Barretto Point Bronx County, New York

Site Management Plan

NYSDEC Site Number: B00032-2

Prepared for:

New York City Department of Environmental Protection 96-05 Horace Harding Expressway, 5th Floor Corona, New York 11368

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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at Barretto Point (hereinafter referred to as the "Site") under the New York State (NYS) Environmental Restoration Program (ERP) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with State Assistance Contract (SAC) # C302809, Site # B00032-2, which was executed on December 13, 2005 and last amended on April 12, 2011.

1.1.1 General

The New York City Department of Environmental Protection (NYCDEP) entered into a SAC with the NYSDEC to remediate a 13-acre acre property located in the Hunts Point section of Bronx County, New York. This SAC required the Remedial Parties, the NYCDEP and the New York City Department of Parks and Recreation, to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of the area subject to this plan is provided in Figure 1. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

After completion of the remedial work described in the Record of Decision, 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 Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. 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 URS, on behalf of the NYCDEP, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Bronx County Clerk, will require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement 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 Environmental Easement 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 after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems.

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 Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the SAC 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 Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

Since investigations regarding the contamination at Barretto Point have been completed, many soil vapor, surface soil, subsurface soil, groundwater and surface water discharge samples have been collected and characterized to determine the extent of the contamination. The main categories of contaminants that exceed their SCGs are VOCs, semivolatile organic compounds (SVOCs), in particular PAHs, and inorganics. Based on the results of the sampling the site has been divided into two main parts. The western part of the site is referred to as the Barretto Point Park area and is contaminated with SVOCs and low level VOCs. This portion of the site was remediated by covering it with a 2-foot clean soil cover and turned into a park. The eastern part of the site is a smaller 2.5-acre area which had much higher concentrations of VOCs and will someday be used for expansion of the Hunts Point WPCP.

The area with the highest concentrations of VOCs within the 2.5 acre part of the Barretto site is a 0.7-acre area described as the Former Paint and Varnish Manufacturing area. Figure 1 shows the areas described above.

During the remediation project 14,826 CY of contaminated material were removed from the 0.7 acre Paint and Varnish Manufacturing area. The excavation was conducted under an air containment structure to keep any volatizing compounds from entering the public air. Air in the containment structure was treated with activated carbon filters. A dewatering system was put in place for deeper parts of the excavation and this water was treated with a system consisting mainly of activated carbon and bag filters. Treated water was released into the public sewer system eventually being treated at Hunt's Point Water Pollution Control Plant (HPWPCP). Excavated material was replaced with clean fill and the entire 2.5 acre area was covered with a soil/crushed stone layer. Currently, a 8.5 acre portion of the site [redacted]¹ is covered with 2 feet of clean soil and the remaining portion of the site is covered with either a layer of existing fill, asphalt, gravel or vegetation, as documented in the November 2010 ESD (see Figure 16).

In addition to the 14,826 CY of contaminated soil excavated, 6 underground storage tanks were found on site. These tanks were properly registered and disposed of, including the 2,800 gallons of hazardous waste found in one of the tanks.

The remaining contamination consists of the previously identified low level contamination in the Barretto Point Park area, and possible higher levels of VOCs in the 2.5 acre area surrounding the excavation.

1.2.1 Site Location and Description

The site is located in the Hunts Point section of Bronx County, New York (Figure 2) and is identified as Block 2777, Lots 100, 105, 600 and 901, and Block 2779¹, Lot 1 on the Bronx Tax Map (Figure 3). The site is an approximately 13-acre area bounded by Viele Avenue to the north, Manida Street to the east, and the East River to the south and west (see Figure 2). The 2.5 acre area of the main remediation effort is bounded by Ryawa Ave to the south and Old Barretto St to the west. A metes and bounds description of the site boundaries will be submitted under a separate cover.

The area surrounding the Barretto Point Site is primarily commercial/industrial in nature, including waste transfer stations, warehouses and the Hunt's Point Water Pollution Control Plant. The nearest residences are located approximately 1,500 feet north of the site.

1.2.2 Site History

Sanborn fire insurance maps (1901, 1915, 1950, 1981, 1991, 1992, 1993, 1994, 1995 and 1996) and aerial photographs (1954, 1962, 1978, 1984 and 1992) were reviewed to evaluate historic site uses. Significant features identified by review of these documents are described below.

The earliest available information (1901) show buildings in the northern portion of the site that were identified as a yacht club in 1915. By 1950, much of the site had been developed for industrial purposes. These uses included a sand and gravel operation in the northwestern portion of the site (including a transformer house along Barretto Street), an asphalt plant at the southwest corner of Barretto Street and Ryawa Avenue, and coal pockets to the west along the East River. Industries in the northeastern portion of the site included a paint and varnish manufacturing facility.

An aerial photograph from 1962 showed that the coal pockets (two large rectangular structures likely used for the storage of coal) had been removed from the site. In addition, the aerial photograph showed that the southern and northwestern portions of the site had been expanded into the East River, apparently as a result of filling operations.

By 1978, only the buildings associated with the asphalt plant were still present at the site, although the plant has been reported as not being operational (these buildings were demolished by 1991). The northwestern portion of the site had also been further expanded into the East River.

As many as eight squatter dwellings were constructed on the west side of Barretto Street between 1992 and 1999. These structures were removed in October 1999 and their occupants were relocated by the City of New York.

A historic map is included as Figure 4.

1.2.3 Geologic Conditions

The site is underlain by fill material, till deposits and weathered bedrock. Fill material was encountered in all soil borings and test pits at thicknesses ranging from one foot to more than Fifteen feet. The fill material generally is comprised of a mixture of sand, silt, gravel and cobbles with varying amounts of construction and demolition debris

(including concrete, bricks, asphalt, wood, scrap metal, tires, plastic, cloth, paper, glass, cinders and/or ash).

Beneath the fill, the site is generally underlain by poorly to moderately graded compacted till which ranges in thickness from approximately six to twenty feet. The till consists of fine to medium sand, silt and fine to coarse gravel with trace amounts of clay. Varying amounts of cobble, boulders and weathered rock fragments are also part of the till. The till was not observed above weather bedrock in the western portion of the site. This may be the result of this portion of the site being historically within the East River.

Weathered bedrock was encountered below the fill or till at depths ranging from approximately 14 feet to 24 feet below ground surface. The weathered rock was identified as black-gray mica schist. A geologic cross-section is shown in Figures 5A and 5B.

The depth to groundwater at this site ranges from 8 feet to 18 feet below ground surface. The groundwater flow direction is predominantly to the southwest toward the East River. A groundwater flow figure is shown in Figure 6.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. During the investigation a geophysical survey was conducted to evaluate possible subsurface features of concern, 50 soil vapor samples and 6 groundwater samples were taken, 11 surface soil samples were collected, 8 test pits and 4 test trenches were dug, and 5 monitoring wells were installed and sampled throughout the site. Afterwards in the area of the former paint and varnish manufacturing plant an additional 46 test pits were dug, 33 soil borings advanced and additional groundwater samples taken in order to delineate the greatest of the contamination. The results of the RI are described in detail in the following reports:

"Site Investigation Report for the Barretto Point Site" – November 2000, prepared by Dvirka and Bartilucci Consulting Engineers.

"Remedial Alternatives Report for the Barretto Point Site" –January 2003, prepared by Dvirka and Bartilucci Consulting Engineers.

Generally, the RI determined that surface soil within the area of the planned park had been widely impacted by semivolatile organic compounds (SVOCs), in particular probable carcinogenic polycyclic aromatic hydrocarbons (CaPHAs), and metals at levels exceeding NYSDEC Recommended levels. The metal levels were not significantly high so the most significant contaminants of concern were determined to be the CaPAHs. Surface soil in the remainder of the site was also affected by CaPAHs to a greater extent. Subsurface soil in the area of the former paint and varnish manufacturing facility was significantly impacted by VOCs in particular ethlybenzene and xylenes, likely due to historical operations and waste disposal on the facility property. Groundwater in portions of the site along the East River shoreline was slightly impacted by VOCs. Soil vapor results showed that significant volatilization of contaminants from groundwater was not occurring except possibly in the area of the paint and varnish factory. Potential impacts to the East River by groundwater were likely minimal due to the low concentrations of contaminants detected in down gradient groundwater samples and high water flux within the East River. The RI recommended remediation of the VOC-contaminated subsurface soil in the area of the former paint and varnish manufacturing facility along with remediation of the groundwater in this area.

Below is a summary of site conditions when the RI was performed in years 2000-2002:

Surface Soil

Surface soil samples were collected at ten on-site locations to assess the presence and nature of surface soil contamination. One off-site surface soil sample was collected to establish background surface soil quality. Samples locations and the detected concentrations for the indicators of contamination in each sample are show on Figure 7 Samples were collected from 0 to 2 inches below ground surface except for the samples to be analyzed for VOCs which were collected from 4 to 6 inches below ground surface. The surface soil samples were analyzed for VOCs, SVOCs and inorganics.

The concentrations of total or individual VOCs did not exceeded SCGs in any surface soil sample. Concentrations of total CaPAHs in the samples ranged from approximately 3 ppm to 44 ppm, with the exception of sample SS-09 which contained total CaPAHs approximately 166 ppm.

Most of the surface soil samples contained metals, such as barium, beryllium, copper, iron, nickel and zinc at concentrations in excess of their respective TAGM 4046 soil cleanup objectives, including surface soil samples SS-03 and SS-04 collected in the planned park area which contained zinc at 1700 and 1000 ppm respectively. The NYSDEC TAGM 4046 soil cleanup objective for zinc is 20 ppm.

The levels of contaminants detected in the background surface soil sample (SS-11) were within established guidelines. Based on the samples results, surface soil throughout the site has been impacted by CaPAHs and metals at levels exceeding SCGs.

Surface Soil results are shown in Table 1-A.

Subsurface Soil

The original scope for the Site Investigation included the excavation of eight test pits (TP-01 through TP-08) and four test trenches (TT-01 through TT-04), and construction of five soil borings (B-01 through B-05) to characterize the fill material and to allow for collection of subsurface soil samples for laboratory analysis. Soil samples collected from these test pits, test trenches and soil borings were analyzed for VOCs, SVOCs and inorganics. The locations of these test pits, test trenches and soil borings, and the detected concentrations for the indicators of contamination in the samples collected, are shown on Figure 8.

The test pits and test trenches were completed to groundwater, the maximum reach of the backhoe (approximately 15 feet) or refusal, whichever came first. One or two samples were collected from each pit and from test trench TT-04 for laboratory analysis of VOCs, SVOCs and inorganics. Elevated organic vapors were not detected by field instrumentation, nor were visual or olfactory signs of contamination apparent in the other test trenches, so no sample were collected.

The soil borings were constructed to allow for the installation of permanent monitoring wells to assess groundwater quality and flow direction at the site. One of two soil samples were collected from the unsaturated zone in each boring for laboratory analysis of VOCs, SVOCs and inorganics to evaluate subsurface soil quality.

The analytical results from the samples collected within the planned park area (SB-02, TP-03, TP-04 and TP-05) contained individual CaPAHs and metals at

concentrations exceeding SCGs. In the northeaster portion of the site (the area of the former paint and varnish manufacturing facility), the sample from test pit TP-02 contained the VOCs ethylbenzene at 110 ppm and xylenes at 510 ppm, well above the SCGs of 5.5 ppm and 1.2 ppm, respectively, and the sample from test pit TP-01 contained the CaPAH benzo(a)pyrene at a concentration slightly above the SCG. Each of these test pits also showed metals at concentrations exceeding SCGs. Test pits TP-06, TP-07 and TP-08 and test trench TT-04 all contained individual CaPAHs and metals at concentrations exceeding SCGs.

Due to the elevated organic vapors detected by field instrumentation and chemical odors encountered during excavation of test pits TP-01 and TP-02, an additional 34 test pits (TP-09 through TP-42) were excavated in the area of the former paint and varnish manufacturing facility during the site investigation to delineate the soil contamination in this area. The test pits were initially excavated to identify the presence of contamination and were excavated until visual staining; odors or elevated field instrument readings were detected. The horizontal and vertical extent of the contamination was established by those test pits in which no staining or odors were apparent above groundwater, and screening with field instruments indicated minor or no detections of organic contamination. Confirmatory soil samples were collected for VOC analysis from selected test pits with no odors or staining. The soil borings were constructed to determine the vertical limits of the soil contamination. Confirmatory soil samples were collected for VOC analysis from below identified contamination. The locations and results of the additional test pits are shown in Figures 9 and 10.

As part of a supplemental soil investigation to further delineate and characterize soil contamination in the area of the former paint and varnish manufacturing facility, an additional 22 soil borings (SB-14 through SB-23, SB-25 through SB-29, SB-31 through SB-34 and SB-36 through SB-38) were constructed and twelve test pits were excavated. The supplemental test pits were excavated adjacent to previous test pits where contamination has been detected by field instrumentation and observations. Samples of the contaminated soil were collected for VOC analysis to chemically characterize the limits of contamination that had been previously based on odors and staining. The locations of the delineation soil borings and test pits in the area of the former paint and varnish manufacturing facility, and the concentrations of total VOCs and total RICVS detected in the samples collected from each test pit are show on Figure 10.

As shown in Figure 10, the concentrations of total VOCs (including TICs) in most of the supplemental test pit samples were above the TAGM 4046 soil cleanup objective of 10 ppm and were detected up to 5,247 ppm.

Site-Related Groundwater

At most of the soil vapor/groundwater screening sample locations in the original site investigation, probe refusal was encountered before groundwater was reached. Although several attempts were made at each such location, groundwater samples were only collected from six of the 50 locations (10, 19, 60B, 65, 66 and 76). It appeared that collection of groundwater samples was most successful during periods of high tide, indicating that the presence of groundwater in the unconsolidated materials at the site is a function of tidal conditions. The detected concentrations for total benzene, toluene, ethylbenzene and xylenes (BTEX) in all of the samples were fairly similar, ranging from 5.8 micrograms per liter (ug/l) to 40.3 ug/l, indicating that the detected groundwater contamination may be due to regional conditions, possibly including contaminated fill material or historic gasoline spills/leaking tanks at the site or off-site sources. The highest concentration detected (65.6 ug/l) was near the area of contaminated soil around the former paint and varnish manufacturing facility, indicating that VOCs detected in this sample are likely the result of historic activities in this area in addition to sitewide / regional conditions.

A second groundwater investigation was conducted prior to the design of the remediation. Five 2-inch diameter monitoring wells (B-1 through B-5) were installed to determine the depth to groundwater and groundwater quality. The compounds detected were mainly benzene-toluene-ethylbenzene-xylene (BTEX) type constituents, although low concentrations of tetracholoroethene (3.5 ug/l) and trichloroethene (2.7 ug/l) were detected in the sample collected from monitoring well B-5. Low concentrations of petroleum hydrocarbons (up to 8.6 mg/l) were detected in samples B-2 and B-3. These results can be seen in Table 2. Monitoring well locations are show in Figure 11.

Site-Related Soil Vapor Intrusion

VOCs were not detected in soil vapor data over most of the site. Trace levels (total VOCs less than 5 milligrams per cubic meter (mg/m³) of VOCs were detected in the west central portion of the site (toluene and xylenes). A trace xylene concentration

was also detected in the northern portion of the site at location 78. The low levels and sporadic distribution of these VOCs likely indicates the presence of contaminated fill or contaminated groundwater at the site.

Toluene, ethylbenzene and xylenes were also detected in the east-central portion of the site that was historically occupied by the paint and varnish manufacturers. Low levels (total VOCs up to 10 mg/m³) of these compounds were detected in the northern and eastern portions of the area (sample locations 59, 60, 60A and 60B), with greater concentrations (total VOCs up to 150 mg/m³) detected at sample locations 60C and 60E (see Figure 12 and Table 3). Based on these results, eight additional soil vapor samples (locations 60F through 60M) were collected from locations surrounding the initial locations with elevated VOCs. These additional locations were constructed at a spacing of approximately 25 feet surrounding locations 60C and 60E (see Figure 12).

Low levels of toluene, ethylbenzene and xylenes (total VOCs up to 15 mg/m³) were detected at locations 60F, 60H, 60I and 60K, and no VOCs were detected at location 60L. In addition, a trace concentration of tetrachloroethene (1.2 mg/m³) was detected at 60F. These sample locations were north, south and east of 60C and 60E. Greater concentrations of toluene and/or xylenes (total VOCs up to 136 mg/m³) were detected to the west at locations 60G and 60J. The soil vapor sample collected from 60M contained the greatest concentration of toluene, ethylbenzene and xylenes, with total VOCs of 3,118 mg/m³. This location was just west of the large boulder in the central portion of this area. Table 3 shows that similar results were obtained from the on-site and off-site laboratories.

<u>Underground Storage Tanks</u>

During the Site Investigation and subsequent further soil sampling no underground storage tanks were identified. During the remediation effort six (6) Underground Storage Tanks (USTs) were unearthed. Three of the tanks were empty and the remaining three tanks contained varying amounts of liquid. After the discovery of the tanks, NYCDEP registered the tanks with the New York State Department of Environmental Conservation (NYSDEC) for closure purposes. The tanks were cleaned, excavated and properly disposed of. The residual resulting from the cleaning of the tank was collected in 5 – 55 gallon drums. The tanks were taken by Metal Depot, a NYS

license scrap yard and drums were taken to Clean Earth of New Jersey. The following is a summary of the tanks found.

Tank	PBS Tank	Discovery	Material	Size	Supported	Content
No.	No.	Date			on	
1	HP-017-69	4/23/09	Single Wall Steel	1000g	Concrete	Liquid
2	HP-018-69	4/23/09	Single Wall Steel	1000g	Concrete	Liquid
3	HP-019-69	4/28/09	Single Wall Steel	1000g	Soil	Liquid
4	HP-020-69	4/23/09	Single Wall Steel	3000g	Concrete	Empty
5	HP-021-69	4/23/09	Single Wall Steel	3000g	Concrete	Empty
6	HP-022-69	4/28/09	Single Wall Steel	800g	Soil	Empty

Accutest Laboratories was enlisted by the Contractor to test the liquid and sludge inside of the tanks. Each liquid was analyzed for the full RCRA criteria, including full TCLP, ignitability and reactivity. The results of the testing found that the contents of Tank 2 were classified as hazardous waste while the contents of tanks 1 and 3 were classified as non-hazardous. The laboratory results are attached in Appendix E.

No areas of soil discoloration were noted around the tanks. The tanks had no holes in them and there were no indications of leakage. All the soil around the tanks was removed during the remediation of the site.

1.4 SUMMARY OF REMEDIAL ACTIONS

The site was remediated in accordance with the NYSDEC Record of Decision (ROD) dated December 2003 and the NYSDEC approved design specifications.

The following is a summary of the Remedial Actions performed at the 2.5 acre site:

1. Excavation of soil/fill exceeding 10 ppm of VOC's to a depth of 20 feet in the area outlined in the 2003 Record of Decision.

- 2. Construction and maintenance of a soil cover system consisting of 18" of clean fill overlain by 6" of crushed stone to prevent human exposure to remaining contaminated soil/fill remaining at the site;
- Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.
- 4. Extraction of groundwater as part of the dewatering process during excavation of contaminated soil. Extracted groundwater was treated in order to meet requirements for discharge to the New York City sanitary sewer system.
- 5. Air treatment system and vapor control was implemented during excavation to ensure health and safety of on-site workers and the surrounding community
- 6. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, 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 2009.

The Barretto Point Park area was graded from higher to lower areas. All graded material was spread to lower areas below sub-grade and compacted and demarcated. Two additional feet of new clean fill was spread across the site to achieve final elevations and complete remediation.

1.4.1 Removal of Contaminated Materials from the Site

Contaminated material was only removed from the area of the former paint and varnish manufacturing plant. An excavation of all contaminated material would have been implausible task considering cost and time constraints. The previous site investigations considered the contaminants found, the safety risks associated with them and the future use of the land in order to determine the amount and location of the soil to

be removed. As part of this consideration the criteria of TAGM 4046 was considered, along with NYCRR part 360. TAGM 4046 can be considered the main source of soil cleanup objectives; however soil above these criteria does still remain on site.

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs) and applicable land use for this site is provided in Table 4.

The total amount of contaminated soil removed was 14,826 CY. The total amount of waste from underground storage tanks removed was 7,700 Gallons. Excavation was performed based on a grid system. The area of excavation as defined in the ROD was divided into 38 sections, and a depth of excavation was determined for each grid based roughly on the contour illustration from the ROD (included in this report as Figure 9) and from additional sampling done by the Contractor prior to start of construction. The grid layout system can be seen in Figure 13B, along with a table listing the depth of excavation in each gird.

The entire area of excavation was then backfilled with clean fill, as approved by the Engineer. Clean fill from two sources was brought onsite to replace excavated contaminated material. One source of clean fill was brought from the Thalle Elmsford Recycling facility. The source was tested for chemical properties and gradation analysis. Gradation analysis results showed that the soil was within the specified limits and chemical tests found that the soil was below the New York State DEC regulatory cleanup objective.

The second backfill used was described as "mole rock" and came from the Long Island Railroad's East Side Access Tunnel Project. This material was considered a virgin source. Both gradation analysis and chemical analysis were performed on this fill. Although the gradation analysis showed a slightly higher amount of fines than the specification called for however the Engineer found this to be acceptable for the intended use of the fill. The analytical report found five metals that exceeded NYSDSC recommended soil cleanup objectives; however the metals were within the respective Eastern USA Background concentrations listed.

Tables summarizing chemical analytical results for backfill, in comparison to allowable levels, are provided in Appendix number D.

1.4.2 Site-Related Treatment Systems

During the remediation part of the project air and water treatment systems were installed and used to remove contaminants from air and water entering the public supply.

The water treatment system was designed to treat any contaminated water from dewatering operations during construction. The system was set up to process 30 gpm of water generated from a series of well points. Water from the well points was directed into a settling tank with a weir and open top. The tank was approximately 21.25' in length, 7.5' in width and 3.6' deep with an operating volume of 3,000 gallons. During the retention time solids settled to the bottom of the tank and then the liquid continued to flow over the weir in the tank to be pumped to a bag filter skid via a duplex pump skid.

The duplex pump system contained a control system and two full capacity centrifugal pumps each capable of producing 50 gpm @ approximately 75' TDH. The pumps were equipped with 2 Hp, 460 V, 3 phase electric motors. The control system consisted of two pump motor starters and four float controls – Pump 1 on, Pump 2 on, pump ½ off, and a high level alarm which activated an alarm light.

The bag filter skid consisted of one multi-bag filter housing and one single bag filter housing plumbed in parallel. The inlet and outlet of the bag filter skin were equipped with manifolds complete with isolation valves. The multi-bag filter housing contained size 5-micron bag filters while the single bag filter housing contained one size 5-micron bag filter designed to remove sediment generated from the dewatering process prior to the inlet of the carbon filters. The inlet and outlet of each of the bag filter housings were equipped with pressure gauges to monitor the differential pressure across the filter housing. The bag filter housing was plumbed in parallel such that the bags in one filter housing could be changed while the remaining filter housing continued to process water at the design water flow rate of 30 gpm.

Duplex transfer pumps located on the bag filter skid pumped water to the two (2) carbon absorbers. These transfer pumps were identical to the transfer pumps located on the effluent side of the settling tank.

From the bag filter ski, water continued to flow under pressure to the carbon absorber battery. The carbon absorber contained 1,000 lbs of reactivated, granular liquid

phase carbon media designed to remove low levels of SVOC's and VOC's prior to discharge.

The inlet and outlet of each carbon absorber was equipped with a pressure gauge to monitor the differential pressure across the carbon media. The inlet and outlet of each carbon absorber was equipped with tees and valves to facilitate backwashing. Backwash water from the backwash process was directed to the settling/equalization tanks and was processed through the treatment system.

A 2" diameter mechanical flow meter with a totalizer was provided at the end of the treatment system to indicate the flow rate and to record the total gallons of water treated. The flow meter had an acceptable flow range of 8 to 160 gpm. Flow readings were recorded daily in a log book. The individual components of the system were skid mounted to the greatest extent possible and were interconnected using PVC piping and suction hose. Pressure gauges and sample taps were located throughout the system to monitor system performance. Butterfly valves were provided on the inlet and outlet of each of the major units to isolate them for maintenance.

Testing for VOC/SVOC breakthrough was done by the operator at the midpoint of the carbon absorption system.

The final effluent was tested by the operator periodically as required by regulatory authorities and contract specifications. Effluent quality was not found to be an issue at any time.

The air treatment system was designed to treat the air trapped inside the air containment structure. During excavation it was possible that compounds volatilized out of the soil into the air. In order to stop these compounds from entering the public air supply, air was contained and treated. The system operated by using six blowers, operating at 20,500 cfm each for a total airflow of 123,000 cfm. The project specified that the air exchange within the structure should be 6 times the volume per hour and the building should be held under a negative pressure of ½ inch of vacuum. The air traveled through the blower into horizontal bed of TIGG 5C 0410 virgin/reactivated vapor phase granular activated carbon. There were 6 beds total, each bed contained 16,000 lbs of carbon. Treated vapor exited the unit through two 20" duct fittings on top of the bed.

Due to the small amount of contamination found in the air the carbon beds never reached breakthrough and did not have to be changed during this project.

All systems were removed from the site once the project was completed. No long-term treatment systems were installed as part of the site remedy.

1.4.3 Remaining Contamination

The .7 acre area of the former paint and varnish manufacturing plant was the main focus of the remediation excavation. The excavation was performed based on a grid system. Each grid was excavated to a pre-determined depth. At the bottom of each grid a demarcation barrier was placed in order to separate the placed clean fill from the existing contaminated soil. It is not anticipated that high levels of contamination exist below the excavation. End point samples were taken below grids 1, 2, 7 and 8 and all samples were found to be clean. This information is available in Table 5.

Contamination to the sides of the grid will vary at different parts of the site. Specific data is available for certain areas. Chemical data for these points is included in Table 6. A demarcation barrier was also placed on the sides of the excavation. Contamination outside the area of excavation consists mostly of PAHs and lower concentrations of VOCs.

Figure 13b summarizes the contamination remaining directly outside the excavated area. The contamination remaining in the Barretto Point Park area of the site and the other parts of the site that were not excavated is consistent with the figures included in this SMP showing data reported in during the site investigation.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil and groundwater/soil vapor exists beneath the site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/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 EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- 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 EC/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 EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

Exposure to remaining contamination in soil/fill at the site is prevented by a cover consisting of either a minimum of 18 inches of clean soil and 6 inches of crushed stone in the 2.5 acre portion of the site; a 2 foot clean soil cover in the Barretto Point Park portion of the site (6.2 acres); or a layer of existing fill, asphalt, gravel or vegetation in the remaining site area (4.3 acres). The Excavation Work Plan that appears in Appendix A outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls are required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the 6.2 acre Barretto Point Park portion of the site to recreational use/public space and the remaining 6.8 acre portion of the site, including the 2.5 acre remediation area, to industrial uses. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

• Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;

- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the 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 Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The site has a series of Institutional Controls in the form of site restrictions.

Adherence to these Institutional Controls is required by the Environmental Easement.

Site restrictions that apply to the Controlled Property are:

- The Barretto Point Park portion of the site may only be used for recreational use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The remaining site area may only be used for industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The Barretto Point Park portion of the site may not be used for a higher level of use, such as restricted residential or residential use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC:
- The remaining site area may not be used for a higher level of use, such as commercial, restricted residential or residential use without additional remediation and amendment of the Environmental Easement, 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 without treatment rendering it safe for intended use;

- The potential for vapor intrusion must be evaluated for any buildings developed on the property 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 annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Hunts Point Water Pollution Control Plant Upgrade portion of the site has been remediated for restricted industrial use. The Barretto Point Park portion has been remediated to meet recreational use requirements. 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 system 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 sample HASP is attached as Appendix B 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 Periodic Review Report (See Section 4).

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.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 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 sitewide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Any changes, or modifications needed, to the remedial or 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 4.2).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 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 SAC, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 15-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 foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Notice within 48-hours of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, including 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 ECs.

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

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the SAC, 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.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 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 the qualified environmental professional, URS Corporation 201-262-7000. These emergency contact lists must be maintained in an easily accessible location at the site.

Table 7: 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 8: Contact Numbers

Qualified Environmental Professional URS Corporation, 201 262 7000

2.5.2 Map and Directions to Nearest Health Facility

Site Location: The intersection of Barretto St and Ryawa Ave, Bronx NY

Nearest Hospital Name: Bronx-Lebanon Hospital Center

Hospital Location: 853 Tiffany St, Bronx NY 10459

Hospital Telephone: 718-590-1800

Directions to the Hospital:

- 1. Head north on Barretto St toward Viele Ave
- 2. Turn left at Viele Ave

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

3. Viele Ave turns right and becomes Tiffany St

Total Distance: 1.2 miles

Total Estimated Time: 5 mins

Map Showing Route from the site to the Hospital:

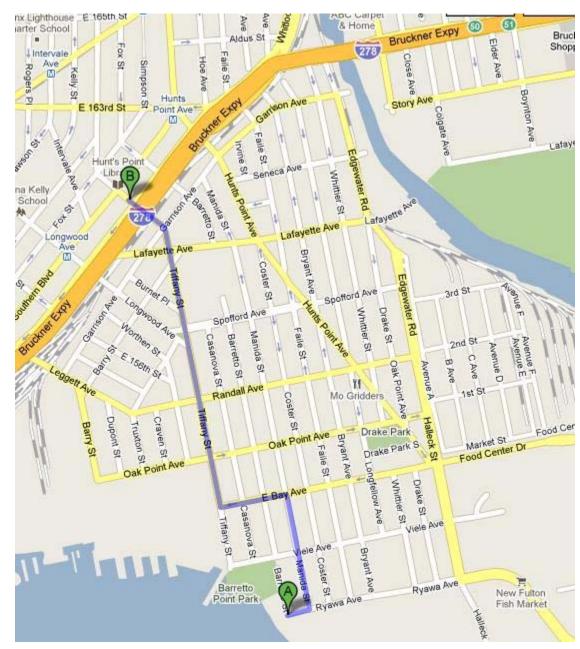


Figure 15

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 7). The list will also be posted prominently at the site and made readily available to all personnel at all times.

In the case of a spill of hazardous or possible contaminating substance standard procedures should be followed as defined for the Hunts Point Water Pollution Control Plant and the New York State Department of Environmental Conservation. In the need of evacuation the Hunts Point Water Pollution Control Plant evacuation procedure will be followed.

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, the soil cover system, and all affected site media identified below.

3.1.2 Soil Cover System

On a yearly basis, site-wide monitoring by a qualified professional engineer will be performed to ensure that the cover system is intact; appears level, has not eroded and if construction in the area has occurred, the cover has been replaced.

3.2 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during annual site 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.

4. INSPECTIONS, REPORTING AND CERTIFICATIONS

4.1 SITE INSPECTIONS

4.1.1 Inspection Frequency

Inspections will be performed on a yearly basis with additional ones occurring as seen necessary based on emergency events such as spills or construction projects.

4.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

A general site-wide inspection form will be completed during the site-wide inspection. These forms are 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 certification to confirm that the:

- The cover is in place, performing properly, and remains effective;
- The Monitoring Plan is being implemented;
- The site remedy continues to be protective of public health and the environment and is performing as designed in the ROD.

4.2 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every second, year, beginning eighteen 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 Metes and Bound. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

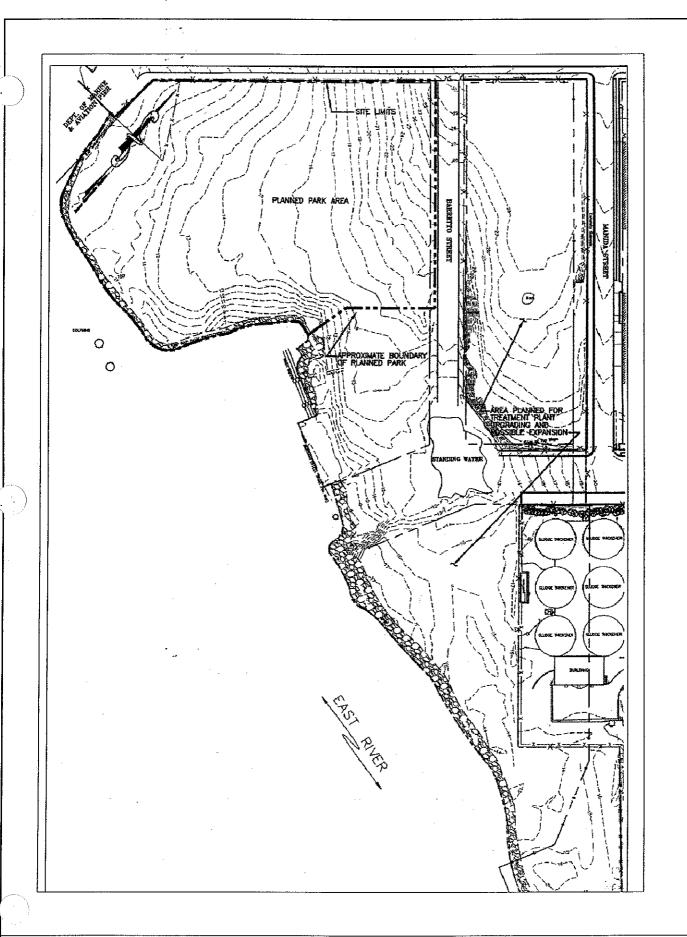
- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;
 - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
 - o The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted in electronic format to NYSDEC Central Office and the NYSDOH Bureau of Environmental Exposure Investigation.

