utilities should be determined prior to erecting the rig.
- The drill rigs must be properly erected, leveled and stabilized prior to drilling.
- The operator must shut down the vehicle engine before leaving the vicinity of the machine.
- All personnel not directly involved in operating the rig or in sampling should remain clear of the drilling equipment when it is in operation.
- All unattended boreholes must be adequately covered or otherwise protected to prevent trip and fall hazards. All open boreholes should be covered, protected or backfilled as specified in local or state regulations.
- When climbing to or working on a derrick platform that is higher than 20 feet, a safety climbing device should be used.
- The user of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron and Steel Institute Wire Rope Users Manual.
- The rig should be operated in a manner which is consistent with the manufacturers' ratings of speed, force, torque, pressure, flow, etc. The rig and tools should be used for the purposes for which they were intended.

APPENDIX E

CHEMICAL HAZARDS

1,1,1-TRICHLOROETHANE

0079
October 1994

CAS No: 71-55-6
RTECS No: KJ2975000
UN No: 2831
EC No: 602-013-00-2

Methyl chloroform
Methyltrichloromethane
alpha-Trichloroethane
$C_2H_3Cl_3$ / CCl_3CH_3
Molecular mass: 133.4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible under specific conditions. Heating will cause rise in pressure with risk of bursting. See Notes. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		**PREVENT GENERATION OF MISTS!**	
Inhalation	Headache. Dizziness. Drowsiness. Nausea. Ataxia. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness.	Safety goggles 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	Diarrhoea. Nausea. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	**PACKAGING & LABELLING**	
Ventilation. Collect leaking and spilled liquid in sealable, suitable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus.	Xn Symbol N Symbol R: 20-59 S: (2-)24/25-59-61 Note: F UN Hazard Class: 6.1 UN Pack Group: III	Do not transport with food and feedstuffs. Marine pollutant.

EMERGENCY RESPONSE	**SAFE STORAGE**
Transport Emergency Card: TEC (R)-61S2831 NFPA Code: H2; F1; R0	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Cool. Dry. Ventilation along the floor.

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IMPORTANT DATA

Physical State; Appearance
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers
The vapour is heavier than air.

Chemical dangers
The substance decomposes on heating or on burning producing toxic and corrosive fumes including phosgene and hydrogen chloride. Reacts violently with aluminium, manganese and their alloys, alkalis, strong oxidants, acetone and zinc. Attacks natural rubber. Mixtures of 1,1,1-trichloroethane with potassium or its alloys are shock sensitive. Reacts slowly with water releasing corrosive hydrochloric acid.

Occupational exposure limits
TLV: 350 ppm as TWA, 450 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued (ACGIH 2004).
MAK: 200 ppm, 1100 mg/m^3; Peak limitation category: II(1); skin absorption (H); Pregnancy risk group: C; (DFG 2004).

Routes of exposure
The substance can be absorbed into the body by inhalation of its vapour and by ingestion.

Inhalation risk
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

Effects of short-term exposure
The substance is irritating to the eyes, the skin and the respiratory tract. The substance may cause effects on the heart, central nervous system and liver, resulting in cardiac disorders and respiratory failure. Exposure at high levels may result in death. Medical observation is indicated.

Effects of long-term or repeated exposure
The liquid defats the skin. The substance may have effects on the liver.

PHYSICAL PROPERTIES

Boiling point: 74/C
Melting point: -30/C
Relative density (water = 1): 1.34
Solubility in water: none
Vapour pressure, kPa at 20/C: 13.3
Relative vapour density (air = 1): 4.6
Flash point: see Notes
Auto-ignition temperature: 537/C
Explosive limits, vol% in air: 8-16
Octanol/water partition coefficient as log Pow: 2.49

ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to air quality and ground water contamination.

NOTES

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions.
The substance burns only in excess oxygen or if a strong source of ignition is present.
Use of alcoholic beverages enhances the harmful effect.
Depending on the degree of exposure, periodic medical examination is suggested.
An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.
Do NOT use in the vicinity of a fire or a hot surface, or during welding.
Aerothene, Algylen, Trichloran, Chlorylen, Genklene, Chlorothene NU, Chlorothene VG, and Solvent 111 are trade names.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

Safety data for chloroethane

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: ethyl chloride, anodynon, chelen, chlorene, chloryl, choryl anesthetic, cloretilo, dublofix, monochloroethane, narcotile
Use:
Molecular formula: C_2H_5Cl
CAS No: 75-00-3
EINECS No: 200-830-5

Physical data

Appearance: colourless gas
Melting point: -139 C
Boiling point: 12.3 C at 760 mm Hg
Vapour density: 2.22 (air = 1)
Vapour pressure: 19.2 psi at 20 C, 57.68 psi at 55 C
Density (g cm^{-3}):
Flash point: -50 C (closed cup)
Explosion limits:
Autoignition temperature:
Water solubility:

Stability

Stable. Highly flammable - may form explosive mixtures with air. Incompatible with strong oxidizing agents, alkali metals and their alloys.

Toxicology

Limited evidence of a carcinogenic effect. Typical OEL 100 ppm.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)
IHL-RAT LC50 152000 mg/m3/2h

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R12 R40 R52 R53.

Environmental information

Harmful in the environment.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 1037. Hazard class 2.

Personal protection

Safety glasses, good ventilation. Keep possible sources of ignition away from the working area.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S9 S16 S33 S36 S37 S61.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

Safety data for 1,1-dichloroethane

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: ethylidene chloride, ethylidene dichloride
Use: solvent, floatation agent
Molecular formula: $C_2H_4Cl_2$
CAS No: 75-34-3
EC No: 200-863-5
Annex I Index No: 602-011-00-1

Physical data

Appearance: colourless aromatic viscous liquid
Melting point: -97 C
Boiling point: 57.2 C
Vapour density:
Vapour pressure: 230 mm Hg at 25 C
Specific gravity: 1.175 at 20 C
Flash point: -5 C
Explosion limits:
Autoignition temperature:

Stability

Stable. Highly flammable. Vapour/gas mixtures explosive. Incompatible with plastics, many organic materials. Reacts with metals, oxidizing agents.

Toxicology

Harmful if swallowed or inhaled and by skin absorption. Readily absorbed through the skin. May cause dermatitis. Skin and eye irritant. Causes CNS depression. Typical 8h TWA 200 ppm.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

ORL-RAT LD50 725 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)

R11 R20 R21 R22 R36 R38 R52 R53.

Environmental information

Harmful to aquatic organisms - may cause long-term environmental damage.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)

Personal protection

Safety glasses and gloves. Adequate ventilation.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)

S16 S23 S61.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

VINYL CHLORIDE

0082
April 2000

CAS No: 75-01-4
RTECS No: KU9625000
UN No: 1086 (stabilized)
EC No: 602-023-00-7

Chloroethene
Chloroethylene
VCM
(cylinder)
C_2H_3Cl / $H_2C=CHCl$
Molecular mass: 62.5

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Use non-sparking handtools.	In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Dizziness. Drowsiness. Headache. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	ON CONTACT WITH LIQUID: FROSTBITE.	Protective gloves. Cold-insulating gloves. Protective clothing.	ON FROSTBITE: rinse with plenty of water, do NOT remove clothes.
Eyes	Redness. Pain.	Safety goggles 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		Do not eat, drink, or smoke during work.	

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus.	F+ Symbol T Symbol R: 45-12 S: 53-45 Note: D UN Hazard Class: 2.1

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-20S1086 NFPA Code: H 2; F 4; R 2	Fireproof. Separated from incompatible materials. (See Chemical Dangers.) Cool. Store only if stabilized.

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SEE IMPORTANT INFORMATION ON THE BACK.

IMPORTANT DATA

Physical State; Appearance
COLOURLESS COMPRESSED LIQUEFIED GAS, WITH CHARACTERISTIC ODOUR.

Physical dangers
The gas is heavier than air, and may travel along the ground; distant ignition possible. Vinyl chloride monomer vapours are uninhibited and may form polymers in vents or flame arresters of storage tanks, resulting in blockage of vents.

Chemical dangers
The substance can under specific circumstances form peroxides, initiating explosive polymerization. The substance will polymerize readily due to heating and under the influence of air, light and on contact with a catalyst, strong oxidizing agents and metals such as copper and aluminium, with fire or explosion hazard. The substance decomposes on burning producing toxic and corrosive fumes (hydrogen chloride, phosgene). Attacks iron and steel in the presence of moisture.

Occupational exposure limits
TLV: 1 ppm as TWA; A1 (confirmed human carcinogen); (ACGIH 2004).
MAK: Carcinogen category: 1; (DFG 2004).

Routes of exposure
The substance can be absorbed into the body by inhalation.

Inhalation risk
A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

Effects of short-term exposure
The substance is irritating to the eyes. The liquid may cause frostbite. The substance may cause effects on the central nervous system. Exposure could cause lowering of consciousness. Medical observation is indicated.

Effects of long-term or repeated exposure
The substance may have effects on the liver, spleen, blood and peripheral blood vessels, and tissue and bones of the fingers. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: -13/C
Melting point: -154/C
Relative density (water = 1): 0.9 (liquid)
Density: 8 (vapour) at 15/C g/l
Solubility in water: none
Relative vapour density (air = 1): 2.2
Flash point: -78/C c.c.
Auto-ignition temperature: 472/C
Explosive limits, vol% in air: 3.6-33
Octanol/water partition coefficient as log Pow: 0.6

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to ground water contamination.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
The odour warning when the exposure limit value is exceeded is insufficient.
Do NOT use in the vicinity of a fire or a hot surface, or during welding.
An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

BENZO(a)PYRENE

0104
October 2005

CAS No: 50-32-8
RTECS No: DJ3675000
EC No: 601-032-00-3

Benz(a)pyrene
3,4-Benzopyrene
Benzo(d,e,f)chrysene
$C_{20}H_{12}$
Molecular mass: 252.3

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE	**See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.**	**AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!**	
Inhalation		Local exhaust or breathing protection.	Fresh air, rest.
Skin	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes		Safety goggles 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		Do not eat, drink, or smoke during work.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	T Symbol N Symbol R: 45-46-60-61-43-50/53 S: 53-45-60-61

EMERGENCY RESPONSE	SAFE STORAGE
	Separated from strong oxidants.

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IMPORTANT DATA

Physical State; Appearance
PALE-YELLOW CRYSTALS

Chemical dangers
Reacts with strong oxidants causing fire and explosion hazard.

Occupational exposure limits
TLV: Exposure by all routes should be carefully controlled to levels as low as possible A2 (suspected human carcinogen); (ACGIH 2005).
MAK: Carcinogen category: 2; Germ cell mutagen group: 2; (DFG 2005).

Routes of exposure
The substance can be absorbed into the body by inhalation of its aerosol, 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 when dispersed.

Effects of long-term or repeated exposure
This substance is carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 496/C
Melting point: 178.1/C
Density: 1.4 g/cm^3

Solubility in water: none (<0.1 g/100 ml)
Vapour pressure : negligible
Octanol/water partition coefficient as log Pow: 6.04

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish, in plants and in molluscs. The substance may cause long-term effects in the aquatic environment.

NOTES

Do NOT take working clothes home.
Benzo(a)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAHs) in the environment, usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.

ADDITIONAL INFORMATION

BENZO(b)FLUORANTHENE

0720
March 1999

CAS No: 205-99-2
RTECS No: CU1400000
EC No: 601-034-00-4

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		**AVOID ALL CONTACT!**	
Inhalation		Local exhaust or breathing protection.	Fresh air, rest.
Skin		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes		Safety spectacles 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		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	T Symbol N Symbol R: 45-50/53 S: 53-45-60-61

EMERGENCY RESPONSE	SAFE STORAGE
	Provision to contain effluent from fire extinguishing. Well closed.

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IMPORTANT DATA

Physical State; Appearance
COLOURLESS CRYSTALS

Chemical dangers
Upon heating, toxic fumes are formed.

Occupational exposure limits
TLV: A2 (suspected human carcinogen); (ACGIH 2004).
MAK: Carcinogen category: 2; (DFG 2004).

Routes of exposure
The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

Inhalation risk
Evaporation at 20/C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

Effects of long-term or repeated exposure
This substance is possibly carcinogenic to humans. May cause genetic damage in humans.

PHYSICAL PROPERTIES

Boiling point: 481/C
Melting point: 168/C
Solubility in water: none
Octanol/water partition coefficient as log Pow: 6.12

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to air quality and water quality.