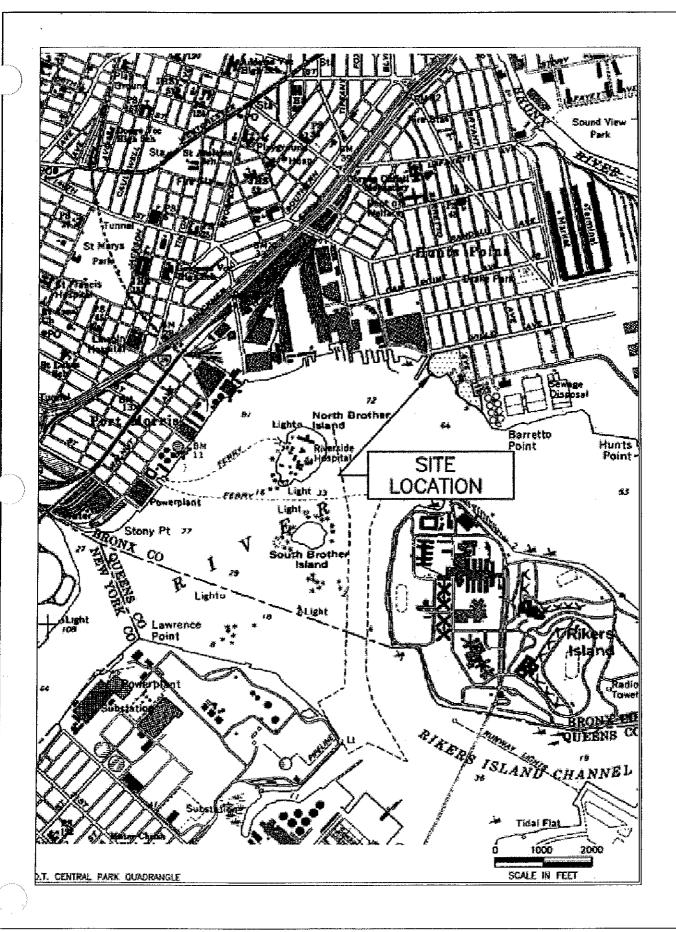
4.3 CORRECTIVE MEASURES PLAN

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 or engineering 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.

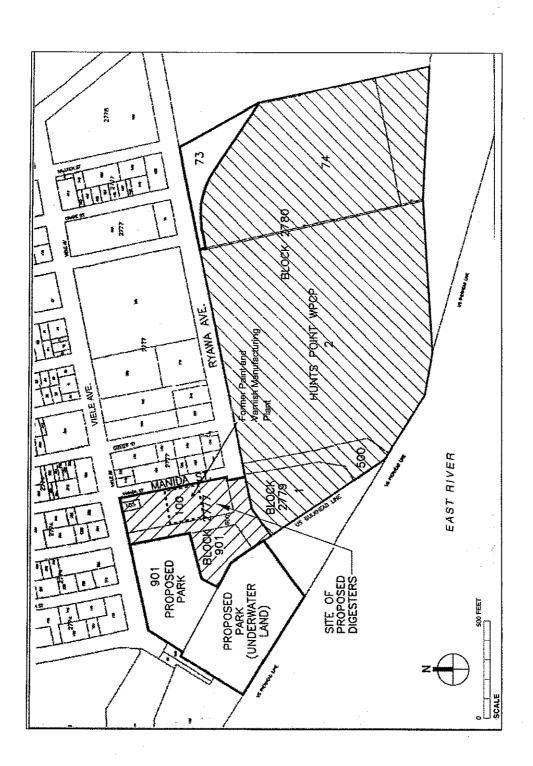
FIGURES



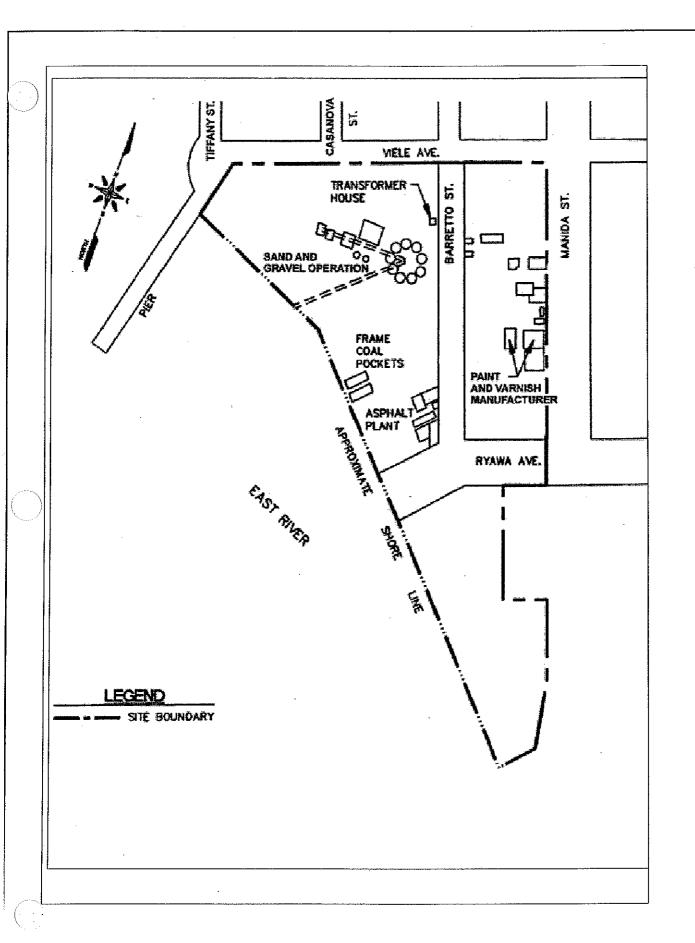
SITE PLAN BARRETTO POINT SITE BARRETTO POINT SITE BRONX, NY



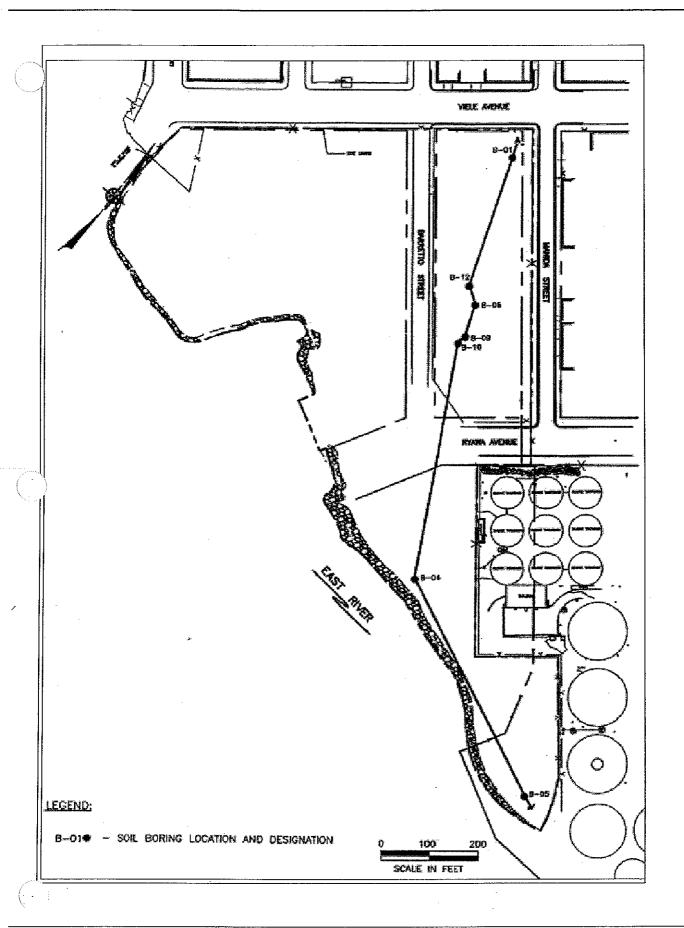










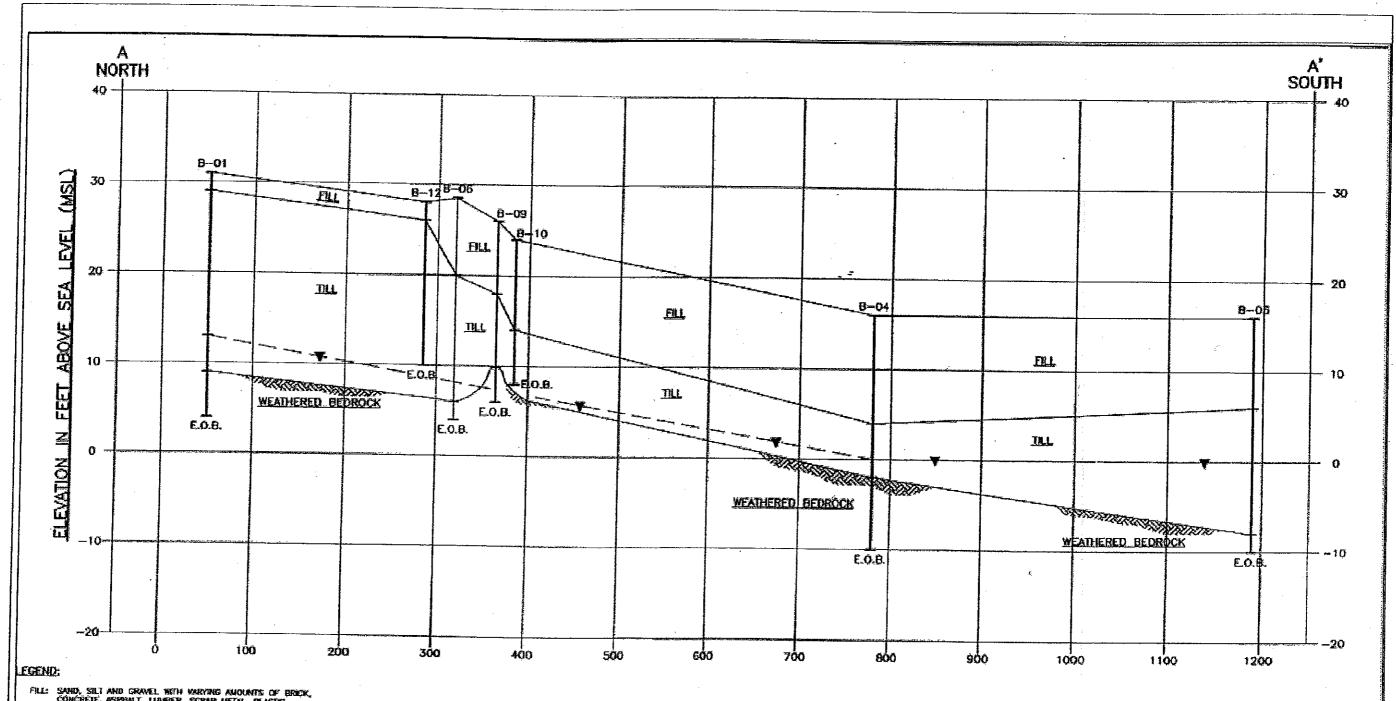




GEOLOGIC CROSS SECTION BARRETTO POINT SITE

BARRETTO POINT SITE BRONX, NY

FIGURE 5A



FILL: SAND, SILT AND CRAVEL WITH VARYING AUGUSTS OF BRICK, CONCRETE, ASPRALT, LUMBER, SCRAP HETAL, PLASTE, PAPER AND GLASS

THE SAME, SILL GRAVEL, COBBLES AND BOULDERS, TRACE CLAY

ATHERED WICK SCHIST

WATER TABLE ELEVATION (B/9/00)

E.O.B. END OF BORING

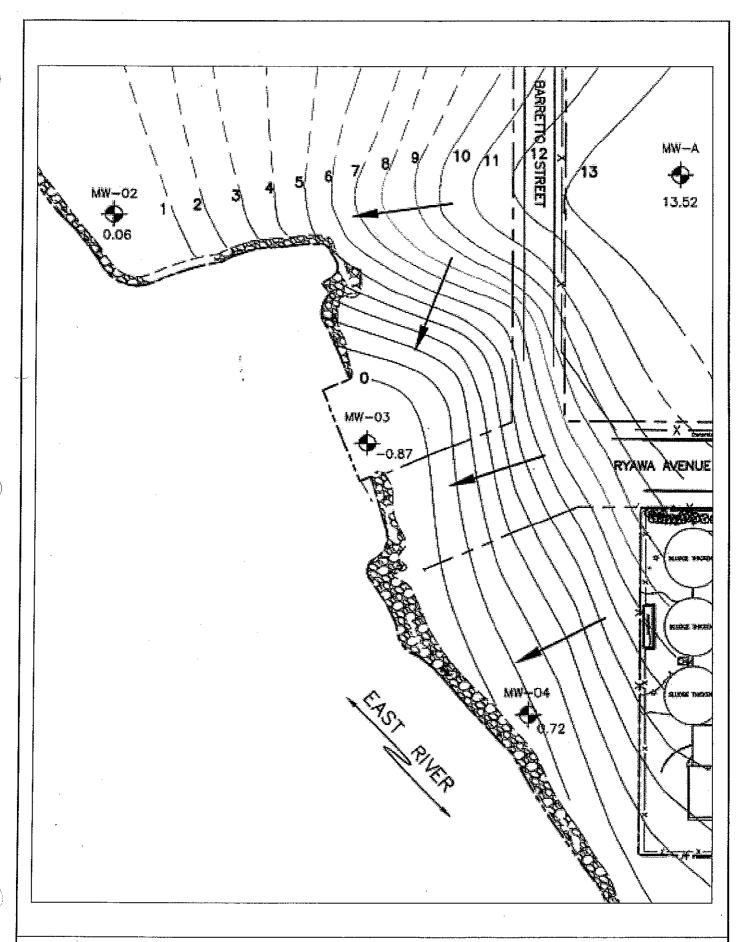
MOTE: SECTION LOCATION SHOWN ON FIGURE 3-1.

HORIZONTAL SCALE: 1'
VERTICAL SCALE: 1'

URS PARAMUS, NEW JERSEY

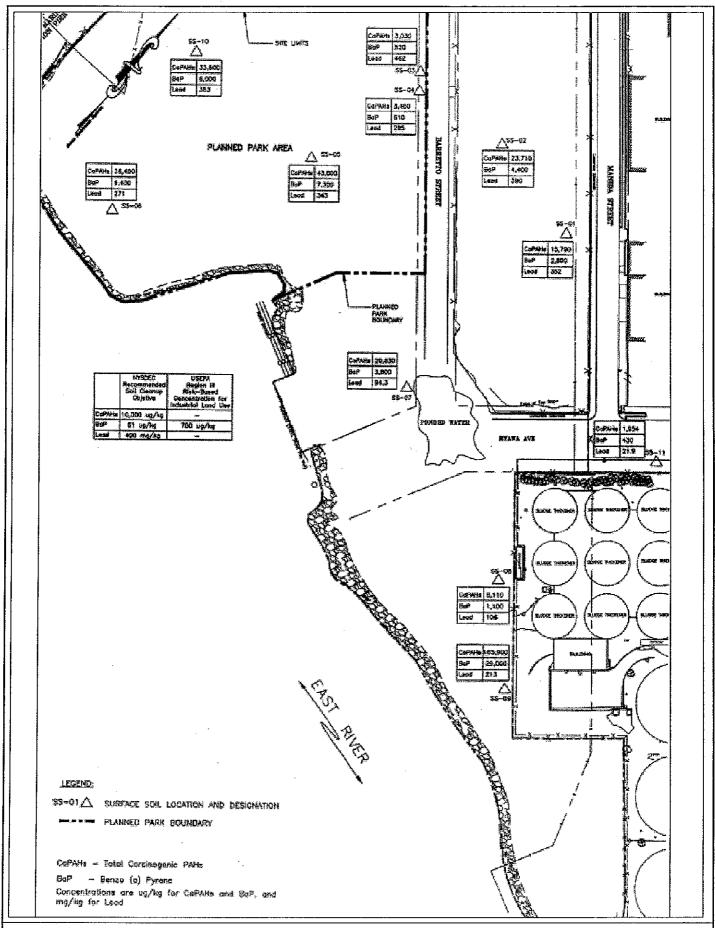
GRID LAYOUT SAMPLE LOCATIONS

BARRETTO POINT SHE BRONX, NY



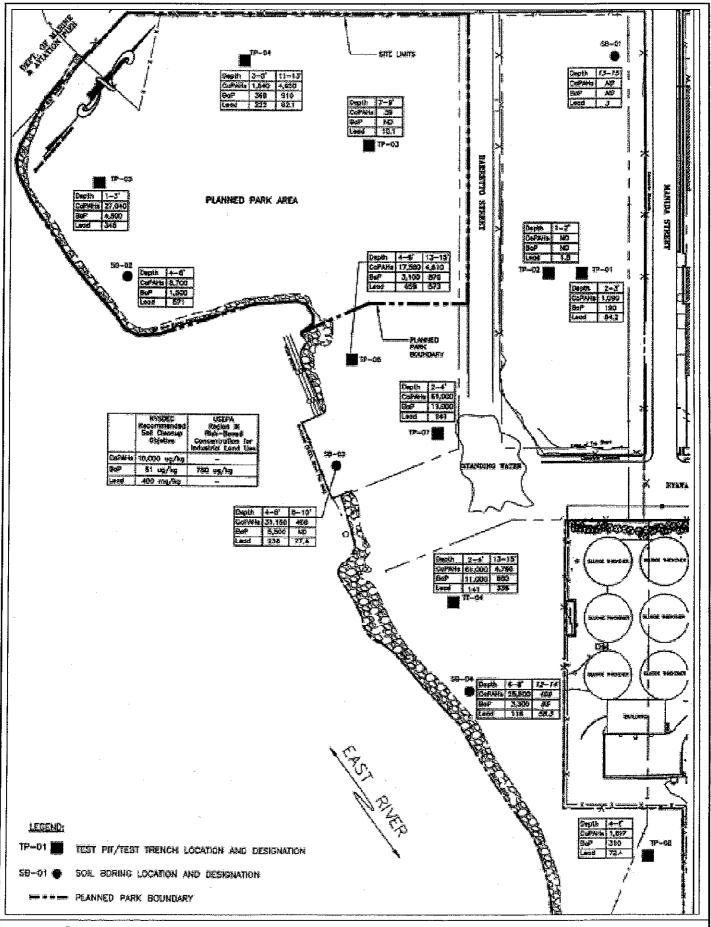
GROUNDWATER FLOW DIRECTION BARRETTO POINT SITE

BARRETTO POINT SITE BRONX, NY



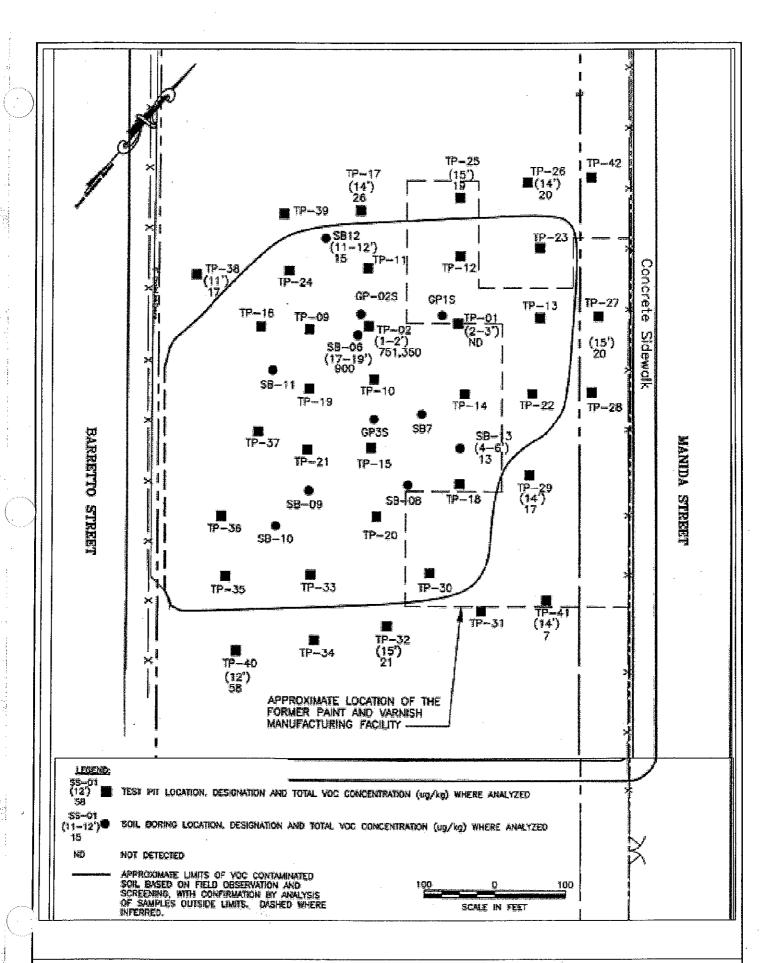
SURFACE SOIL TEST LOCATIONS AND TEST RESULTS
BARRETTO POINT SITE

BARRETTO POINT SITE BRONX, NY

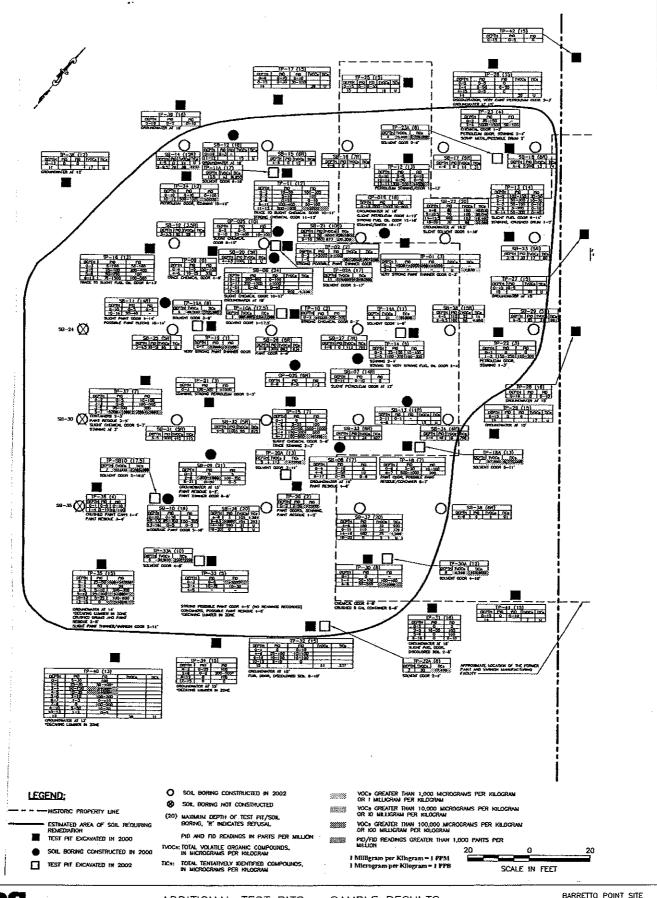


SUBSURFACE SOIL TEST LOCATIONS AND TEST RESULTS
BARRETTO POINT SITE

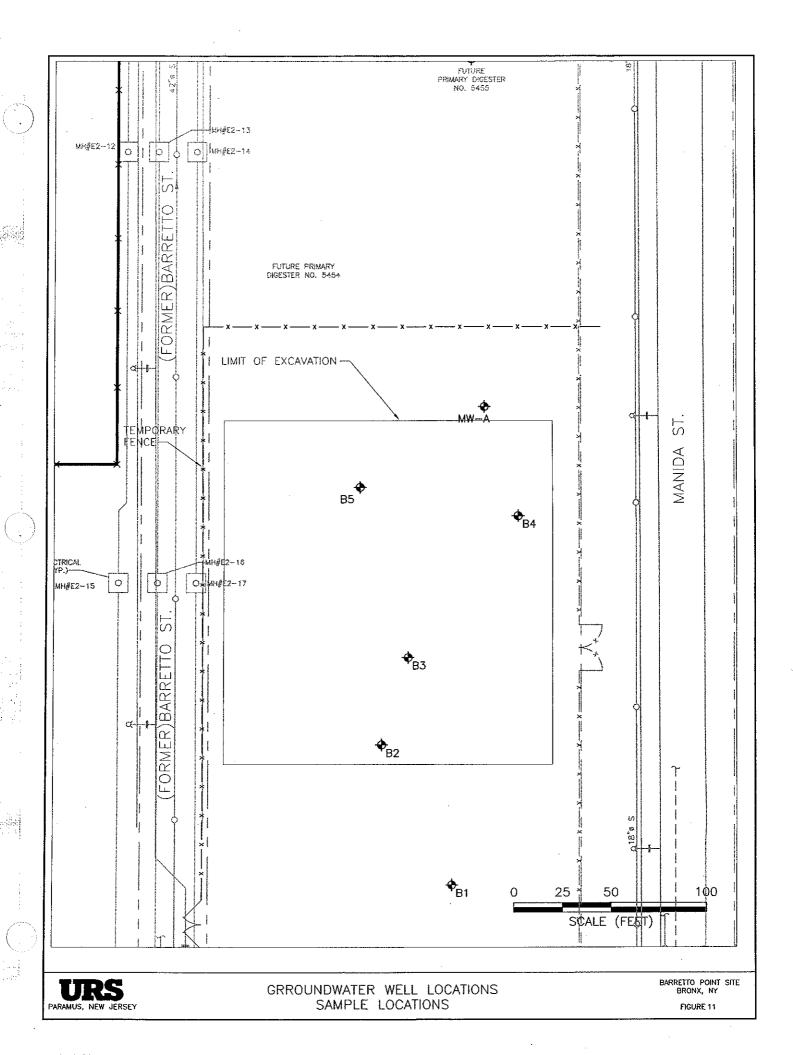
BARRETTO POINT SITE BRONX, NY

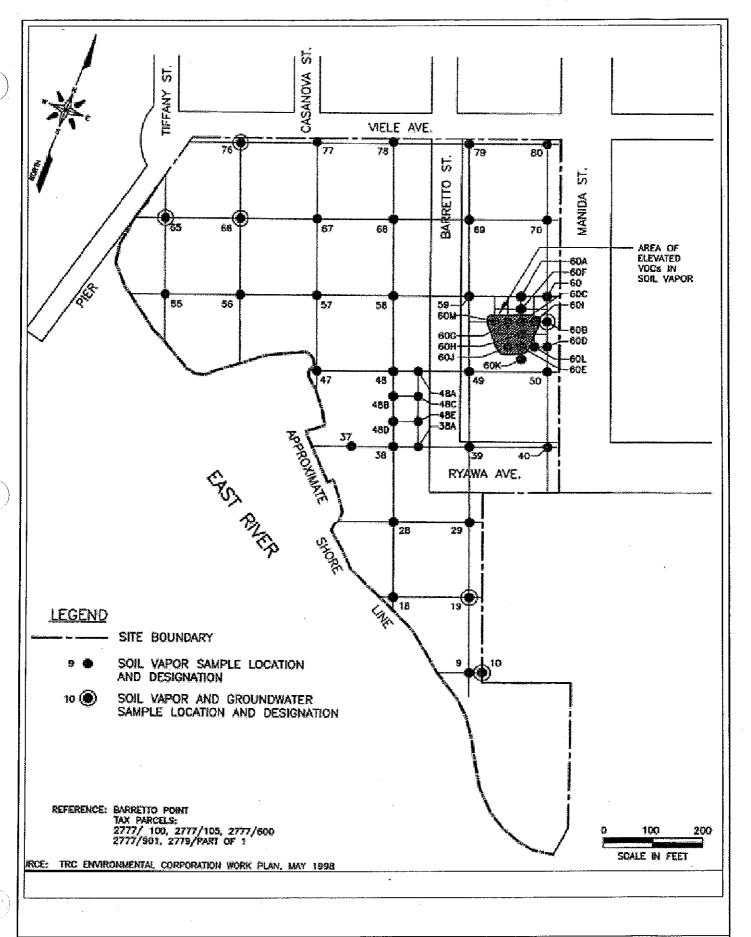


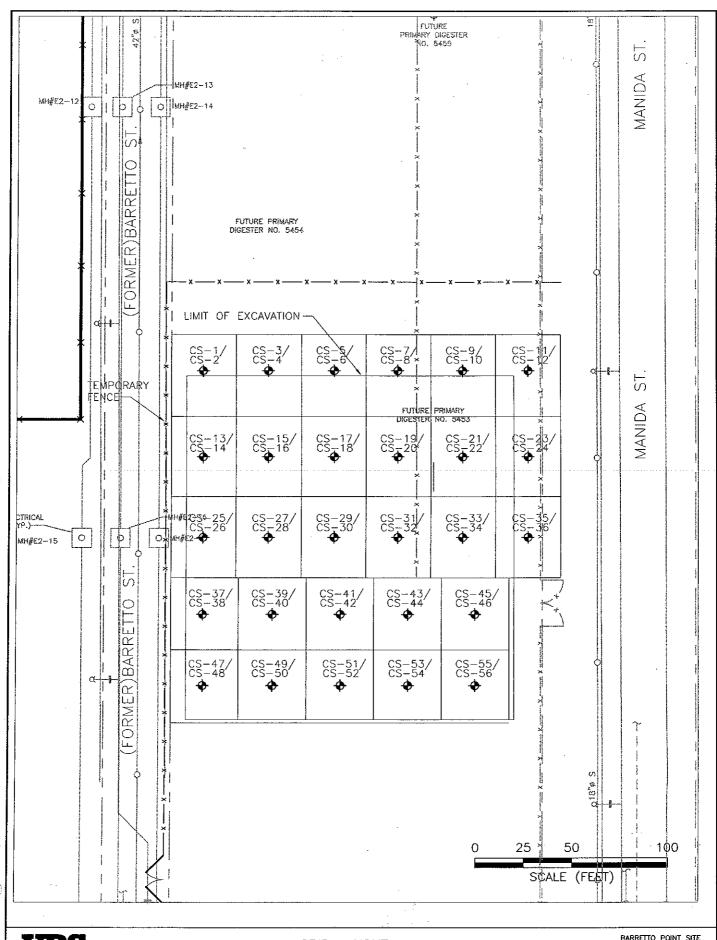




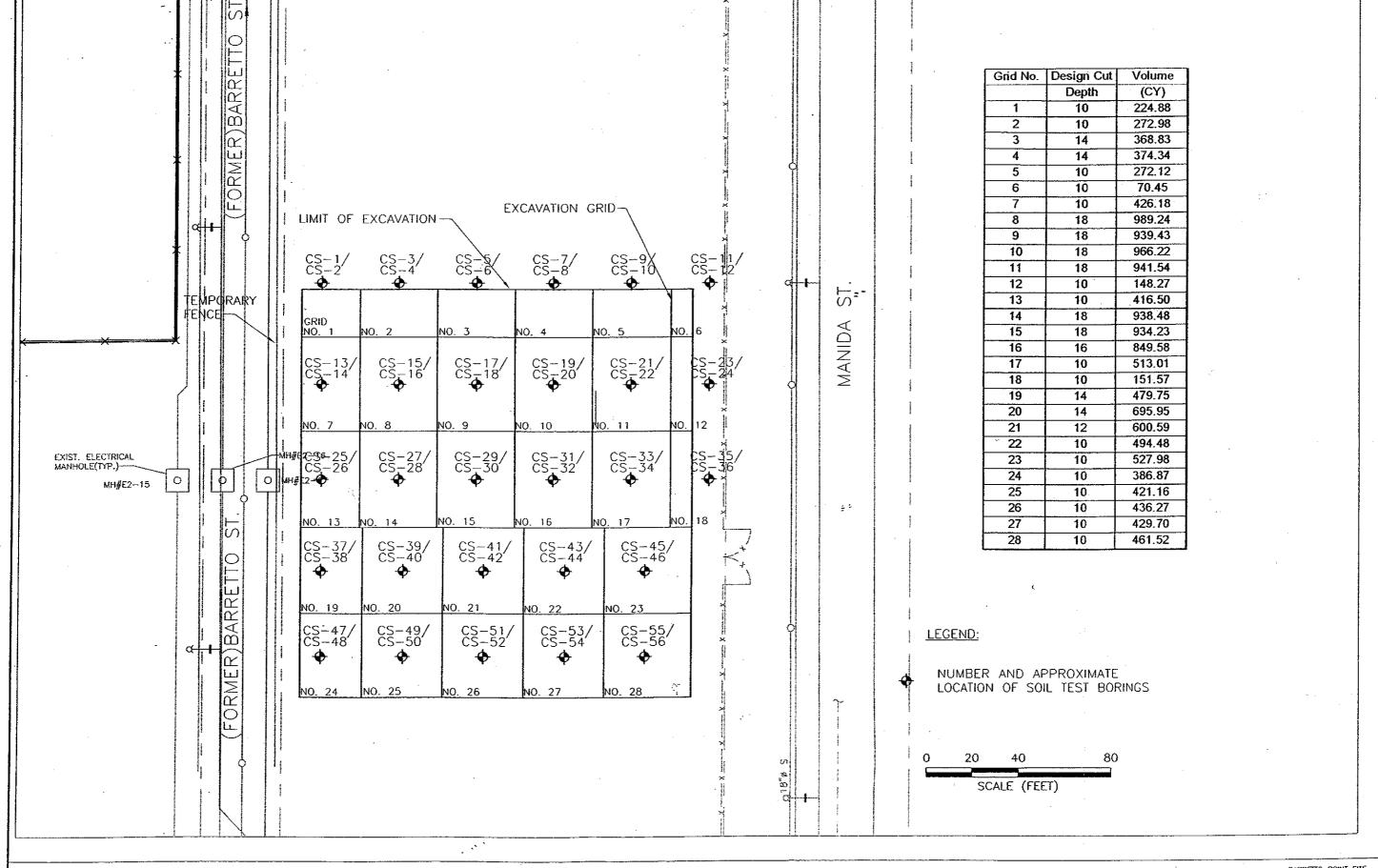
ADDITIONAL TEST PITS - SAMPLE RESULTS BARRETTO POINT SITE BARRETTO POINT SITE BRONX, NY





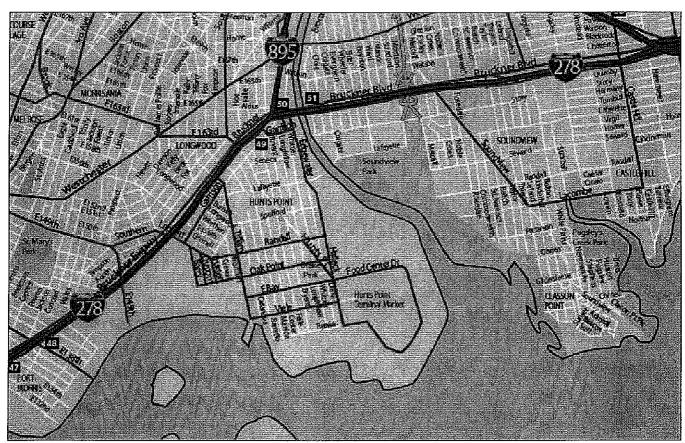


GRID LAYOUT SAMPLE LOCATIONS BARRETTO POINT SITE BRONX, NY FIGURE 13A

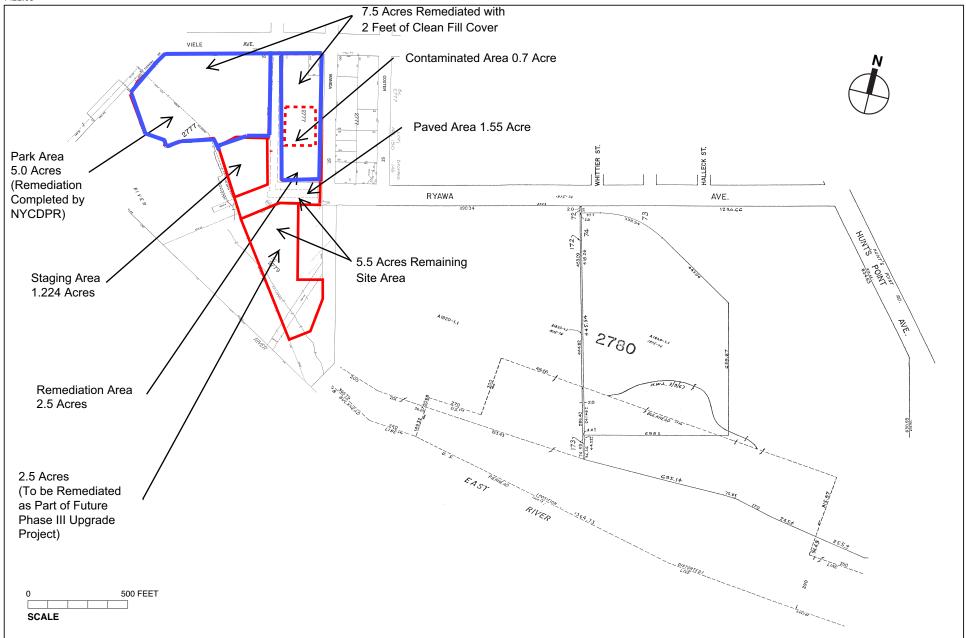


GRID LAYOUT SAMPLE LOCATIONS

BARRETTO POINT SITE BRONX, NY



NOTE: HIGHLIGHTED ROADS ARE PERMITTED TRUCK ROUTES



TABLES

Table 1-A COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN SURFACE SOIL SAMPLES BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	SS-01	SS-02	SS-03 *	SS-04 *	SS-05 *	SS-06 *	Contract	Recommended	USEPA Region III
SAMPLE DEPTH (FT)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	Required	Soil	Risk-Based
PERCENT SOLIDS	94	98	83	91	80	76	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1	.1	Limit	Objectives	industrial
DATE OF COLLECTION	03/06/2000	03/06/2000	03/06/2000	03/06/2000	03/07/2000	03/08/2000			Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Semi-volatile Organics					(-3-3/	1-337	(-39/	(uging)	(ogrig)
2-Methylphenol	υ	į ui	U	บ	U	U	330	100 or MDL	100000000
Fluoranthene	4700	7200	1100 J	1200 J	23000	14000	330	50000	82000000
Pyrene	4200	6400	1000 J	1100 J	19000	12000	330	50000	61000000
Benzo(a)anthracene	2700	3900	560 J	640 J	7900	6800	330	224 or MDL	7800
Chrysene -	2800	4100	590 J	760 J	8700	6800	330	400	780000
Benzo(b)fluoranthene	3700	5400	730 J	800 J	10000	8400	330	1100	7800
Benzo(k)fluoranthene	1200 J	2000	220 J	220 J	3400	2700	330	1100	78000
Benzo(a)pyrene	2800	4400	520 J	610 J	7300	6400	330	61 or MDL	780
Indeno (1,2,3-cd)pyrene	2100	3100	410 J	450 J	5100	4200	330	3200	
Dibenzo(a,h)anthracene	490 J	810 J	U	450 0	1200 J	4200 4100 J			7800
Total carcinogenic PAHs	15790	23710	3030	3480	43600		330	14 or MDL	780
			5550	J-10U	43000	36400		10000	

SAMPLE ID	SS-07	SS-08	SS-09	SS-10 *	SS-11		Contract	Recommended	USEPA Region III
SAMPLE DEPTH (FT)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5		Required	Soil	Risk-Based
PERCENT SOLIDS	86	84	84	73	96		Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1		Limit	Objectives	industrial
DATE OF COLLECTION	03/07/2000	03/06/2000	03/06/2000	03/06/2000	03/06/2000		_,,,,,t	Objectives	Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		(ug/kg)	(ug/kg)	(ug/kg)
Semi-volatile Organics			, , , , , , ,		. (-5.1.5/		(ug/kg)	(ug/ig/	(ugrkg)
2-Methylphenol	ប	ប	220 J	U	U		330	100 or MDL	100000000
Fluoranthene	6600	2100	66000 D	11000	380		330	50000	82000000
Pyrene	6000	1900 J	53000 D	11000	910		330	50000	61000000
Benzo(a)anthracene 6	3800	1100 J	27000 D	6200	370		330	224 or MDL	7800
Chrysene	3800	1200 J	28000 D	6400	260 J		330	400	780000
Benzo(b)fluoranthene	4600	1400 J	39000 D	7400	460		330	1100	
Benzo(k)fluoranthene	1600 J	550 J	14000	2500	150 J	*.			7800
Benzo(a)pyrene	3800	5100	29000 D	6000			330	1100	78000
Indeno (1,2,3-cd)pyrene	2600	760 J	000000000000000000000000000000000000000	************	430		330	61 or MDL	780
Dibenzo(a,h)anthracene	630 J	700 3	23000	4000	240 J		330	3200	7800
Total carcinogenic PAHs		0140	5900	1100 J	44 J	1	330	14 or MDL	780
Total Carcinogenic PANS	20830	6110	165900	33600	1954			10000	19.5

NOTES:

All samples analyzed for, VOCs, SVOCs and metals. SS-03 and SS-04 also analyzed for, PCBs.

*: Sample location within the planned park.
U: Compound analyzed for, but not detected.
J: Estimated concentration.

- MDL: Method detection limit.
- D: Concentration from diluted sample.

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective. Concentration exceeds USEPA Region III Risk-Based Concentration.

Table 1-A COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN SURFACE SOIL SAMPLES **BARRETTO POINT SITE INVESTIGATION**

SAMPLE ID	SS-01	SS-02	SS-03 *	SS-04 *	SS-05 *	00.004	<u> </u>		
SAMPLE DEPTH (FT)	0-0.5	0-0.5	0-0.5	0-0.5		SS-06 *		Recommended	· · · · · · · · · · · · · · ·
PERCENT SOLIDS	94	92	85		0-0.5	0-0.5	Instrument	Soil	Risk-Based
DILUTION FACTOR	1	- 32	- 03	91	87	83	Detection	Cleanup	Concentrations -
DATE OF COLLECTION	03/06/2000	03/08/2000	03/06/2000	7	1	1	Limit	Objectives	Industrial
UNITS	(mg/kg)	(mg/kg)	03/06/2000			03/08/2000			Land Use
Metals	(mg/kg)	(Hg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	(mg/kg)	(mg/kg)
Arsenic	2.8	2.7	5.8	555000000 0000000 000000					
Barium	313	385	234	6.7	3.8	3.7	4	7.5 or SB	3.8
Beryllium	0.67	0.34 B		264	752	1480	1	300 or SB	140000
Copper	104		1.3	0.76	0.24 B	0.2 B	2	0.16 or SB	4100
Iron -	24500	89.6	332	199	15.7	28.9	5	25 or SB	82000
Lead		15200	29200	27500	7740	6740	6	2000 or SB	610000
	352	390	463	295	343	271	0.3	400 **	0.0000
Mercury	0.24	0.24	0.28	0.15	0.18	0.21	0.1	0.1	_
Nicket	29.1	21.1	46.6	32.1	9.2	10.1			
Zinc	702	491	1700	1000	344	834	0.5	13 or SB	41000.
					3-94	034	4 [20 or SB	610000

SAMPLE ID	SS-07	SS-08	SS-09	SS-10 *	SS-11				
SAMPLE DEPTH (FT)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5		l	Recommended	
PERCENT SOLIDS	89	87	84	74			Instrument	Soil	Risk-Based
DILUTION FACTOR	1	1	1	- '4	96		Detection	Cleanup	Concentrations -
DATE OF COLLECTION	03/07/2000	03/06/2000	03/06/2000	03/02/0000	7		Limit	Objectives	Industrial
UNITS	(mg/kg)	(mg/kg)			03/06/2000			L	Land Use
Metals	(mg/kg/	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(ug/l)	(mg/kg)	(mg/kg)
Arsenic	1	2.8	**************************************						, , , , , , , , , , , , , , , , , , , ,
Barium	169		5.4	3.3	1.1		4	7.5 or SB	3.8
Beryllium		136	313	1520	15.5		1 1	300 or SB	140000
Copper	0.38 B	0.22 B	0.24 B	0.24 B	U	- 1	, ,	0.16 or SB	
	134	41.6	81.3	70.1	11.4				4100
iron	22200	11600	20800	9040	2930		2	25 or SB	82000
Lead	94.3	106	213	353	21.9	9	6	2000 or SB	610000
Mercury	0.16	0.11	0.39		21.9		0.3	400 **	
Nickel	36.1	11.4		0.26	υĮ	` I	0.1	0.1	_
Zinc			17.6	11.8	2.9 B		0.5	13 or SB	41000
	133	145	396	847	50.1		4	20 or SB	610000

NOTES:

All samples analyzed for, VOCs, SVOCs and metals. SS-03 and SS-04 also analyzed for, PCBs. *: Sample location within the planned park.

SB: Site background.

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective. Concentration exceeds USEPA Region III Risk-Based Concentration.

U: Compound analyzed for, but not detected. B: Concentration is between instrument detection limit and contract required detection limit.

^{*:} Average background levels for lead in metropolitan or suburban areas or near highways typically range from 200-500 ppm.

Table 1-B COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN TEST PIT AND TEST TRENCH SOIL SAMPLES BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	TP-1-1	TP-2-1	TP-3-1 *	TP-4-1 *	TP-4-2*	177-4-1	TP-5-1*	Contract	Doggmanded	USEPA Region II
SAMPLE DEPTH	2-3	1-2	7-9	3-5						
					11-13	13-15	1-3	Required	Soil	Risk-Based
PERCENT SOLIDS	93	92	86	92	84	89	80	Detection	Cleanup	Concentrations -
DILUTION FACTOR	50	500	1	1	1	1	1	Limit	Objective	Industrial
DATE OF COLLECTION	03/08/2000	03/08/2000	03/16/2000	03/16/2000	03/16/2000	03/09/2000	03/07/2000	4		Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)						
Volatile Organics					V-3-9/	(-3-3)		(ogg)	(19/19)	(Ug/Ng)
4-Methyl-2-pentanone	יט	2800	Ü	່ : ປ	υ	U	11	5	1000	160000000
Ethylbenzene	U	110000 D	U.	Ū :	Ū	ŭ.	Ĭ	5	5500	200000000
Xylene (total)	ן ט	510000 D	ľűĺ	ű	ŭ	4 J	. 11	5	1200	4100000000
Total VOCs	- U	751350	8	36	35.	36	5	-	10000	4100000000

SAMPLE ID	TP-6-1	TP-6-2	TP-7-1	TP-8-1	TP-17-1	TP-25-1	TP-26-1	Contract	Recommended	USEPA Region III
SAMPLE DEPTH	4-6	13-15	2-4	4-6	14	15	14	Required	Soil	Risk-Based
PERCENT SOLIDS	80	69	73	85	87	90	88	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1	1	1	Limit	Objective	Industrial
DATE OF COLLECTION	03/07/2000	03/07/2000	03/07/2000	03/16/2000	03/14/2000	03/16/2000	03/16/2000	3.	00,000.0	Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Volatile Organics				1		· · · · · · · · · ·	1-5-5/		7-331	(03.13/
4-Methyl-2-pentanone	บ	U		U	ן ט	U	U	5	1000	160000000
Ethylbenzene	U	U	U	· 2J	ان ا	Ü	Ü	5	5500	200000000
Xylene (total)	J U	U	U	8	ا ن	ľυĺ	บ	5	1200	4100000000
Total VOCs	8	5	23	21	26	19	20	<u> </u>	10000	

SAMPLE ID	TP-27-1	TP-29-1	TP-32-1	TP-38-1	TP-40-1	TP-41-1	Contract	Recommended	USEPA Region III
SAMPLE DEPTH	15	14	15	11	12	14	Required	Soil	Risk-Based
PERCENT SOLIDS	90	89	92	92	83	91	Detection		Concentrations -
DILUTION FACTOR	1	1	1	1	1	1 1	Limit	Objective	Industrial
DATE OF COLLECTION .	03/16/2000	03/20/2000	03/21/2000	03/23/2000	03/24/2000	03/24/2000		Objective	Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Volatile Organics						(-39)	(19,19)	(09/19/	(ug/kg)
4-Methyl-2-pentanone	υ	u	υ	υ	lυi	U U	5	1000	160000000
Ethylbenzene	υ	ប	l u	บ	ŭ	ŭ l	5	5500	200000000
Xylene (total)	ប	U U	Ū	ŭ	2 j	ŭ	5	1200	4100000000
Total VOCs	20	17	21	17	58	7		10000	710000000

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective.

^{*:} Sample location within the planned park.

U: Compound analyzed for, but not detected.

J: Estimated concentration.

D: Concentration from diluted sample.

Table 1-B COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN TEST PIT AND TEST TRENCH SOIL SAMPLES BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	TP-1-1	TP-2-1	TP-3-1	TP-4-1 *	TP-4-2 *	TT-4-1	Contract	Docommonded	USEPA Region III
SAMPLE DEPTH	2-3	1-2	7-9	3-5	11-13	13-15			
PERCENT SOLIDS	93	92	86	92	86		Required	Soil	Risk-Based
DILUTION FACTOR	1	1	4	92		82	Detection	Cleanup	Concentrations -
DATE OF COLLECTION	03/08/2000	02/05/0000	001001000	5	5	1	Limit	Objective	Industrial
UNITS		03/08/2000	03/06/2000	03/06/2000	03/06/2000	03/09/2000			Land Use
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Semi-volatile Organics							1.5.07	1	(33.37
Benzo(a)anthracene	180 J	υ	U	330 J	890 J	880	330	224 1401	7000
Chrysene	210 J	υ	ับไ	330 J	890 J	860		224 or MDL	7800
Benzo(b)fluoranthene	260 J		39 1	440 J			330	400	780000
Benzo(k)fluoranthene	100 J	i ii	39 1		1000 J	1100	330	1100	7800
Benzo(a)pyrene			υį	180 J	400 J	360 J	330	1100	78000
, ,,,	190 J	U	υĮ	360 J	910 J	860	330	61 or MDL	780
Indeno (1,2,3-cd)pyrene	150 J	비	· U	200 J	560 J	560	330	3200	7800
Dibenzo(a,h)anthracene	U.	u	υl	ប	i ii l	140 J	330	14 or MDL	
Total carcinogenic PAHs	1090	U	39	1840	4650	4760	330		780
				1040	4000	4/00		10000	

SAMPLE ID	TP-5-1 *	TP-6-1	TP-6-2	TP-7-1	TP-8-1		Contract	[Dann-1-1-1	HOEDA D. J. W
SAMPLE DEPTH	1-3	4-6	13-15	2-4	4-6			Recommended	USEPA Region III
PERCENT SOLIDS	80	80	69	73	85		Required Detection	Soil	Risk-Based
DILUTION FACTOR	5	5	5	10	1 1		Limit	Cleanup	Concentrations -
DATE OF COLLECTION	03/07/2000	03/07/2000	03/07/2000	03/07/2000	03/16/2000		CHINE	Objective	Industrial
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		(ug/kg)	(1.00 (1.00)	Land Use
Semi-volatile Organics			1-5-0/	1-8-9/	(09/19/		(Ug/kg)	(ug/kg)	(ug/kg)
Benzo(a)anthracene	5400	3600.	950 J	97(0)	310 J]	330	224 or MDL	7000
Chrysene	5400	3200	870 J	10000	320 J	1	330	400	7800
Benzo(b)fluoranthene	6200	3800	1200 J	14000	390		330	1100	780000 7800
Benzo(k)fluoranthene	1900 J	1500 J	350 J	4500	120 J		330	1100	78000
Benzo(a)pyrene	4600	3100	870	11000	310 J		330	61 or MDL	780 780
Indeno (1,2,3-cd)pyrene	2900	2000 J	570 J	9400	200 J		330	3200	7800 7800
Dibenzo(a,h)anthracene	640 J	380 J	U	2400 J	47 J	Į.	330	14 or MDL	
Total carcinogenic PAHs	27040	17580	4810	61000	1697		- 550	10000	780

NOTES:

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective. Concentration exceeds USEPA Region III Risk-Based Concentration.

Samples from test pits numbered 9 and greater were analyzed for volatile organic compounds only.

^{*:} Sample location within the planned park.

U: Compound analyzed for, but not detected.
J: Estimated concentration.

Table 1-B COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN TEST PIT AND TEST TRENCH SOIL SAMPLES BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	TP-1-1	TP-2-1	TP-3-1*	TP-4-1*	TP-4-2*	TT-4-1		Recommended	USEPA Region III
SAMPLE DEPTH (FT)	2-3	1-2	7-9	3-5	11-13	13-15	Instrument	Soit	Risk-Based
PERCENT SOLIDS	94	94	90	87	84	79	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1	1 - 1	Limit	Objective	Industrial
DATE OF COLLECTION	03/08/2000	03/08/2000	03/06/2000	03/06/2000	03/06/2000	03/09/2000	CHAIL	Objective	Land Use
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	(===0)	
Metals		(99)	((mg/kg)	(mg/kg/	(nig/kg)	(ug/i)	(mg/kg)	(mg/kg)
Arsenic	1.1 B	1.4 B	1.7	4.3	3,5	7.2	4	7.5 or SB	3.8
Barium	71.8	47	85.5	130	82.8	89	4	300 or SB	140000
Beryllium	1.7	0.32 B	0.45 B	0.52 B	0.71	0.47 B	2	0.16 or SB	
Copper	141	21.8	26.7	48.7	63.3	52.7	5		4100
Iron -	17900	12300	19200	14700	16900	18400	-	25 or SB	82000
Lead [*]	84.2	1.8	10.1	222	92.1	336	6	2000 or SB	610000
Mercury	0.018 B	U	0.084	0.26	0.17		0.3	400	
Nickel	22.9	13.2	20.2			0.092	0.1	0.1	**
Zinc	733	50.8 B		14.4	19.6	17.1	.0.5	13 or SB	41000
	199	30.0 5	51.3	180	271	162	4	20 or SB	610000

SAMPLE ID	TP-5-1 *	TP-6-1	TP-6-2	TP-7-1	TP-8-1		r	Recommended	USEPA Region III
SAMPLE DEPTH (FT)	1-3	4-6	13-15	2-4	4-6		Instrument	Soil	Risk-Based
PERCENT SOLIDS	87	83	78	79	83		Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1		Limit	Objective	Industrial
DATE OF COLLECTION	03/07/2000	03/07/2000	03/07/2000	03/07/2000	03/09/2000		Cirric	Objective	Land Use
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(ug/l)	(mg/kg)	(mg/kg)
Metals							1-0-7	((gg)
Arsenic	5.3	6.5	12.1	6.5	1.4		4	7.5 or SB	3.8
Barium	226	841	507	826	146			300 or SB	140000
Beryllium	0.29 B	0.35 B	0.38 B	0.3 B	0.4 B		2	0.16 or SB	4100
Copper	47.8	169	133	72.8	23.6		5	25 or SB	82000
Iron	8580	23000	29600	22800	16200		6	2000 or SB	610000
Lead	346	659	573	141	72.4		0.3	400 **	010000
Mercury	0.64	0.63	0.42	0.17	0.16	ì	0.3	• - :	-
Nickel	10,9	37.4	35,7	23.7	16.3		0.1	0.1	44000
Zinc	405	1200	849	646	101		• • • • • • • • • • • • • • • • • • •	13 or SB 20 or SB	41000 610000

NOTES:

SB: Site background.

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective.

Concentration exceeds USEPA Region III Risk-Based Concentration.

^{*:} Sample location within the planned park.

U: Compound analyzed for, but not detected.

B: Concentration is between instrument detection limit and contract required detection limit.

^{**:} Average background levels for lead in metropolitan or suburban areas or near highways typically range from 200-500 ppm. Samples from test pits numbered 9 and greater were analyzed for volatile organic compounds only.

Table 1-B COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN **SOIL BORING SOIL SAMPLES** BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	B-1-1	B-1-2	B-2-1 *	B-2-2 *	B-3-1	B-3-2	B-4-1	B-4-2	Contract	Recommended	USEPA Region III
SAMPLE DEPTH	13-15	19-21	4-6	15-17	4-6	8-10	6-8	12-14	Required	Soil	Risk-Based
PERCENT SOLIDS	92	94	85	87	85	79	88	89	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	1	1	50	1	Limit	Objectives	Industrial
DATE OF COLLECTION	04/05/2000	04/05/2000	04/05/2000	04/05/2000	04/10/2000	04/10/2000	04/11/2000	04/11/2000			Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)							
Volatile Organics											
Total VOCs	7	8	13	11	131	48	11074	62		10000	

SAMPLE ID	B-4-3	B-5-1	B-5-2	B-5-3	B-6-1	B-12	B-13	 Contract	Recommended	USEPA Region III
SAMPLE DEPTH	18-20	8-10	14-16	20-24	17-19	11-12	4-6	 Required	Soil	Risk-Based
PERCENT SOLIDS	86 ~	89	87	84	89	95	94	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	.1	1	1	 Limit	Objectives	Industrial
DATE OF COLLECTION	04/11/2000	04/10/2000	04/10/2000	04/11/2000	04/06/2000	04/21/2000	04/21/2000		,	Land Use
UNITS	(ug/kg)	 (ug/kg)	(ug/kg)	(ug/kg)						
Volatile Organics					, <u> </u>		1.0.0/	 <u> </u>		<u></u>
Total VOCs	11	38	9	51	900	15	13	 	10000	

SAMPLE ID	B-1-1	B-1-2	B-2-1 *	B-2-2*	B-3-1	B-3-2	B-4-1	B-4-2	Contract	Recommended	USEPA Region III
SAMPLE DEPTH	13-15	19-21	4-6	15-17	4-6	8-10	6-8	12-14	Required	Soil	Risk-Based
PERCENT SOLIDS	92	94	85	87	85	79	88	89	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1	10	10	1	1	Limit	Objectives	Industrial
DATE OF COLLECTION	04/05/2000	04/05/2000	04/05/2000	04/05/2000	04/10/2000	04/10/2000	04/11/2000	04/11/2000		1	Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)							
Semi-volatile Organics						1 3 3	- X X X		1-0-07		
Phenol	U	ម	υ	U	· u	υ	51 J	υ	330	30 or MDL	1200000000
Dibenzofuran	٤U	U	220 J	บ	1500 J	υ	20000 D	120 J	330	6200	8200000
Phenanthrene	U	υ	3100	100 J	9700	730 J	73000 D	380	330	50000	!
Benzo(a)anthracene	U	υ	1800	78 J	5400	460 J	8100 DJ	100 J	330	224 or MDL	7800
Chrysene	U	U	1600	57 J	6200	U	6000 DJ	98 J	330	400	780000
Benzo(b)fluoranthene	IJ	U U	1900	94 J	7000	υ	5200	110 J	330	1100	7800
Benzo(k)fluoranthene	U	U,	680	U	3000 J	υ	1600	52 J	330	1100	78000
Benzo(a)pyrene	U	υl	1500	70 J	5500	Ü	3300	85 J	330	61 or MDL	780
Dibenzo(a,h)anthracene	U	U	230 J	U	880 J	U	400	U	330	14 or MDL	780
Total carcinogenic PAHs	U	U	8700	299	31160	460	25800	499		10000	

SAMPLE ID	B-4-3	B-5-1	B-5-2	B-5-3		<u> </u>		Contract	Recommended	USEPA Region III
SAMPLE DEPTH	18-20	8-10	14-16	20-24				Required	Soil	Risk-Based
PERCENT SOLIDS	86	89	87	84		· · · · · · · · · · · · · · · · · · ·	-	Detection	Cleanup	Concentrations -
DILUTION FACTOR	1	1	1	1				Limit	Objectives	Industrial
DATE OF COLLECTION	04/11/2000	04/10/2000	04/10/2000	04/11/2000						Land Use
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(vg/kg)				(ug/kg)	(ug/kg)	(ug/kg)
Semi-volatile Organics										
Phenoi	U	U	U,	U		i I		330 -	30 or MDL	1200000000
Dibenzofuran	U	U	! υ	170 J				330	6200	8200000
Phenanthrene	U	220 J	U	2900		Į.		330	50000	_
Benzo(a)anthracene	U	250 J	49 J	2600				330	224 or MDL	7800
Сhrysene	U.	270 U	43 J	2900				330	400	780000
Benzo(b)fluoranthene	Ų	L 008	56 J	2700				330	1100	7800
Benzo(k)fluoranthene	υ	89 J	l ul	830				330	1100	78000
Benzo(a)pyrene	U	290 J	48 J	2200			l	330	61 or MDL	780
Dibenzo(a,h)anthracene	Ū	IJ	U	370 J				330	14 or MDL	780
Total carcinogenic PAHs	Ų	1359	196	12800	 				10000	

- NOTES:
 *: Sample location within the planned park
 U: Compound analyzed for, but not detected.
- D: Concentration from diluted sample.
- MDL: Method detection limit.

Concentration exceeds NYSDEC Recommended Soil Cleanup Objective.

Concentration exceeds USEPA Region III Risk-Based Concentration.
Samples from borings numbered 6 and greater were analyzed for volatile organic compounds only.

Table 1-B COMPOUNDS EXCEEDING STANDARDS, CRITERIA AND GUIDELINES IN SOIL BORING SOIL SAMPLES BARRETTO POINT SITE INVESTIGATION

SAMPLE ID	B-1-1	B-1-2	B-2-1 *	B-2-2*	B-3-1	B-3-2		Recommended	HICEDA D. C. BI
SAMPLE DEPTH (FT)	13-15	19-21	4-6	15-17	4-6	8-10	Instrument	Soil	
PERCENT SOLIDS	92	86	86	85	85	83	Detection		Risk-Based
DILUTION FACTOR	1	1	1	1	1	1	Limit	Cleanup	Concentrations -
DATE OF COLLECTION	04/05/2000	04/05/2000	04/05/2000	04/05/2000	04/10/2000	04/10/2000	Laint	Objectives	Industrial
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(v.~/l)	(B)	Land Use
Metals					(riig/kg/	(mg/kg)	(ug/l)	(mg/kg)	(mg/kg)
Arsenic	U	1.3 B		υ	0.46 B	0.64 B	4	7.5 or SB	0.0
Beryllium	0.39 B	0.85	0.3 B	0.52 B	0.3 B	0.31 B	2		3.8
Copper	11.5	3.6	60.9	44.2	32.4	47.9	_	0.16 or SB	4100
tron	-12000	19200	11900	31600	15500	13600	5	25 or SB	82000
Lead	3	3.5	571	96.5	236		6	2000 or SB	61,0000
Mercury	0.024 B	0.024 B	1.3	0.061		77.4	0.3	400 **	- }
Nickel	12.5	12.5	21.1		0.23	0.46	0.1	0.1	
Selenium	0.41 B	0.53 B	41.7	39,5	18.9	21.6	0.5	13 or SB	41000
Zinc	18.3		470	2	U	0.39 U	4	2 or SB	10000
	10.0	23.2	180	139	137	103	4	20 or SB	610000

SAMPLE ID	B-4-1	B-4-2	B-4-3	B-5-1	B-5-2	B-5-3	r · · · · · ·	T Bosommondad	LUCEDA D
SAMPLE DEPTH (FT)	6-8	12-14	18-20	8-10	14-16	20-24	Instrument		USEPA Region III
PERCENT SOLIDS	92	94	90	89	88	89	4	Soil	Risk-Based
DILUTION FACTOR	1	1	1	- 00		89	Detection	Cleanup	Concentrations -
DATE OF COLLECTION	04/11/2000	04/11/2000	04/11/2000	0444040000	1	1	Limit	Objectives	Industrial
UNITS	(mg/kg)			04/10/2000	04/10/2000	04/11/2000			Land Use
Metals	l (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	(mg/kg)	(mg/kg)
Arsenic			İ			·			
t i	U	U	υ	0.52 B	Uί	3.8	4	7.5 or SB	3.8
Beryllium	0.5 B	0.47 B	0.53 B	0.32 B	0.52 B		2	0.16 or SB	
Copper	30.6	29.9	38.5	35	24.9	101			4100
lron	20400	21200	27400	12300	19600		5	25 or SB	82000
Lead	118	58.3	16.2			77400	6	2000 or SB	610000
Mercury	0.36			53.9	16.1	108	0.3	400 **	-
Nickel		0.11	U	0.69	0.02 B	0.36	0.1	0.1	_
	23.8	20.2	23.9	13	15.8	71.6	0.5	13 or SB	41000
Selenium	0.56 B	1.8	1.5 B	ប	Ü	5.5	_		
Zinc	102	128	70.2	79.7	61.2		4	2 or SB	10000
				79.7	01.2	97.1	4	20 or \$B	610000

NOTES:

Concentration exceeds USEPA Region III Risk-Based Concentration.

Samples from borings numbered 6 and greater were analyzed for volatile organic compounds only.

^{*:} Sample location within the planned park

U: Compound analyzed for, but not detected.

B: Concentration is between instrument detection limit and contract required detection limit.

SB: Site background.

**: Average background levels for lead in metropolitan or suburban areas or near highways typically range from 200-500 ppm. Concentration exceeds NYSDEC Recommended Soil Cleanup Objective.