NOTES

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco. ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3.
Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.
Card has been partly updated in October 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

MERCURY

0056
April 2004

CAS No: 7439-97-6
RTECS No: OV4550000
UN No: 2809
EC No: 080-001-00-0

Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

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	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Abdominal pain. Cough. Diarrhoea. Shortness of breath. Vomiting. Fever or elevated body temperature.	Local exhaust or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
Skin	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
Eyes		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		Do not eat, drink, or smoke during work. Wash hands before eating.	Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING	
Evacuate danger area in case of a large spill! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable non-metallic containers as far as possible. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Chemical protection suit including self-contained breathing apparatus.	T Symbol N Symbol R: 23-33-50/53 S: (1/2-)7-45-60-61 UN Hazard Class: 8 UN Pack Group: III	Special material. Do not transport with food and feedstuffs.

EMERGENCY RESPONSE	STORAGE
Transport Emergency Card: TEC (R)-80GC9-II+III	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs. Well closed.

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IMPORTANT DATA

Physical State; Appearance
ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.

Chemical dangers
Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams.

Occupational exposure limits
TLV: 0.025 mg/m^3 as TWA; (skin); A4; BEI issued; (ACGIH 2004).
MAK: 0.1 mg/m^3; Sh; Peak limitation category: II(8); Carcinogen category: 3B; (DFG 2003).

Routes of exposure
The substance can be absorbed into the body by inhalation of its vapour and through the skin, also as a vapour!

Inhalation risk
A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20/C.

Effects of short-term exposure
The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous system and kidneys. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure
The substance may have effects on the central nervous system and kidneys, resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. May cause inflammation and discoloration of the gums. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

PHYSICAL PROPERTIES

Boiling point: 357/C
Melting point: -39/C
Relative density (water = 1): 13.5
Solubility in water: none
Vapour pressure, Pa at 20/C: 0.26
Relative vapour density (air = 1): 6.93
Relative density of the vapour/air-mixture at 20/C (air = 1): 1.009

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.
No odour warning if toxic concentrations are present.
Do NOT take working clothes home.

ADDITIONAL INFORMATION

Hydrogen Release Compound (HRC®)
MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised: **October 9, 2007**

Section 1 - Material Identification

Supplier:

REGENESIS
1011 Calle Sombra
San Clemente, CA 92673
Phone: **949.366.8000**
Fax: **949.366.8090**
E-mail: **info@regenesis.com**

Chemical Name:	**Propanoic acid, 2-[2-[2-(2-hydroxy-1-oxopropoxy)-1-oxopropoxy]-1-oxopropoxy]-1,2,3-propanetriyl ester**
Chemical Family:	**Organic Chemical**
Trade Name:	**Hydrogen Release Compound® (HRC®)** **Glycerol tripolylactate and Glycerol**
Product Use:	**Used to remediate contaminated soil and groundwater (environmental applications)**

Section 2 – Chemical Identification

CAS#	Chemical
201167-72-8	**Glycerol Tripolylactate**
56-81-5	**Glycerol**
50-21-5	**Lactic Acid**

Section 3 - Physical Data

Melting Point:	**Not Available (NA)**
Boiling Point:	**Not Determined (ND)**
Flash Point:	**ND**
Density:	**1.3 g/cc**

Section 3 – Physical Data (cont)

Solubility:	**Acetone and DMSO**
Appearance:	**Viscous amber gel/liquid**
Odor:	**Not detectable**
Vapor Pressure:	**None**

Section 4 - Fire and Explosion Hazard Data

Extinguishing Media: **Use Water Spray, Carbon Dioxide, Dry Chemical Powder or Appropriate Foam.**

Water may be used to keep exposed containers cool.

For large quantities involved in a fire, one should wear full protective clothing and a NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or positive pressure mode as for a situation where lack of oxygen and excess heat are present.

Section 5 - Toxicological Information

Acute Effects: **May be harmful by inhalation, ingestion, or skin absorption. May cause irritation. To the best of our knowledge, the chemical, physical, and toxicological properties of the glycerol tripolylactate have not been investigated. Listed below are the toxicological information for glycerol and lactic acid.**

RTECS#: **MA8050000**
Glycerol

Irritation data:

SKN-RBT 500 MG/24H MLD	**BIOFX* 9-4/1970**
85JCAE-,207,1986	**85JCAE-,207,1986**
EYE-RBT 126 MG MLD	**85JCAE -,656,86**
EYE-RBT 500 MG/24H MLD	**AJOPAA 29,1363,46**
SKN-RBT 5MG/24H SEV	
EYE-RBT 750 UG SEV	

Section 5 – Toxicological Information (cont)

Toxicity data:	**ORL-MUS LD50:4090 MG/KG**	**NIIRDN 6,215,1982**
	FRZKAP (6),56,1977	**FEPRA7 4,142,1945**
	SCU-RBT LD50:100 MG/KG	**RCOCB8 56,125,1987**
	ORL-RAT LD50:12600 MG/KG	**ARZNAD 26,1581,1976**
	IHL-	**ARZNAD 26,1579,1978**
	RATLC50:>570MG/M3/1HBIO	**NIIRDN 6,215,1982**
	FX*9-4/1970 IPR-RAT LD50:	**JAPMA8 39,583,1950**
	4420 MG/KG	**DMDJAP 31,276,1959**
	IVN-RAT LD50: 5566 MG/KG	**BIOFX* 9-4/1970**
	IPR-MUS LD50: 8700 MG/KG	**NIIRDN 6,215,1982**
	SCU-MUS LD50: 91 MG/KG	**FMCHA2-,C252,91**
	IVN-MUS LD50: 4250 MG/KG	**FMCHA2-,C252,91**
	ORL-RBT LD50: 27 GM/KG	**FAONAU 40,144,67**
	SKN-RBT LD50:>10GM/KG	**JIHTAB 23,259,41**
	IVN-RBT LD50: 53 GM/KG	**FMCHA2-,C252,91**
	ORL-GPG LD50: 7750 MG/KG	**JIHTAB 23,259,1941**
	ORL-RAT LD50:3543 MG/KG	
	SKN-RBT LD50:>2 GM/KG	
	ORL-MUS LD50: 4875 MG/KG	
	ORL-GPG LD50: 1810 MG/KG	
	ORL-QAL LD50: >2250 MG/KG	
Target Organ data:	**Behavioral (headache), gastrointestinal (nausea or vomiting), Paternal effects (spermatogenesis, testes, epididymis, sperm duct), effects of fertility (male fertility index, post-implantation mortality).**	
RTECS#:	**OD2800000** **Lactic acid**	

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information on lactic acid and glycerol.

Section 6 - Health Hazard Data

Handling:	**Avoid continued contact with skin. Avoid contact with eyes.**

In any case of any exposure which elicits a response, a physician should be consulted immediately.

First Aid Procedures

Inhalation:	**Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.**
Ingestion:	**No effects expected. Do not give anything to an unconscious person. Call a physician immediately.**
Skin Contact:	**Flush with plenty of water. Contaminated clothing may be washed or dry cleaned normally.**
Eye contact:	**Wash eyes with plenty of water for at least 15 minutes lifting both upper and lower lids. Call a physician.**

Section 7 - Reactivity Data

Conditions to Avoid:	**Strong oxidizing agents, bases and acids**
Hazardous Polymerization:	**None known**
Further Information:	**Hydrolyses in water to form Lactic Acid and Glycerol.**

Section 8 - Spill, Leak or Accident Procedures

After Spillage or Leakage:	**Neutralization is not required. This material may be burned in a chemical incinerator equipped with an afterburner and scrubber.**
Disposal:	**Laws and regulations for disposal vary widely by locality. Observe all applicable regulations and laws. This material, may be disposed of in solid waste. Material is readily degradable and hydrolyses in several hours.**

No requirement for a reportable quantity (CERCLA) of a spill is known.

Section 9 - Special Protection or Handling

Should be stored in plastic lined, steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass containers.

Protective Gloves:	**Vinyl or Rubber**
Eyes:	**Splash Goggles or Full Face Shield** **Area should have approved means of washing eyes.**
Ventilation:	**General exhaust.**
Storage:	**Store in cool, dry, ventilated area. Protect from incompatible materials.**

Section 10 - Other Information

This material will degrade in the environment by hydrolysis to lactic acid and glycerol. Materials containing reactive chemicals should be used only by personnel with appropriate chemical training.

The information contained in this document is the best available to the supplier as of the time of writing. Some possible hazards have been determined by analogy to similar classes of material. No separate tests have been performed on the toxicity of this material. The items in this document are subject to change and clarification as more information becomes available.

APPENDIX F

DAILY AIR MONITORING RECORD FORM

PWGC
Strategic Environmental Engineering Solutions

DAILY AIR MONITORING RECORD FORM

Date: _____ Site Safety Officer

Printed Name: _____

Signature:_____

Time: _____ Air Monitor: _____

Tasks of day / Location: _____

_____

Remarks: _____

_____

Weather Condition – Wind Direction: _____ Sky Cover: _____

	Station Number	PID	DUST	LEL	H2S
Perimeter Monitoring Points					

Dust suppressant necessary: Yes or No

Calibration (date & background level): _____

Instruments used including model & serial number

PID	Model #	Serial #
Dust Meter	Model #	Serial #
4-Gas Meter	Model #	Serial #

Monitoring Results & Comments: _____

_____

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

APPENDIX G

CONFINED SPACE ENTRY CHECKLIST/PERMIT

PWGC
Strategic Environmental Engineering Solutions

CONFINED SPACE ENTRY PERMIT

_____ Confined Space _____ Hazardous Area _____ Non Permit Required

Note: No work will be performed unless the space meets non permit requirements.
Permit valid 8 hours only. All copies of permit will remain at this job site until job is completed.

Site location and description: _____

Purpose of entry: _____

Supervisor(s) in charge of crew: _____

Type of crew: _____ Phone: _____

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED & REVIEWED PRIOR TO ENTRY

Requirements Completed	*Date*	*Time*		*Requirements Completed*	*Date*	*Time*	
Lock Out/De-energize/try-out				Full Body Harness w/"D" Ring			
Line(s) Broken-capped-blanked				Emergency Escape Retrieval			
Purged-Flush and Vent				Lifelines			
Ventilation				Fire Extinguishers			
Secure Area (Post and Flag)				Lighting (Explosive Proof)			
Breathing Apparatus				Protective Clothing			
Resuscitator-Inhalator				Respirator(s) (Air Purifying)			
Standby Safety Personnel				Burning and Welding Permit			

Note: Items that do not apply enter N/A in the blank

Record Continuous Monitoring Results Every 2 Hours **

Continuous Monitoring to Test(s) to be taken	*Permissible Entry Level*	*Monitoring Results*									
Percent of Oxygen	19.5% to 23.5%										
Lower Flammable Limit	Under 10%										
Hydrogen Sulfide	+ 10 PPM* 15 PPM										

Notes: * Short-term exposure time: Employee can work in area up to 15 minutes
+ 8 hour time – Weighted average: Employee can work up to 8 hours (longer if appropriate respiratory protection).
** Record continuous monitoring results every 30 minutes starting ½ hour prior to beginning work.

REMARKS:

Gas Tester Name & Check #	Instrument(s) Used	Model &/or Type	Serial &/or Unit #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

Safety standby person(s)	Check #	Safety standby person(s)	Check #
_____	_____	_____	_____

Supervisor Authorizing Entry: _____

All Above Conditions Satisfied: _____

Emergency Number Posted in Job Trailer.

Note: A single entry permit can be filled out prior to start of daily work.