GROUNDWATER RESULTS BARRETTO POINT SITE Table 2

VOC Results - February 16, 2005

	NYSDEC	NYCDEC				B-3	
	Groundwater	Sanitary	B-5	B-4	B-3	Duplicate	B-2
VOCs	Quality	Effluent	(l/gn)	(l/gn)	(l/gn)	(l/gn)	(ng/l)
(ug/l)	Criteria	Limitations (ug/l)	02/16/05	02/16/05	02/16/05	02/16/05	03/08/05
Benzene		134	ţ ;	1.2	80	83	~
Ethylbenzene	5	380	5	22	2.700	3 200	9
M&n-xvlenes	1 /	27			0000	200,0	;
	`	† '	Ç	× .	3,200	3.500	•
C-xylene	^	74	[;	200	260	i
Methylene Chloride	v.	none listed	;	!	09	82	
Tetrachloroethene	ν,	164	3.6	•	•		
Trichloroethene	'n	none listed	2.7	-	1	ļ	1

Effluent Limitation Source = Undated NYSDEC Bureau of Wastewater Treatment

Concentrations reported in ug/l (parts per billion) NOTES: VOCs=Volatile Organic Compounds ---=undetected

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GROUNDWATER RESULTS BARRETTO POINT SITE Table 2

SVOC, Pesticide, PCB, and TPH Groundwater Results -February 16, 2005

	NYSDEC Groundwater	NYCDEC Sanitary	B-5	B-4	B-3 ,	B-3 Duplicate	B-2
SVOCs (ug/l)	Quality Standards	Effluent Limitations (ug/l)	(ug/l) 02/16/05	(ug/l) 02/16/05	(ug/l) 02/16/05	(ug/l) 02/16/05	(l/gu)
2,4-Dimethylphenol	50	none listed			09		
2-Methylnaphthalene	not regulated	none listed	· ;	· .	× ×	,	
2-Methylphenol	, ,	none listed	ł	•	16	19	}
3&4-Methylphenol		none listed	i	1	3.3	4.2	ł
Benzoic Acid	not regulated	none listed	1.7 J		81	110	;
Bis (2-ethylhexyl)phthalate	5	none listed	1	2.5	i i	2.3	;
Carbozole	not regulated	none listed	}	;	1.5	4:1	. }
Naphthalene	10	74	:	;	50	54	
Pesticides (ug/l)		not applicable	l			i a a a	NA
PCBs (ug/l)	ļ		ļ		**	į	NA
TPH (mg/l)	å 5 9	50 mg/l	< 1.1	< 1.2	8.1	8,6	1.4

PCB=polychlorinated biphenyl TPH=total petroleum hydrocarbons J=analyte detected at a concentration below reporting limits SVOC=Semivolatile Organic Compound

---=undetected

Concentrations reported in ug/l (parts per billion) NA=not analyzed

Effluent Limitation Source = Undated NYSDEC Bureau of Wastewater Treatment

Table 2 GROUNDWATER RESULTS BARRETTO POINT SITE

Total Inorganic Groundwater Results - February 16, 2005

Inorganic Constituents	CHARLE		۲.	-		2 2	
nts	Groundwater	Sanitary	B-5	 84	-B-3	Duplicate	B-2
	Quality	Effluent Limitations (ug/l)	(ug/l) 02/16/05	(ug/l) 02/16/05	(l/gn) 50/91/20	(ug/l)	(l/gn)
		_			COLOT	COLOTINA	CO/DO/CO
	200	i	27,000	240,000	000'89	74,000	6.900
	m		<30	< 30	< 15	<15	< 7.5
	25	1	45	< 16	∞ ∨	80 V	< 4.0
	1,000	j	880	1,500	2,600	2,600	170
	w		<15	< 16		80 V	< 4.0
	ري	2,000	10	& V	4 >	4 >	< 2.0
	;	1	2,500,000	1,400,000	380,000	380,000	180,000
	50	5.000	< 100	640	180	190	< 25
	730 (2)	:	55	150	99	72	< 10
	200	5,000	< 200	390	240	250	29
	300	i	50,000	400,000	210,000	230,000	16,000
	25	2,000	44	110	57	58	24
	35,000	1	790,000	390,000	150,000	150,000	39,000
	300	1	33,000	000'09	16,000	17,000	3,600
	0.7	50	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
	100	3,000	130	360	140	150	19
		1	100,000	100,000	38,000	45,000	18,000
	10	;	< 200	< 100	< 50	< 50	< 25
	20	1	< 40	< 40	< 20	< 20	01 >
	20,000	Ī	12,000,000	14,000,000	2,700,000	2.700.000	280 000
-	0.5		< 40	< 20	× 10	< 10	00000
	260	1	< 100	630	210	230	2.5.
	2,000	5,000	< 200	830	350	380	730

Concentrations reported in ug/l (parts per billion) Effluent Limitation Source = Undated NYSDEC Bureau of Wastewater Treatment

* total iron and manganese standard = 500 ug/l

**concentration of magnesium is a NYSDEC guidance value, not a standard (1) FPA secondary drinking water etandard (Summer 2000)

(1)EPA secondary drinking water standard (Summer 2000) (2)EPA Region III Rish-Based Criteria for Tap Water (9/25/2001)

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GROUNDWATER RESULTS BARRETTO POINT SITE Table 2

Dissolved Inorganic Groundwater Results - February 16, 2005

Inorganic Groundwater Sanitary Constituents Quality Effluent	y B-5 (ug/l) (ug/l) 02/16/05 (230 <32 <560 <16 9 2,500,000 <100 <100 <100 <100 <100 <100 <10	(ug/l) 02/16/05 02/16/05 < 400 < 30 < 16 470 < 15 < 8 1,600,000 < 100	B-3 (ug/l) 02/16/05 < 200 < 15 < 8 2,300 < 8 < 4 < 4 410,000	Duplicate (ug/l) 02/16/05 \$\frac{2}{200}\$ \$ 15 \$ 8 \$ 8 \$ 8 \$ 4	B-2 (ug/l) 03/08/05 < 100 < 7.5 4.2 180 < 4.0 < 2.0
Unents Quality Criteria Lim 1 (1) 200 3 25 1,000 3 5 5 730(2) 200 300 25 100 100 50	(ug/l)	(ug/l) 02/16/05 < 400 < 400 < 30 < 16 470 < 15 < 8 1,600,000 < 100	(ug/l) 02/16/05 < 200 < 15 < 8 2,300 < 8 < 4 410,000	(ug/l) (ug/l) 02/16/05 \$\frac{2}{200} \$\left(15) \$\left(8) 1,600 \$\left(8) \$\left(8) \$\left(4) \$	(ug/l) 03/08/05 03/08/05 < 100 < 7.5 4.2 180 < 4.0
7.1) Criteria Lim 1.000 3 2.5 1.000 3 5 7.30(2) 2.00 3.00 2.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	(ugJ)	(ug/l) 02/16/05 < 400 < 400 < 16 470 < 15 < 8 1,600,000 < 100	(ug/l) 02/16/05 < 200 < 15 < 8 2,300 < 8 < 4 410,000	(ug/l) 02/16/05 \$\frac{\}{2}00 \$< 15 \$< 8 1,600 \$< 8 \$< 4	(ug/l) 03/08/05 < 100 < 7.5 4.2 180 < 4.0
1(1) 200 3 25 1,000 3 3 5 50 730(2) 200 300 25 26 300 27 100 100 50	2	 < 400 < 400 < 30 < 16 470 < 15 < 8 < 1,600,000 < 100 < 400 	 4200 200 15 8 2,300 8 4 410,000 	02/16/05 < 200 < 15 < 8 1,600 < 8	03/08/05 < 100 < 7.5 4.2 180 < 4.0
3 200 25 1,000 3 5 5 50 730(2) 200 300 25 25 25 35,000 6 * 35,000 25 100 25 100 25 100 25 100 25 100 25 25 25 25 25 25 25 25 25 25 25 25 25		 < 400 < 30 < 16 470 < 15 < 8 < 1,600,000 < 100 	< 200 < 15 < 8 2,300 < 8 < 4 410,000	, 200 , 200 , 15 , 8 , 8 , 8 , 8	< 100 < 7.5 4.2 180 < 4.0
25 1,000 3 1,000 3 5 5 5 730(2) 200 300 25 300 25 300 0.7 100 50 100 50 100 50 100 50 50 50 50 50 50 50 50 50 50 50 50 5	· · · · · · · · · · · · · · · · · · ·	 < 400 < 30 < 16 470 < 15 < 8 < 1,600,000 < 100 < 100 	< 200 < 15 < 8 < 2,300 < 8 < 4 < 4	, 200 < 15 < 8 < 8 < 8 < 4	< 100 < 7.5 4.2 180 < 4.0 < 2.0
25 1,000 3 5 5 5 730(2) 200 300 25 25 300 0.7 100 50	·	< 30 < 16 470 < 15 < 8 1,600,000 < 100	< 15 < 8 2,300 < 8 < 4 < 4 410,000	/ 15 / 8 / 600 / 4	< 7.5 4.2 180 < 4.0 < 2.0
25 1,000 3 5 50 730(2) 200 300 25 25 35,000 6** 35,000 100 100 100 50		< 16 470 470 < 15 < 8 1,600,000 < 100	< 8 2,300 < 8 < 8 < 4 410,000	1,600	4.2 180 < 4.0
1,000 3 5 5 730(2) 200 300 25 25 300 0.7 100 50		470 < 15 < 8 1,600,000 < 100	2,300 < 8 < 4 410,000	1,600	4.2 180 < 4.0
3 5 5 50 730(2) 200 300 25 25 300 0.7 100 100 50		 4.15 4.8 1,600,000 4.00 6.100 	2,2002 84 44 10,000	1,000 8 × 4 ×	180 < 4.0 < 2.0
5 50 730(2) 200 300 25 4 300 0.7 100 50 50 50 50 50 50 50 50 50 50 50 50 5	``	< 15 < 8 1,600,000 < 100	< 8 < 4 410,000	∧ ∧ ∞ 4	< 4.0 < > 0
50 730(2) 200 300 25 25 35,000 6* 300 0.7 100 50		< 8 1,600,000 < 100	<4 410,000	4 \	< 2.0
50 730(2) 200 300 300 6* 35,000 6.7 100 100 50		1,600,000 < 100	410,000		1.1
50 730(2) 200 300 300 6* 35,000 0.7 100 100 50		001 > 700		340 000	000 000
730(2) 200 300 300 6* 35,000 0.7 100 100 50		40	O\$ >	2006	200,000
200 300 25 25 36,000 6* 300 0.7 100 100 50			0 0	00%	C7 >
300 25 25 300 6* 300 0.7 100 100 50		7	()7. >	< 20) v
300 25 25 300 6* 300 0.7 100 100 50		001 >	< 50	< 50	< 25
25 8* 35,000 0.7 100 10 50		48,000	89,000	74.000	1.500
35,000 8 * 300 0.7 100 10 50		< 20	< 10	01 >	087
0.7 100 100 50		390,000	140 000	120,000	0.00
0.7 100 50		966,000	15,000	11,000	44,000
100		2000	0000	11,000	4,400
10		07.0 >	07:0 >	< 0.20	< 0.20
10		× 40	22	< 20	< 10
10 50		29,000	20,000	16,000	16.000
50		× 100	< 50	< 50	< 25
		< 40	< 20	> 20) \
		15,000,000	2 000 000	000000000000000000000000000000000000000	000000
	·	000000	000,000,	7,700,000	350,000
			 ∩! ∨	< 10 < 10	< > >
1007 uniu	> 100	< 100	< 50	< 50	< 25
Zinc 2,000 5,000	× 100	< 100	130	75	450
))

Concentrations reported in ug/l (parts per billion)

* total iron and manganese standard = 500 ug/l **concentration of magnesium is a NYSDEC guidance value, not a standard

(1) EPA secondary drinking water standard (Summer 2000) EPA Region III Rish-Based Criteria for Tap Water (9/25/2001 Samples filtered in the Laboratory

Effluent Limitation Source = Undated NYSDEC Bureau of Wastewater Treatment

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Table 2
GROUNDWATER RESULTS
BARRETTO POINT SITE

Geoprobe Groundwater Analytical Results from on-site Laboratory

		•				
SAMPLE LOCATION	GW-10	GW-19	GW-60B	GW-65	GW+66	9X-VB
SAMPLE DEPTH	15-16 feet	13-16 feet	14-18 feet	8-12 feet	14-18 feet	8-12 feet
SAMPLE DATE	12/6/99	12/1/99	11/30/99	12/2/99	12/2/99	12/2/99
Vinyl Chloride	Ω	Ω	Ω	D	n	Ŋ
1,1-Dichloroethene	D	Þ	Þ	D	Þ	Þ
Methylene Chloride	כ	n	Þ	Þ	D	Þ
trans-1,2-Dichloroethene	D	Þ	Þ	D	Þ	Ω
1,1-Dichloroethane	D	D	D	n	D	Þ
cis-1,2-Dichloroethene	n	n	D	D	Þ	Þ
1,1,1-Trichloroethane	D	D	D	D	Þ	Ď
Carbon Tetrachloride	D	Þ	Þ	n	D	'n
1,2-Dichloroethane	n	D	n	Þ	D	þ
Trichloroethene	D	D	C	Þ	Þ	ָ בּי
Tetrachloroethene	D	D.	Þ	D	Þ	Þ
Benzene	1.4	2.0	D	1.2	D	D
Toluene	7.0	17	27	12	5.2	2.7
Chlorobenzene	D	Þ	D	Þ	Ω	n
Ethylbenzene	1.9	4.1	7.1	2.5	1.4	Þ
m&p-Xylene	6.4	12	22	8.0	8.4	2.0
o-Xylene	3.2	5.2	9.5	3.4	2.2	1.1
TOTAL VOCs	19.9	40.3	9:29	27.1	13.6	5.8

NOTES: Units are milligrams per cubic meter U: Undetected Page 5 of 5

Table 3
SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY
BARRETTO POINT SITE INVESTIGATION

SAMPLE LOCATION	SG-09	SG-10	SG-18	SG-19	SG-28	SG-29	SG-37	SG-38	SG-38A	SG-39
SAMPLE DEPTH	3 feet	2 feet	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet
SAMPLE DATE	12/2/99	12/6/99	12/1/99	12/1/99	12/1/99	12/1/99	12/6/99	12/6/99	12/6/99	12/1/99
Vinyl Chloride	Ω	Ω	D	Ŋ	Ω	Ŋ	Ω	Ω	11	1
1,1-Dichloroethene	Þ	Þ	Þ	Þ	Þ	D	- - - -	Þ) <u> </u>	
Methylene Chloride	D	Þ	'n	D	D	בי) 	ם ס) 	- -
trans-1,2-Dichloroethene	Þ.	D	þ	D	D	D	- -	- 1) [· ;=
1,1-Dichloroethane	Ω	D	Þ	Þ	D	מ	Þ	ם כ	n D	> =
cis-1,2-Dichloroethene	Þ	Þ	Þ	Þ	D	ח		- -) [
1,1,1-Trichloroethane	Ω	D	n	Þ	Þ	n D	· 🗀) <u> </u>	> =) <u>;</u>
Carbon Tetrachloride	n	D	Þ	n	n	o D	· Þ))	> =
1,2-Dichloroethane	Ω	D	n	Þ	Þ	D) <u> </u>	> =) <u> </u>
Trichloroethene	D	n	'n	Þ	D	· =) <u> </u>	- -) <u> </u>	 >
Tetrachloroethene	n	Þ	Þ	Þ) D) <u></u>	> =) <u> </u>	> =) ;
Benzene	Þ	Þ	Þ	Þ) D) <u> </u>	· ;:	> =) [) =
Toluene	Ω	ב	D	D	D) <u> </u>	· :=) <u> </u>)) =
Chlorobenzene	Ŋ	Þ	D	Þ) <u> </u>) [· :) ;) <u> </u>
Ethylbenzene	Þ	Þ	D	Þ) <u> </u>	> =		> =	> =	- - -
m&p-Xylene	Þ	Þ	\Box	n n	4.	> =		> =	> ;) <u>;</u>
o-Xylene	D	D	1		0.7). <u> </u>) <u>;</u>	ָ כ
TOTAL VOCs	n	Þ	i i	· ;=) =) =) ;) ;
)	7	7	-	_	_	_ 	_

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SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY BARRETTO POINT SITE INVESTIGATION Table 3

SAMPLE LOCATION	SG-40	SG-47	SG-48	SG-48A	SG.48B	QG-48C	GG 48D	10V 70	07 00	
SAMPLE DEPTH	3 feet	3 feet	3 feet	2 feet	2 feet	100 to 64 C	754-00	00-400	20-42	06-50
SAMPLE DATE	12/1/99	12/3/99	12/3/99	12/3/99	12/3/99	12/6/99) Ieel	4 Teet	3 reet	3 feet
Vinyl Chloride	Ω	Ω	n	1		11	11	12/0/22	11/30/99	11/30/99
1,1-Dichloroethene	Ω		· <u> </u>) ;) ;) ;) ;	- ;	; ار)
Methylene Chloride	<u> </u>)) ;	 Э })	כ		⊃		Þ
trees 1 2 To 12 To) 	⊃	\supset	Þ	Þ	Þ	'n	Þ	Þ	Ω
trans-1,2-Dichloroethene	Þ	Þ	D	Þ	D	Þ	Þ	Þ	· =	· =
1,1-Dichloroethane	Þ	Þ	Þ	Þ	Þ	l U	11	1) <u> </u>) ;
cis-1,2-Dichloroethene	D	'n	Ω		11	1.		- - -) ;) ;
1,1,1-Trichloroethane	11	11), [=) ;	- F) ‡	;	; ;))	
Carbon Tetrocklonds) ;	;) ¦))	_ >	-		Þ	Þ
Catoon renacinonide	>	<u> </u>	D ₁	Þ	Þ	Þ	Þ	Þ	11	
1,2-Ulchloroethane	Þ	Þ	D	Þ	ח	D	Þ	11	, <u>,</u>) <u> </u>
1 richloroethene	Þ	D.	C	D	ם	F) [- -) <u>;</u>
Tetrachloroethene	Þ	Þ	n) <u> </u>) <u> </u>		 ⊃);
Benzene	Þ	11	1	· =) <u>;</u>		 	;) ;
Toluene	11	90	- - -))	 >); 	; ⊃;	 ⊃	<u> </u>
Chlorohenzene	-		- -))	0.0		<u> </u>	<u> </u>	D	Þ
D+hv.lb	 > ;))	 _>	⊃	Þ	Þ	Þ	Þ	Þ	Þ
omytoenzene		Þ	Þ	Þ	Þ	Þ	Þ	Ω		Ļ
m&p-Aylene	Þ	6.0	Þ	D	-		11) <u> </u>) [) [
o-Xylene	Þ	Þ	-	ĭ	<u></u>) <u> </u>	0 00) ;) ;	o ;
TOTAL VOCs	Ω	4) 🚡	· ‡	, t)	0.0))	 	
	,	21			7:1	2	3.8	Ω	n	Þ

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SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY BARRETTO POINT SITE INVESTIGATION Table 3

SAMPLE LOCATION	SG-55	SG-56	SG-57	SG-58	SG-59	09-DS	SG-60A	SG-60B	SG-60C	SG-60D
SAMPLE DEPTH	3 feet	5 feet	3 feet	3 feet	3 feet	5 feet				
SAMPLE DATE	12/3/99	12/3/99	12/3/99	12/3/99	11/30/99	11/30/99	11/30/99	11/30/99	11/30/99	11/30/99
Vinyl Chloride	Ω	U	Ω	D	n	n	n	n	D	n
1,1-Dichloroethene	Ŋ	ם	'n	Þ	n	Ď	n	n	Þ	ב
Methylene Chloride	D	Þ	ņ	'n	Þ	Þ	D	Ď	Þ) D
trans-1,2-Dichloroethene	D	Ŋ	Þ	'n	D	n	Þ	Þ	n	, D
1,1-Dichloroethane	'n	D	Þ	Þ	D	Þ	n	Þ	Þ	D
cis-1,2-Dichloroethene	Ω	n	Þ	ם	D	Þ	D	Þ	D	- - -
1,1,1-Trichloroethane	D	D	Þ	D	n	D	D	, D	·) <u> </u>
Carbon Tetrachloride	Ω	D	Þ	Þ	D	Þ) D) D	 >
1,2-Dichloroethane	þ	Þ	Þ	Ω	Þ	Þ	Þ	· D) [
Trichloroethene	Þ	₽	Þ	Þ	n	Þ	Þ	n D	· =	· =
Tetrachloroethene	Þ	D	Þ	0.05	n	Þ	Þ) D) Þ) <u></u>
Benzene	Þ	D	Þ	Þ	D	D	Þ	ņ	· Þ	: :
Toluene	Þ	Þ	Þ	n	n	Þ	n	0.6	300	· ;=
Chlorobenzene	Þ	Þ	þ	Ω	Þ	Þ	n		3 =	· =
Ethylbenzene	Þ	Þ	Þ	D	Þ	Þ	· [· =	7	> =
m&p-Xylene	Þ	Þ	D	D	1.0	0.1	<u> </u>) ;=	40	
o-Xylene	n	Þ	D	Þ	Þ	<u> </u>	<u> </u>	· 🗀	, 4	
TOTAL VOCs	U	n	n	0.05	1.0	1.0	1.1	9.0	142	

NOTES:

Units are milligrams per cubic meter U: Undetected

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SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY BARRETTO POINT SITE INVESTIGATION Table 3

SAMPLE LOCATION	309-DS	SG-60F	509-5S	H09-DS	SG-60I	SG-60I	SG-60K	109-51S	M09-578	39 00
SAMPLE DEPTH	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet	S feet	2 feet	2 feet
SAMPLE DATE	11/30/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/2/00
Vinyl Chloride	Ω	Ω	Ω	D	n	Ω	11	11	11	11 11
1,1-Dichloroethene	Ω	Ω		11	<u> </u>) <u> </u>)) ;) <u>;</u>	; כ
Methylene Chloride	11	, ;) ‡) ;))))	 o)	-	Э
treather chart	Э ¦)	-	D	Þ	Þ	Þ	⊃	D	Þ
trans-1,2-Dichloroethene	Þ	D ·	n	Þ	Þ	Þ	₽	Þ	n	- 1
1,1-Dichloroethane	D	Þ	D	n	n		<u></u>	· ::) <u>;</u>) <u> </u>
cis-1,2-Dichloroethene	n	Þ	D	Ω		11) ;) [> ‡
1,1,1-Trichloroethane	D	Þ	þ	<u> </u>) <u> </u>) <u> </u>	> =) <u>;</u>) ;
Carbon Tetrachloride	D	n	Ξ	, <u>_</u>) <u> </u>) <u> </u>) <u> </u>))
1,2-Dichloroethane	Ω	1	<u> </u>) <u> </u>) [- - -);))
Trichloroethene	, <u>L</u>) <u>;</u>);) ;);	 		<u> </u>		>
Total oculon))	-)	Þ	Þ	Þ	D	D	D
l etrachioroethene	<u> </u>	0.5	Þ	Þ	Þ	D	ב	Þ	Þ	n
Benzene	Þ	Þ	D	₽	Þ	D	n	Þ		· []
Toluene	7.6	Þ		1.9	2.1	3.4	2.1	<u> </u>	, <u>e</u>	· <u></u>
Chlorobenzene	D	Þ	n	D	D		-) <u>;</u>	3	- <u>-</u>
Ethylbenzene	20	0.7	12	2.9	2.2	. 01	0.0) <u> </u>	63.0)
m&p-Xylene	35	1.6	48	6.4	6.5	· •	× ×) <u> </u>	2100	,
o-Xylene	36	0.7	99	2.0	7	×		> =	360	0 I
TOTAL VOCs	66	3.2	137	7 7	1 %	3.5	1 6) <u>;</u>	2 110) <u>_</u>
					20077	4:40	٥,	5	3,110	1.0

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Table 3
SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY
BARRETTO POINT SITE INVESTIGATION

SAMPLE LOCATION	99-9S	. 29-9S	SG-68	69-DS	SG-70	9G-76	SG-77	SG-78	SG-79	08-50
SAMPLE DEPTH	3 feet	3 feet	3 feet	3 feet	5 feet	3 feet	3 feet	3 feet	3 feet	3 feet
SAMPLE DATE	12/2/99	12/3/99	12/3/99	11/29/99	11/30/99	12/2/99	12/2/99	12/2/99	11/29/99	11/29/99
Vinyl Chloride	Ω	Ω	Ω	Ω	n	D	n	U	IJ	11
1,1-Dichloroethene	Þ	ם	Þ	n	Ω		: =	· ;) [) <u>;</u>
Methylene Chloride	D	Þ	D	Þ	ם ס) []) <u> </u>	>	> =	> =
trans-1,2-Dichloroethene	D	Ω	n	Þ) <u> </u>) <u> </u>) <u> </u>) =	> ;
1,1-Dichloroethane	n	n	Þ	Þ	Þ). Þ	- - -) <u> </u>) <u> </u>	
cis-1,2-Dichloroethene	Þ	D	'n	D	Þ	ı D	· =) <u> </u>) <u> </u>) <u> </u>
1,1,1-Trichloroethane	D	Þ	Þ	Þ	D	· Þ) <u> </u>) <u> </u>	- <u>-</u>	> :
Carbon Tetrachloride	Ω	Þ	Þ	D	Þ) [) <u> </u>) <u> </u>) <u> </u>) [
1,2-Dichloroethane	Þ	Þ	D	Þ	Þ	11) <u> </u>) <u> </u>	> =	> =
Trichloroethene	Þ	Þ	Þ	Þ) <u> </u>	> =	>) <u> </u>)	- - -
Tetrachloroethene	Þ	Þ	n		> <u>;</u>) :		> =) <u> </u>)
Benzene	D	Þ	Þ	- - -) ;	- -) <u> </u>	> =	> =	⊃
Toluene	Þ	Þ	0.4	Þ) <u> </u>	- -	> ;	> =	> =
Chlorobenzene	Þ	Þ	Þ	Þ	Ξ.		- -	- -	- :) :
Ethylbenzene	D	Þ	Ω	- =) <u> </u>		> <u>_</u>) <u> </u>))
m&p-Xylene	Þ	Þ	1.0) =) <u> </u>		 >	> 5	> ;) ‡
o-Xylene	D	8.0	11) ;=)	 >) ;)	- ;	 - ;
TOTAL VOCs	-	8	7	> =	> =	 	- ;	; -> ;))	⊃ ;
	,	2.0	1.1	0)	_	-		_ _	=

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SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY BARRETTO POINT SITE INVESTIGATION Table 3

Г		-		-		-																			:
	FB-9	}	12/7/99	1 1)	Þ	Þ	- 1) <u> </u>)	⊃ ¦	Þ	Þ	Þ) h) ;	D	Þ	D	Ţ) ;))	Þ	Þ	
	FB-8		12/6/99	1))		Þ	D	· <u> </u>) <u>;</u>);	<u> </u>	Þ	Þ	<u>.</u>))	 _	Þ	Þ	1) ;) 	<u> </u>	Þ	n
			12/3/99			<u> </u>	Þ	Þ	11) ;	>) 	Þ	Þ		- > ;) 	_ 	Þ		 • ‡)	→ ⊃	Þ	Þ
4	FB-6	1	12/2/99	1.1) ;)	Þ	D	[]) [) <u>;</u>)		Þ	11) <u> </u>))	⊃	D'	Þ	11) ;))	_ 	n
2 00	7 7 7	1	12/1/99	Ω	<u> </u>))	Þ	D	Þ	<u> </u>) [- - :	 	- -	Þ) <u> </u>) ¦))		Þ) ;	 > ;	 	· D
7 Q.3	FB-4	1 1	12/1/99	Þ	Ĭ);		Þ	Þ	1) <u> </u>) ‡	о ;		Þ	<u>_</u>	о <u>;</u>	- - ;)	Þ) <u>;</u>	 - ;	-	ū
ED 2	. C-Q.I	00, 1, 01	12/1/99	Þ	1) ;	- ⊃ ¦		Þ	Þ	- [) <u>;</u>	- - ;)	Þ	11) ;	- ;))		Þ	Ė) <u> </u>))	D
FR.7	7-CT ;	11/20/00	11/50/99	⊃	₽	, <u>†</u>) ;	⊃ .	Þ	Þ	Þ	-) ;);)	D	Þ			 - ;		Þ			;	
FB-1	· ·	11/20/00	11/2/17	<u> </u>	Þ	=) ‡	о; Э		⊳	D	Ω) <u> </u>) <u>;</u>	<u> </u>	þ	n	-) <u>;</u>)	Þ	D	11) ;	
SAMPLE LOCATION	SAMPLE DEPTH	SAMPLEDATE	Vinvil Chloride	ringi cimorine	1,1-Dichloroethene	Methylene Chloride	trans-1 2-Dichloroathans	1 1 Dishlamand	1,1 Tichnologinane	cis-1,2-Dichloroethene	1,1,1-Trichloroethane	Carbon Tetrachloride	1,2-Dichloroethane	Trichloroethana		1 etrachloroethene	Benzene	Toluene	Chlorohenzene	D4111	Einyloenzene	m&p-Xylene	o-Xylene	TOTALVOC	

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COMPARISON OF SOIL VAPOR ANALYTICAL RESULTS FROM ON-SITE LABORATORY OFF-SITE LABORATORIES
BARRETTO POINT SITE INVESTIGATION Table 3

SAMPLE LOCATION	SG-28	SG-28	1 -	SG-29	SG-47	SG-47	29-DS	2G-67	SG-77	SG-77
LABORATORY	On-site	Off-site	_	Off-site	On-site	Off-site	On-site	Off-site	On-site	Off-site
SAMPLE DEPTH	3 feet	3 feet		3 feet	3 feet	3 feet	3 feet	3 feet	3 feet	3 feet
SAMPLE DATE	12/1/99	12/1/99	_	12/1/99	12/3/99	12/3/99	12/3/99	12/3/99	12/2/99	12/2/99
Vinyl Chloride	Ω	NA		NA	n	NA	n	NA	n	NA
1,1-Dichloroethene	D	NA		NA	ח	NA	Þ	NA	Þ	Ä
Methylene Chloride	Þ	NA		NA	Þ	NA	Þ	NA	Þ	NA
trans-1,2-Dichloroethene	Þ	NA	Þ	NA	ņ	NA	Þ	NA	Þ	NA
1,1-Dichloroethane	Þ	NA		NA	þ	NA	Þ	NA	n	NA
cis-1,2-Dichloroethene	Þ	NA		NA	Þ	NA	Þ	NA	n	NA
1,1,1-Irichloroethane	Þ	NA		NA	n	AN	Þ	NA	n	NA
Carbon Tetrachloride	Þ	NA		NA	Þ	NA	Þ	NA	Þ	AN
1,2-Dichloroethane	Ď	NA		NA	D	NA	D	NA	Þ	N A
Trichloroethene	Þ	NA		NA	D	NA	D	NA	Þ	NA
Tetrachloroethene	₽	NA		NA	D :	NA	D	NA	Þ	N AN
Benzene	Þ	Þ		Þ	Þ	Þ	Þ	Þ	Þ	þ
Toluene	Þ	Þ		D	9'0	Þ	D	n	Ď	- Þ
Chlorobenzene) D	NA		NA	Þ	NA	ם	N AN	ם	N A
Ethylbenzene	n	n		n	D	D	Þ	⊃	n	Ξ
Styrene	NA	'n	•	Þ	NA	D	NA	Þ	NA) <u> </u>
Naphthalene	NA	Þ		D	NA	Þ	NA	Þ	N.) ;;;
m&p-Xylene	1.4	D		'n	6.0	Þ	Ω	Þ	'n	'n
o-Xylene	0.7	0.2		Þ	D	'n	0.8	D	[])
TOTAL VOCs	2.1	0.2		n	1.5	n	8.0	n D) <u> </u>) =

NOTES:

Units are milligrams per cubic meter

U: Undetected

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Table 4 Recommended Soil Cleanup Objectives (mg/kg or ppm) Volatile Organic Compounds

		а	1		CRQL	***
	Groundwater	Allowable	1		(ppb)	Rec. Soil
•	Standards/	soil conc.,		alth Based	11-1-7	Cleanup
0-4	Criteria, Cw	Cs (ppm)	(pr	om)		Objective
Contaminant	(ug/l or ppb)					(ppm)
			Carcin-	Systemic		
			ogens	Toxicants		
Acetone	50	0.0044				0.0
		0.0011	N/A	8,000	10	0.2
Benzene	0.7	0.0006	24	N/A	5	0.06
Benzoic Acid	50	0.027	N/A	300,000	5	2.7
2-Butanone	50	0.003	N/A	4,000	10	0.3
Carbon Disulfide	50	0.027	N/A	8,000	5	2.7
Carbon Tetrachloride	5	0.006	5.4	60	5	0.6
Chlorobenzene	5	0.017	N/A	2,000	5	1.7
Chloroethane	50	0.019	N/A	N/A	10	1.9
Chloroform	7	0.003	114	800	5	0.3
Dibromochloromethane	50	N/A	N/A	N/A	5	N/A
1,2-Dichlorobenzene	4.7	0.079	N/A	N/A	330	7.9
1,3-Dichlorobenzene	5	0.0155	N/A	N/A	330	1.6
1,4-Dichlorobenzene	5	0.085	N/A	N/A	330	8.5
1,1-Dichloroethane	5	0.002	N/A	N/A	5	0.2
1,2-Dichloroethane	5	0.001	7.7	N/A	5	0.1
1,1-Dichloroethene	5	0.004	12	700	5	0.4
1,2-Dichloroethene (trans)	5	0.003	N/A	2,000	5	0.3
1-3 dichloropropane	5	0.003	N/A	N/A	5	0.3
Ethylbenzene	5	0.055	N/A	8,000	5	5.5
113 Freon (1,1,2 Trichloro-		•				
1,2,2 Trifluoroethane)	5	0.06	N/A	200,000	5	6
Methylene chloride	5	0.001	93	5,000	5	0.1
4-Methyl-2-Pentanone	50	0.01	N/A	N/A	10	1
Tetrachloroethene	5	0.014	14	800	5	1.4
1,1,1-Trichloroethane	5	0.0076	N/A	7,000	5	0.8
1,1,2,2-Tetrachloroethane	5	0.006	35	N/A	5	0.6
1,2,3-trichloropropane	5	0.0034	N/A	- 80	5	0.4
1,2,4-trichlorobenzene	- 5	0.034	N/A	N/A	330	3.4
Toluene	5	0.015	N/A	20,000	5	1.5
Trichloroethene	5	0.007	64	N/A	5	0.7
Vinyl chloride	2	0.0012	N/A	N/A	.10	0.2
Xylenes	5	0.012	N/A	200,000		1.2

a. Allowable Soil Concentration $Cs = f \times Cw \times Koc$ N/A is not available

^{***} As per TAGM #4046, Total VOCs < 10 ppm.

Table 4
Recommended Soil Cleanup Objectives (mg/kg or ppm)
Semi-Volatile Organic Compounds

	Groundwater	a		ealth Based pm)		***
Contaminant	Standards/ Criteria, Cw (ug/l or ppb)	Allowable soil conc., Cs (ppm)	Carcino- gens	Systemic Toxicants	CRQL (ppb)	Rec. Soil Cleanup Objective (ppm)
Acenaphthene	20	0.9	N/A	5,000	330	50.0 ***
Acenaphthylene	20	0.41	N/A	N/A	330	41
Aniline	5	0.001	123	N/A	330	0.1
Anthracene	50	7	N/A	20,000	330	50.0 ***
Benzo(a)anthracene	0.002	0.03	0.224	N/A	330	0.224 or MDL
Benzo (a) pyrene	0.002 (ND)	0.11	0.0609	N/A	330	0.061 or MDL
Benzo (b) fluoranthene	0.002	0.011	N/A	N/A	330	1.1
Benzo (g,h,i) perylene	5	8	N/A	N/A	330	50.0 ***
Benzo (k) fluoranthene	0.002	0.011	N/A	N/A	330	1.1
bis(2-ethylhexyl)phthalate	50	4.35	50	2,000	330	50.0 ***
Butylbenzylphthlate	50	1.215	N/A	20,000	330	50.0 ***
Chrysene	0.002	0.004	N/A	N/A	330	0.4
4- Chloroaniline	5	0.0022	200	300	330	0.220 or MDL
4-Chloro-3-methylphenol	5	0.0024	N/A	N/A	330	0.240 or MDL
2-Chlorophenol	50	0.008	N/A	400	330	0.8
Dibenzofuran	5	0.062	N/A	N/A	330	6.2
Dibenzo(a,h)anthracene	50	1,650	0.0143	N/A	330	0.014 or MDL
3,3'-Dichlorobenzidine	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dichlorophenol	1	0.004	N/A	200	330	0.4
2,4-Dinitrophenol	5	0.002	N/A	200	1,600	0.200 or MDL
2,6 Dinitrotoluene	5	0.01	1.03	N/A	330	1
Diethylphthlate	50	0.071	N/A	60,000	330	7.1
Dimethylphthlate	50	0.02	N/A	80,000	330	2
Di-n-butyl phthalate	50	0.081	N/A	8,000	330	8.1
Di-n-octyl phthlate Fluoranthene	50	1.2	N/A	2,000	330	50.0 ***
Fluorene	50	19	N/A	3,000	330	50.0 ***
Hexachlorobenzene	50	3.5	N/A	3,000	330	50.0 ***
Indeno (1,2,3-cd)pyrene	0.35	0.014	0.41	60	330	0.41
Isophorone	0.002 50	0.032	N/A	N/A	330	3.2
2-methylnaphthalene	50	0.044	1,707	20,000	330	4.4
		0.364	N/A	N/A	330	36.4 0.100 or
2-Methylphenol 4-Methylphenol	5	0.001	N/A	N/A	330	MDL
Naphthalene	50	0.009	N/A	4,000	330	0.9
Nitrobenzene	10 5	0.13	N/A N/A	40	330	13 0.200 or MDL
2-Nitroaniline	5	0.0043	N/A	N/A	1,600	0.430 or MDL
2-Nitrophenol	5	0.0033	N/A	N/A	330	0.330 or MDL

Table 4 Recommended Soil Cleanup Objectives (mg/kg or ppm) Semi-Volatile Organic Compounds

4-Nitrophenol	5	0.001	N/A	N/A	1,600	0.100 or MDL
3-Nitroaniline	5	0.005	N/A	N/A	1,600	0.500 or MDL
Pentachlorophenol	1	0.01	N/A	2,000	1,600	1.0 or MDL
Phenanthrene	50	2.2	N/A	N/A	330	50.0 ***
Phenol	1	0.0003	N/A	50,000	330	0.03 or MDL
Pyrene	. 50	6.65	N/A	2,000	330	50.0 ***
2,4,5-Trichlorophenol	1	0.001	N/A	8,000	330	0.1

a Allowable Soil Concentration Cs = f x Cw x Koc

N/A Not available

MDL Method Detection Limit

*** As per TAGM #4046, Total VOCs < 10 ppm., Total Semi-VOCs < 500ppm. and Individual Semi-VOCs < 50 ppm.

Table 4
Recommended Soil Cleanup Objectives (mg/kg or ppm)
Organic Pesticides/ Herbicides and PCBs

		1				·
		. <u>а</u>	1	ealth Based		***
	Groundwater	Aliowable	(P	pm)		Rec. Soil
Contaminant	Standards/	soil conc	Carcin-	Systemic	CRQL	Cleanup
- Containment	Criteria, Cw	Cs (ppm)	ogens	Toxicants	(ppb)	Objective
<u> </u>	(ug/l or ppb)	oo (ppiii)	ogona	TOXICATES	(ppb)	(ppm)
	(-5				<u> </u>	(ррии)
Aldrin	ND (<0.01)	0.005	0.041	2	8	0.041
aipha- BHC	ND (<0.05)	0.002	0.111	N/A	8	0.11
beta - BHC	ND (<0.05)	0.002	3.89	N/A	8	0.2
delta - BHC	ND (<0.05)	0.003	N/A	N/A	8	0.3
Chlordane	0.1	0.02	0.54	50	80	0.54
2,4-D	4.4	0.005	N/A	800	800	0.5
4,4'- DDD	ND (<0.01)	0.077	2.9	N/A	16	2.9
4,4'-DDE	ND (<0.01)	0.044	2.1	N/A	16	2.1
4,4'-DDT	ND (<0.01)	0.025	2.1	40	16	2.1
Dibenzo-P- dioxins (PCDD)	·					
2,3,7,8 TCDD	0.000035	0.0006	N/A	N/A	N/A	N/A
Dieldrin	ND (<0.01)	0.000	0.044	4	16	0.044
Endosulfan I	0.1	0.009	N/A	N/A	16	0.044
Endosulfan II	0.1	0.009	N/A	N/A	16	0.9
Endosulfan	<u> </u>	0.000	14// (19/75	10	0.5
Sulfate	0.1	0.01	N/A	N/A	16	1 1
Endrin	ND (<0.01)	0.001	N/A	20	8	0.1
Endrin keytone	N/A	N/A	N/A	N/A	N/A	N/A
gamma - BHC			- '-			
(Lindane)	ND (<0.05)	0.0006	5.4	20	8	0.06
gamma - chlordane	0.1		0.54	. ب		
Heptachlor	0.1 ND (<0.01)	0.14	0.54	5	80	0.54
Heptachlor	ND (~0.01)	0.001	0.16	40	8	0.1
epoxide	ND (<0.01)	0.0002	0.077	0.8	8	0.02
Methoxychlor	35	9	N/A	400	80	***
Mitotane	N/A	N/A	N/A	N/A	N/A	N/A
Parathion	1.5	0.012	N/A	500	8	1.2
						1.0
						(Surface)
PCBs	0.4				405	10 (sub-
Polychlorinated	0.1	0.1	1	N/A	160	surf)
dibenzo-		•				
furans (PCDF)	N/A	N/A	N/A	N/A	N/A	N/A
Silvex	0.26	0.007	N/A	600	330	0.7
2,4,5-T	35	0.019	N/A	200	330	1.9

N/A Not available

^{***} As per TAGM #4046, Total VOCs < 10 ppm.

Table 4
Recommended Soil Cleanup Objectives (mg/kg or ppm)
Heavy Metals

	Protect Water Quality	Eastern USA Backgroun d	*	****
Contaminants	(ppm)	(ppm)	CRDL	Rec. Soil
			(mg/kg or	Cleanup
			ppm)	Objective
				(ppm)
Aluminum	N/A	33,000	2	SB
Antimony	N/A	N/A	0.6	SB
Arsenic	N/A	3-12 **	0.1	7.5 or SB
Barium -	N/A	15-600	2	300 or SB
Beryllium	N/A	0-1.75	0.05	0.16 (HEAST) or SB
Cadmium	N/A	0.1-1	0.05	1 or SB
Calcium	N/A	130 - 35,000	50	SB
Chromium	N/A	1.5 - 40 **	0.1	10 or SB
Cobalt	N/A	2.5 - 60 **	0.5	30 or SB
Copper	N/A	Jan-50	0.25	25 or SB
Cyanide	N/A	N/A	0.1	***
Iron	N/A	2,000 - 550,000	1	2,000 or SB
Lead	N/A	***	0.03	SB ****
Magnesium	N/A	100 - 5,000	50	SB
Manganese	N/A	50 - 5,000	0.15	SB
Mercury	N/A	0.001 - 0.2	0.002	0.1
Nickel	N/A	0.5 -25	0.4	13 or SB
Potassium	N/A	8,500 - 43,000 **	50	SB
Selenium	N/A	0.1 - 3.9	0.05	2 or SB
Silver	N/A	N/A	0.1	SB
Sodium	N/A	6,000 - 8,000	50	SB
Thallium	N/A	N/A	0.1	SB
Vanadium	N/A	1-300	0.5	150 or SB
Zinc	N/A	Sep-50	0.2	20 or SB

SB is site background

N/A is not available

CRDL is contract required detection limit which is approx. 10 times the CRDL for water.

^{**} New York State background

^{***} Some forms of Cyanide are complex and very stable while other forms are pH dependent and hence are very unstable. Site-specific form(s) of Cyanide should be taken into consideration when establishing soil cleanup objective.

^{****} Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61 ppm. Average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm.

^{*****} Recommended soil cleanup objectives are average background concentrations as reported in a 1984 survey of reference material by E. Carol McGovern, NYSDEC.

Table 5
Endpoint Sampling Results









10/09/09





Technical Report for

Posillico Environmental

Barretto Point Remediation, Hunts Point, NY

HP-ER-1

Accutest Job Number: JA20908

Sampling Date: 06/12/09

Report to:

Posillico Environmental

dsposito@posillicogroup.com

ATTN: David Sposito

Total number of pages in report: 15





Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Nadine Yakes 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, PA, RI, SC, TN, VA, WV

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

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VP Ops, Laboratory Director

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2.4: JA20908-4: EP-8	. 1
Section 3: Misc. Forms	
3.1: Chain of Custody	
•	











Sample Summary

Posillico Environmental

Barretto Point Remediation, Hunts Point, NY

Job No:

JA20908

Duriouco x Oii	it zwincunduni,	TTUILIO	T OHILL	
Project No:	HP-ER-1		,	

Sample	Collected	earchaile ar rains Er Chilliaichean	5,8	Matri	ix	Client
Number	Date	Time By	Received	Code	Туре	Sample ID
JA20908-1-	06/12/09	10:30 DS	06/12/09	SO	Soil	EP-1
JA20908-2	66/12/09	10:30 DS	06/12/09	so	Soil	PP2
JA20908-3	06/12/09	10:30 DS	06/12/09	so	Soil	EP 7
JA20908-4	06/12/09	10:30 DS	06/12/09	so	Soil	EP-8









T'S ALL EN THE CHEMISTRY

Sample Results

Report of Analysis



Page 1 of 2

Client Sample ID: EP-1

Lab Sample ID:

JA20908-1

Date Sampled:

06/12/09

Matrix:

SO - Soil

Date Received:

06/12/09

Method:

SW846 8260B

Percent Solids: 95.4

Project:

Barretto Point Remediation, Hunts Point, NY

Analyzed

06/24/09

Analytical Batch

Run #1

File ID V91829.D DF 1

By JLI Prep Date

Prep Batch

VV3758

Run #2

Initial Weight

Run #1 ~ 5.0 g

Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.3	ug/kg	
71-43-2	Benzene	ND	1.0	0.36	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	0.27	ug/kg	
75-25-2	Bromoform	ND	5.2	0.16	ug/kg	
74-83-9	Bromomethane	ND	5.2	0.42	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	2.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.2	0.32	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.2	0.58	ug/kg	
108-90-7	Chlorobenzene	ND	5.2	0.36	ug/kg	
75-00-3	Chloroethane	ND	5.2	1.2	ug/kg	
67-66-3	Chloroform	ND	5.2	0.33	ug/kg	
74-87-3	Chloromethane	ND	5.2	0.17	ug/kg	
110-82-7	Cyclohexane	ND	5.2	0.16	ug/kg	
96-12-8		ND	10	0.57	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	0.12	ug/kg	
106-93-4	1,2-Dibromoethane	ND	1.0	0.14	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND .	5.2	0.28	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	5.2	0.29	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	5.2	0.35	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	5.2	0.99	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	0.14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.36	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.2	0.69	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.2	0.25	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.2	0.47	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	0.14	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND.	5.2	0.14	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND.	5.2	0.10	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.39	ug/kg	
76-13-1		ND	5.2	0.59	ug/kg	
591-78-6	2-Hexanone	ND	5.2	1.0	ug/kg	
98-82-8	Isopropylbenzene	ND	5.2	0.54	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 2 of 2

Client Sample ID: EP-1

Lab Sample ID: Matrix: JA20908-1

SO - Soil

SW846 8260B

Date Sampled:

06/12/09

Date Received: Percent Solids:

06/12/09 95.4

Method: Project:

Barretto Point Remediation, Hunts Point, NY

VOA TCL List (OLM4.2)

79-20-9 Methyl Acetate ND 5.2 0.86 ug/kg 108-87-2 - Methylcyclohexane ND 5.2 0.69 ug/kg 1634-04-4 Methyl Tert Butyl Ether ND 1.0 0.30 ug/kg 108-10-1 4-Methyl-2-pentanone(MIBK) ND 5.2 0.85 ug/kg 75-09-2 Methylene chloride ND 5.2 0.23 ug/kg 100-42-5 Styrene ND 5.2 0.11 ug/kg	1.
108-87-2 - Methylcyclohexane ND 5.2 0.69 ug/kg 1634-04-4 Methyl Tert Butyl Ether ND 1.0 0.30 ug/kg 108-10-1 4-Methyl-2-pentanone(MIBK) ND 5.2 0.85 ug/kg 75-09-2 Methylene chloride ND 5.2 0.23 ug/kg 100-42-5 Styrene ND 5.2 0.11 ug/kg	
1634-04-4 Methyl Tert Butyl Ether ND 1.0 0.30 ug/kg 108-10-1 4-Methyl-2-pentanone(MIBK) ND 5.2 0.85 ug/kg 75-09-2 Methylene chloride ND 5.2 0.23 ug/kg 100-42-5 Styrene ND 5.2 0.11 ug/kg	
108-10-1 4-Methyl-2-pentanone(MIBK) ND 5.2 0.85 ug/kg 75-09-2 Methylene chloride ND 5.2 0.23 ug/kg 100-42-5 Styrene ND 5.2 0.11 ug/kg	
75-09-2 Methylene chloride ND 5.2 0.23 ug/kg 100-42-5 Styrene ND 5.2 0.11 ug/kg	
100-42-5 Styrene ND 5.2 0.11 ug/kg	
70.04 5 4 4 0 0 = 11 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
79-34-5 1,1,2,2-Tetrachloroethane ND 5.2 0.31 ug/kg	11.
127-18-4 Tetrachloroethene ND 5.2 0.15 ug/kg	
108-88-3 Toluene ND 1.0 0.31 ug/kg	
120-82-1 1,2,4-Trichlorobenzene ND 5.2 0.36 ug/kg	$(+,-)^{-1}$
71-55-6 1,1,1-Trichloroethane ND 5.2 0.13 ug/kg	٠,
79-00-5 1,1,2-Trichloroethane ND 5.2 0.19 ug/kg	1.7.1
79-01-6 Trichloroethene ND 5.2 0.55 ug/kg	
75-69-4 Trichlorofluoromethane ND 5.2 0.24 ug/kg	100
75-01-4 Vinyl chloride ND 5.2 0.19 ug/kg	
m,p-Xylene ND 2.1 0.49 ug/kg	
95-47-6 o-Xylene ND 1.0 0.49 ug/kg	
1330-20-7 Xylene (total) ND 2.1 0.49 ug/kg	
enterentation of the second of	1000
CAS No. Surrogate Recoveries Run#1 Run#2 Limits	٠.
1868-53-7 Dibromofluoromethane 91% 67-127%	
17060-07-0 1,2-Dichloroethane-D4 86% 65-132%	
2037-26-5 Toluene-D8 92% 74-129%	4.54
460-00-4 4-Bromofluorobenzene 69% 62-138%	
02-130/0	
CAS No. Tentatively Identified Compounds R.T. Est. Conc. Units	Q .
Total TIC, Volatile ug/kg	5

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 2

Client Sample ID: EP-2

Lab Sample ID:

JA20908-2

Matrix: Method:

SO - Soil

SW846 8260B

Date Sampled:

06/12/09 06/12/09

Date Received:

Percent Solids:

95.2

Project: Barretto Point Remediation, Hunts Point, NY

File ID Run #1

V91864.D

DF Analyzed 06/25/09

By JLI Prep Date n/a

Prep Batch n/a

Analytical Batch VV3760

Run #2

Initial Weight

Run #1 - 5.4 g

Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	9.7	2.2	ug/kg	
71-43-2	Benzene	ND	0.97	0.33	ug/kg	4
75-27-4	Bromodichloromethane	ND	4.9	0.25	ug/kg	
75-25-2	Bromoform	ND	4.9	0.15	ug/kg	
74-83-9	Bromomethane	ND -	4.9	0.39	ug/kg	
78-93-3	2-Butanone (MEK)	ND	9.7	1.9	ug/kg	
75-15-0	Carbon disulfide	ND	4.9	0.30	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.9	0.54	ug/kg	
108-90-7	Chlorobenzene	ND	4.9	0.33	ug/kg	
75-00-3	Chloroethane	ND	4.9	1.1	ug/kg	
67-66-3	Chloroform	ND	4.9	0.31	ug/kg	
74-87-3	Chloromethane	ND	4.9	0.16	ug/kg	
110-82-7	Cyclohexane	ND	4.9	0.15	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	9.7	0.53	ug/kg	
124-48-1	Dibromochloromethane	ND	4.9	0.11	ug/kg	
106-93-4	1,2-Dibromoethane	ND	0.97	0.13	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	4.9	0.26	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	4.9	0.27	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	4.9	0.33	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	4.9	0.92	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.9	0.13	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.97	0.34	ug/kg	
75-35-4		ND	4.9	0.64	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	4.9	0.23	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	4.9	0.44	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.9	0.13	ug/kg	
10061-01-5		ND	4.9	0.13	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.9	0.093	ug/kg	
100-41-4		ND	0.97	0.36	ug/kg	,
76-13-1		ND	4.9	0.55	ug/kg	
591-78-6	2-Hexanone	ND	4.9	0.94	ug/kg	
98-82-8	Isopropylbenzene	ND	4.9	0.50	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Client Sample ID: EP-2

Lab Sample ID:

Method:

Project:

JA20908-2

Matrix:

SO - Soil

SW846 8260B

Date Sampled: Date Received:

06/12/09 06/12/09

Percent Solids:

95.2

VOA TCL List (OLM4.2)

1.5	· · ·					
CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	ND	4.9	0.80	ug/kg	٠.
108-87-2 -	Methylcyclohexane	ND	4.9	0.64	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.97	0.27	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	4.9	0.79	ug/kg	
75-09-2	Methylene chloride	ND	4.9	0.22	ug/kg	
100-42-5	Styrene	ND	4.9	0.10	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.9	0.28	ug/kg	Section 1994
127-18-4	Tetrachloroethene	ND	4.9	0.14	ug/kg	
108-88-3	Toluene	ND ==	0.97	0.28	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND =	4.9	0.34	ug/kg	11
71-55-6	1,1,1-Trichloroethane	ND	4.9	0.12	ug/kg	. *
79-00-5	1,1,2-Trichloroethane	ND -	4.9	0.18	ug/kg	
79-01-6	Trichloroethene	ND	4.9	0.51	ug/kg	The state
75-69-4	Trichlorofluoromethane	ND	4.9	0.22	ug/kg	
75-01-4	Vinyl chloride	ND	4.9	0.17	ug/kg	1
	m,p-Xylene	ND	1.9	0.46	ug/kg	1 × 1
95-47-6	o-Xylene	ND	0.97	0.46	ug/kg	1.73
1330-20-7	Xylene (total)	ND	1.9	0.46	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	105%	CA CA	67-1	27%	in graph of an
17060-07-0	1,2-Dichloroethane-D4	102%		65-1		1.1
2037-26-5	Toluene-D8	92%		74-1		.4. "
460-00-4	4-Bromofluorobenzene	68%		62-1		
CAS No.	Tentatively Identified Compo	unds	R.T.	Est.	Conc. U	Inits Q
	Total TIC, Volatile	raysik r		0	u	g/kg

Barretto Point Remediation, Hunts Point, NY

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 2

Client Sample ID: EP-7

Lab Sample ID: Matrix:

JA20908-3

SO - Soil

SW846 8260B

Date Sampled: Date Received:

06/12/09 06/12/09

Percent Solids:

94.0

Method: Project:

Barretto Point Remediation, Hunts Point, NY

File ID V91827.D DF Analyzed 1 06/24/09

By JLI Prep Date n/a

Prep Batch n/a

Analytical Batch VV3758

Run #1 Run #2

Initial Weight

Run #1 ~ 5.1 g

Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.3	ug/kg	
71-43-2	Benzene	ND	1.0	0.36	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	0.27	ug/kg	. 54
75-25-2	Bromoform	ND	5.2	0.10	ug/kg	
74-83-9	Bromomethane	ND	5.2	0.42	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	2.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.2	0.32	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.2	0.58	ug/kg	
108-90-7	Chlorobenzene	ND:	5.2	0.35	ug/kg	
75-00-3	Chloroethane	ND	5.2	1.2	ug/kg	
67-66-3	Chloroform	ND	5.2	0.33	ug/kg	
74-87-3	Chloromethane	ND	5.2	0.17	ug/kg	
110-82-7	Cyclohexane	ND	5.2	0.16	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	0.56	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	0.11	ug/kg	-
106-93-4	1,2-Dibromoethane	ND	1.0	0.14	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	5.2	0.28	ug/kg	* . *.
541-73-1	1,3-Dichlorobenzene	ND	5.2	0.29	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	5.2	0.35	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	5.2	0.99	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	0.14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.36	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.2	0.69	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.2	0.25	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.2	0.47	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	0.14	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	0.14	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	0.10	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.39	ug/kg	
76-13-1	Freon 113	ND	5.2	0.59	ug/kg	
591-78-6	2-Hexanone	NĎ	5.2	1.0	ug/kg	
98-82-8	Isopropylbenzene	ND	5.2	0.54	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Client Sample ID: EP-7

Lab Sample ID:

JA20908-3

Matrix: Method:

Project:

SO - Soil

SW846 8260B

Date Sampled:

06/12/09

Date Received: 06/12/09

Percent Solids: 94.0

VOA TCL List (OLM4.2)

4 2	4					
CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	ND -	5.2	0.86	ug/kg	
108-87-2 -	Methylcyclohexane	ND	5.2	0.68	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.2	0.85	ug/kg	
75-09-2	Methylene chloride	ND	5.2	0.23	ug/kg	
100-42-5	Styrene	ND	5.2	0.11	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	0.31	ug/kg	
127-18-4	Tetrachloroethene	ND	5.2	0.15	ug/kg	
108-88-3	Toluene	ND	1.0	0.30	ug/kg	4,
120-82-1	1,2,4-Trichlorobenzene	ND =	5.2	0.36	ug/kg	1. 1.
71-55-6	1,1,1-Trichloroethane	ND	5.2	0.13	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND =	5.2	0.19	ug/kg	
79-01-6	Trichloroethene	ND .	5.2	0.55	ug/kg	
75-69-4	Trichlorofluoromethane	ND .	5.2	0.24	ug/kg	100
75-01-4	Vinyl chloride	ND	5.2	0.19	ug/kg	
	m,p-Xylene	ND	2.1	0.49	ug/kg	
95-47-6	o-Xylene	ND.	1.0	0.49	ug/kg	11 May 12
1330-20-7	Xylene (total)	ND	2.1	0.49	ug/kg ug/kg	
				0.10	46/16	1.1
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	1. (1. 35. 17
1868-53-7	Dibromofluoromethane	91%	2	67-1	27%	100
17060-07-0	1,2-Dichloroethane-D4	84%		65-1		
2037-26-5	Toluene-D8	92%		74-1		
460-00-4	4-Bromofluorobenzene	69%		62-1		
CAS No.	Tentatively Identified Compo	unds	R.T.	Est.	Conc. U	nits Q
	Total TIC, Volatile	uzuğunuğ		0	uş	g/kg

Barretto Point Remediation, Hunts Point, NY

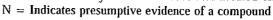
ND = Not detected

RL = Reporting Limit E = Indicates value exceeds calibration range

MDL - Method Detection Limit

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





Page 1 of 2

Client Sample ID: EP-8

Lab Sample ID:

JA20908-4

Matrix:

SO - Soil

SW846 8260B

1

Date Sampled:

06/12/09

Date Received: 06/12/09

Percent Solids: 94.6

Method: Project:

Barretto Point Remediation, Hunts Point, NY

06/24/09

File ID DF Analyzed

By JLI

Prep Date n/a

Prep Batch n/a

Analytical Batch VV3758

Run #1 Run #2

Initial Weight

V91828.D

Run #1 - 5.2 g

Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.3	ug/kg	13
71-43-2	Benzene	ND	1.0	0.35	ug/kg	11
75-27-4	Bromodichloromethane	ND	5.1	0.26	ug/kg	
75-25-2	Bromoform	ND	5.1	0.15	ug/kg	٠.
74-83-9	Bromomethane	ND	5.1	0.41	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	2.0	ug/kg	(14.5
75-15-0	Carbon disulfide	ND	5.1	0.31	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.1	0.56	ug/kg	
108-90-7	Chlorobenzene	ND-	5.1	0.34	ug/kg	
75-00-3	Chloroethane	ND	5.1	1.2	ug/kg	:
67-66-3	Chloroform	ND	5.1	0.32	ug/kg	
74-87-3	Chloromethane	ND	5.1	0.17	ug/kg	
110-82-7	Cyclohexane	ND	5.1	0.15	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	0.55	ug/kg	
124-48-1	Dibromochloromethane	ND	5.1	0.11	ug/kg	
106-93-4	1,2-Dibromoethane	ND	1.0	0.14	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	5.1	0.27	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	5.1	0.28	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	5.1	0.34	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	5.1	0.96	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.1	0.14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.1	0.67	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.1	0.24	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.1	0.46	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.1	0.13	ug/kg	,
10061-01-5	cis-1,3-Dichloropropene	ND	5.1	0.14	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.1	0.098	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/kg	
76-13-1	Freon 113	ND	5.1	0.57	ug/kg	
591-78-6	2-Hexanone	ND	5.1	0.98	ug/kg	
98-82-8	Isopropylbenzene	ND	5.1	0.53	ug/kg	

MDL - Method Detection Limit

ND = Not detected RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 2 of 2

Client Sample ID: EP-8

Lab Sample ID: Matrix:

JA20908-4

SO - Soil

Date Sampled: Date Received:

06/12/09 06/12/09

Method:

SW846 8260B

Percent Solids: 94.6

Project:

Barretto Point Remediation, Hunts Point, NY

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	ND	5.1	0.84	ug/kg	
108-87-2 -	Methylcyclohexane	ND	5.1	0.66	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.1	0.82	ug/kg	
75-09-2	Methylene chloride	ND	5.1	0.23	ug/kg	
100-42-5	Styrene	ND	5.1	0.11	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.1	0.30	ug/kg	
127-18-4	Tetrachloroethene	ND	5.1	0.15	ug/kg	
108-88-3	Toluene	ND	1.0	0.30	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	0.35	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.1	0.13	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.1	0.19	ug/kg	
79-01-6	Trichloroethene	ND	5.1	0.53	ug/kg	
75-69-4	Trichlorofluoromethane	ND	5.1	0.23	ug/kg	
75-01-4	Vinyl chloride	ND	5.1	0.18	ug/kg	
	m,p-Xylene	ND	2.0	0.48	ug/kg	
95-47-6	o-Xylene	ND -	1.0	0.48	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.48	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts	
1868-53-7	Dibromofluoromethane	92%		67-12	27%	
17060-07-0	1,2-Dichloroethane-D4	85%		65-13		
2037-26-5	Toluene-D8	91%		74-12		
460-00-4	4-Bromofluorobenzene	68%		62-13		
CAS No.	Tentatively Identified Compo	unds	R.T.	Est.	Conc. U	nits Q
	Total TIC, Volatile			0	ug	g/kg

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank









Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

· Chain of Custody



	<i>4</i> 0	CHAIN OF CUSTODY
The second of th	7"	2235 Route 130, Dayton, NJ 68810
BACCUTEST		732-329-0200 FAX 732-329-3499/3480 FED-E

Baccu						732-329	-0200				08810 3499i3	480	FED EX	Tracking	•				Bottle C	order Con	trol P		
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Client / Reporting Inform							<u> </u>						-									JA	20908
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			Project N	lame: B	arre	H0	Po	int						H]			DVF Drinking Wat
States 1750 NEW HIGH CHY FARMILKIDALE 1 Project Contact: DAVE SROSIM	rudy		Streat	221 1	ngn.	da	51						1 _	S O MTBE O	L C STARSD +TIGSD								GW- Ground Water
FARMINGDALE	υν	zip 11735	City	200.N			l	State		. الم	74		NAP	STAR	ST	. %					-		SW- Surface Wat SO- Soil
roject Contact: DAVE SPOSITI	2 E-mail		Project #	Boarx H	18-1	5L - 1			/	07)-/		10 602 TRACE N	PPL D STARS (D PPLO	₹.		۲,			1		St-Studge OI-Oil
516779 24	137		Fax #		,,, \// _A							—	8	1CE 0:	TCL D BNO PAH	46		ź					LIG- Other Liquid
iamplera's Name DGVE SI			Client Pu	rchase Orde									85.0	F 5	F %		ા	-2				1	AIR-Air
Accutest	SUMMA #		Collect	ion	Τ	1	INO	mber	of nre	senie	d Bottl	loc	0 624 0 MTB	NAPO	8270 C 625 C ABNC AEC	Total	7	N	.			1	SOL-Other Solid
Sample # Field ID / Point of Coll	anting lumanus			i	1	# of	Г				41	80			99	3	+	5					WP-Wipe
-1 EP-1	ection MEOH Vial	· · · · · ·	1030	Sampled by	Matrix	bottles	<u>ş</u> Ş	Į,	403 H2804	Įį	MEOH A	Į, č	8260 8TEX	9260 TBA	AB A								LAB USE ONL
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		6-12	1030	DS		1	\perp	L^{I}									X	Y			\neg	1	
3 EP-7		6-12	1030	D5				1 T	T	П							$\langle \vec{J} $				┪~	17	1
" 4 EP-8		6-12	1030	D5		1	+	1 †		#	+	1					\mathcal{A}		\dashv				05V5
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Turnaround Time (Business X Std. 15 Business Days					Crate Da	silverable	higi	mation:	士			Ш. -		—l			<u>—</u> l	Co	mments	/Remad			L
10 Day RUSH	Approved B	y:/ Date:		X Comm					LCLP														
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3 Day EMERGENCY			_	H NJ Fu			\vdash		SP Cate		3		1										
2 Day EMERGENCY				Other			H		Forma				}										
1 Day EMERGENCY			1	_			_																
Emorganeur T/A data No.			- [Comme	rcial "A"	= Resu	its On	ily					ŀ										
Emergency T/A data availab													.										
Religiousehed to sampler:	Sample Custody must b	Oak Time:	nted belov	v each time Pecciyed By:	sample	es chan	ge po	DSBest	sion, it	actudi	N) COU	rier d	lelivery					.]					
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JA20908: Chain of Custody