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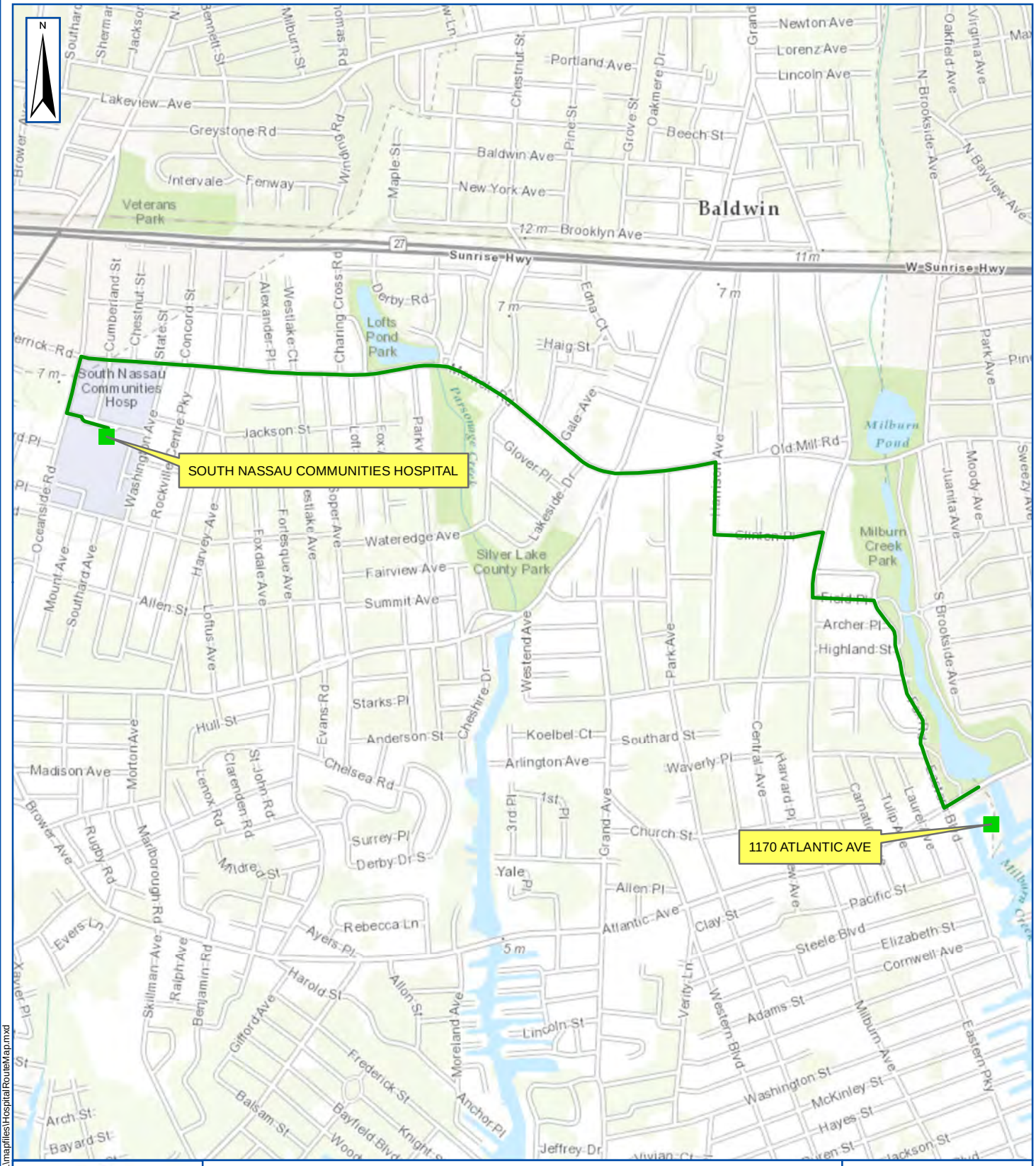
APPENDIX H

EMERGENCY TELEPHONE NUMBERS
HOSPITAL INFORMATION AND MAP
FIELD ACCIDENT REPORT

Emergency Telephone Numbers

General Emergencies	911
Nassau County Police	911
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
Baldwin Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Health and Safety Officer	1-631-589-6353
Alternate Health and Safety Officer	1-631-589-6353



HOSPITAL ROUTE MAP

1170 ATLANTIC AVE
BALDWIN, NY

0 ¼ ½ ¾ 1 Miles

PWGC
Strategic Environmental and Engineering Solutions
P.W. GROSSER CONSULTING, INC.
630 Johnson Avenue, • Suite 7
Bohemia • NY • 11716-2618
Phone: (631) 589-6353 • Fax: (631) 589-8705
E-mail: INFO@PWGROSSER.COM

Project:	SSS1101
Date:	1/30/2015
Designed by:	JE
Drawn by:	JCG
Approved by:	JE
Figure No:	5

Document Path: D:\GIS\Projects\S-Z\SSS1101\mapfiles\HospitalRouteMap.mxd

PWGC
Strategic Environmental Engineering Solutions

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME: _____ PROJECT. NO.: _____

Date of Accident: _____ Time: _____ Report By: _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured: _____ DOB or Age _____

How Long Employed: _____

Names of Witnesses: _____

Description of Accident: _____

_____

_____

Action Taken: _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claims through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

_____

_____

_____

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PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

1170 ATLANTIC AVENUE
BALDWIN, NEW YORK 11510
VCP SITE #V00523

COMMUNITY AIR MONITORING PLAN

ON BEHALF OF:

Safeguard Self Storage
105 Maxess Road
Melville, NY 11747

PREPARED BY:

P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
Fax: 631-589-8705

James P. Rhodes, Senior Vice President JimR@pwgrosser.com
John D. Eichler, Project Manager JohnE@pwgrosser.com

PWGC Project Number: SSS1101

FEBRUARY 2015

TABLE OF CONTENTS

TABLES

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in remedial activity) from potential airborne contaminant releases resulting from remedial activities at the Safeguard Self Storage facility in Baldwin, New York.

Action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that ground-intrusive work does not spread contamination off-site through the air.

The primary concerns for this site are VOCs and dust particulates.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air.

- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

The following sections contain information describing the types, frequency, and location of real-time monitoring.

2.1 Real-Time Monitoring

This section addresses the real-time monitoring conducted within the work area, and along the site perimeter, during intrusive activities such as drilling, excavation, product recovery, manipulation of soil piles, extraction of sheet piling, etc.

2.1.1 Work Area

The following instruments shall be used for work area monitoring:

- Photoionization Detector (PID)
- Dust Monitor

Table 1-1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. **Table 1-2** lists the Real-Time Air Monitoring Action Levels to be used in work areas.

2.1.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air quality monitoring shall be performed at several locations around the site perimeter before investigation activities begin. Air monitoring shall be continued periodically in series during work activities.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for site-related VOCs with a MiniRae 2000 photoionization detector (PID) with an 11.7 eV lamp. **Table 1-1** presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. **Table 1-2** lists the Real-Time Air Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a site log book by the designated site safety officer. PWGC's site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be zeroed daily and checked for accuracy and a daily log shall be kept. If additional air monitoring is required, protocols shall be appended to this plan.

TABLE 1-1
FREQUENCY AND LOCATION OF AIR MONITORING

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Drilling, Excavation	PID, Dust Monitor	Continuous in Breathing Zone (BZ) during intrusive activities or if odors become apparent, screening in the BZ every 30 minutes during non-intrusive activities; Continuous at downwind site boundary with a 15 minute running average

TABLE 1-2
REAL-TIME AIR MONITORING ACTION LEVELS

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone	0-25 ppm, non-transient	None	Exposure below established exposure limits
PID	Breathing Zone	25-100 ppm, non-transient	Don APR	Based on potential exposure to VOCs
PID	Breathing Zone	>100 ppm, non-transient	Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas.
PID	Work Area Perimeter	< 5 ppm	None	Exposure below established exposure limits.
PID	Work Area Perimeter	> 5 ppm	Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas
Aerosol Monitor	Work Area Perimeter	>100 but < 150 µg/m³ for 15 minutes	Institute dust suppression measures, Notify HSM.	Work to continue if particulate concentrations remain below 150 µg/m³
Aerosol Monitor	Work Area Perimeter	>150 µg/m³	Don ASR or SCBA, Institute dust suppression measures, Notify HSM.	Stop work and implement dust suppression techniques until readings return to acceptable levels, Notify HSM.

3.0 VAPOR EMISSION RESPONSE PLAN

This section is excerpted from the NYSDOH guidance for Community Air Monitoring Plan - Ground Intrusive Activities.

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

- Organic vapor levels 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If organic vapor levels exceed 25 ppm at the perimeter of the work area, work activities shall be halted. When work is halted, downwind air monitoring as directed by the Site Health & Safety Officer (SHSO) shall be implemented to determine whether vapor emission may impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan Section.

4.0 MAJOR VAPOR EMISSION RESPONSE PLAN

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

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

If efforts to abate the emission source (see Section 5.0) are unsuccessful and if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

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

Upon activation, the following activities shall be undertaken:

1. Emergency Response Contacts, as identified in the Health & Safety Plan, shall go into effect.

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

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

5.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques shall be employed when action levels warrant their use. Techniques to be implemented for control of VOCs from stockpiled soil or from the open excavation should include one or more of the following:

- cover with plastic
- cover with "clean soil"
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

6.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques shall be employed during work that may generate dust, such as excavation, grading, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays should prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust not create surface runoff.

7.0 DATA QUALITY ASSURANCE

7.1 Calibration

Instrument calibration shall be documented in the designated field logbook. Instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.2 Operations

Instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment shall be maintained on-site by the field team leader for reference.

7.3 Data Review

The Field Team Leader shall interpret monitoring data based on **Table 1-2** and his/her professional judgment. The field team leader shall review the data with the project manager to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with sample documentation shall be periodically reviewed by the project manager.

8.0 RECORDS AND REPORTING

Readings shall be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources shall be notified in writing within five (5) working days.

The notification shall include a description of the control measures implemented to prevent further exceedances.

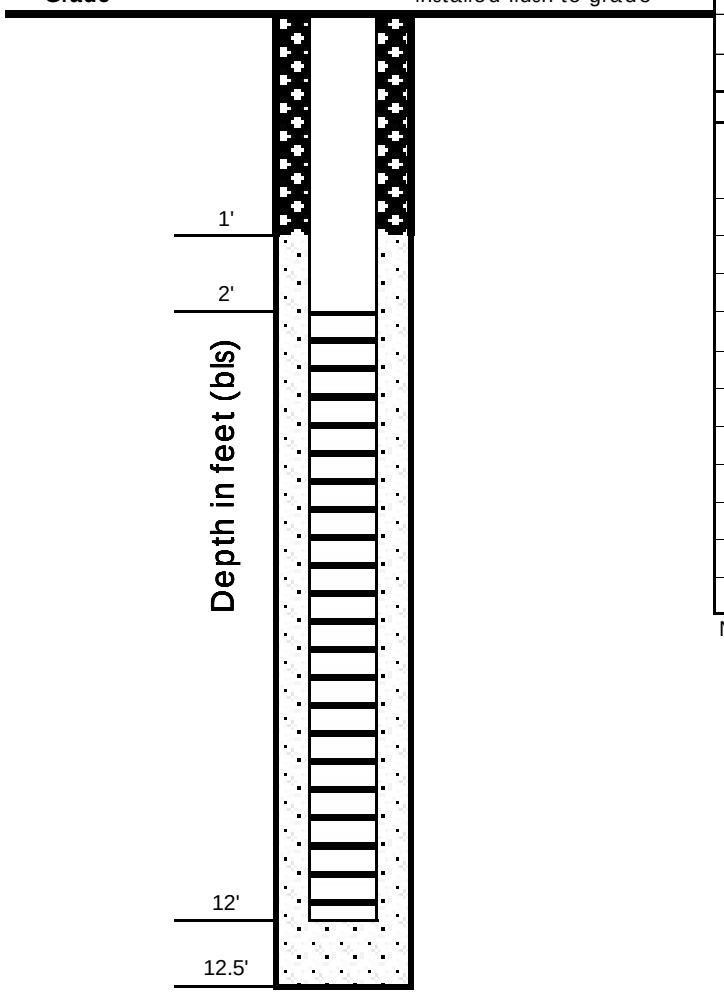
APPENDIX D

MONITORING WELL CONSTRUCTION LOGS

P.W. Grosser Consulting

Monitoring Well Construction and Development Log

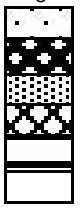
MW Designation:	**MW-3**	**Logged By:**	IB
Site Address:	1170 Atlantic Avenue, Baldwin, NY	**Project Manager:**	JE
Project Name:	Safeguard	**PWGC Project Number:**	SSS1101
Drilling Contractor:	Associated Environmental	**Driller Name:**	John / Ryan
Drilling Method:	Hollow Stem Augers	**Borehole Diameter:**	5"
Soil Sampling Method:	NA	**Total Borehole Depth (bls):**	12.5'
Drilling Fluid:	NA	**Fluid Loss During Drilling:**	NA
Start Time:	11:05	**Completion Time:**	11:40
Start Date:	5/8/2012	**Completion Date:**	5/8/2012
Surveyor:	PWGC	**Survey Date:**	5/30/2012



Well Purpose:	Monitoring	Well Material:	Schedule 40 PVC
Well Diameter:	2"		
Screen Slot:	10	Development Date:	NA
Static DTP (bmp):	N/A	Development Method:	NA
Static DTW (bmp):	4.33	Pumping Duration:	NA
Static DTB (bmp):	11.8	Water Removed:	NA

Notes:

Legend:



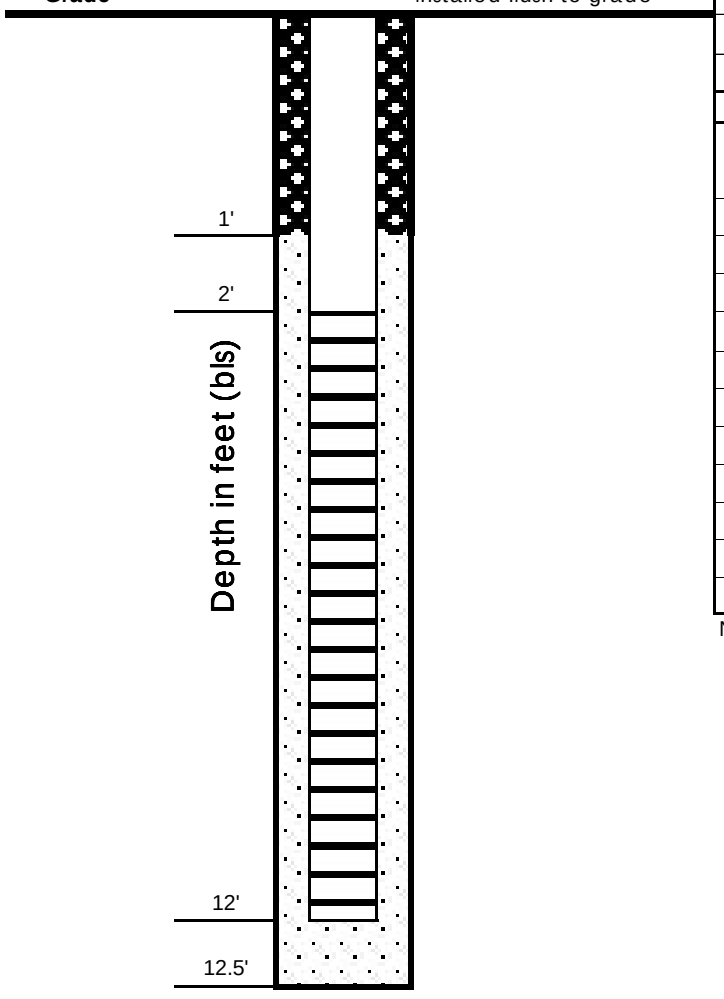
#2 sand filter pack
bentonite pellets
native fill
bentonite / cement grout
well screen
well riser

Notes:
bls = below level surface
bmp = below measuring point

P.W. Grosser Consulting

Monitoring Well Construction and Development Log

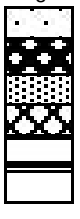
MW Designation:	**MW-5**	**Logged By:**	IB
Site Address:	1170 Atlantic Avenue, Baldwin, NY	**Project Manager:**	JE
Project Name:	Safeguard	**PWGC Project Number:**	SSS1101
Drilling Contractor:	Associated Environmental	**Driller Name:**	John / Ryan
Drilling Method:	Hollow Stem Augers	**Borehole Diameter:**	5"
Soil Sampling Method:	NA	**Total Borehole Depth (bls):**	12.5'
Drilling Fluid:	NA	**Fluid Loss During Drilling:**	NA
Start Time:	9:52	**Completion Time:**	10:22
Start Date:	5/8/2012	**Completion Date:**	5/8/2012
Surveyor:	PWGC	**Survey Date:**	5/30/2012



Well Purpose:	Monitoring	Well Material:	Schedule 40 PVC
Well Diameter:	2"	Reference Elevation:	-4.81
Screen Slot:	10	Development Date:	NA
Static DTP (bmp):	N/A	Development Method:	NA
Static DTW (bmp):	5.05	Pumping Duration:	NA
Static DTB (bmp):	11.37	Water Removed:	NA

Notes:

Legend:



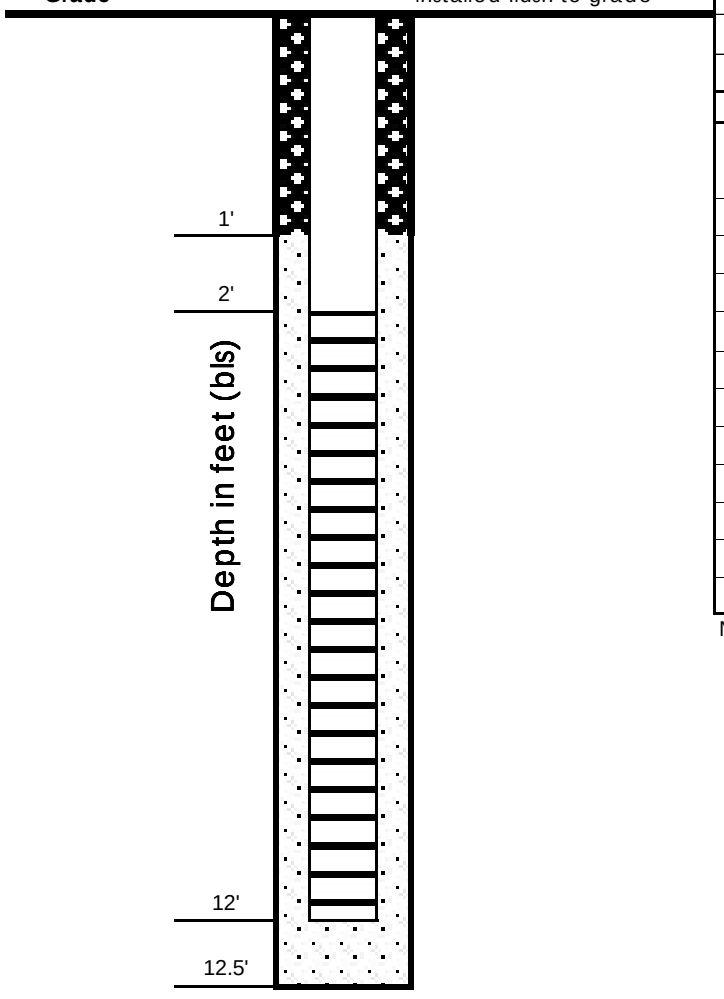
#2 sand filter pack
bentonite pellets
native fill
bentonite / cement grout
well screen
well riser

Notes:
bls = below level surface
bmp = below measuring point

P.W. Grosser Consulting

Monitoring Well Construction and Development Log

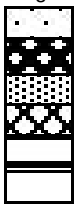
MW Designation:	**MW-6A**	**Logged By:**	IB
Site Address:	1170 Atlantic Avenue, Baldwin, NY	**Project Manager:**	JE
Project Name:	Safeguard	**PWGC Project Number:**	SSS1101
Drilling Contractor:	Associated Environmental	**Driller Name:**	John / Ryan
Drilling Method:	Hollow Stem Augers	**Borehole Diameter:**	5"
Soil Sampling Method:	NA	**Total Borehole Depth (bls):**	12.5'
Drilling Fluid:	NA	**Fluid Loss During Drilling:**	NA
Start Time:	8:45	**Completion Time:**	9:30
Start Date:	5/8/2012	**Completion Date:**	5/8/2012
Surveyor:	PWGC	**Survey Date:**	5/30/2012



Well Purpose:	Monitoring	Well Material:	Schedule 40 PVC
Well Diameter:	2"	Reference Elevation:	-3.25
Screen Slot:	10	Development Date:	NA
Static DTP (bmp):	N/A	Development Method:	NA
Static DTW (bmp):	5	Pumping Duration:	NA
Static DTB (bmp):	12.1	Water Removed:	NA

Notes:

Legend:



#2 sand filter pack
bentonite pellets
native fill
bentonite / cement grout
well screen
well riser

Notes:
bls = below level surface
bmp = below measuring point

APPENDIX E – GROUNDWATER SAMPLING LOG

P.W. GROSSER CONSULTING, INC.

Monitoring Well Sampling Log

SITE INFORMATION

SITE ID / PROJECT NUMBER: SSS1101

SAMPLING POINT _____ SAMPLED BY _____

DATE SAMPLED _____ TIME SAMPLED _____

STATIC WATER ELEVATION (feet) _____ TOTAL WELL DEPTH (feet) _____

WELL DIAMETER (inches) 2

SAMPLING INFORMATION

PURGE METHOD _____ SAMPLE METHOD _____

PURGE RATE (GPM) _____ PURGE TIME (Min) _____

SAMPLE APPEARANCE _____ ODORS OBSERVED _____

ANALYSIS VOCs 8260 LABORATORY _____

DATE SHIPPED _____ SHIPPING METHOD _____

SAMPLING PARAMETERS

Time	Flow Rate (mL/min)	pH	Cond. (mS/cm)	Turbidity (NTU)	ORP (mV)	Temp. (ºC)	DO

Low-Flow Guidelines:

Flow Rate - between 200 - 500 mL/min
pH - ±0.1
Conductivity - ±3%
ORP - ±10 mV
DO - ±10%
Turbidity - ±10%

APPENDIX F – SITE INSPECTION FORM

Site Inspection Form

SAFEGUARD SELF STORAGE FACILITY

1170 ATLANTIC AVENUE

BALDWIN, NEW YORK

Date / Time: _____

Inspector (name/organization): _____

Detail the condition of monitoring wells – Confirm well integrity; note damage to well casing, j-plug, cover; note missing bolts: _____

Detail the condition of ground cover and evidence of ground intrusive activity: _____

Are any repairs and/or maintenance needed at this time? If so, conduct another inspection following repairs.

Name	Signature	Date

APPENDIX G – QUALITY ASSURANCE PROJECT PLAN

PWGC
Strategic Environmental Engineering Solutions

QUALITY ASSURANCE PROJECT PLAN

SAFEGUARD SELF STORAGE FACILITY
BALDWIN, NEW YORK

Prepared For:
Safeguard Self Storage

Prepared By:
P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716

SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

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FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

%R	Percent Recovery
ASP	Analytical Sampling Protocol
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
DESA	Division of Environmental Science and Assessment
DI	Deionized
DOT	US Department of Transportation
DQO	Data Quality Objective
FCR	Field Change Request
FID	Flame Ionization Detector
FOL	Field Operations Lead
FSP	Field Sampling Plan
GC	Gas Chromatograph or Gas Chromatography
GIS	Geographic Information System
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HSO	Health and Safety Officer
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
LCS	Laboratory Control Sample
MDL	Method Detection Limit
MRR	Material Received Report
MSDS	Material Safety Data Sheet
N/A	Not Applicable or Not Available.
Non-RAS	Non-Routine Analytical Services
NTU	Nephelometric Turbidity Units
NYSDEC	New York State Department of Environmental Conservation
PARCC	Precision, Accuracy, Representativeness, Completeness, Comparability
PID	Photoionization Detector
PM	Project Manager
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAS	Routine Analytical Services
RI/FS	Remedial Investigation and Feasibility Study
RPD	Relative Percent Difference
RSCC	Regional Sample Control Center
RSD	Relative Standard Deviation
SD	Standard Deviation
SMP	Site Management Plan
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TDEMI	Time-Domain Electromagnetic Induction
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
VPB	Vertical Profile Boring
WAM	Work Assignment Manager

1.0 INTRODUCTION

Presented herein is the Quality Assurance Project Plan (QAPP) for site management activities at the Safeguard Self Storage Site in Baldwin, New York. Site management activities, as specified in the Site Management Plan for the subject site, will be performed in accordance with the selected remedy for the site. The selected remedy includes:

- Groundwater monitoring;
- Implementation of Institutional Controls to protect human health from exposure to the existing contamination;
- Development of a Site Management Plan (SMP) to address groundwater and indoor air at the site and ensure the proper management of all site remedy components.

This QAPP has been prepared to define the quality assurance (QA) and quality control (QC) activities to be implemented, to verify the integrity of the work to be performed at the site, and that the data collected will be of the appropriate type and quality needed for the intended use.

Specifically, this QAPP addresses the following:

- Description of Project
- Organization and Responsibilities of Project Personnel
- Project Objectives, including Quality Assurance Objectives for Data
- Overview of Field Sampling Program and Procedures
- Sample Packaging and Shipping
- Sample Documentation
- Sample Analytical Program
- Quality Assurance/Quality Control Procedures

2.0 PROJECT ORGANIZATION AND PERSONNEL RESPONSIBILITIES

PWGC will be responsible for collecting data in accordance with the associated project plans and preparation of monitoring reports. The NYSDEC is the lead regulatory agency overseeing the site activities.

Although QA/QC responsibilities lie principally with the PWGC's Project Director and QA Officer, proper implementation of QA/QC requirements necessitate that the entire project staff be cognizant of all procedures and goals. A field program organization chart is presented as Figure 2-1. PWGC project personnel and respective responsibilities are described below.

The Project Director is responsible for the overall quality of the work performed on this project. The responsibilities generally include technical review, resolution of technical issues and client and agency relations. He monitors the progress of each work assignment to ensure that adequate resources are available and that major quality problems are prevented or minimized. The Project Director implements the program standard of quality for work under the contract and ensures that the Project Manager adheres to that standard. The Project Director's review concentrates on the technical quality, schedule, and cost for all work assignments.