Page 1 of 2





Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JA20	908	Client:				Immediate Client Services	Action Requ	ired: No
Date / Time Received: 6/12/	2009		Delive	ry Meth	od:	Client Service Action F	Required at Lo	ogin: No
Project:			No. Co	olers:		1 Airbill #'s:		······································
	or N			Υo	<u>r_N</u>	Sample Integrity - Documentation	Y or	<u>N</u>
1. Custody Seals Present:		3. COC Prese		Ø		Sample labels present on bottles;	. 🔽	.
2. Custody Seals Intact:		4. Smp! Dates/T	ime OK	\square		Container labeling complete:	\square	o .
Cooler Temperature	Y or I	<u>N</u> .	3			Sample container label / COC agree;	$ \mathbf{Z} $	
 Temp criteria achieved: 	Ø I					Sample Integrity - Condition	Y or	<u>N_</u>
Cooler temp verification:	Infared		:			Sample recyd within HT:	<u> </u>	
3. Cooler media;	Ice (ba	2 g)	:			2. All containers accounted for:	\square	
Quality Control Preservatio	Y or	N N/A				3. Condition of sample:	Intact	
Trip Blank present / cooler:					٠.	Sample Integrity - Instructions	Y or N	1 N/A
2. Trip Blank listed on COC;						Analysis requested is clear.] "
Samples preserved properly;	☑ (Bottles received for unspecified tests		3
VOCs headspace free:	. 🗆 (Sufficient volume recyd for analysis:		j
			1			Compositing instructions clear:		3 2
						5. Filtering instructions clear.		
Comments								
	•							* 44.4
			٠					
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,								
								:1
						in the second		
•			is a			•		
Arrutest Laboratories - C						:		
Accutest Laboratories C V:732.329.0200						Highway 130		Dayton, New Jersey www/accutest.com

JA20908: Chain of Custody

Page 2 of 2



				able 6 - (ontamina	tion Kem	Table 6 - Contamination Remainging on Site	ite					
	Depth (ft)	0-2	2-4	4-6	8-9	8-10		10-12	12-14	14-16	16-18	18-20	
Compound	Rec. Critera	CS-1A	CS-1B	CS-1C	CS-1D	CS-1E	CS-1COMP	CS-2A	CS-2B	CS-5C	CS-2D	CS-2E	CS-2COMP
VOC's													
Trichloroethene	800	11.6	1	ľ		,	1	-	,	1		١.	0.0122
SVOC's					٢								
Acenaphthene	20000	47.3	-		-	1		<u> </u>	-,		1		1
Anthracene	20000	39.2	-			1						,	
Benzo(a)anthracene	224	392	47.8		1	 -	44.5		,	1		1	
Benzo(a)pyrene	61	387	52.5		-		42.3	,	1	ı			
Benzo(b)fluoranthene	1100	352	49.4		1	t	41.3	,	,	-	1	-	
Benzo(g,h,i)perylene	20000	237	38.3	1	-		29.4	-		,		1	1
Benzo(k)fluoranthene	1100	265	42.8	1	ı		33.5		1	,	,		
Chrysene	400	390	53.9	ı		, 	44.4	,	'				,
Dibenzo(a,h)anthracene	14	79.2			,								,
Di-n-butyl phthalate	8100	854							,		,		-
bis(2-ethylhexyl)phthalate	20000	341	-	,		,			1		,		
Fluoranthene	50000	691	78.9			,	75.9	,	'	ı	,		
Fluorene	20000	23.3	-		1					,			
Indeno(1,2,3-cd)pyrene	3200	219	34,4		,	1	76.7			-	1		
Phenanthrene	20000	274	44.7										
Pyrene	50000	601	6.77	•			71.2	,	-	,			
Total SVOC's	<500000	5192	520.6			t	409.2	-				ı	
1										_			
TPH-DRO (C10-C44)	mg/kg	114	106	-	1			1,	•	,			,

Wetals													
Arsenic	7.5	,	ı	-			201		,				,
Bariim	300										-		-,
	000	-	1			-	61.1	•				1	158
Cadmium	-	1	t	•	ı	_	< 53						7.53
Chromium	10	-	1		1	ľ	40.8					1	20.7
Copper	30						183 Charles 199 (199 Charles 199 Charles 1	1	,	•	,		60.3
Copper	62	_	•	•	•	-	16.1	,		,	,	1	11.7
Lead	•		ı	•			10.5				,		4
Mercury	U 1	-					,						9
N. 1					,		×.030		•				×.034
NICKel	13				t	1	13.1	,		,			N 0 P
Selenium	2			1	1		20.1	-					100
Silver		1					7					<u>'</u>	-
Wanadium	711								,				
Vailacialli	, nel	1		1	ŀ	1	33.7	1	,		•	•	37 a
Zinc	50	1	-	,		,	C LP						0.00
ua/ka unless noted	Petrotected						STREET, STREET			-		,	C.0C

Compound VOC's VOC's Acetone Trichloroethene Ethylbenze chloroform Xylene	Rec. Critera	0-2 CS-3A	2-4 CS-3B	68-30 08-30	8.8	8-10	4-6 6-8 8-10	10-12	12-14	14-16	16-18	18-20	
VOC's VOC's Acetone Trichloroethene Ethylbenze chloroform Xylene	nec, offiera	A5-52	2000		, v			-					
Acetone Trichloroethene Ethylbenze chloroform Xylene					3	CS-3E	CS-3COMP	CS-4A	CS-4B	CS-4C	CS-4D	CS-4E	CS-4COMP
Trichloroethene Ethylbenze chloroform Xylene	200	,		28.5	277.0								
Ethylbenze chloroform Xylene	800	,		20.0	7.4.5	•		-	-	•	,		τ
chloroform Xylene	5500		12			•		<u> </u>		•	•	,	,
Xylene	300	,						'	,	,		,	
2,00/8	1200	ļ,	2.5		Ţ.				•		-	1	,
2,00/10								<u> </u>	,	'	'		<u>'</u>
2000													
Acenaphthene	20000	39.1			,		Ç.						
Acenaphthylene	41000	43.1	19.2				34.3			1	,	-	-
Anthracene	50000	159	503				6.00	r	,	•	'	-	-
Benzo(a)anthracene	224	695	000		<u> </u>	<u> </u>	2.69.7	1		•			,
Benzo(a)pvrene	64	518	200	'	,		301	١,	•	-	,	,	,
Benzo(b)fluoranthene	1100	465	214	. ,		•	280	•	1	'		•	
Benzo(a,h,i)pervlene	50000	348	185	<u> </u>	'		167		•	-	,	-	,
Benzo(k)fluoranthene	1100	25	36	,	•	'	27.1			•	,	'	-
Carbazole	S C	101	70.7		,	-	336	,	'	•	,	1	,
Chrysana	200	1.	5.0.5	<u> </u>		1	36.3	1	,	1	-		
Dihonzo(a h) anthron	400	573	235	,		,	360	•	•	-		-	
Dibert f	14	106	46.3	-	,	•	86.4	•			,	-	
Diberzoluran	6200	22.1	•	1	•			,	·	,			
Di-n-buty/ pnthalate	8100	'	,	,	,	•	,		ı		 -		,
Uis(z-ettiyinexyt)pnthalate	20000	65.1	112	103	t	91.6	378	-	ı	,			
Fluorantnene	20000	980	357	1		•	586	,	1		,	,	
riuorene	20000	51.6	-	•	-	,	28.1		,	-	-	-	
Indeno(1,2,3-cd)pyrene	3200	318	151	,	•	•	242			ļ.	,	,	
Pnenanthrene	20000	571	177	•	,	1	323		,	,		,	
Pyrene	20000	931	363	-	,		605			-			-
Total SVOC's	50000	2150 7	75/7 4	25									
	2000	1.00.10	11/1	3	1	0, 5	4434.3	-	F	+	-		-
TPH-DRO (C10-C44)	mg/kg	77.2	221	,								-	
Metais										-			
Arsenic	7.5		,	 	†		2.4			+			
Barium	300						73.7	1		'	-	'	-
Cadmium	-						0.50		1	+	+	'	'
Chromium	10	-	ļ.,		,		20,02		-		-	-	-
Copper	25		 				200		<u> </u>	<u> </u>		'	-
Lead			 				2.1.1	•	 	,	•	•	
Mercury					<u>'</u>	 	4: -	- 			,	-	-
Nickel	2				<u> </u>	'	0.034	•	•	•		,	-
Selenium	2 0	 	 	,	•	•	6.71	-	-	'	-		,
Silver	7	,			•	•	2.1	1	•	1	ı	-	ı
Venedim	1 7	1	<u> </u>	•	•	•	-	1	•	•	,	-	
7:00	200		1	•	,	•	35	,	ı	1	-	•	•
ZINC	20	,	-	,	,	•	48.7	•	•		,	, 	

	Depth (#)	0-5	2-4	4-6	'	8-10	6-8 8-10 Selitating on Site	40.42	12-14	14.16	16.18	18.20	
Compound	Rec. Critera	CS-5A	CS-5B	CS-5C	CS-5D	CS-5E	CS-SCOMP	CS-6A	CS-6B	29-S2	CS-6D	S-S-SE	CS-6COMP
VOC's													
Acetone	200	,	•		22.3	20.5	-	119	20.7			'	,
Trichloroethene	800	_	•		•			,		,			,
Ethylbenzene	5500	-			2			156	13.4	1070	,		
Methyl Acetate	•	-	14700	-			,		١.				
chloroform	300		ı	1	,			-	 -				
Xylene	1200	•	-	1	1	-		208	21	670	-		
SVOC's													
Acenaphthene	50000	222	-					-	,	_	ı	,	
Acenaphthylene	41000	100			1	-	r	ı	1	*			
Anthracene	50000	489	1			1							
Benzo(a)anthracene	224	1380		,	'								
Benzo(a)pyrene	61	1370		-		1							
Benzo(b)fluoranthene	1100	1110		,		t	•		,				
Benzo(g,h,i)perylene	20000	998		1							'		
Benzo(k)fluoranthene	1100	1280								•	•		•
Butyl Benyl Phthalate		70.8		,			-	•	•	•	,	•	•
Carbazole	SN	192				'		•	•	١	•		
Chrysene	400	4490			'		-		-		-	-	
Dihenzo(a h)anthracene	77	1440			1	-	•	•	-	-		t .	
Diboozofiran	1000	402		•	-		-		,	•	,		
Die hittlichtelete	0070	601	-	-	-	-	1		t	1		1	
bisto at the minimum	8100		1	·	,	•	-		1		-		
Chiotopthone	00000	909	1	,	- 	'	•	•	ı	1	•		
ricolaliuleile	nnne	2490			1	•	,	-	-	•	1	1	
Figure	ດດດດຣ	208			•		•	-	•	ī		1	,
lituerio(1,2,3-cg)pyrene	3200	819	•			1	-	•	•		1	,	
z-metnyinaphtnalene		36.5	1	'		-	•	,			-	,	
napnthalene		49.3			-	•				-			108
Phenanthrene	90009	1870	1	1	ŀ					,		,	
Pyrene	50000	2240	4	,		,				-			
F					_								
Fotal SVOC's	20000	17178.6					1						
			-										
1FR-URO (C10-C44)	mg/kg	232	40.4	62.2			-	63.9		98.5	,	'	
Metaic													
Arsenic	7 &							-					
Barium	300	•		-	•		2.2		•		1	-	2.2
Cadmium						1	57.6	1		•		,	519
Chromium	10	1			†		0.00	1	1			•	0,54
Copper	2 10	-	-	'	-	-	22.3	,		-	-	-	27.5
000	67	-	-	-		-	23.3		1	,	,		19.2
Marchine	,	-				-	5	,		-			5,3
Mickel	L.O		1	,	,	•	0.034		1	1		ļ- ļ,	0.031
Solonium	2 (•	•	'	'	1	16.5		ı			-	18
Silver	7		•	1		•	2.2	-					2.2
Vacadium			•	•			1.1	-	•	,	,	-	1.1
Valiation I	001	1	-		·	,	32.4		-			,	29.1
	20	•	•	•	-	.505	34.9		,	-			23
ug/kg unless noted	 Not detected 												25

kg unless noted - = Not detected

;					Contamin	ation Ken	- Contamination Remainging on Site	ite					
	Depth (ft)	0-2	2-4	4-6	8-9	8-10		10-12	12-14	14-16	16-18	18-20	
compound	Rec. Critera	CS-9A	S-9B	CS-9C	CS-9D	CS-9E	CS-9COMP	CS-10A	CS-10B	CS-10C	CS-10D	CS-10E	CS-10COMP
SVOC's													
Acenaphthene	50000	204				7							
Acenanhthylene	41000	070			١	•		,	-	'	ı		•
Anthracene	50000	1910		'	,		8.75	24.2	7		,	1	,
Renzo(a)anthracene	2000	1310	•		,	1	31.6	1/./	1	ı	,	•	-
Derizo(a)antinacene	477	3030	'	F	•	•	106	49.5	1	1	1		,
Benzo(a)pyrene	61	2900	•		-	1	116	68.3				-	
Benzo(b)fluoranthene	1100	2730	1	1		·	107	70.1			-		
Benzo(g,h,i)perylene	20000	1750	,			,	89.6	543					
Benzo(k)fluoranthene	1100	1490	•				0.00					,	
Butví Benví Phthalate	50000	66.1					30.7	2		-		-	,
1 1'-biohenvi		Ş		1	•	,	-	-	-	-	-	-	
orbono C	9	100	1		-	,	1		1		ı	1	•
Caluazore	2	209		'	•	•	ı		ı	·	,	,	·
Chrysene	400	3060	-	-	,	,	109	55.6	-		,		
Dibenzo(a,h)anthracene	14	526			,		1	.1		,			
Dibenzofuran	6200	208	1	,			•					-	'
Di-n-butyl phthalate	8100		,				-			-	•	•	
bis(2-ethylhexyl)phthalate		101										•	•
Fluoranthana		16.0		'	,		, !		1		,		1
	20000	OSOC -	-	,	•		149	71.5	ı	•	•		
I ladielle	onnoc	(45	,		1	1			•			,	r
Indeno(1,2,3-cd)pyrene	3200	1580	,	'	-		82.6	36.7		,		-	-
2-methyinaphthalene	36400	567	1	,	•		1	,	,	,	,		
naphthalene	13000	675	-	•		-	1	,					
Phenanthrene	50000	5750	-	•	1	,	83.6	37			'	.1	,
Pyrene	20000	6700	,		•	•	172	80.8		,			
Total SVOC's	20000	40464.1	1			ı	1182.4						-
1PH-DRO (C10-C44)	mg/kg	217	•	11.8	,	-	-	•		•			,
Metals											-		
Arsenic	7.5	1		,		-	2.2	,	,		,		2.2
Barium	300	•	,	•	•	,	6.77	•		-	,		42.7
Cadmium	_	,	-	1	1	-	0.55		,		,	,	0.55
Chromium	10	•	1	1	ı	-	21.1	1		,		-	354
Copper	25	•		1	1	,	19.7	,		•	-		36.1
Lead	•			ļ ,	,	,	30.6		 -				5 4
Mercury	0.1		,	-	-		0.037	,		,	,	,	0.033
Nickel	13		,	,	1		13.2				,		0000
Selenium	2	,	1	,	,		2.2		,	,			2.2
Silver	1	•	•	,			1.1	1		-			1.1
Vanadium	150	ı				,	29.7	,		r			18.5
Zinc	20	,	,	,			1.98	,			 	1 1	7.46
ug/kg unless noted	 Not detected 											**	A STATE OF THE STA

	0.000			ande o	Containi	ration Ken	Table o - Contamination Kemainging on Site	ire		:			
	neptn (π)	7-0	44	4 -6	8-6	8-10		10-12	12-14	14-16	16-18	18-20	
compound	Rec. Critera	CS-7A	CS-7B	CS-7C	CS-7D	CS-7E	CS-7COMP	CS-8A	CS-8B	CS-8C	CS-8D	CS-8E	CS-8COMP
NOC's													
Acetone	200	-		,	1	24.4	,		•	,			,
Ethylbenzene	5500	-	3.4	77.4	,		-		432	146	538		
Xylene	1200		5.9	91	٤.		-		,				 -
Isopropylbenzene		-	,			,			851	361	386		-
Methylcyclohexane		,			-			,			200		
Methylene chloride	100				1	-			١.	-	43.4	,	
SVOC's													
Acenaphthene	20000	64.4	29.5		,	,		,					
Acenaphthylene	41000	134								,	,	,	
Anthracene	20000	230	-		-			,	,				
Benzo(a)anthracene	224	941	203	-		1		63.2	-	-	,	-	
Benzo(a)pyrene	61	066	228			,		70.3	,				
Benzo(b)fluoranthene	1100	882	241	-				54.1					
Benzo(g,h,i)perylene	50000	673	176	•	-		J	57.2					
Benzo(k)fluoranthene	1100	673	122		-	ı		57.7	,	,	 -	١,	
Butyl Benyl Phthalate	50000	580	•	-	-	1	1						
Carbazole	NC	68.4	_		ı		-		,	,	<u> </u>		
Chrysene	400	986	218		,		,	64.3			<u> </u>		
Dibenzo(a,h)anthracene	14	238	57.8					17.8			,		
Dibenzofuran	6200	30.5			,							1	
bis(2-ethylhexyl)phthalate	20000	2480	4470			,		168					
Fluoranthene	50000	1590	323	,	,	,		95.1					
Fluorene	50000	6.07	,			-		,				1	
Indeno(1,2,3-cd)pyrene	3200	909	151	,	,		-	48.9	,				
2-methylnaphthalene	36400	,	24.9									,	
naphthalene	13000	26.1	163		,		54.6	41.6		,			
Phenanthrene	50000	749	131	-		4		37.7		,	,		
Pyrene	50000	1470	314				z	95.4					-
1000													
iotal svocs	00000	13482.3	6852.2		1	•	1	871.3	٠				1
TPH-DRO (C10-C44)	a discontinue	9	60,	,	,	į							
	Bulging	180	138	28.1	13.4	35.2	ı.	79.6	55.7	57.4		-	٠
Mantale													

Metals						·							
Δτοσούο	7 6												
2000	6.7		'	-	,	ŀ	r)	,	•	,	•		2.2
Barium	300	,	1		•	,	55.9		,				0 00
Cadmium	-						200						90.9
Character					•		0.00			,			0.55
Cilioniain	10 or SB	•					23		•	•		,	600
Copper	25	-			,		22.8						400
700							2						0.0
rean			1	,			32	,					u
Mercury	Č												0.0
7 100 1011	-		1				0.033		•	,	•	. •	0.033
Nickel	13 or SB			ı		,	9 64						
Selenium	c)	•		'	,	,	77.2
		-					2.7			,		•	9.0
Silver	•						¥						7 .
Mondiam	150						- 1	,	,	•	•	•	-
ימו ומטוחווו	DGI.				,	1	34.9	•					111
Zinc	20 or SB			,			2,40					r	4.1
Actor 2001011 24/211	1 1 1 1 1 1 1						6.10	٠	1	•			26.6
naturas noten	- = Not detected												

				Table 6 -	Contamin	ation Ren	Table 6 - Contamination Remainging on Site	te					
	Depth (ft)	0-2	2-4	4-6	8-9	8-10		10-12	12-14	14-16	16-18	18-20	
Compound	Kec. Critera	CS-11A	CS-11B	CS-11C	CS-11D	CS-11E	CS-11COMP	CS-12A	CS-12B	CS-12C	CS-12D	CS-12E	CS-12COMP
800													
Acetone	200		27.6	ı	,	ı	,		,	,			,
Ethylbenzene	5500	4.4	•		,		,	,	,	,			
Xylene	1200	14.2	1	-	٤	,				ľ			
Isopropylbenzene		7.2											
Methylene chloride	100												
SVOC's													
Acenaphthene	20000							,		1	1		
Acenaphthylene	41000	•		,		,	,						•
Anthracene	50000	108	27.8	,	,	,							
Benzo(a)anthracene	224	95.2	,	,									,
Benzo(a)pyrene	61	81.3	,				,	, ,				•	r
Benzo(b)fluoranthene	1100	74	'	<u>'</u>		,				1		1	1
Benzo(g,h,i)perylene	50000	51.9		,			,			•	-		,
Benzo(k)fluoranthene	1100	41.5		,	-			.		1	1		•
Butyl Benyl Phthalate	50000	-			,	 				'			•
1,1'-biphenyi		609	131									'	-
Carbazole	NC	,				-					1		
Chrysene	400	116									<u> </u>	<u> </u>	,
Dibenzo(a,h)anthracene	14	-	,					1			†		
Dibenzofuran	6200	277	60.4	-	,						1		,
Di-n-butyl phthalate						<u> </u> .							<u>'</u>
bis(2-ethylhexyl)phthalate		101	61.4									•	
Fluoranthene	50000	202	26.7	20.9	-		21.3	<u> </u>					
Fluorene	50000	681	161	31.4	,	ļ-,	23.1						
Indeno(1,2,3-cd)pyrene	3200	-	-			 -							
2-methylnaphthalene	36400	8980	1520	187	,		120		,			<u> </u>	
naphthalene	13000	1640	247	26.6			18.6				<u> </u>	 	•
Phenanthrene	50000	1500	347	79.7	,	,	59.8	 -		,	,	<u>†</u>	
Pyrene	50000	253	35	19.8		-	21.9	,	,	,	,	١.	
Tatal 01/001-						-							
I OIGH SVOCS	იიიიი	14810.9	2617.3	365.4			,			-		,	
TPH-DRO (C10-C44)	mg/kg	3640	422	139				8 00			74.0		
								0.04		-	9.4		·
Metals					-			-					

								2			1		
Metals													
Arsenic	7.5						,						
			·	<u>.</u>	,		2.0			-	•	,	2.5
barium	300	,		•		•	76.7			,			53.8 8
Cadmium	•	•		,	,	,	0.64	,					0.55
Chromium	40		[ļ,	9,6	[1				0.00
Copper	25						19.2						17.0
Lead							174.3				'		7 0
Mercury	0 1						2000		'		•	,	5.0
, include	-	'	•		•	,	0,037		•	,	•		0.035
Nickel	. 13	•	•		,		14.7	,	•	,			107
Selenium	2						2.6						200
Silver				 - 	,		-	-					2.5
Vanadium	150						31.2						25.9
Zinc	20	,			,		54.8	,			'		9.60
natha unlace nated	Potocton to N 1												

	O cate	00		TAIDICO	Containe	I TOTAL	Table o - Contamination Remainging on Site	Ite		:			
Compound	Rec. Critera	CS-23A	CS-23B	CS-23C	CS-23D	CS-23E	CS-23COMP	CS-24A	12-14 CS-24B	CS-24C	CS-24D	18-20 CS-24F	CS-24COMP
NOC.s													
Acetone	200		,				,		,	-			
Ethylbenzene	5500	,					-		,				
Xylene	1200	,		5.9	5.				2.1				
Isopropylbenzene			,	-					,			,	
Methylene chloride	100		-	•			-		-		,		
SVOC's													
Acenaohthene	50000	173	,										
Acenaphthylene	41000	277		100		<u> </u>	26.6			•	-	•	,
Anthracene	00004	117	•	7.6		'	35.5		47.8		•	•	1
Bonzo(a)anthrocon	00000	03/		42.6			28.5		48.7	-	-		•
Borzo(a) piriono	477		31,4	1/0	t		101		238	-	•	-	-
Benzo(a)pyrene	61	1590	34.7	158	,	•	121		281	•	-	-	1
Benzo(b)illoranmene	2000	1250	24.7	124	,	•	108		199				
Benzu(g,n,)perylene	00005	1010	35.6	106		-	99.6		187	-	•	1	,
Benzo(k)riuoranmene	1100	1230	36.2	131	,	•	89.9		225		-		,
Butyl Benyl Primalate	00000	9.6	t	-	,	ι	•			-		،	
1,1'-bipnenyl		26					-						
Carbazole	NC	116		1	r	-			17.1		١,	ľ	-
Chrysene	400		32	194		,	111		264		,		,
Dibenzo(a,h)anthracene	14	285	1	. 39.1	,		45	1.000	09		'		,
Dibenzofuran	6200	79.1	1	-		,			-				
Di-n-butyl phthalate		-	1	,	,	,	,				,		,
bis(2-ethylhexyl)phthalate		337	70.2	112	-		-		60.4	1			, ,
Fluoranthene	50000	3090	44.2			-	105		430				'
Fluorene	50000	197	•		,		163			,			
Indeno(1,2,3-cd)pyrene	3200	950	30.4	9.66	ſ		98		158				
2-methylnaphthalene	36400	7.1		F			,				,		
naphthalene	13000	88.1	-	,	_		-				,	,	
Phenanthrene	50000	2470	24.8	260			70		187	,			
Pyrene	50000	3360	47.5	367	-	,	187		422				
Total SVOCIE	000												
rolai ovocis	00000	20442.8	411.7	1822.5			1350.5		2822				•
TPH-DRO (C10-C44)	mg/kg	230	467	32.2	,		,		43				
Matais													
C. 0000	l I												
Baring	0.0	1	-				2.2	'	1	1	-	,	2.2
	000		-	,		-	84.8	•		1	,	•	58
Cauralum	- (3	-	-	'	-	0.54			•			0.54
Compliant	0.1	•	1	-			28.8	-	-			1	45.8
Copper	25		•	•	'	,	32.7				ŀ	,	24.6
Lead		,		•			29.8	,					5,3
Nietcury	l.in	•	,			,	0.052				,	-	0.034
Nickel	13		,	,	١		17.3		1				17.9
Selection	2	'	'	•	•	•	2.2				,		2.2
Silver	,	•			,	•	1.1						1,1
Valladium	150	•	'	•	1	•	33.4	1	,	,			31.5
Zinc	20	·		-	•	-	104	,			,		50.7
ug/kg unless noted	- = Not detected									ļ.			

				Toble 6.	Contamin	ation Rem	Table 6 - Confamination Remainging on Site	e		,	40.49	18.20	
			7,6	4-6	8-9	8-10		10-12	12-14	14-10	C8.24D	CS-24E	CS-24COMP
	Depth (Ft)	7-0	4-7	08 230	CS-23D	CS-23E	CS-23COMP	CS-24A	CS-24B	22-245	25.55		
Sompound	Rec. Critera	CS-23A	C3-53B	22.5									•
VOC's			1.77	844			•		•	•			
Acetone	200			5	1400	,	•	٠	-	•		,	,
Benzene			, (105	,	-			•	•			,
2-Butanone (MEK)		•	4.4	36		•	•	•			•	,	
Oarbon distiffide		,	,	70	000000	248000		•	301000	•	1		
Cal DOIT-4134 High	5500	2	13.6	197	7280000	21000			1240000			•	
CITY IN CALL IN	1200	33.4	93.5	11500	nnne/e	200		 	18300		ı		
Xylene (total)			2.3	176	134000	13800					•	,	•
Isopropylbenzene				,	3790	-					ļ.		
Methylcyclohexane		, 2	7 8	72.	,	•	•	,	, ,		,	,	,
Methylene chloride	100	2.5	o o		56000	2220	•	,	4010				
Toluene		-	<u> </u>									,	•
		,	9 0 7 0	190801	49826 7 42535190 1093020	1093020			1563910				
Total VOCs	<10,000	35.4	240.0	16020									
										\ \ -+			
				1						-		\ \ +	
8/70/s						-		•	'		,	<u> </u>	
OVOC S	50000	873	43.6	•	<u>.</u>	\ \ \		,		1	,	, - -	
Acenapilitielle	41000	965	66.1	•	3	,		ļ ,	24.7	•	١	ı	-
Acenaphtnylene	0000	2930	139	•	44.4	35.9			7 44 7	,		•	
Anthracene	20000	2000	229	24.1	63.2	42.8	,	<u>-</u>	7		\ \ \	•	
Benzo(a)anthracene	224	070	100	l	83	38.4	•	,	- -		\ \ \		1
. Benzo(a)pvrene	91	7410	200	1	* 7.7	45	•	,	50.7		· - -		
Denizo(b) fluoranthene	1100	7150	365	-	- 6	2 4 5		,	33.8	-	-	<u> </u>	
Benzo(b)lluolativicitic	50000	4010	262		(2.9	0 .		•	38.7		-		-
Benzo(g,n,l)peryletie	4400	4780	247	29.5	79.6	0 45 C 45			 -			-	-
Benzo(k)fluoranthene	00001	; ; ;		1		' -	'	,	70.7		_		
Butyl Benyl Phthalate	nnnne	· -	,		220	159	-	,	7.0	,	,		
1.1'-biphenyl		, 000	73.7	\downarrow	 - -	,	•	•	. 8		-	,	
Carbazole	SO	1020	(3.		7 08	53.1	,	-	g G			,	
Chrysene	400	7130	USS.	- San	,	 -			,	-	-		-
Dibenzo(a h)anthracene	14	1230	DOC .		90	79.1	 	,	-	,	, - -		,
Dibenzofiran	6200	497	40	1	90.5	· -			•	, - -	:	1	,
Discharge and a batholate	8100	,	-	4	' 6		,	, -	181	'	-	.	
The state of the s		1090	221	-{	38.7	· -		 -	103	-			1
DIS(Z-EIII)IIIEAyi/DIIXIIEIEE		17300	_	43.6	067			 -	60.4	•	1	,	<u> </u>
Fluoranthene	20000	1100	├		140	<u>, </u>			23.9			-	
Fluorene	2000	4910	252		25	-		+	1100			•	-
Indeno(1,2,3-cd)pyrene	35400	146	33.1	L		•	•		2810	 - -	,	-	-
2-methylnaphthalene	20400	5	84.5	L	9280	•		,	250	\ \ \	,		,
naphthalene	13000	107	+	344	\vdash		7	-	202	+		-	,
Phenanthrene	50000	10400	+	\downarrow	\mid	-	•	-	7	1		-	
Pyrene	20000	13300	+	+	+			- -				,	
		100	7 474 7	7 11217				<u>'</u>	20//.2	7	-	-	
Total SVOC's	<500,000	93/43	}	╀				 	١	1	,	•	,
			200	250	6180	,	•	-	2	, - -			
TPH DRO (C10-C44)	ma/ka	578	-	1	$\frac{1}{2}$								

TPH-DRO (C10-C44) mg/kg ug/kg unless noted -= Not detected

CS-36COMP 18-20 CS-36E 16-18 CS-36D 11.5 14-16 CS-36C 12-14 CS-36B 10-12 CS-36A 19.3 Table 6 - Contamination Remainging on Site CS-35COMP 56 160 200 149 92.6 195 32.4 191 283 155 38.1 8-10 CS-35E 6-8 CS-35D 4-6 CS-35C 2-4 CS-35B 775.4 26.7 35.4 71.7 65.7 50.4 70.6 76.3 76.5 49.4 57.9 246 4 8 Ξ 0-2 CS-35A 1250 1510 84.9 23.6 244 2240 457 27237.76 1190 46.36 58.9 257 162 930 598 4790 425 172 Depth (ft) Rec. Critera 1200 50000 50000 50000 224 61 1100 50000 50000 14 6200 8100 50000 50000 3200 3200 3200 13000 50000 50000 50000 지 음 mg/kg Dibenzo(a.h)anthracene Dibenzofuran Di-n-butyl phthalate bis(2-ethylhexyl)phthalate Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Butyl Benyl Phthalate Indeno(1,2,3-cd)pyrene TPH-DRO (C10-C44) 2-methylnaphthalene Acenaphthylene Acenaphthene Phenanthrene Fluoranthene Total SVOC's Compound Xylene 1,1'-biphenyl naphthalene Anthracene Carbazole Fluorene Chrysene SVOC's Pyrene

Metals								-					
Arsenic	7,5		,	,	,		2.2	1	,		ļ,		2.2
Barium	300			,		١.	112		,				300
Cadmium	1		,	,			0.59		-	, ,			90.0
Chromium	10			,		,	24 €						0.00
Conner	30						2.00			- 	,	,	0.0
5225	2.0	•	,	,			7.77	•					203
Lead			,		1	,	61.1				-		6
Mercury	10						2700	l		Ì	1		
1 1 1 1 1 1 1	-		•	-	,	•	0.041	•	•	,			0.033
Nickei	13	,	,	·		,	15.4		-			5352	4.6.4
Selenium	2				,	۱	00		-				
Silver							3,3,	١		-	•	•	7.7
	,		•		,	•	1.1	•		•	•	,	_
Vanadium	150	1	,			,	35.2		,	-			30.4
Zinc	20	-	,	,	,		428	 	ļ,				1.00
ug/kg unless noted	 - = Not detected 										-		P. +

APPENDIX A – EXCAVATION WORK PLAN

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:

Ronnie E. Lee, P.E.

NYSDEC Project Manager

625 Broadway, 12th Floor

Albany, New York 12233-7016

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 below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated 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 B 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.