The Project Manager (PM) has primary responsibility for planning and implementation of site activities, including the overall management of the project team. The PM is accountable for ensuring that the work is conducted in accordance with applicable plans and guidelines. In addition, the PM will communicate all technical, QA and administrative matters to the PWGC Project Director. He will ensure that any deviations from the approved plans are documented and reviewed/approved. The PM has the responsibility for overseeing the preparation of project deliverables to be submitted by PWGC.

The overall management of the activities to ensure the quality of work associated with the project is the responsibility of the Quality Assurance/Data Quality Officer. A site-specific QA Officer will be assigned to the project, to hold responsibility for on-site QA activities, including performance of audits and verification of corrective actions. In addition, the QA Officer will coordinate with the PM and other project staff, as applicable, during the reduction, review and reporting of the analytical data.

The Field Operations Lead (FOL) will be responsible for the management and supervision of the field investigation program, providing consultation and decision-making on day-to-day issues relating to the sampling activities. The FOL shall monitor the sampling to determine that operations are consistent with plans and procedures, and that the data acquired meets the analytical and data quality needs. When necessary, the FOL will document any deviations from the plans and procedures for approval.

The Sample Coordinator is responsible for overseeing the collection, packaging, preservation and shipping procedures for the investigation samples and ensuring that these procedures are performed in accordance with applicable plans and guidelines.

The Site Geologist/Hydrogeologist shall be responsible for the geological and hydrogeological field investigation/monitoring at the site. In addition, the analysis and evaluation of the field data will be the responsibility of the Site Geologist/Hydrogeologist.

The site-specific Health and Safety Officer (HSO) reports to the FOL and PM and is responsible for the implementation of the PWGC Health and Safety Program. The HSO shall advise the project staff on health and safety issues, conduct health and safety training sessions, and monitor the effectiveness of the health and safety program conducted in the field. The HSO, acting for the safety of all site personnel, has the authority to stop work when unsafe work conditions exist during the field activities.

In addition, other technical sampling team members may provide support to the PM and the FOL on an as-needed basis.

The services of several subcontractors (e.g., drilling, surveying, waste management, and laboratory services) may also be necessary for the performance of site activities. The PM, with assistance from the FOL, and the Quality Assurance/Data Quality Officer, will be the liaison between each of the subcontractors.

3.0 QUALITY ASSURANCE PROJECT OBJECTIVES

The objective of monitoring activities for the site is to obtain sufficient data at a known quality level to assess the effectiveness of the selected remedy in eliminating, reducing, or controlling risks to human health and the environment.

3.1 Data Quality Objective Process

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions during remedial activities. DQOs can be defined as what the end user expects to obtain from the analysis results, and are developed through a seven-step process:

- Step 1 State the problem
- Step 2 Identify the decision
- Step 3 Identify inputs to the decision
- Step 4 Define the study boundaries
- Step 5 Develop a decision rule
- Step 6 Specify limits on decision errors
- Step 7 Optimize the decision for obtaining data

For the site, screening data generated by rapid, less precise methods of analysis (PID screening, collection of groundwater field parameters, etc.) will achieve a data use level for site characterization and monitoring. Definitive laboratory analytical data generated during the groundwater monitoring activities will achieve a data use level to support an assessment of the overall effectiveness of the site remedy.

Specifically, these data will be used to monitor the extent of residual groundwater contamination through the comparison of constituent results to applicable criteria and the development of isoconcentration maps (as applicable).

Known contaminants present in samples collected from the site include chlorinated volatile organic compounds (VOCs).

3.2 Data Quality Categories

DQOs are composed of written expectations for precision, accuracy, representativeness, completeness and comparability of a data set. These aspects will be further defined in Section 3.3. The DQO process provides a logical basis for linking the QA/QC procedures to the intended use of the data, primarily through the decision maker's acceptable limits on decision error. Two descriptive data categories - screening data and definitive data - will be used for the site.

Screening data are generated by rapid, less precise methods of analysis and are deemed non-critical to project objectives. Portable instruments to be used during this field investigation to collect screening data include:

- Interface probe/water level indicator
- Dissolved oxygen meter
- pH meter
- Specific conductivity meter
- Temperature meter
- Turbidity meter
- Photoionization detector (PID)

Definitive data are generated using specific analytical methods and guidelines and have satisfied known QA/QC requirements. Analytical data provided by an off-site laboratory shall be definitive data, and are deemed critical to project objectives. QA/QC elements of definitive data include determination and documentation of calibrations, detection limits, method blanks, and matrix spike recoveries. Additional information on analytical QC elements and their acceptance criteria are provided in Section 9.2. For further information on analytical data validation and reporting, see Section 10.0.

3.3 QA/QC Characteristics

The overall QA/QC objective for monitoring activities is to develop and implement procedures that will provide data of known and documented quality. QA/QC characteristics for data include precision, accuracy, representativeness, completeness, and comparability. Data quality objectives for each of these parameters are determined based on the level of data required. Descriptions of these characteristics are provided below, and specific QA objectives for both screening and definitive data are presented on Table 3-1. Analytical matrices and methods are provided on the table; further information on the monitoring procedures and analytical methodologies are presented in Sections 4.0 and 6.0, respectively.

TABLE 3-1
QA OBJECTIVES FOR FIELD INVESTIGATION DATA

Parameter	*Measurement*	*Matrix*	*Method*	*Units*	*Precision*	*Accuracy*	*CRQL / MDL*	*Completeness (%)*
Water Level	Screening	Aqueous	Direct Field Measurement	feet	± 0.01 feet	N/A	N/A	90
Dissolved Oxygen	Screening	Aqueous	Direct Field Measurement	mgO_2/L	± 3%	N/A	N/A	90
pH	Screening	Aqueous	Direct Field Measurement	Std. Units	± 0.1 units	N/A	N/A	90
Specific Conductivity	Screening	Aqueous	Direct Field Measurement	umhos/cm or mS/cm	± 1% of full scale*	N/A	N/A	90
Temperature	Screening	Aqueous	Direct Field Measurement	°C	± 0.1 °C	N/A	N/A	90
Turbidity	Screening	Aqueous	Direct Field Measurement	NTU	± 2 NTU	N/A	N/A	90
VOCs	Screening	Air	Direct Field Measurement	PPM	± 1%	N/A	N/A	90
TCL VOCs	Definitive	Aqueous	EPA Method 8260B	ug/kg	± 25% RPD	172% R	1-5 ug/L (aq.)	90
		Air/Vapor	EPA Method	ug/m^3	± 25% RPD	70-130% R	5 ug/m^3	90

Notes:
Abbreviations include:

%R = Percent Recovery
GC = Gas Chromatography
N/A = Not Applicable
NTU = Nephelometric Turbidity Units
TAL = Target Analyte List
TCL = Target Compound List
CRQL = Contract Required Quantitation Limit
MDL = Method Detection Limit
VOCs = Volatile Organic Compounds
RPD = Relative Percent Difference

* Precision dependent on meter and scale.
· Target VOCs include trichloroethene, 1,1,1-trichloroethane, and tetrachloroethene.
· Water quality parameters include the following: dissolved oxygen, nitrate, sulfide, sulfate, iron II, redox potential, dissolved organic carbon, carbon dioxide, alkalinity and chloride. Methods and detection limits are provided in Table 6-2.

Precision is the measurement of agreement in repeated tests of the same or identical samples, under prescribed conditions. Analytical precision can be expressed in terms of Standard Deviation (SD), Relative Standard Deviation (RSD) and/or Relative Percent Difference (RPD). The precision of analytical environmental samples has two components - laboratory precision and sampling precision. Laboratory precision is determined by replicate measurements of laboratory duplicates and by analysis of reference materials. The objectives for laboratory precision are specified in the analytical methodologies and are presented on Table 3-1. The precision of the field sampling effort is determined by the analysis of field duplicate samples; see Section 9.1.5. Field duplicate analysis will be performed at a rate of five percent (i.e., one duplicate collected for every 20 samples). Acceptance criteria for duplicates analyzed by an off-site laboratory shall be an RPD of 25 percent. The precision limits provided in Table 3-1 for the screening measurements are acceptance criteria for duplicate and calibration analyses of field measurement parameters.

Accuracy is the degree of agreement of a measured sample result or average of results with an accepted reference or true value. It is the quantitative measurement of the bias of a system, and is expressed in terms of percent recovery (%R). Measurements of accuracy for the laboratory include surrogate spike, laboratory control spike, matrix spike and matrix spike duplicate samples. The laboratory must meet or exceed control limit objectives, as stated in Table 3-1 and the applicable methodologies.

Representativeness is the degree to which the results of the analyses accurately and precisely represent a characteristic of a population, a process condition, or an environmental condition. In this case, representativeness is the degree to which the data reflect the contaminants present and their concentration magnitudes in the sampled site areas. Representativeness of data will be ensured through the selection of sampling locations and implementation of approved sampling procedures. Results from environmental field duplicate sample analyses can be used to assess representativeness, in addition to precision.

Completeness is defined as the percentage of samples that meet or exceed all the criteria objective levels for accuracy, precision and detection limits within a defined time period or event. It is the measure of the number of data "points" which are judged to be valid, usable results. The objective for completeness for this project is 90 percent, and will be calculated by dividing the number of usable data results (i.e., all results not considered to be "rejected" and all samples able to be analyzed) by the number of possible data results (i.e., the total number of field samples collected), and then multiplying by 100 percent.

Comparability is the degree of confidence with which results from two or more data sets, or two or more laboratories, may be compared. To achieve comparability, standard environmental methodologies will be employed in the field and in the laboratory. See Table 3-1 and Section 6.0 for analysis methods and detection limits for this field investigation.

3.4 Impact of Failure to Meet Data Quality Objectives

The QA objectives presented in Table 3-1 represent the data quality necessary to meet the project's technical goals. The QA/QC efforts discussed in this QAPP focus on controlling measurement error and, ultimately, providing a database for estimating the uncertainty in the measurement data for the project. QA objectives will be evaluated throughout the monitoring effort to see if the results for the project meet the stated objectives. If these objectives are not being met, the precision and/or accuracy of the sampling data will be decreased, and corrective actions shall be taken, as documented in Section 13.0.

4.0 MONITORING ACTIVITIES

This section provides an overview of the planned monitoring operations by matrix and type of procedures. It also includes activities that may be necessary in the future to supplement the existing groundwater monitoring well network (i.e., site survey; monitoring well installation, etc.). Field monitoring and sampling activities include the following:

- Mobilization and Demobilization
- Monitoring Well Installation and Development (if necessary)
- Monitoring Well Survey (if necessary)
- Water Level Measurements
- Groundwater Field Screening
- Monitoring Well Sampling
- Decontamination

4.1 Remedial Action Monitoring Procedures

Monitoring activities to be performed will be conducted in accordance with established technical guidelines, methods, policies and Standard Operating Procedures (SOPs). The subsections below present an overview of the sampling program procedures.

4.1.1 Mobilization and Demobilization

The mobilization effort will consist of logistical planning, identification of sampling locations, equipment mobilization to the site, and field personnel orientation. The orientation meeting will familiarize the sampling team with a brief history of the site, health and safety requirements, and monitoring procedures. Mobilization and demobilization will take place before and after completion of routine monitoring events. Demobilization will consist of site area clean-up, staging and inventory of monitoring-derived wastes, decontamination and demobilization of field equipment, and organization of monitoring records.

4.1.2 Monitoring Well Installation and Development

The current site groundwater monitoring well network consists of 12 monitoring wells. These monitoring wells are sampled on a semi-annual basis as part of the groundwater monitoring program for the site. In the event that one of the wells is damaged, a replacement monitoring well will be installed using a rotary drill rig and hollow stem augers. Monitoring wells will be constructed of 2- inch pvc. Wells screened at the water table will have 15 feet of 0.020 inch slotted screen set to intersect the water table interface (5 ft above, 10 ft below). A Morie® # 1 filter pack will be placed to two feet above top of the screen followed by a two-foot thick bentonite pellet seal and cement/bentonite grout to ground surface. Monitoring wells will be developed by pumping and/or surging until turbidity has been eliminated or stabilized.

4.1.3 Monitoring Well Survey

Any new monitoring wells will be surveyed for horizontal location (nearest 0.1 foot), ground elevation (nearest 0.1 foot), and measuring point elevation (nearest 0.01 foot). The survey will include the elevation of the top of the monitoring well casing, with the well cap removed, for determination of water table elevations. The survey will be presented in the New York State Plane coordinate system, using the NAD

1983 horizontal datum and NAVD 1988 elevation datum, and will be provided in AutoCAD Version 2008 electronic format.