Trucks shall exit the site from Ryawa Ave onto Manida Ave to reach Viele Ave (approved truck road). All trucks loaded with site materials will exit the vicinity of the site using only this approved truck route. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to

highways; and (f) overall safety in transport; (g) community input. The truck route is shown in Figure 14.

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 preexcavation 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

Due to the contamination remaining on site, any soil outside of the excavated area of the former paint and varnish manufacturing shall not be reused on site. All material excavated shall be properly disposed of. Clean fill placed within the excavated area, and within the demarcation barrier, may be excavated and reused onsite if it is properly tested and passes the chemical criteria for on-site reuse of material, as shown on the following table.

Imported Backfill Limits Barretto Point Site No. B00032-2

Contaminant	CAS Number	Backfill Limit	
Metals	•		
Arsenic	7440-38-2	16c	
Barium	7440-39-3	400	
Beryllium	7440-41-7	47	
Cadmium	7440-43-9	4.3	
Chromium, hexavalent(d)	18540-29-9	19	
Chromium, trivalent(d)	16065-83-1	180	
Copper	7440-50-8	270	
Total Cyanide(d)	57-12-5	27	
Lead	7439-92-1	400	
Manganese	7439-96-5	2000c	
Total Mercury		0.73	
Nickel	7440-02-0	130	
Selenium	7782-49-2	4c	
Silver	7440-22-4	8.3	
Zinc	7440-66-6	2480	
PCBs/Pesticides			
2,4,5-TP Acid (Silvex)	93-72-1	3.8	
4,4'-DDE	72-55-9	1.8	
4,4'-DDT	50-29-3	7.9	
4,4'-DDD	72-54-8	13	
Aldrin	309-00-2	0.097	
alpha-BHC	319-84-6	0.02	
beta-BHC	319-85-7	0.09	
Chlordane (alpha)	5103-71-9	4.2	
delta-BHC	319-86-8	0.25	
Dibenzofuran	132-64-9	59	
Dieldrin	60-57-1	0.1	

Contaminant	CAS Number	Backfill Limit
Endosulfan I	959-98-8	24e
Endosulfan II	33213-65-9	24e
Endosulfan sulfate	1031-07-8	24e
Endrin	72-20-8	0.06
Heptachlor	76-44-8	0.38
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	1
Semivolatile organic compounds	·	·
Acenaphthene	83-32-9	98
Acenapthylene	208-96-8	100a
Anthracene	120-12-7	100a
Benz(a)anthracene	56-55-3	1c
Benzo(a)pyrene	50-32-8	1c
Benzo(b)fluoranthene	205-99-2	1c
Benzo(g,h,i)perylene	191-24-2	100a
Benzo(k)fluoranthene	207-08-9	1.7
Chrysene	218-01-9	1c
Dibenz(a,h)anthracene	53-70-3	0.33b
Fluoranthene	206-44-0	100a
Fluorene	86-73-7	100a
Indeno(1,2,3-cd)pyrene	193-39-5	0.5c
m-Cresol	108-39-4	0.33b
Naphthalene	91-20-3	12
o-Cresol	95-48-7	0.33b
p-Cresol	106-44-5	0.33b
Pentachlorophenol	87-86-5	0.8b
Phenanthrene	85-01-8	100a
Phenol	108-95-2	0.33b
Pyrene	129-00-0	100a
Volatile organic compounds		
1,1,1-Trichloroethane	71-55-6	0.68
1,1-Dichloroethane	75-34-3	0.27
1,1-Dichloroethene	75-35-4	0.33
1,2-Dichlorobenzene	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02c
cis -1,2-Dichloroethene	156-59-2	0.25
trans-1,2-Dichloroethene	156-60-5	0.19
1,3-Dichlorobenzene	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1b

Contaminant	CAS Number	Backfill Limit
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene	104-51-8	12
Carbon tetrachloride	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene	100-41-4	1
Hexachlorobenzene	118-74-1	3.2
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether	1634-04-4	0.93
Methylene chloride	75-09-2	0.05
n - Propylbenzene	103-65-1	3.9
sec-Butylbenzene	135-98-8	11
tert-Butylbenzene	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene	95-63-6	3.6
1,3,5-Trimethylbenzene	108-67-8	8.4
Vinyl chloride	75-01-4	0.02
Xylene (mixed)	1330-20-7	1.6

All Soil clean up objectives (SCOs) are in parts per million (ppm).

Footnotes:

- a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm.
- b For constituents where the calculated SCO was lower than the Contract Required Quantitation Limit (CRQL), the CRQL is used as the SCO value.
- c For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
- d The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
- e This SCO is for the sum of Endosulfan I, Endosulfan II, and Endosulfan Sulfate.

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. On-site material, that is acceptable for re-use on-site will be placed below the

demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

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

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 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the Record of Decision. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt, this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

A-10 BACKFILL FROM OFF-SITE SOURCES

For all imported soil materials testing shall be performed to confirm that the materials are non-hazardous in accordance with USEPA Test Method 1311 TCLP Ignitability, Reactivity and Corrosivity.

Additionally the material shall conform to the following:

- -Material is not capable of burning nor be capable of generating excess smoke when subject to the Department's flammability test.
- -Total Petroleum Hydrocarbons (TPH) does not exceed 1,000 ppm.
- -Material shall not contain more than 1% of asbestos as determined through a Polarized Light Microscope using the specified 40 CRF Part 763 or NYSDOH ELAP Manual Item 198.1.

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). 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-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by 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 will be installed around the entire perimeter of the construction area.

A-12 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 full 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-13 COMMUNITY AIR MONITORING PLAN

Air monitoring for dust particulates and VOCs will be performed during groundintrusive activities in accordance with the NYSDOH Generic Community Air Monitoring Plan (gCAMP).

A-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors offsite. 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 a dedicated on-site
 water truck for road wetting. The truck will be equipped with a water cannon
 capable of spraying water directly onto off-road areas including excavations
 and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-16 OTHER NUISANCES

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

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

APPENDIX B - HEALTH AND SAFETY PLAN



Site Specific
Health and Safety Plan
for
Barretto Point
Environmental Remediation
Hunts Point, Bronx County, NY

REV-2

Prepared By
Posillico Environmental
131-36A 20th Avenue
College Point NY 11356
Posillico Project # PE 05522

October 20, 2008

SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)

Site:

New York City DEPARTMENT OF ENVIRONMENTAL

PROTECTION - BARRETTO POINT SITE

Location:

HUNTS POINT, NEW YORK

NYCDEP Project:

HP-ER-1

Date Prepared:

October 20 2008

Prepared By:

Lee B. Kaplan, MPH

Revision:

REV-2

Project Description:

Excavation, Testing, Handling and Disposal of Contaminated Soil; Shoring, De-Watering and Backfilling Excavation; Furnish and Operate Tent; Furnish and Operate Air Treatment System; Furnish and Operate Water Treatment System; Furnish and Operate Electrical Control System; Placing Clean Fill and Grading Site.

Waste types:

VOC, SVOC and Metals Contaminated Soil and Groundwater

Characteristics:

Toxic and Contaminated

Status:

Former Paint and Varnish Manufacturing Facility

Background Review:

Site investigations have been performed. Remedial action work plan approved by the New York State Department of

Environmental Conservation (NYSDEC).

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CONTRACTOR APPROVALS

By their signature, the undersigned hereby certify that this SSHASP has been reviewed, modified for site-specific hazards and approved for use at the New York City Department of Environmental Protection — Barretto Point Environmental Remediation Site located in Hunts Point, New York.

PREPARER AND SITE SAFETY PROFESSIONAL

DATE

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Appendix V

Appendix W

Incident Reporting

1.0 INTRODUCTION

1.1 Purpose

This Site Specific Health and Safety Plan (SSHASP) addresses the health and safety practices that will be employed by workers participating in remedial construction activities at the New York City Department of Environmental Protection (NYCDEP) – Barretto Point – Environmental Remediation Site, located in Hunts Point, New York (herein termed the Site).

Prior to development of this SSHASP the Safety Professional (SP) visited the site in order to incorporate all needed site-specific controls and reviewed the detailed specification (Attached as Appendix A) for the project so that all NYCDEP required components were included in the document. The SSHASP includes procedures to be followed by Posillico, Posillico subcontractors, and all third parties in order to avoid and if necessary, protect against health and/or safety hazards. Activities performed under this SSHASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926. A copy of this SSHASP will be maintained on-site for the duration of work.

All workers who may participate in activities at the Site under the direction of Posillico are required to comply with the provisions specified in this SSHASP. All third parties who enter designated work zones must also comply with this SSHASP. Refusal or failure to comply with the SSHASP or violation of any safety procedures by field personnel and/or subcontractors performing work covered by this SSHASP may result in immediate removal from the site following consultation with the Project Manager (PM) and project SP.

Please note that at no time during site work will Posillico employees touch or take out of service and NYCDEP equipment.

1.2 Scope

This SSHASP has been developed to address the health and safety concerns at the Site during remedial actions under the direction of Posillico. Although the SSHASP addresses all activities listed below, work at individual locations may include all, or only some of these tasks.

The SSHASP addresses the following activities:

Mobilization

- Mobilization of Equipment and Supplies
- Establishment of Site Security, Work Zones, Staging Areas and Surveying

Pre Construction, Excavation, and Trenching Activities

- Locate All Utilities to and from the Site
- Locate All Active Utility Lines on Site

Construction of Temporary Fabric Excavation Structure (Tent)

- Stage Materials on Site
- Grading of Tent Areas
- Erection of Tent
- Installation of Air Treatment System

Construction Activities

- Utility Connections (Water, Sewer, Electrical)
- Installation of Steel Sheet Piles
- Installation of De-Watering System
- Installation of Air Handling Units
- · Clearing and Grubbing of Site

Excavation, Trenching and Backfilling Activities

- Excavate Contaminated Soil
- Backfill of Excavation and remainder of site
- Site Restoration

Other Remediation Activities

Operation and Maintenance Tasks

Demobilization

Demobilization of Equipment and Supplies

1.3 Application

The SSHASP applies to all personnel involved in the above tasks that are under the direction of Posillico, who wish to gain access to active work areas, including but not limited to:

- Federal, State or local representatives;
- Posillico employees; and
- Posillico subcontractors.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies Posillico project organization and responsibilities. All Posillico personnel, including its subcontractors, will be responsible for adherence to the safety procedures during the performance of this project. Deviations from this SSHASP will not be allowed without express consent of the Regional Posillico Safety Manager (RPSM). Project management and field supervisors for subcontractors are responsible for ensuring that their personnel will follow the procedures of this SSHASP. Violations of this SSHASP will result in dismissal from site operations.

2.1 Area Manager (AM)

The AM responsibilities include the following:

- Ensures implementation of the SSHASP;
- Participates in incident investigations;
- Ensures the SSHASP has all of the required approvals before any site work is conducted;
- Ensures the PM, SP, and RPSM are informed of project changes which require modifications of the site safety plan; and

2.2 Regional Posillico Safety Manager (RPSM)

The RPSM responsibilities include the following:

- Assists in the development and approval of the SSHASP;
- Approves revised or new safety protocols for field operations;
- Approves individuals who are assigned Health and Safety responsibilities;
- Coordinates revisions of this SSHASP with field personnel;
- Assists in Coordinating upgrades or downgrades of personal protective equipment with the PM and the site SP;
- Assists with safety walkthroughs and safety inspections
- · Assists with the implementation of the SSHASP; and
- Assists in the investigation of all accidents/incidents.

2.3 Site Safety Professional (SP)

The Site Safety Professional responsibilities include the following:

- Ensures that all health and safety activities identified in this SSHASP are conducted and/or implemented;
- Determines upgrades or downgrades of personal protective equipment (PPE) based on site conditions and/or real-time monitoring results;
- Identifies operational changes which require modifications to health and safety procedures and site safety plans, and ensures that the procedure modifications are implemented and documented through changes to the

SSHASP, with RPSM approval; Directs and coordinates health and safety monitoring activities;

- Ensures proper personal protective equipment is utilized by field teams;
- · Conducts weekly safety inspections of work areas;
- Monitors compliance with this SSHASP.
- Serves as the primary contact to review health and safety matters that may arise;
- Investigates major accidents;
- Approves revised or new safety protocols for field operations;
- Approves individuals who are assigned HS responsibilities;
- Coordinates revisions of this SSHASP with field personnel;
- Assists in the investigation of accidents/incidents; and
- Has overall project responsibility for Project Health and Safety.

2.4 Safety Representative (SR)

The Safety Representative's responsibilities include the following:

- Schedule and conduct safety meetings and safety programs as required;
- Determine the qualifications of equipment operators;
- Develop and implement emergency response procedures and post as required;
- Post all appropriate notices regarding safety and health regulations;
- Post appropriate warnings and instruction signs for all hazardous areas and conditions;
- Conduct inspections/audits to enforce all safety rules and regulations;
- · Submit to engineer copies of all inspections, reports and citations; and
- Provide appropriate site-specific orientation to visitors, employees and subcontractors.

2.5 **Project Manager (PM)**

The Project Manager's responsibilities include the following:

- Ensures that the SSHASP is implemented in conjunction with the RPSM and the site SP;
- Ensures that work is scheduled with adequate personnel and equipment resources to complete the job safely;
- Ensures that adequate communication between field crews and emergency response personnel is maintained;
- Ensures that site personnel are adequately trained and qualified to work at the site;
- Enforces site health and safety rules;
- Conducts and documents daily safety briefings;
- Conducts periodic inspections;
- Stops work if necessary;

- Notifies SP and RPSM of accidents/incidents;
- Reports to the RPSM and SP to provide summaries of field operations and progress.
- Acts as the primary point of contact with the NYCDEP for site related activities and coordination with project related site operations; and
- Acts as the Emergency Coordinator (see Section 12.0)

2.6 Site Personnel

The Site Personnel responsibilities include the following:

- Perform work tasks according to the Posillico Code of Safe Work Practices;
- Report any unsafe or potentially hazardous conditions to the PM and SP;
- Maintain knowledge of the information, instructions and emergency response actions contained in the SSHASP;
- Comply with rules, regulations and procedures as set forth in this SSHASP and any revisions;
- Prevent admittance to work sites by unauthorized personnel; and
- Inspect all tools and equipment, including PPE, prior to use each day.

2.7 Competent Person

The competent persons on the site must meet the requirements of OSHA 29 CFR, 1926.65.

- Dock building Foreman TBD Competent Person for Welding Operations
- Labor Foreman TBD

Competent Person for Rigging, Crane Operations, Trenching, Excavation and Falls

• Project Manager - Dave Sposito P.E.

Competent Person for Oversight of Electrically Unqualified Personnel

2.8 Subcontractors

At a minimum, Posillico subcontractors will comply with this SSHASP. Posillico subcontractors will also maintain an independent HASPs that comply with their specific site related tasks. If necessary the applicable sections of the subcontractor HASP will be added to this HASP to cover additional hazards. Posillico will evaluate the safety performance of its on site subcontractors in the same manner that it evaluates its own performance.

Posillico subcontractors will submit a HASP that includes:

A written description of required safety needed for the job;

"我就是我们的人",我们就是一点,这个时间就是一个人的人,就是一个人的人。

- Applicable safety training documentation as well as licenses and certifications;
- The name and telephone number of the site safety coordinator responsible for safety on site.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Location

The Barretto Point Site is located in the Hunts Point Section of the Bronx, New York. The site is bound by Veile Avenue to the North, Ryawa Avenue to the South, the former Barretto Street to the West and Manida Street to the East. See the Site-Specific Emergency Information provided in Appendix B for the Site Location Map.

The area surrounding the Barretto Point site is primarily commercial and industrial in nature. This includes the Hunts Point Water Pollution Control Plant (HPWPCP) located south of the site.

3.2 Background and Site History

The following background and site history information was taken form the Sanborn fire insurance map review located in the Dvirka and Bartillucci, Site Investigation Report, dated September 2000:

- The 1901 map shows buildings in the northern portion of the site that were identified as a yacht club. By 1959 much of the site has been developed for industrial purposes. These uses included a sand and gravel operation in the northwestern portion of the site, a asphalt plant at the southwest corner of Barretto Street and Ryawa Avenue and coal pockets to the west along the East River. In the northeastern portion of the site, industries included a paint and varnish manufacturer, food products manufacturer and iron works. A boat yard was located on the south side of Ryawa Avenue near Barretto Street.
- The 1962 map shows the coal pockets being removed from the area surrounding the site. In addition, the southern and northwestern portions of the site have been expanded into the East River.
- By 1978, only the asphalt plant buildings are still present.
- By 1981, a stone yard had been constructed at the northeastern corner of Barretto Street and Ryawa Avenue.
- The asphalt plant is no longer visible in 1991.

4.0 POTENTIAL HAZARDS AT THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the tasks specified under Section 1.2. A Hazard Communication Program is included in Appendix C. The Hazard Communication Program describes the procedures for determining hazards posed by a chemical, providing proper training on those hazards and transmitting the hazard information to those who could come in contact with the chemical.

4.1 Chemical Hazards

The characteristics of compounds at the Site are discussed below for informational purposes. Adherence to the safety and health guidelines in this SSHASP will reduce the potential for exposure. Extensive analytical testing has been performed and personnel shall familiarize themselves with the characteristics of the known chemicals and their properties. Listed below is the chemical data regarding exposure for the following chemicals:

Semi-volatile organic compounds (SVOCs) are present at the Site in impacted soil and groundwater in the dissolved phase or in the gas phase. These compounds generally have a depressant effect on the central nervous system (CNS), may cause chronic liver and kidney damage, and some are suspected human carcinogens. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation.

Volatile organic chemicals (VOCs), such as benzene, toluene, ethyl benzene, and xylene (BTEX) may be present in soil and groundwater in the dissolved phase or in the gas phase. These compounds generally have a depressant effect on the CNS, may cause chronic liver and kidney damage, and some are suspected human carcinogens. Benzene is a known human carcinogen. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation.

The Site potentially contains elevated levels of heavy metals including lead, arsenic, mercury, nickel, zinc, iron, copper, beryllium, and barium. The primary routes of this exposure for these compounds are inhalation (of particles containing these compounds) and ingestion (as well as dermal absorption for mercury). Exposure to lead may cause acute symptoms such as eye irritation, weakness, weight loss, abdominal pain, and anemia. Chronic exposure to lead may result in kidney disease, effects to the reproductive system, blood forming organs, and CNS. Acute exposure to arsenic may cause dermatitis, GI disturbances and respiratory irritation. Chronic exposure to arsenic has resulted in lung cancer in humans. Acute exposure to cadmium may cause breathing difficulty, cough, chest tightness, headache, chills, muscle aches, nausea, vomiting, diarrhea, loss of the sense of smell, emphysema, proteinuria, mild anemia. Chronic exposure to cadmium may result in cancer in humans. Acute exposure to mercury may cause irritated eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis,

headache, irritability and salivation. Chronic effects of mercury include gastrointestinal disturbance, anorexia, weight loss, proteinuria, tremor and insomnia.

Building materials from the former paint and varnish manufacturing facility may be present within the subsurface of the site such as asbestos containing materials, Transite panels and pipe containing lead joints. If any such materials are encountered, a stop work order will be issued and the materials will be thoroughly investigated in order to determine the appropriate abatement approach.

4.2 <u>Biological Hazards</u>

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. Workers will be instructed in hazard recognition, health hazards, and control measures during site-specific training.

4.2.1 Animals

During the conduct of site operations, wild animals such as stray dogs or cats, raccoons, rats, birds and mice may be encountered. Workers shall use discretion and avoid all contact with wild animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed animal control technician.

4.2.2 Insects

Insects, including bees, wasps, hornets, mosquitos and spiders, may be present at the Site making the chance of a bite possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect should notify a supervisor immediately. The following is a list of preventive measures:

- Apply insect repellent prior to performing any field work and as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, socks and light colored pants).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who may have insect allergies shall have bee sting allergy
 medication on site and should provide this information to the PM and SP
 prior to commencing work.

4.2.3 Lyme Disease

Lyme disease is caused when spirochete is transferred from an infected tick to the worker through a painless bite. The tick, which often embeds itself within the skin will transmit the virus as it is uses the bloodstream to feed.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash usually develops around the area of the bite. A person may develop more than one rash, in some instances. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bites. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis.

The disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

It is recommended that personnel check themselves when in areas that could harbor ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the PM should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be

disinfected with an antiseptic wipe. The employee will be offered the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If personnel feel sick or have signs similar to those above, they should notify their immediate supervisor.

4.2.4 Plants

The potential for contact with poisonous plants exists when performing fieldwork in undeveloped and wooded areas. During clearing and grubbing of the site, poison ivy, sumac, and oak may be encountered. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac has white, "hairy" berry clusters. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches. Prophylactic application of Tecnu may prevent the occurrence of exposure symptoms. Post exposure over the counter products are available and should be identified at the local pharmacist. Susceptible individuals should notify the PM.

Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

4.3 Physical Hazards

A variety of physical hazards may be present during Site activities. The most common hazards are struck-by/against hazards; slips, trips, and falls; and temperature extreme (cold and heat) stress. Other physical hazards are due to the use of hand and power tools and material handling. Additional specific safety requirements may be covered during safety briefings at the Site.

4.3.1 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, poor judgment and unauthorized procedural changes. The procedures to be followed are found in Appendix D, the Cold Stress Program.

4.3.2 Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. A heat stress prevention program will be implemented when ambient temperatures exceed 70°F for personnel wearing impermeable clothing. The procedures to be followed are found in Appendix E, the Heat Stress Program.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps and generators. Site workers who will perform suspected high noise tasks and operations for short durations (less than 1-hour) would be provided with hearing protection devices. If deemed necessary the PM and SP will be consulted on the need for additional hearing protection and the need to monitor sound levels for site activities. The procedures to be followed are found in Appendix F, the Hearing Conservation Program.

4.3.4 Hand and Power Tools

In order to complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when utilizing hand and power tools and GFI-equipped circuits will be used for all power tools. Tool inspections will be conducted prior to each work shift. Damaged tools will be tagged out of service and repaired. Additional procedures to be followed when using hand and power tools are attached in Appendix G.

4.3.5 Slips, Trips, and Falls

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from surfaces that are wet from rain or ice. Excavation at the sites will cause uneven footing in the trenches and around the spoil piles.

Daily housekeeping inspections of the work areas will be conducted to identify, eliminate and control slip trip and fall hazards.

4.3.6 Fire and Explosion

When conducting excavating activities, the opportunity of encountering fire and explosion hazards exists from contamination in the soil from historic underground piping systems. This will be especially hazardous when pipelines are sawed or broken to grout the ends. Additionally, the use of a diesel engine on excavating equipment could present the possibility of encountering fire and explosion hazards.

Real time monitoring will be conducted with all hot work activity to determine potentially flammable/explosive atmospheres. In the event that a fire or explosion is serious enough to warrant evacuation or coordinated emergency response; all employees will be instructed to follow Posillico Emergency Response Plan in Section 12.0.

4.3.7 Manual Lifting

Manual lifting of heavy objects such as sections of pipe may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers will be instructed to use power equipment to lift heavy loads whenever possible and to evaluate loads before trying to lift them (i.e. they should be able to easily tip the load and then return it to its original position).

Carrying heavy loads with a buddy and proper lifting techniques:

- 1) Make sure footing is solid.
- 2) Make back straight with no curving or slouching.
- 3) Center body over feet,
- 4) Grasp the object firmly and as close to your body as possible.
- 5) Lift with legs.
- 6) Turn with your feet, to avoid stress in the lower back.

Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods. In addition, hand digging for pipes may present lifting/ergonomic hazards.

4.3.8 Heavy Equipment Operations

Excavators, loaders, bulldozers, compactors, and dump trucks will be utilized in trenching, excavation, and backfilling operations. Cranes will be used to install the Steel Sheet Piles and the temporary fabric excavation structure. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm. Prior to each work shift, operators will inspect

their equipment using the Daily Equipment Checklist Attached in Appendix H, which also contains information on Motorized Vehicle and Equipment Operation.

4.3.9 Electrocution

The use of power tools and extension cords may pose electrical hazards to workers. Additionally overhead electrical lines on the Site are of potential concern during excavation, trenching, drilling, sheet pile driving, and tent mobilization and demobilization operations. Potential adverse effects of electrical hazards include shocks, burns, and electrocution, which could result in death. Please refer to section 10.1 and Appendix I for detail on electrocution hazards and lockout/tagout procedures. Additionally, all lockout/tagout procedures will be preformed in accordance with the NYCDEP lockout/tagout policy, which is also included in Appendix I.

In the event that an employee is seriously hurt from being electrocuted; all employees will be instructed to follow Posillico Emergency Response Plan in Section 12.0 of this document.

5.0 ACTIVITY HAZARD ANALYSIS

Activity Hazard Analysis (AHAs) are a systematic way of identifying the potential health and safety hazards associated with the activities required for completion of the work and the methods to avoid, control and mitigate those hazards. The AHAs will be used to train work crews in proper safety procedures during training prior to each phase of work.

Below is a Project Wide AHA developed for this project. Additional and more detailed AHAs will be developed for specific work tasks prior to the commencement of each activity. In the event that site conditions change, AHA's will be updated to include the new situations.

Phase of Work:

Mobilization/Demobilization

Tasks: Mobilization and Demobilization of Equipment and Supplies,

Establishment of Site Security, Work Zones and Staging Areas, Utility Connections (Water, Sewer, Communications and Electrical) for all temporary facilities, Site restoration (re-establishment of stabilization

cover, site grading, replacement of fences, etc).

BAZARDS	
- OARLAND - AREA	CONTROL MEASURES
Slips/trips/falls	Maintain alertness to slip/trip/fall hazards;
	Maintain good housekeeping;
	Personnel will use caution when working on slopes, plastic, wet or
	muddy areas, or oily areas;
	Walk, do not run; and
٤	Wear footwear with soles that grip.
	See Appendix M for General Health and Safety Work Rules.
Manual lifting and	Use proper lifting techniques; and
material handling	Team lifting will be used for heavy loads or use mechanical lifting
	devices.
Temperature	Drink plenty of fluids;
extremes	 Train personnel of signs/symptoms of heat/cold stress;
	Monitor air temperatures when extreme weather conditions are
	present;
	Stay in visual and verbal contact with your buddy; and
	Use Temperature Extremes program (Appendices D and E).
Hand tool usage	Use Appendix G for proper use of Hand and Power tools.
	Daily inspections will be performed;
	Remove broken or damaged tools from service;
	Use the tool for its intended purpose; and
	Use in accordance with manufacturer instructions.
Back injuries	Follow proper lifting techniques: lift with legs, keep load close to
	the body, do not bend or twist with load, test load prior to lift; get
	help for heavy or awkward loads, clear path.
	Site personnel will be instructed on proper lifting techniques:
	 Site personnel will be instructed on proper lifting techniques;

HAZARDS	GONTROLLMIDASURES	
	mechanical devise should be used to reduce manual handling of	
	materials; team lifting should be utilized if mechanical devices are	
	not available.	
Vehicular Traffic	 Use Motorized Vehicle and Equipment Safety Procedures 	
	(Appendix H).	
	 Wear High Visibility Vests at all times. 	
	 Personnel will be required to wear hard hats that meet ANSI 	
Overhead Hazards	Standard Z89.1;	
	 All ground personnel will stay clear of suspended loads; 	
	 All equipment will be provided with guards, canopies or grills to 	
~	protect the operator from falling or flying objects; and	
	 All overhead hazards will be identified prior to commencing work 	
Noise	operations.	
Dropped Objects	Ear plugs or ear muffs.	
Eye Injuries	Steel toe boots meeting ANSI Standard Z41 will be worn.	
Fire/Explosion	Safety glasses meeting ANSI Standard Z87 will be worn.	
Fire/Expression	ABC type fire extinguishers shall be readily available;	
Electrocution	and no smoking in work area.	
Electrocution	 Use Posillico and NYCDEP Lockout/Tag-out policy attached in Appendix I. 	
	• Equipment will be equipped with GFCI;	
	All electrical work will be conducted by a licensed electrician;	
	• All equipment will stay a minimum of 15 feet from overhead	
	energized electrical lines (50 kV). This distance will increase .4	
	inches for each 1 kV above 50 kV.	
Pinch/Cut/Smash	• Cut resistant Kevlar work gloves will be worn when dealing with	
	sharp objects;	
.	All hand and power tools will be maintained in safe condition; and	
	Guards will be kept in place while using hand and power tools.	
Biological hazards	Be alert to the presence of biological hazards;	
	Wear insect repellent;	
	Follow procedures in Section 4.2.3 for tick bites;	
	• PM should be aware of on-site personnel with allergic reactions in	
	insect bites and stings.	

Phase of Work: Tasks:

Pre-Construction and Site Preparation

Delineate and Protect Utilities located on site and those leading to and from the Site, Site Preparation (on-site roads, installation of soil erosion measures, temporary facilities, etc.), Clearing and Grubbing, Prepare decontamination pads and facilities, Develop and Create Staging Area for Materials Storage, Drilling for Collection of Characterization Samples

HAZARDS	CONTROL MEASURES
Slips/trips/falls	Maintain alertness to slip/trip/fall hazards;
	Maintain good housekeeping;
	Personnel will use caution when working on slopes, plastic, wet or
	muddy areas, or oily areas;
-	Walk, do not run; and
	Wear footwear with soles that grip.
	See Appendix M for General Health and Safety Work Rules.
Manual lifting and	Use proper lifting techniques; and
material handling	Team lifting will be used for heavy loads or use mechanical lifting
	devices.
Temperature	Drink plenty of fluids;
Extremes	Train personnel of signs/symptoms of heat/cold stress;
:	Monitor air temperatures when extreme weather conditions are
	present;
:	Stay in visual and verbal contact with your buddy; and
	Use Temperature Extremes program (Appendices D and E).
Hand tool usage	Use Appendix G for proper use of Hand and Power tools.
	Daily inspections will be performed;
	Remove broken or damaged tools from service;
	Use the tool for its intended purpose; and
	Use in accordance with manufacturer instructions.
Back injuries	• Follow proper lifting techniques: lift with legs, keep load close to
	the body, do not bend or twist with load, test load prior to lift; get
	help for heavy or awkward loads, clear path.
	 Site personnel will be instructed on proper lifting techniques;
	mechanical devise should be used to reduce manual handling of
	materials; team lifting should be utilized if mechanical devices are
Vehicular Traffic	not available.
veilicular traffic	Use Motorized Vehicle and Equipment Safety Procedures
	(Appendix H).
	Wear high visibility vests at all times.
Overhead Hazards	• Personnel will be required to wear hard hats that meet ANSI
	Standard Z89.1;
	All ground personnel will stay clear of suspended loads;
	• All equipment will be provided with guards, canopies or grills to
	protect the operator from falling or flying objects; and

HAZARDS	CONTROL MICASTURES
	All overhead hazards will be identified prior to commencing work
	operations.
Noise	Ear plugs or ear muffs.
Dropped Objects	Steel toe boots meeting ANSI Standard Z41 will be worn.
Eye Injuries	Safety glasses meeting ANSI Standard Z87 will be worn.
Fire/Explosion	ABC type fire extinguishers shall be readily available;
	and no smoking in work area.
Electrocution	Use Posillico and NYCDEP Lockout/Tag-out policy attached in
	Appendix I.
	Equipment will be equipped with GFCI;
	All electrical work will be conducted by a licensed electrician;
	• All equipment will stay a minimum of 15 feet from overhead
* *	energized electrical lines (50 kV). This distance will increase .4
Pinch/Cut/Smash	inches for each 1 kV above 50 kV. • Cut resistant Keylar work gloves will be worn when dealing with
T MION OUT BINASII	 Cut resistant Kevlar work gloves will be worn when dealing with sharp objects;
	All hand and power tools will be maintained in safe condition; and
	Guards will be kept in place while using hand and power tools.
Biological hazards	Be alert to the presence of biological hazards;
_	Wear insect repellent;
	Follow procedures in Section 4.2.3 for tick bites;
	• PM should be aware of on-site personnel with allergic reactions in
	insect bites and stings.
Training	All employees will be given a New To Job orientation (Appendix
	W).
	All employees will be required to have the appropriate training
	(Section 13 of this SSHASP) prior to working on the site.
Underground	 Call New York City One Call (811) prior to excavation activities.
Utilities Contact	Use Posillico Utility Safety Protocol attached in Appendix Q and
	Section 10-6.
Lacerations	Mala manufactura de la companya del companya de la companya del companya de la co
associated with	Make sure all equipment is in proper operating order.
clearing and	Make sure guards are attached properly to all equipment. Chains are attached properly to all equipment.
grubbing	Chains are attached properly to chainsaws. Personnel must be trained on each piece of covirment annuals.
	Personnel must be trained on each piece of equipment properly.
	2

Phase of Work: Tasks:

Construction Activities

Crane operations, Tent relocation, Construction activities near electrical transmission lines (above and below ground), Installation of dewatering system, Tent Setup (including air handler installation), Installation of dewatering wells.

	watering wells.
HAZARDS	CONTROL MEASURES
Chemical	 Work in your assigned area only. Maintain proper site control. Wear appropriate PPE;
	• Perform air monitoring per Table 7-1;
	Practice contamination avoidance;
	Follow proper decontamination procedures; and
-	Wash hands/face before eating, drinking, or smoking.
	• See Posillico Personal Protective Equipment program attached in Appendix J for PPE selection.
Slips/trips/falls	See Appendix M for General Health and Safety Work Rules and
	Section 4.3 for physical hazards.
	Maintain alertness to slip/trip/fall hazards;
	Maintain good housekeeping;
	Personnel will use caution when working on slopes, plastic, wet or
	muddy areas, or oily areas;
	Walk, do not run; and
	Wear footwear with soles that grip.
Temperature	Drink plenty of fluids;
extremes	Train personnel of signs/symptoms of heat/cold stress;
	Monitor air temperatures when extreme weather conditions are
	present;
	Stay in visual and verbal contact with your buddy; and
TT31	Use Temperature Extremes program (Appendices D and E).
Hand tool usage	Use Appendix G for proper use of Hand and Power tools.
	Daily inspections will be performed;
	Remove broken or damaged tools from service;
	Use the tool for its intended purpose; and
D-1-: · ·	Use in accordance with manufacturer instructions.
Back injuries	• Follow proper lifting techniques: lift with legs, keep load close to
	the body, do not bend or twist with load, test load prior to lift, get
	help for heavy or awkward loads, clear path.
	Site personnel will be instructed on proper lifting techniques;
	 Mechanical devices should be used to reduce manual handling of materials;
44.0	 Team lifting should be utilized if mechanical devices are no available.
Vehicular Traffic	 Use Motorized Vehicle and Equipment Safety Procedures (Appendix H).