4.1.4 Water Level Measurements

Static water level measurements will be collected prior to each round of the semi-annual groundwater sampling from each of the wells in the groundwater monitoring well network. A water level indicator will be used to collect measurements in the monitoring wells from surveyed measuring points. Readings will be recorded in a field logbook or on applicable field investigation sheets (see Section 5.3) in increments of 0.01 feet. The water level indicator will be tested prior to the commencement of measurements with a jar of water and the depths will be calibrated on the ground against a steel tape.

4.1.5 Groundwater Field Parameter Measurement

Groundwater field parameters, including temperature, pH, turbidity, specific conductance, and/or dissolved oxygen will be monitored during purging of monitoring wells using an Orion® water quality meter or equivalent. The water quality meter will be calibrated in accordance with the manufacturer's instructions at the start of each day of groundwater sampling. The meter probe will be positioned in the flow-through cell and measurements will be collected every two minutes during well purging. Readings will be recorded in a field logbook or on applicable field investigation sheets (see Section 5.3). The well will be considered stabilized and ready for sample collection when the groundwater field parameters have stabilized for three consecutive measurements as follows:

- +0.1 for pH
- 3 percent for specific conductance
- 10 percent for dissolved oxygen
- 10 percent for turbidity

The water quality meter probe will be decontaminated between wells by rinsing it with distilled or de-ionized water in accordance with the decontamination procedures specified in Section 4.2.

4.1.6 Monitoring Well Sampling

The site groundwater monitoring network (4 wells) will be sampled on an 18-month basis. Monitoring wells will be purged and sampled in accordance with Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling (EPA Region II, March 16, 1998) and EPA-ERT SOP#2007, Groundwater Well Sampling (EPA-ERT, January 26, 1995) (Appendix A).

Groundwater samples will be placed into laboratory glassware and a cooler and maintained at 4°C while taken under chain of custody to a NYSDOH certified laboratory for analysis. All groundwater samples will be analyzed for VOCs by EPA Method 8260.

4.2 Decontamination Procedures

All non-disposable equipment involved in field sampling activities will be decontaminated prior to and subsequent to sampling. Equipment leaving the site will also be decontaminated.

All drilling equipment will be steam cleaned prior to use and between sample locations. Pressurized steam will be used to remove all visible excess material from augers, rods, drill bits, the back of the drill rig, and other parts of the rig which contact augers and rods. Steam cleaning will be conducted on a decontamination pad, which will be constructed on-site in the event that drilling services are required.

Field instrumentation (such as interface probes, water quality meters, etc.) will be decontaminated between sample locations by rinsing with de-ionized water. If visible contamination still exists on the equipment after the rinse, an Alconox detergent scrub step will be added, and the probe thoroughly rinsed again.

Decontamination of non-disposable sampling equipment used to collect samples for chemical analyses will be conducted as described below:

1. Alconox detergent and potable water scrub
2. Potable water rinse
3. Rinse with 10 percent nitric acid (ultra pure grade) when sampling for inorganics. Carbon steel split-spoons will be rinsed with a 1 percent nitric acid solution to avoid stripping of metals.
4. Distilled water rinse
5. Air dry
6. Wrap or cover exposed ends of equipment with aluminum foil for transport and handling if not immediately used.

Decontamination of sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated disposable sampling equipment will be used. Decontamination fluids will be stored in US Department of Transportation (DOT)-approved 55-gallon drums or in an on-site storage tank (liquids only) until proper disposal. Personnel directly involved in equipment decontamination will wear protective clothing in accordance with PWGC health and safety procedures.

5.0 SAMPLE CUSTODY AND DOCUMENTATION

Identification and documentation of samples are important in maintaining data quality. Strict custody procedures are necessary to ensure the integrity of the environmental samples. The subsections below address sample identification, packaging, shipping, and documentation.

5.1 Sample Identification System

The method of identification of a sample depends on the type of measurement or analysis performed. When field screening measurements (e.g., pH, turbidity) are made, data are recorded directly in logbooks or on field investigation forms (see Section 5.3). Identifying information such as project name, sample location and depth, date and time, name of sampler, field observations, remarks, etc. shall be recorded.

Each sample collected for off-site laboratory analysis during the field investigation will be specifically designated by PWGC for unique identification. Samples will be identified using a letter code to indicate sample collection methodology. A letter code (see below) will follow, along with the name and/or number that depicts the specific location. Field equipment blanks will be denoted by the letter code "FB" and trip blanks with TB. Sample collection date and time will be recorded in the field logbook/form, chain of custody as well as the sample label.

Letter code prefixes for monitoring activities are as follows:

- MW Monitoring Well Groundwater Sample
- FB Field Blank Sample
- TB Trip Blank Sample
- MS Matrix Spike Sample
- MSD Matrix Spike Duplicate Sample
- DUP Duplicate Sample

At a minimum, all location and identification information for the samples shall be recorded in the field sampling logbook (see Section 5.3.2), and on the appropriate chain of custody record form for shipment (see Section 5.2.1). In addition, sampling location information may be entered into a computerized database during RA monitoring activities (if possible).

5.2 Sample Custody, Packaging and Shipping

Sample custody must be strictly maintained and carefully documented each time the sample material is collected, transported, received, prepared, and analyzed. Custody procedures are necessary to ensure the integrity of the samples, and samples collected during monitoring activities must be traceable from the time the samples are collected until they are disposed of and/or stored, and their derived data are used in the subsequent monitoring report. Sample custody is defined as (1) being in the sampler's possession; (2) being in the sampler's view, after being in the sampler's possession; (3) being locked in a secured container, after being in the sampler's possession; and (4) being placed in a designated secure area. Section 5.2.1

documents the on-site packaging and shipment procedures for sample custody in the field. The analytical laboratories will maintain custody after arrival of the samples through internal logging procedures, as indicated in Section 5.2.2.

5.2.1 Field Custody, Packaging and Shipping Procedures

Field custody procedures shall be implemented for each sample collected. The field sampler shall be responsible for the care and custody of the samples until they are properly transferred or dispatched. To maintain the integrity of the samples, the samples are to be stored in a designated, secure area and/or be custody sealed in the appropriate containers prior to shipment.

Each environmental sample will be properly identified and individually labeled. Labels will be filled out in indelible ink with at least the following information: sample identification (see Section 5.1), type and matrix of sample, date and time of sample acquisition, name of sampler, analysis required, and preservation (as necessary). The sample label will be securely attached to the sample container.

Environmental samples being analyzed by off-site laboratories will be properly packaged and shipped for analysis. Samples are to be packed with sufficient wet ice to cool the samples to 4°C. Additionally, each cooler will be packed with a cooler temperature blank (see Section 9.1.4). Lastly, the cooler should be filled with adequate cushioning material to minimize the possibility of container breakage. Any modifications to the previous procedures will be documented (see Section 13.0).

A laboratory-supplied completed chain of custody form will be included with all sample shipments.

When the samples are being shipped by an overnight delivery service to the laboratory, the chain of custody form and any other paperwork shall be checked against the sample labels and field documentation, and then placed in a waterproof sealable plastic bag and taped securely to the inside lid of the cooler. The cooler must then be secured, with custody seals affixed over the lid opening in at least two locations, and the cooler wrapped with strapping tape (without obscuring the custody seals). Orientation "this end up" arrows shall be drawn or attached on two sides of the cooler, and a completed overnight delivery service shipping label shall be attached to the top of the cooler.

Samples to be shipped by an overnight delivery service shall be shipped within 24 hours of sample collection and arrive at the laboratory within 24 hours of sample shipment. A member of the field team will notify the laboratory of a sample shipment.

5.2.2 Laboratory Custody Procedures

The following generally summarizes laboratory custody procedures; more detailed operations are presented in the laboratory's SOPs.

- A designated sample custodian will accept custody of the shipped samples and will verify that the information on the sample labels matches that on the chain of custody record(s),

- The laboratory custodian will use the sample label number or assign a unique laboratory number to each sample label and will assure that all samples are transferred to the proper analyst or stored in the appropriate secure area; and,
- Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or returned to the custodian or sample storage area. Internal chain of custody records shall be maintained by the laboratory.

The laboratory shall communicate with PWGC personnel by telephone, Email or facsimile, as necessary, throughout the process of sample scheduling, shipment, analysis and data reporting, to ensure that samples are properly processed. If a problem occurs during sample shipment or receipt (e.g., a sample container arrives broken or with insufficient sample volume, a sample was not preserved correctly, a sample was not listed on the chain of custody, etc.), the laboratory shall immediately notify the appropriate person for resolution. Corrective actions shall be documented and approved before implementation; see Section 13.0.

Samples received by the laboratory will be retained until analyses and QA checks are completed. When sample analyses and necessary QA checks have been completed, the unused portion of the sample and the sample container must be disposed of properly by the laboratory. All identifying tags, data sheets, and laboratory records shall be retained as part of the permanent documentation.

5.3 Sample Documentation

5.3.1 Sample Logbook

A cumulative sampling log will be maintained by the FOL or his designee as the monitoring program progresses. All of the samples will be referenced by sampling location in this master log and on a detailed site map. The log data will be maintained as the table of contents for the sample logbook. The sample logbook shall be a loose-leaf notebook containing sample log sheets, as shown in Figure 5-2, or pages of a similar data management format, which includes all the necessary information items. A sample log sheet (or equivalent) must be filled out for each sample from the information recorded in the field notebook (see Section 5.3.2).

5.3.2 Site and Field Logbooks

A bound weatherproof master site logbook will be kept by the FOL or an otherwise designated holder. The site logbook is a controlled document that records all major on-site activities during monitoring activities. At a minimum, the site logbook shall contain an abbreviated version of the notes listed in the team or individual field logbooks, a summary of sampling identifiers and shipment information, visitor's names and arrival/departure times, community contacts, and other site-specific information determined by the FOL to be noteworthy. In addition, prior to field work each day, the personnel on the site, the proposed activities and the weather shall be recorded in the site logbook. Discussions of program activities, field difficulties/problems, and deviations from the SMP, the QAPP and/or other site plans (with justification) must also be included in the logbook record, along with corresponding times.

FIGURE 5-2
SAMPLE LOG SHEET (TYPICAL)

I. SAMPLE IDENTIFICATION

PROJECT MANAGER: _____
SITE: _____
SAMPLE NAME/NUMBER: _____ DATE: _____ TIME: _____ HRS
SAMPLING LOCATION/DEPTH: _____ TYPE: _____ GRAB:_____ COMPOSITE
SAMPLE MATRIX: _____ SURFACE WATER _____ GROUNDWATER _____ SEDIMENT
_____ SOIL _____ WASTE _____OTHER (SPECIFY) _____
SAMPLED BY: _____

I. SAMPLE SOURCE

_____ WELL _____ OUTFALL _____ LEACHATE
_____ DRUM _____ BORING _____ RIVER/STREAM
_____ BLDG/STRUCTURES _____ TANK _____ IMPOUNDMENT
_____ TEST PIT/TRENCH _____ OTHER (SPECIFY)_____
SOURCE DESCRIPTION _____
_____

III. FIELD OBSERVATIONS/MEASUREMENTS

APPEARANCE/COLOR: _____
VOLATILE ORGANIC ANALYSIS (VOA): _____ HNU _____ OVA _____ OTHER
VOA READINGS: OFF SAMPLE _____ RESPIRATORY ZONE _____
LEL/O_2/H_2S READINGS: _____
RADIOACTIVITY (mR/hr): _____
pH: _____ CONDUCTIVITY: _____ TEMPERATURE _____
SALINITY: _____ OTHER: _____
OBSERVATIONS: _____

IV. SAMPLE DISPOSITION

PRESERVATION: _____
LABORATORY NAME: _____
LABORATORY LOCATION: _____ ON-SITE _____ OFF-SITE
FORWARDED TO LABORATORY: DATE _____ TIME: _____ HRS
LABORATORY SAMPLE NO.: _____
CHAIN OF CUSTODY NO.: _____ FED EX NO.: _____

5.3.3 Additional Remarks

The sampling team or any individual performing a particular monitoring activity shall be required to maintain a field logbook. Each logbook will be controlled and assigned a unique sequential identification (e.g., the second logbook devoted to groundwater monitoring well sampling activities would be designated "Well Sampling Logbook No. 2"). The field logbook shall be a bound weatherproof notebook, and entries to the logbook must be filled out legibly in ink. Pertinent information to be recorded in field logbooks includes all information that is necessary to reconstruct the investigative/sampling operations. Documentation of sample activities in the field logbook shall be completed immediately after sampling at the location of sample collection. Logbook entries shall contain all sample information, including sample number, collection time, location, descriptions, field measurements, and other site- or sample-specific observations. Difficulties with sample recovery and field observations (e.g., odor, visible contamination, etc.) must be noted if encountered.

If photographs are taken as part of the documentation procedure, the name of the photographer, the date, the time, the site name, the site location, and a description of the photo shall be entered sequentially in the field logbook.

Logbook pages (for both the master site logbook and the field logbooks) shall be consecutively numbered, and upon entry of data, the logbook pages require the date and the signature of the responsible project team member at the bottom of each page. Corrections to the logbooks shall consist of a single strike line through the incorrect entry, the new accurate information, the initials of the corrector, and the date of amendment. Any blank spaces/pages in the logbooks shall be crossed out with a single strike mark and signed by the person making the notation.

5.3.4 Field Investigation Forms

In addition to field logbooks, field team members will use appropriate forms applicable to the field activities. A well installation sheet shall detail the construction of the monitoring wells should the installation of a replacement new monitoring well be necessary. During development of monitoring wells, a data sheet shall be filled out for each well and field parameters recorded.

Laboratory-supplied chain of custody forms shall be used for all sample shipments.

Records of calibration attainment and preventive maintenance shall be kept for all field instrumentation used that require daily calibration. Further information on calibration and maintenance procedures can be found in Section 8.0.

5.3.5 On-Site Screening Analysis Records

Field data for water level measurements, PID screening, dissolved oxygen measurements, pH measurements, conductivity measurements, temperature measurements, and turbidity measurements (see

Table 3-1) will be reported by site personnel in field logbooks and/or on field investigation forms associated with the sampling event (see Sections 5.3.2 and 5.3.3).

6.0 ANALYTICAL REQUIREMENTS

The analytical program to be undertaken at the site is summarized in Table 6-1. Sample collection and analytical protocol information, which includes the following: sample type, matrix, sampling device, number of samples, analytical parameter, sample container requirements, sample preservation, analytical method, detection limits, and sample holding times, are presented in Table 6-2.

Results from the analyses are to be reported in standard units for the matrix and analysis. For further information on reporting units, see Tables 3-1 and 6-2.

Analytical services will be provided by a NYSDOH ELAP approved laboratory. The laboratory will follow NYSDEC Analytical Sampling Protocol (ASP) and provide data with Category B deliverables (ASP-B). Analyses not available using ASP-B will be provided in results only format.

Table 6-1

Analytical Program

Sample Type	Field Screening	VOCs	Water Quality Parameters	Field Meas.
GROUNDWATER (18 Month Basis):				
Groundwater	--	4	4	4
Field Blanks	--	1	--	--
Trip Blanks	--	1	--	--

Notes:

1. The table does not include field environmental duplicate samples or laboratory QA/QC samples.
2. Field measurements: dissolved oxygen, pH, conductivity, temperature, and turbidity.
3. QA/QC blanks are estimated on the basis of 1trip blank/day/matrix when VOC samples are collected; and at least 1 field blank/decontamination event/type of sampling equipment, not to exceed one per day/matrix.

TABLE 6-2
SAMPLE COLLECTION AND ANALYSIS PROTOCOLS

Sample Type	Matrix	Sampling Device	No. of Samples	Parameter	Sample Container	Sample Preservation	Analytical Method#	CRQL / MDL	Holding Time
Groundwater (Monitoring Wells)	Water	Low Flow Pump or dedicated bailer	3	pH; conductivity; dissolved oxygen; temp.; turbidity	NA	NA	Field measurement	NA	NA
Field Blank (groundwater)	Water	Collected Rinsate Passed Over/ Through Sampling equipment	1	VOCs	(4) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; Cool to 4°C	EPA method 8260B	Compound specific (1-5 ug/l)	10 days
MS/MSD (groundwater)	Water	Low Flow Pump or Dedicated bailer	2/round	VOCs	(8) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; Cool to 4°C	EPA method 8260B	Compound specific (1-5 ug/l)	10 days
Trip Blank	Water	Direct Fill of Sample Bottles	1	TCL Volatile Organic Compounds	(4) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; Cool to 4°C	EPA Method 8260B	Compound specific (1-5 ug/l)	10 days

Notes:
All holding times listed are from Verified Time of Sample Receipt (VTSR) unless noted otherwise. * Holding time listed is from time of sample collection.
The number in parentheses in the "Sample Container" column denotes the number of containers needed. All bottles will comply with OSWER Directive 9240.0-05A: "Specifications and Guidance for Obtaining Contaminant - Free Sample Containers", EPA 540/R-93/051, December 1992.
Triple volume required when collected MS/MSD samples
The number of field blanks, trip blanks and MS/MSDs are estimated.
(1) Targeted volatile organic compounds include trichloroethene, 1,1,1-trichloroethane, and tetrachloroethene.
CRQL / MDL = Contract Required Quantitation Limit / Method Detection Limit.
NA = Not available or not applicable.

7.0 SUPPLIES AND CONSUMABLES

Supplies and consumables necessary for the field investigation will be obtained through appropriate commercial markets and shall meet any supply-specific requirements outlined in the SMP and/or this QAPP. All supplies and consumables will be inspected by PWGC personnel (e.g., the FOL, the Site Geologist) prior to use. Any supplies/consumables that do not meet requirements will be discarded or returned to the supplier.

Supply-specific requirements include the following:

- Sampling equipment shall be manufactured from the procedural-specific material (e.g., teflon lined polyethylene tubing for groundwater sampling, etc.).
- Sample bottle containers will be supplied by the analytical laboratory and will meet all guidelines specified in Specification and Guidance for Obtaining Contaminant-Free Sample Containers (EPA 540/R-93/051) and OSWER Directive 9240.0-05A (EPA, 1992).
- The field QC sample water will be distilled or de-ionized water that is contaminant-free. Certifications from the supplier will be retained in the project files or by analytical laboratory.
- The drilling subcontractor (if drilling services are necessary) may be required to provide a potable water supply for equipment decontamination, depending on availability of water at the site. Any necessary permits or testing will be obtained or reviewed/approved by PWGC. Documentation of the potable water source will be retained in the project files.
- Decontamination chemical supplies shall be of ultra pure grade (nitric acid). Certifications from the supplier will be provided and retained in the project files. In addition, MSDS for the chemicals will be maintained at the site.
- Field screening instrumentation supplies shall be of procedural- and/or manufacturer-specific grade.

Supplies and consumables will be stored, as necessary, in a designated area on the site. The storage area shall be protected from adverse conditions (e.g., weather, heat, etc.) to protect the supplies/consumables from possible outside contamination and breakage.

8.0 INSTRUMENT CALIBRATION AND PREVENTIVE MAINTENANCE

8.1 Calibration

This section describes the requirements for control, calibration, and adjustment of instrumentation. Instruments shall be calibrated and adjusted (if warranted) at specified, predetermined intervals using known, recognized standards. All instruments shall be calibrated in accordance with manufacturer's instructions.

8.1.1 Field Instrumentation

The FOL or his designee will be responsible for ensuring that instrumentation are of the proper range, type and accuracy for the measurement/test being performed, and that all of the equipment are calibrated at their required frequencies, according to their specific calibration protocols/procedures.

All field measurement instruments must be calibrated according to the manufacturer's instructions prior to the commencement of the day's activities. Exceptions to this requirement shall be permitted only for instruments that have fixed calibrations pre-set by the equipment manufacturer. QC objectives for field measurement parameters are presented in Table 3-1. Calibration information shall be documented on instrument calibration and maintenance log sheets (see Figure 8-1 for a typical form) or in a designated field logbook. Information to be recorded includes the date, the operator, and the calibration standards (concentration, manufacturer, lot number, expiration date, etc.). All project personnel using measuring equipment or instruments in the field shall be trained in the calibration and usage of the equipment (see Section 12.0), and are personally responsible for ensuring that the equipment has been properly calibrated prior to its use.

In addition, all field instruments must undergo response verification checks at the end of the day's activities and at any other time that the user suspects or detects anomalies in the data being generated. The checks consist of exposing the instrument to a known source of analyte (e.g., the calibration solution), and verifying a response. If an unacceptable instrument response is obtained during the check (i.e., not within specifications; see Table 3-1), the data shall be labeled suspect, the problem documented in the site logbook, and appropriate corrective action taken. See Section 13.0 for further information on corrective action procedures.

FIGURE 8-1

EQUIPMENT CALIBRATION AND MAINTENANCE FORM (TYPICAL)

Instrument (Name / Model No. / Serial No.): _____

Manufacturer: _____ **Date Purchased or Leased:** _____

CALIBRATION LOGSHEET

Calibration Date	Initial Settings	Standard(s) Used	Procedure	Adjustments Made	Final Settings	Signature of Operator	Comments

MAINTENANCE LOGSHEET

Maintenance Date	Reason for Maintenance	Maintenance Performed	Signature of Operator	Comments

Any equipment found to be out of calibration shall be recalibrated. When instrumentation is found to be out of calibration or damaged, an evaluation shall be made to ascertain the validity of previous test results since the last calibration check. If it is necessary to ensure the acceptability of suspect items, the originally required tests shall be repeated (if possible), using properly calibrated equipment. Any instrument consistently found to be out of calibration shall be repaired or replaced.

8.1.2 Laboratory Instrumentation

Personnel at the laboratory will be responsible for ensuring that analytical instrumentation are of the proper range, type and accuracy for the test being performed, and that all of the equipment are calibrated at their required frequencies, according to specific protocols/procedures.

Off-site laboratory equipment shall be calibrated using certified/nationally recognized standards and according to the applicable methodologies and the laboratory SOPs. In addition, these methods/procedures specify the appropriate operations to follow during calibration or when any instrument is found to be out of calibration. Information on and frequency for laboratory QC samples are presented in Section 9.2 and/or the specified analytical method procedures.

8.2 Preventive Maintenance

8.2.1 Field Instrumentation

Field equipment shall be maintained at its proper functional status in accordance to manufacturer manual specifications. A check of the equipment shall be performed before field activities begin, and any potential spare parts (e.g., batteries, connectors, etc.) and maintenance tools will be brought on site, to minimize equipment downtime during the field activities. Routine preventive maintenance shall be performed to assure proper operation of the equipment. Any maintenance performed on field equipment will be documented on instrument calibration and maintenance sheets or in the designated field logbook, and shall be undertaken by personnel who have the appropriate skills and/or training in the type of maintenance required (see Section 12.0).

8.2.2 Laboratory Instrumentation

The laboratory is responsible for the maintenance of their analytical equipment, in accordance with manufacturers' specifications. Analytical personnel will be responsible for ensuring that instrumentation is functioning properly and within specific guidelines/specifications prior to starting any analysis. Maintenance, performed by either laboratory personnel or the manufacturer's service personnel, will be conducted according to manufacturer's recommendations and procedures.

9.0 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE REQUIREMENTS

This section will discuss the type and quantities of QA/QC samples to be utilized during implementation of the field programs. The site-specific number and type of QA/QC samples are discussed in Section 6.0.

9.1 Field Quality Control Samples

The subsections below present general information and guidance on field QC samples, including definition and frequency of QC blanks. Field QC samples will be labeled and shipped according to the procedures outlined in Section 5.0.

9.1.1 Field Blanks

A field blank will be collected to evaluate the potential for contamination of environmental samples from inadequate decontamination of field equipment. Field blanks shall be collected by pouring laboratory supplied distilled/de-ionized (DI) water over and/or through decontaminated non-disposable equipment or disposable equipment, and collecting the rinsate (see Section 4.2 for decontamination procedures). Field blanks will be collected at a frequency of one per decontamination event per type of sampling equipment, not to exceed one per day per sample matrix. Preservation and analysis of field blanks will be identical to that of the associated environmental samples (see Table 6-2).

During the groundwater sampling utilizing the low flow sampling and purging method, the field blank will be collected after sampling from the most contaminated well (as per previous data and/or location estimation). This blank will be collected by pumping DI water through the decontaminated low flow sampling apparatus and collecting the rinsate. If dedicated pumps are used, a field blank will not be collected.

9.1.2 Trip Blanks

A trip blank serves to detect possible cross-contamination of samples resulting from handling, storage and shipment procedures. Trip blanks will accompany VOC glassware in transit through sample collection and shipment to the laboratory. In addition, trip blanks are stored by the laboratory under the same conditions as the environmental samples. A trip blank will accompany each cooler containing samples submitted for VOC analysis, and will be preserved as per the groundwater samples and analyzed identically to the associated environmental samples. VOC samples will be consolidated in one cooler for daily shipment, if possible, to minimize the number of trip blanks required in the field program. It is anticipated that only one trip blank per day will be necessary.

9.1.3 Temperature Blanks

A temperature blank will be sent with each cooler of samples to verify that the cooler temperature has been maintained at 4°C. One non-preserved VOA vial shall be filled with either potable or DI water, and labeled with "USEPA cooler temperature indicator" and the date. If supplied, the laboratory's temperature blank will be used in place of the VOA vial. The laboratory shall record the temperature of the blank water on the chain of custody immediately upon cooler arrival.

9.1.4 Field Environmental Duplicate Samples

Duplicate environmental samples will be analyzed by the off-site laboratories to evaluate the reproducibility of the sampling procedures. Duplicate samples will be collected at a rate of five percent of the total samples for each specific matrix for each type of analysis (i.e., one duplicate for up to every 20 samples). The duplicate samples will be collected from the same location and at the same time as the original environmental sample; however, the duplicated samples will be "coded" in such a manner that the laboratory will not be able to determine of which original field sample they are duplicated (i.e., "blind" duplicates). For example, the duplicate sample of location MW-3 may be "coded" as location MW-23, as long as there are not more than twenty groundwater monitoring wells being sampled (i.e., the coded sample name should not be assigned a legitimate sample location identification). An explanation of the duplicate "coding" must be written in the field logbook. Preservation and analysis of duplicate samples will be identical to those for the environmental samples. Precision of field data will be evaluated based on the calculation of Relative Percent Difference (RPD), with acceptance criteria of 25 percent for the off-site laboratory samples. Blind duplicate samples will be collected in the same manner as the environmental samples.

9.2 Laboratory Quality Control Samples

General information and guidance on laboratory QC samples are presented in the subsections below. A summary of QC procedures, frequencies, criteria, and corrective actions for the samples, as determined by the applicable method guidelines (see Section 6.0), is provided in Table 9-1.

9.2.1 Method Blanks/Preparation Blanks

A method blank (for organics) or a preparation blank (for inorganics) will be analyzed with every batch of samples to ensure that contamination has not occurred during the analytical process. Method blanks consist of a portion of analyte-free water or solid that is processed through the entire sample procedure the same as an environmental sample.

9.2.2 Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate samples (also known as spike/duplicate samples) will be used to assess precision and accuracy of the analytical methods. In this procedure, three aliquots of an actual field sample are collected at a specific location, and two aliquots are “spiked” by the addition of known amounts of an analyte or analytes and these samples are then analyzed identically to the field samples. A comparison of the resulting concentration to the original sample concentration and among the two “spiked” sample concentrations provides information on the ability of the analytical procedure to generate a correct result from the sample. Matrix spike/matrix spike duplicate samples will be collected in the field at a rate of five percent, and will be analyzed on a per batch basis, with up to 20 samples per week constituting a batch. The validity of matrix spike/matrix spike duplicate recovery and relative percent difference values will be determined using the acceptance criteria stated in Table 9-1.

TABLE 9-1 (Sheet 1 of 4)
SUMMARY OF ANALYTICAL QC PROCEDURE CHECKS, FREQUENCIES, ACCEPTANCE CRITERIA, AND CORRECTIVE ACTIONS FOR LABORATORY SAMPLE ANALYSES

Parameter	***Method***	***QC Procedure***	***Frequency***	***Acceptance Criteria***	***Corrective Action***
VOCs (aqueous)	EPA Method 8260B	Method Blank	1 every 12 hours	no constituent > CRQL	suspend analysis until source rectified
		Surrogate Compounds	all samples	80-120%R	check calculations and instruments, reanalyze affected samples
		Internal Standards	all samples	± 40%R, ± 20 sec retention time shift	check calculations and instruments, reanalyze affected samples
		Laboratory Control Sample	1 per ≤ 20 samples	60-140%R	check calculations and instruments, reanalyze affected samples

Notes:

Abbreviations include:
VOCs = volatile organic compounds
%R = Percent Recovery
CRQL = Contract Required Quantitation Limit RPD = Relative Percent Difference

9.2.3 Laboratory Control Samples

A laboratory control sample (LCS) consists of an analyte-free water or solid phase sample that is spiked with target analytes at a known concentration. The LCS shall be analyzed for every batch of samples (i.e., 1 per 20) to assess the ability of the analytical procedure to generate a correct result without matrix effects/interferences affecting the analysis. The percent recoveries for the LCS compounds will be compared to QC limits stated in the appropriate methods, and are presented in Table 9-1.

9.2.4 Surrogate Compounds

Surrogates (also known as System Monitoring Compounds) are compounds of known concentrations added to every organic analysis sample for analytical chromatography methods at the beginning of the sample preparation to monitor their recovery. Surrogate recoveries will be used to assess potential matrix interferences and to monitor any potential effects of sample preparation and analysis on final analyte concentrations. The recovery values will be compared to values established in the applicable methodologies to determine the validity of the data (see Table 9-1).

9.2.5 Internal Standards

Internal standards are used to provide instrument correction for variation in instrument performance and injection volumes. Internal standards also establish relative response factors for the analytes.

9.2.6 Interference Check Samples

An interference check sample (ICS), which contains target analytes at known concentrations, verifies the laboratory's interelement and background correction factors. Analysis of ICS samples is unique to metals analysis using the inductively coupled plasma (ICP) method.

10.0 DATA REDUCTION, VALIDATION, AND REPORTING

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

10.1 Data Reduction

10.1.1 Field Data Reduction

Field instrumentation data will be reported by site personnel in field logbooks and/or on field investigation forms associated with the monitoring event (see Section 5.3). At the end of each monitoring event, the field screening data results shall be summarized in a computerized database and/or in tabulated form, as warranted.

10.1.2 Laboratory Data Reduction

All data generated by the off-site laboratory will be reported in a specified format containing all required elements to perform data validation (see Section 10.3.1). Analytical results shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs.

10.1.3 Project Data Reduction

Following receipt of the laboratory analytical results by PWGC, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

10.1.4 Non-Direct Measurements

If information necessary for the project has not been measured directly in the field, non-direct measurement data may be obtained from literature files, texts, computer databases, etc. References utilized will be acknowledged sources within the specific discipline. An explanation of the rationale behind using the reference and a description of any concern regarding the use of the referenced data (e.g., uncertainty, conflicting literature, etc.) shall be made within the report. Non-direct measurement data, after usage, will be filed within the project files for the length of the project.

10.2 Data Validation

The data results obtained from the laboratories will be sent to a third party to undergo a systematic data validation to provide assurance that the data is adequate for its intended use (i.e., in assessing the effectiveness of site activities). The validation will be performed by personnel who have appropriate training and/or experience in performing data validation for the analyses of interest associated with the project.

Validation will be performed based on an evaluation of method-specific QC information (such as holding times, calibration records, laboratory and field blanks, duplicate precision, and surrogate and matrix spike recovery; see Section 9.0) and the best professional judgment of the validator. Validation will be performed utilizing guidance from the most current updates of the USEPA Region II validation SOPs for SW846 methodologies, if available, and from the USEPA Region II CLP SOPs, modified for the specific methodology, if not.

Deviation from the USEPA Region II Data Validation SOPs will be documented along with a discussion of the appropriateness of the deviation for EPA approval. Deviation from the USEPA Region II Data Validation SOPs will not compromise State or Federal Applicable or Relevant Appropriate Requirements. Qualifiers (as applicable) will be added to the data result tables by manual computer entry. All keyed entries will be verified and signed off as checked by the QA Officer or his designee.

10.3 Data Reporting

10.3.1 Contents of Laboratory Data Reports

The laboratories performing analysis work on this project will submit a hardcopy data package and an electronic deliverable.

The hardcopy laboratory report, and any associated electronic deliverable files, will be sent directly to PWGC, and will contain information such as:

- Title and Location of the Project
- Project Identification Number
- Name of the Report
- Date Report was Prepared
- Name, Address and Telephone Number of the Laboratory
- Case Narrative
- Sample Identification Number
- Name and Location of Sample
- Type of Sample (e.g., water, air)
- Analysis performed
- Parameter results
- Any special observations, circumstances or comments which may be relevant for interpretation of the data
- Signature of laboratory manager

The laboratory report will include a written case narrative, which will note any problems encountered in receipt or during analysis of the samples, and the corrective actions utilized (including telephone logs, etc.). Each laboratory report will include supporting documentation, such as copies of chromatograms,

data system printouts, internal sample tracking documentation, sample preparation and analysis logbooks, and standard preparation data, as appropriate. Each constituent tested will include the name of parameter, the CAS number (if applicable), approved testing procedure references, results of analysis, and the units of the reported results.

Non-ASP data will be supplied in "results only" format. At a minimum, results only data sheets will include:

- Title and Location of the Project
- Project Identification Number
- Name of the Report
- Date Report was Prepared
- Name, Address and Telephone Number of the Laboratory
- Sample Identification Number
- Name and Location of Sample
- Type of Sample (e.g., water, air)
- Analysis performed
- Parameter results
- Any special observations, circumstances or comments which may be relevant for interpretation of the data

10.3.2 Contents of Reports

The results of the monitoring and sampling activities will be summarized in a monitoring report, and data tables containing the laboratory results, showing all detects and non-detects, detection limits for non-detects, and data qualifiers, will be included. In addition, results of previous monitoring events will be included in the data table set. Appropriate figures illustrating sample locations will also be included. A qualitative evaluation of the usability of the data, along with justification for excluding any data if warranted, will also be provided in the report.

Comparison of the acquired site data to existing standards and guidelines (e.g., drinking water standards) and site cleanup criteria will be performed to assist in the evaluation of the effectiveness of RA activities. In addition, indoor air sample results will be compared to criteria specified in the SMP to ensure that detected concentrations of VOCs are within limits that may be harmful to on-site workers.

The PWGC PM shall review all reports prior to submission to ensure compliance with project requirements.

11.0 PERFORMANCE AND SYSTEMS AUDITS

The PWGC PM and/or FOL will conduct a "readiness review" for field activities, prior to the commencement of monitoring program. Equipment and supplies will be inventoried, and field instrumentation will be checked to ensure that all are in working order. Any maintenance activities performed during the "readiness review" are to be documented on instrument maintenance sheets or in a designated field logbook.

Internal systems and performance audits will be conducted by the off-site laboratories in accordance with USEPA analytical methodology requirements and the laboratory SOPs. The laboratories shall cooperate with USEPA or other regulatory agency personnel with Agency-requested internal technical systems and/or performance audits.

Surveillance of field program activities will be conducted by the PM and FOL. The QA Officer and/or a member of the QA/QC staff will accompany sampling personnel into the field for one or two days annually to verify that sampling is being correctly implemented according to the SMP and this QAPP. Additional inspections may be warranted to ensure that corrective actions of major deficiencies/problems identified in an initial inspection have been implemented/addressed.

The audit will be documented and uniquely identified for tracking purposes, and all deficiencies noted during the audit shall be identified, with a recommended corrective action for compliance. The Quality Assurance/Data Quality Officer shall evaluate all audit corrective action responses and inform the PM/subcontractor organization of the closure of any or all of the deficiencies noted during the audit. A log of the audits conducted and responses thereto shall be maintained by the Quality Assurance/Data Quality Officer.

12.0 TRAINING OF PROJECT STAFF

PWGC will establish requirements for training and qualification of project personnel to ensure that they are capable of performing all required monitoring activities.

Performance-based testing will be provided to all appropriate personnel performing project activities. Performance-based testing involves the review of the personnel's work products by the PM, FOL, Quality Assurance/Data Quality Manager and/or QA Officer, until the monitored individual reaches the desired level of competence in performing his work tasks. Once a person exhibits the required degree of competence, unannounced periodic monitoring is performed to ensure this level is maintained.

12.1 General Personnel Training

Project staff shall receive general training on the project objectives, the DQOs for the site, and the SMP.

12.2 Quality Assurance Training

Training will include topics related to Quality Assurance. It will cover, but not be solely limited to:

- QAPP elements, including project-specific QA requirements
- Need for proper documentation and records maintenance
- Responsibilities of project personnel
- Handling and review of field, laboratory and non-direct measurement data

12.3 Training Records

PWGC will complete and maintain all training records in the project files. They will include, as appropriate:

- Attendance sheets
- Records of course content, including dates of training and the instructor's name
- Training logs and curricula
- Personnel training record
- Formal qualification/certification records (as applicable)

13.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of the PWGC PM, who in turn shall contact the Quality Assurance/Data Quality Manager or his designee (if applicable).

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the project, all changes to the monitoring program or SSDS operation will be documented in field logs/sheets and the PWGC PM will be advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify PWGC PM, who will consult with other PWGC project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PWGC PM shall be responsible for controlling, tracking, implementing and distributing identified changes.

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