HAZARDS	CONTROL MEASURES
	Use high visibility vests at all times during work.
Overhead Hazards	
O COMPAGNICATION	• Use Safe Operation of Cranes, Derricks and Hoisting Equipment
	information attached in Appendix N and in Section 10.3 of the SSHASP.
	• Personnel will be required to wear hard hats that meet ANSI Standard Z89.1;
1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	• Use Aerial Lift Safety Usage attached in Appendix O and Section 10.4.
	All ground personnel will stay clear of suspended loads;
	All equipment will be provided with guards, canopies or grills to
_	protect the operator from falling or flying objects; and
	All overhead hazards will be identified prior to commencing work
****	operations.
Noise	Ear plugs or ear muffs.
Eye Injuries	Safety glasses meeting ANSI Standard Z87 will be worn.
Fire/Explosion	 Use Posillico Welding and Cutting Safety Rules and NYCDEP Hot
	Work Rules attached in Appendix T.
	ABC type fire extinguishers shall be readily available; and
	No smoking in work area.
Electrocution	Use Appendix I (Posillico and NYCDEP Lockout/Tag-out Policy)
	prior to performing any electrical work.
	• Equipment will be equipped with GFCI;
6	All electrical work will be conducted by a licensed electrician;
	• All equipment will stay a minimum of 15 feet from overhead
	energized electrical lines (50 kV). This distance will increase .4
Pinch/Cut/Smash	inches for each 1 kV above 50 kV.
A IIIOIII Out DIIIGSII	 Cut resistant Kevlar work gloves will be worn when dealing with sharp objects;
	All hand and power tools will be maintained in safe condition; and Guards will be kept in place while using hand and power tools.
Biological hazards	Guards will be kept in place while using hand and power tools. Be alert to the pregames of historical beyond.
22010Erout Hazards	Be alert to the presence of biological hazards; Wear insect repullent:
	• Wear insect repellent;
	• Follow procedures in Section 4.2.3 for tick bites;
	 PM should be aware of on-site personnel with allergic reactions in insect bites and stings.
Confined Space	
commod Space	Use Appendix R (Posillico and NYCDEP Confined Space policy prior to entering any confined spaces.)
	prior to entering any confined spaces.
	Ensure that employees have received the proper training.

Phase of Work: Tasks:

Excavation

Installation of sheet piling to support excavations, Benching for slope protection in the excavation areas, Tent maintenance, Protect and support excavation areas in proximity to overhead and underground utilities, Excavation of materials (contaminated and non-contaminated), Staging and stockpiling materials (contaminated and non-contaminated), Removal of subsurface obstructions, Backfill and compaction of excavation areas, Operation and Maintenance of dewatering system and air treatment system, Power Washing of Heavy Equipment/Vehicles, Dry Decontamination of Heavy Equipment/Vehicles, Decontamination of Sampling Equipment.

14 / 77 / GMPVG	
HAZARDS	CONTROL MEASURES
Chemical	Work in your designated work area. Maintain proper site control.
	• See Section 4.1 and the Hazard Communication program attached in
	Appendix C for potential chemical hazards associated with the site.
	Wear appropriate PPE;
	• Perform air monitoring per Tables 7-1;
	• Make sure monitoring equipment is properly calibrated and used as per Appendix L.
	Practice contamination avoidance;
	Follow proper decontamination procedures; and
	Wash hands/face before eating, drinking, or smoking.
	• See Posillico Personal Protective Equipment program attached in
ζ	Appendix J for PPE selection.
Slips/trips/falls	• See Appendix M for General Health and Safety Work Rules and
	Section 4.3 for physical hazards.
	Maintain alertness to slip/trip/fall hazards;
	Maintain good housekeeping;
•	Personnel will use caution when working on slopes, plastic, wet or
	muddy areas, or oily areas;
	Walk, do not run; and
	Wear footwear with soles that grip.
Temperature	Drink plenty of fluids;
extremes	Train personnel of signs/symptoms of heat/cold stress;
	Monitor air temperatures when extreme weather conditions are present;
	Stay in visual and verbal contact with your buddy; and
	Use Temperature Extremes program (Appendices D and E).
Steam, Heat	Use face shield and safety glasses or goggles;
Splashing	• Stay out of the splash/steam radius;
	Do not direct steam at anyone;
	Do not hold objects with your foot or hands and steam area near it;
	• Ensure that direction of spray minimizes spread of constituents of
·····	- Spray minimizes spread of constituents of

HAZARÐS	CONTROLATOR
	concern;
	Use shielding as necessary;
	Pressure washer will be equipped with a dead man's switch; and
	• Use wand extenders.
Back injuries	• Follow proper lifting techniques: lift with legs, keep load close to
	the body, do not bend or twist with load, test load prior to lift, get
	help for heavy or awkward loads, clear path.
A second	Site personnel will be instructed on proper lifting techniques;
	Mechanical devices should be used to reduce manual handling of
	materials;
e e ligit	Team lifting should be utilized if mechanical devices are no available.
Vehicular Traffic	Use Motorized Vehicle and Equipment Safety Procedures
1 -	(Appendix H).
	Wear high visibility vests at all times during work.
Overhead Hazards	Use Safe Operation of Cranes, Derricks and Hoisting Equipment
	information attached in Appendix N and in Section 10.3 of the SSHASP.
\$	• Use Aerial Lift Safety Usage attached in Appendix O and Section 10.4.
	 Personnel will be required to wear hard hats that meet ANSI Standard Z89.1;
٤	All ground personnel will stay clear of suspended loads;
	 All equipment will be provided with guards, canopies or grills to
	protect the operator from falling or flying objects; and
	 All overhead hazards will be identified prior to commencing work operations.
Noise	Ear plugs or ear muffs.
Eye Injuries	Safety glasses meeting ANSI Standard Z87 will be worn.
Fire/Explosion	Use Posillico Welding and Cutting Safety Rules and NYCDEP Hot
	Work Rules attached in Appendix T.
	 Call New York City One Call (811) prior to excavation activities.
	Use Posillico Utility Safety Protocol attached in Appendix Q.
	ABC type fire extinguishers shall be readily available; and
Ti. /	No smoking in work area.
Electrocution	• Call New York City One Call (811) prior to excavation activities.
	Use Posillico Utility Safety Protocol attached in Appendix Q.
	• Equipment will be equipped with GFCI;
	All electrical work will be conducted by a licensed electrician;
	• All equipment will stay a minimum of 15 feet from overhead energized electrical lines (50 kV). This distance will increase .4
	inches for each 1 kV above 50 kV.

HAZARDS	CONTROLAMBASTIRES
Pinch/Cut/Smash	 Cut resistant Kevlar work gloves will be worn when dealing with sharp objects; All hand and power tools will be maintained in safe condition; and Guards will be kept in place while using hand and power tools
Biological hazards	 Guards will be kept in place while using hand and power tools. Be alert to the presence of biological hazards; Wear insect repellent; Follow procedures in Section 4.2.3 for tick bites; PM should be aware of on-site personnel with allergic reactions in insect bites and stings.
- Excavation Areas	 Use Appendix P (Trenching and Excavation) procedures and Section 10.5 prior and while digging in order to make proper decisions. See Appendix S for the Posillico Fall Protection policy.
	 Make sure the competent person for excavations is present while performing work. See Posillico Personal Protective Equipment program attached in Appendix J and Section 6.0 for PPE selection.
Contaminated Water Disposal	 Make sure all permits have been obtained for the disposal of contaminated water. See Posillico Personal Protective Equipment program attached in Appendix J for PPE selection.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Specific information on the selection rationale for each activity can be found in Section 4.0 and Appendix J - Personal Protective Equipment (PPE): Selection and Use. For the purposes of PPE selection, the SP and RPSM are considered competent persons. The signatures on the front of the SSHASP constitute certification of the hazard assessment. For activities not identified in this SSHASP the SP or RPSM will conduct the hazard assessment and select the PPE using the information provided in Appendix J. Prior to any upgrade or downgrade of PPE the Engineer of Construction Management will be notified.

6.1 **PPE Abbreviations**

HEAD PROTECTION HH = Hard Hat HEARING PROTECTION EP = ear plugs EM = ear muffs	EYE/FACE PROTECTION APR = Full Face Air Purifying Respirator MFS = Mesh Face shield PFS = Plastic Face shield SG = ANSI approved safety glasses with side shields	FOOT PROTECTION Neo = Neoprene OB = Overboot Poly = polyethylene coated boot Rub = rubber slush boots STB = Leatherwork boots with steel
HAND PROTECTION Cot = cotton But = Butyl LWG = Leather Work Gloves Neo = Neoprene Nit = Nitrile Sur = Surgical Nit Sur - Nitrile Surgical	BODY PROTECTION Cot Cov = Cotton Coveralls HV = High Visibility Vests Poly = Polyethylene coated tyvek coveralls Saran = Saranex coated tyvek coveralls Tyvek = Uncoated paper tyvek coveralls WC = Work clothes	RESPIRATORY PROTECTION Level D = No respiratory protection required Level C = Half/Full face air purifying respirator with approved cartridges Level B = Full face air supplied respirator with escape bottle

6.2 OSHA Requirements for Personal Protective Equipment

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134	ANSI Z88.1-1980
Head	29 CFR 1910.135	ANSI Z89.1-1969
Foot	29 CFR 1910.136	ANSI Z41.1-1967

ANSI = American National Standards Institute

Any on-site personnel who have the potential to don a respirator must have a valid fit test certification and documentation of medical clearance. The SP will maintain such information on file for Posillico personnel, Posillico subcontractors, and other third party personnel. The SP will obtain such information from the subcontractor's site supervisor prior to the initiation of any such work.

Both the respirator and cartridges specified for use in Level C protection must be fittested prior to use in accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency;
- IDLH concentrations; and
- If contaminant levels exceed designated use concentrations.

6.3 Respiratory Protection Program

A respiratory protection program has been developed in order to comply with 29 CFR 1910.134. The Posillico respiratory protection program is attached to this document as Appendix K.

7.0 MONITORING

Qualified and trained personnel will perform environmental health and safety monitoring on site in accordance with this section.

This section only applies to real time monitoring for on-site activities and does not include community air monitoring which is covered in the NYCDEP Community Air Monitoring Plan (CAMP) attached to section 01355 of the contract specification.

7.1 On-Site Monitoring During Remedial Activities

The following monitoring instruments will be available for use during field operation as necessary:

- Photoionization Detector (PID), Photovac Microtip with 10.6 eV lamp or equivalent; or
- Dust Meter, MIE Miniram model PDM-3 or equivalent; and
- Carbon Monoxide (CO) detector; and
- Lower Explosive Limit (%LEL) Combustible Gas Indicator (CGI) / Oxygen (O₂) / Hydrogen Sulfide (H₂S), MSA model 361 or equivalent; and
- Sound Level and vibration meters for sheet installation and other activities when deemed necessary by the PM or SP. The type of monitoring will be appropriate for the activities performed.

All air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements and the Monitoring Instruments: Use, Care, and Calibration program included in Appendix L.

Organic vapor concentrations shall be measured logged and recorded using the PID during excavating and other intrusive activities. During intrusive operations, organic vapor concentrations shall be measured continuously. Organic vapor concentrations will also be measured upwind/downwind of the work site(s) to determine background concentrations at least twice a day, (once in the morning and once in the afternoon).

A dust meter shall be used to measure, log and record airborne particulate matter during intrusive activities. Monitoring will be continuous and readings will be averaged over a 15-minute period for comparison with the action levels. Monitoring personnel will make a best effort to collect dust-monitoring data from upwind and downwind of the intrusive activity. If off-site sources are considered to be the source of the measured dust, upwind readings will also be collected.

A CGI/O₂ meter and a CO meter shall be used to monitor for combustible/toxic gases (%LEL) and oxygen content in trenches, excavations, surrounding areas and elsewhere as necessary. The data will be logged and recorded at the end of each workday. Since diesel or gasoline powered equipment will be used inside the containment structures during remedial activities, monitoring for buildup of CO from exhaust will be monitored. The CGI will also be equipped with a hydrogen sulfide sensor. H₂S monitoring will be completed every fifteen minutes, or if a sulfur odor is present, monitoring will be continuous.

All trenches will be monitored before entry and as required to ensure a safe working atmosphere.

Guidelines have been established by the National Institute for Occupational Safety and Health (NIOSH) concerning the action levels for work in a potentially explosive environment. These guidelines are as follows: 10% LEL- limit all activities to those that do not generate sparks, 20% LEL- Cease all activities in order to allow time for the combustible gases to vent.

TABLE 7-1 REAL TIME AIR MONITORING ACTION LEVELS

Air Monitoring Instrument	Monitoring Location	Action Level	Site Action
PID	Breathing	0-1 ppm	Level D
1000000	Zone	>1 ppm	Use detector tube to measure benzene concentration
		1-5 ppm	Confirmed benzene concentrations with detector tubes breathing zone, Level C
		1-25 ppm	Total VOCs, non-transient above background, Level D
		25 – 250 ppm	Total VOCs, Confirmed absence of benzene, Level C
		> 250 ppm	Stop work, withdraw from work area; notify PSD
Oxygen meter	Breathing	< 19.5%	Stop work; withdraw from work area; notify PSD.
•	Zone	> 22%	Stop work; withdraw from work area; notify PSD.
H2S meter	Breathing	<5 ppm	No respiratory protection is required
l l	Zone	>5 ppm	Stop work, cover excavation, notify PSD
Combustible gas Indicator CGI with oxygen (O2) meter	Excavation	> 5% Lower Explosive Limit (LEL), < 10% Upper Explosive Limit (UEL)	Investigate possible causes, allow excavation to ventile use caution during procedures.
		> 10% LEL	Stop work; allow excavation, borehole to ventilate
		> 5% LEL, < 10% LEL in breathing zone	Limit activities to those which do not generate sparks
		>10% LEL in breathing zone	Stop work, allow to vent
Dust Meter	Excavation	Background to 50 micrograms per cubic meter (ug/m3) 15 minute average	Implement work practices to reduce/minimize airborne du generation, e.g., spray/misting of soil with water, Level D
		> 50 ug/m3 15 minute average	Upgrade to Level C
Carbon Monoxide Meter	Excavation	>25 ppm	Stop working, allow to vent or change work practices
Sound Level Meter	All Activities	>85 decibels	Don hearing protection

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7.2 <u>Data Quality Assurance</u>

7.2.1 Calibration

Instrument calibration shall be documented and included in a dedicated safety and health logbook or on separate calibration pages. All instruments shall be calibrated before and after each shift in the field. All instruments shall be calibrated by the manufactured at least annually or as specified by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.2.2 **Operations**

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the PM for reference.

7.3 <u>Personal Air Monitoring</u>

Posillico will perform baseline personal air monitoring at the commencement of intrusive remediation operations and as necessary throughout the duration of the project in order to identify specific chemicals that may pose a threat to worker health. Baseline monitoring will include sampling for compounds identified earlier in this document. The results of which will be compared to all applicable OSHA Permissible Exposure Limits (PELs).

Based on the results of the personal air monitoring, Posillico will develop and implement specialized monitoring and protection programs in order to ensure that employee exposure is reduced below permissible limits.

Employee exposure monitoring will be carried out in accordance with NOISH standardized methods for the contaminants of concern. These methods specify quality assurance/quality control (QAQC) provisions for maintaining sampling and analytical integrity, precision and accuracy. Based on the contaminants of concern, it is anticipated that passive badges and filter tubes will be used to collect the appropriate samples. Samples will be analyzed by a laboratory accredited by the American Industrial Hygiene Association (AIHA).

Samples will be collected at the initiation of intrusive activities and as necessary throughout the duration of the project.

8.0 ZONES, PROTECTION, AND COMMUNICATION

8.1 <u>Site Control</u>

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin for each task requiring such delineation (i.e. construction, excavation, trenching in impacted areas of the site).

All zones will be identified by appropriate signage, caution tape, orange cones, orange fence or orange construction barrels. Maps will be available at the Site and used during initial site-specific training.

This project is being conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to site contaminants exists, will only be allowed access after proper training and medical documentation as required by Posillico. These records shall be maintained by the SP, and copies will be provided to the PM prior to mobilization for project activities.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

Support Zone - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ and in an area located outside of the tent enclosure. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities, which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an exclusion zone. This zone will be clearly delineated by cones, tapes or other means. The PM may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site PM allowing adequate space for the activity to be completed, field members and emergency equipment.

8.2 <u>Contamination Control</u>

8.2.1 <u>Decontamination Procedures</u>

Personal and equipment decontamination will take place only in designated areas of the CRZ. Posillico will construct a decontamination pad of heavy polyethylene plastic sheeting in order to contain all contaminated sediments or water. The pad will be large enough to accommodate the equipment to be decontaminated. The pad will contain a pump to collect water.

Decontamination equipment may include the following:

- Wash Tubs
- Scrub Brushes
- Disposable Towels
- Seating to Facilitate Boot Cleaning
- Decontamination Solution
- Hand Soap
- Skin Wash Water Source

8.2.2 Minimization of Contact With Contaminants

During completion of all site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

Field procedures will be developed to control over spray and runoff and to ensure that unprotected personnel working nearby are not affected.

8.2.3 Personnel Decontamination Sequence

Consideration will be given to prevailing wind directions so that the decontamination line, the support zone, and contamination reduction zone exit is upwind from the exclusion zone and the first station of the decontamination line. Decontamination will be performed by removing all PPE used in EZ and placing in appropriate waste contains for disposal at the CRZ.

The following describes procedures to be employed for personal and equipment decontamination:

PERSONAL DECONTAMINATION PROCEDURES FOR LEVEL D PROTECTION

- 1. Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool down stations may be set up within this area.
- 2. Remove outer gloves and deposit in waste container.
- 3. If clothing has become contaminated, remove it and place it into a poly bag.
- 4. Remove inner gloves and deposit in container with liner.
- 5. Wash hands and face.
- 6. Re-dress (as necessary) or put on clean clothes.

PERSONAL DECONTAMINATION PROCEDURES FOR LEVEL C PROTECTION

- 1. Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool down stations may be set up within this area.
- 2. Scrub outer boot covers and gloves with decontamination solution or detergent/water.
- 3. Rinse off decontamination solution from Station 2.
- 4. Remove tape around boots and gloves and deposit in waste container.
- 5. Remove boot covers and deposit in waste container.
- 6. Remove outer gloves and deposit in waste container.
- 7. If worker leaves exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, and joints taped. Worker returns to duty.
- 8. Remove safety boots and place in area with plastic liner.
- 9. With assistance of helper, remove splash suit. Deposit in waste container.
- 10. Remove respirator. Deposit in container with plastic liner. Avoid touching face with fingers.
- 11. Remove inner gloves and deposit in waste container.
 - 12. If inner clothing has become contaminated, remove it and place it into a poly bag.
 - 13. Wash hands and face if shower is not available.
 - 14. Put on clean clothes.

8.2.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination; wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the exclusion zone boundary and decontaminated by site personnel as described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury) provisions shall be made to ensure that emergency response personnel will be able to respond to victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with poly to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent chemical data.

8.2.5 Hand Held Equipment Decontamination

Hand held equipment includes all monitoring instruments, samples, and hand tools. The hand held equipment is dropped at the first decontamination station in the CRZ to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.

To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident.

Decontamination procedures for sampling equipment, hand tools, etc., shall include the use of steam cleaning or a detergent wash, as appropriate for the site conditions.

8.2.6 Heavy Equipment Decontamination

Decontamination of chemically contaminated heavy equipment will be accomplished using high -pressure steam or with brushes and shovels (dry decon) in the CRZ. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an exclusion zone will be treated as contaminated, and will be decontaminated prior to removal. To ensure that the rinse water meets NYCDEP Title 15, Chapter 19 criteria, all decontamination rinse water will be

collected and passed through the water treatment system prior to discharge into the local sewer.

8.3 <u>Communications</u>

The following communications equipment shall be specified as appropriate:

- Telephones A cellular telephone will be located in the SZ for communication with emergency support services/facilities and the home office. Personnel in the EZ can carry cellular telephones for communication as well if Level D PPE has been determined to be appropriate.
- Hand Signals Hand signals shall be used by field teams along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

Meaning
Out of air, can't breathe
Leave area immediately, no debate
Need assistance
Okay, I'm all right, I understand.
No, negative.

9.0 MEDICAL SURVEILLANCE PROCEDURES

All personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f) and, where applicable, expanded health standards.

9.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the SP or RPSM before a worker can enter the exclusion zone. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months. Additional medical testing may be required by the RPSM in consultation with the SP if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

10.0 SAFETY CONSIDERATIONS

The PM and SR will be present on-site at all times during work activities and shall provide all monitoring and health and safety support in order to ensure the adequacy of protective equipment and safety procedures.

During all activities, personnel shall strictly adhere to the following:

- The buddy system or line of sight will be used during intrusive work;
- If field personnel perceive an unsafe condition or situation, the RPSM will be notified immediately; and
- All site personnel shall be aware of the General Health and Safety work rules presented in Appendix M.

Activities to be conducted at the site may involve operations that have the potential for a serious injury to occur, to include the following:

- · Lockout/Tagout
- Heavy Equipment Operation (e.g., trucking, dewatering systems, air handling systems, excavations, cranes, etc.)
- Crane Operations
 - High Wind Operations
 - o Operations in Proximity to Overhead/Underground Lines
- · Excavation and Trenching
 - o Excavation in Proximity to Overhead/Underground Lines
 - Working Inside the Enclosure
 - Working With Contaminated Material
- Confined Space Entry
- Fall Protection

10.1 Lockout-Tagout

Site personnel will assume that all electrical equipment (surface, subsurface and overhead and machinery/equipment) is energized, until a Posillico representative has designated the electrical equipment as de-energized. If the equipment cannot be designated as de-energized, work shall stop and the PM, SR, SP or RPSM will meet to determine a safe path forward. Consolidated Edison (Con Ed) will be notified prior to working adjacent to electrical equipment. Prior to beginning work personnel shall verify that the equipment is energized or de-energized in the vicinity of the construction area. Posillico and NYCDEP's Control of Hazardous Energy Programs (Lock Out/Tag Out) is included in Appendix I.

All power lines, which have been indicated to be de-energized, must be locked out, such that the lines cannot be energized when personnel are working near them. The lines shall not be unlocked and re-energized until Con Ed is notified

that they have completed work in the area and that all personnel are clear of the area.

If power lines cannot be de-energized, the PM will consult with Con Ed safety personnel to determine the safe working distance from the energized line. Work tasks will only commence after determination that a safe working distance can be maintained and all personnel working in the area have been informed of the limitation, and received activity specific training.

10.2 Heavy Equipment Operation

Heavy equipment will be operated under the following conditions:

- The operation of heavy equipment will be limited to authorized personnel specifically trained in its operation. The subcontractor site supervisors must provide this information to the PM.
- The operator will use the safety devices provided with the equipment, including seat belts. Backup warning indicators and horns will be operable at all times.
- While in operation, all personnel not directly required in the area will keep a safe distance from the equipment.
- Personnel directly involved in activity will avoid moving in the path of operating equipment or any portion thereof. Areas blinded from the operator's vision will be avoided. Spotters will be used when personnel may be in areas where the operator's view is obstructed.
- Additional riders will not be allowed on equipment unless it is specifically designed for that purpose.

Additional information on Motorized Vehicle and Equipment Operation may be found in Appendix H.

10.3 Crane Operations

All Crane operations will be planned out prior to execution. Load charts developed for the crane model will be used to design the crane picks to ensure that the radius and weight of picks do not exceed the manufacturer's design criteria. Procedures for the safe operation of cranes, derricks, and hoisting equipment are attached as Appendix N.

10.3.1 High Wind Crane Operations

The Barretto Point Site may occasionally be subject to high winds. The wind level will be monitored with the use of a hand held anemometer and action levels will be developed for corresponding wind speeds. The crane manufacturers technical specifications will be used to develop the applicable actions for wind

speeds recorded on site. These actions may include reduced lifting capacity, additional lines to steady load during installation, work stoppage.

For example, when operating a lattice boom crane under high wind conditions (over 20 mph), the following chart may be used as a guide for capacity reductions required for emergency, one time lifts for any boom length up to 250 feet. Actual lifts will require a lifting plan with wind restrictions included in the calculations.

If the wind Velocity Excee	ds All Crane Capacities Must be Reduced:
20 mph	20%
30 mph	40%
40 mph	70%
45 mph	Crane operations must be shutdown and the boom lowered to the ground.

10.3.2 <u>Crane Operation in Close Proximity to Overhead and Underground Utilities</u>

During work in proximity to active overhead and underground utilities, methods will be developed to ensure the safety of the work and workers. Some methods to mitigate the danger of active utilities are:

- Swing brake to ensure the crane is not capable of swinging into utilities.
- Visible markings on overhead lines, and staking out underground utilities.
- Using a spotter for crane operations to ensure clearance are maintained during work.

In addition, the guidelines specified in Section 10.6 below will be adhered to strictly during operations in close proximity to Overhead and Underground Utilities.

10.3.3 Crane Operations for Moving the Temporary Enclosure

As noted above, weather conditions will be evaluated to help assure they are suitable for the 8-hour window required for each lift. Forecasted wind conditions must be no greater than 9 MPH, with 3-second gusts of no greater than 11 MPH. Posillico will secure all rigging from the crane to the appropriate lifting brackets and attach 1 tag line on each of the four corners of the structure. Once it is ensured that the new site is ready to accept the structure and the necessary equipment is ready to accept the anchor system, it is suitable to remove the fabric membrane weather seal that connects the two halves and then remove the anchor system that has been installed to resist the wind loads. The structure is then ready to be lifted while insuring the balance is suitable for relocation based on design. The structure will be lifted to the maximum height required to clear any obstructions that would impede the path to the new location.

When the desired location is reached, the structure will be set down and any weight load on the crane will be removed. The anchor system will be re-installed to resist the applicable wind loads. Lastly, the rigging that has been attached to the lifting brackets is removed.

10.4 Aerial Lift Usage

Workers on site may use various aerial lifts in the process of performing work tasks. Attached as Appendix O are procedures for safe aerial lift usage. The procedures are based on codes and standards adopted in the Work Smart Standards (WSS) for aerial lifts, along with manufacturers' recommendations and other standards that apply for Posillico activities.

10.5 Excavation and Trenching

A competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to employees must determine the safety requirements for each excavation. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity, the location of underground installations will be determined. The New York State one-call center will be contacted by the excavation subcontractor a minimum of 72 hours prior to excavation activities.
- All excavations will be inspected daily by the competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Excavated and other materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of the excavation.

A more detailed list of Posillico's Trenching and Excavation Procedures are attached in Appendix P.

10.6 Activities in Proximity to Overhead and Underground Utilities

Active electric power supply equipment is located in the southeast corner of the Site. In addition, there are overhead distribution and transmission lines that extend along Manida Street. Extreme care will be used during the implementation of the remedial construction activities so as not to damage or interfere with these utilities. The minimum setbacks from these overhead lines for all equipment and personnel are as follows:

- 15 feet for the 33 kV overhead electrical lines;
- 10 feet for the 13 kV overhead electrical lines; and
- 5.5 feet fort the insulated 33 kV overhead electrical line.

In addition to overhead utilities, there are underground utilities that exist in proximity to the work areas. Extreme care will be used during the implementation of the remedial construction activities so as not to damage or interfere with these underground utilities and shall support and protect these utilities as required. The Posillico Underground Utility Safety Procedures are included in Appendix Q.

10.7 <u>Confined Space Entry</u>

All trenches and excavations deeper than five feet will be considered potential Permit Required Confined Spaces. All trenches deeper than 5 feet will be monitored for oxygen content, combustible gases, and toxic gases and vapors if entry is required. All trenches, which contain hazardous atmospheres at concentrations above the action levels found in Table 7-1, will be classified as Permit Required Confined Spaces. All entry into these trenches will be performed in accordance with the Posillico Confined Space/Hot Work Permitting Procedure and the NYCDEP Confined Space Policy, all of which is found in Appendix R.

In the event that personnel are required to enter a permit required confined space, Posillico will pre-arrange rescue services well in advance of the entry. Posillico will verify that the emergency service provider will be capable of providing adequate rescue equipment, personnel, availability and response time prior to any permit required confined space entry.

10.8 Fall Protection

Posillico has a six-foot maximum fall rate requirement above a lower level requiring 100 percent tie off. During the remedial construction, there is a potential for injuries caused by falls from unprotected leading edges. Posillico shall take precautions to ensure that all leading edges of excavations and trenches are protected in accordance with OSHA 29 CFR 1926. If during the installation

of sheet piles, excavations or trenching a worker is required to assist the process in an aerial lift, they shall be protected from falls by an appropriate harness and latching system as described in OSHA CFR 1926. Posillico's Fall Protection Program is attached as Appendix S.

10.9 Welding and Cutting Safety Rules

All employees performing welding and cutting on site must adhere to Posillico's Welding and Cutting Safety Rules as well as the NYCDEP Hot Work Policy. Both are attached in Appendix T.

11.0 DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal off site with contaminated soils.

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12.0 EMERGENCY RESPONSE / CONTINGENCY PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, and first aid for injuries incurred on-site, record keeping, and emergency site evacuation procedures. Emergency contact information, a list of key site personnel and hospital directions are included in this document in Appendix B. Additionally included in Appendix B is the NYCDEP Hunts Point Emergency evacuation Plan which includes DEP emergency contacts, frequency of evacuation drills, routes of evacuations and gathering and head count point area responsibilities.

12.1 Responsibilities

12.1.1 Safety Professional (SP)

The SP oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The SP acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Project Manager (PM)

The PM is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The PM is responsible for performing head counts at the gathering point after site evacuation. The PM is required to immediately notify the SP and of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the SP can notify OSHA within the required time frame. The SP will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of \$500 within 24 hours.

12.1.3 Emergency Coordinator

The Project Manager and Safety Representative are the Emergency Coordinators.

In the event of an emergency, the Emergency Coordinator shall make contact with Local Emergency Response personnel. In these contacts, the Emergency Coordinator will inform response personnel about the nature of work on the Site, the type of contaminants and associated health or safety effects, and the nature of the emergency, particularly if it is related to exposure to contaminants.

The Emergency Coordinator shall review this plan and verify emergency phone numbers and identify hospital routes prior to beginning work on Site. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the Site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a Site emergency.

12.2 Communications

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

The primary form of communication during an emergency between field groups in the exclusion zone and the Emergency Coordinator will be verbal communications. During an emergency situation, the lines will be kept clear so that all field teams can receive instructions.

12.2.1 <u>Telephone Communications</u>

A cellular telephone or landline telephone will be available on-site.

12.2.2 <u>Air Horns</u>

Air horns will be used to alert Site personnel of emergencies. The following signals will be used:

- Two short blasts shut down equipment, await instructions
- Three short blasts injured employee, first-aid providers respond
- One continuous blast Site evacuation

12.2.3 Hand Signals

Downrange field teams will employ hand signals where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

12.3 Pre-Emergency Planning

Before the field activities begin, the local emergency response personnel may be notified of the schedule for field activities and about the materials that are thought to exist on the site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency.

In order to be able to deal with any emergency that might occur during remedial activities at the Site, emergency telephone numbers will be readily available in the PM vehicle or Construction Office. These telephone numbers are presented in the Site Specific Emergency Contact Information attached in Appendix B. Hospital route maps and MSDS sheets and the list of hazardous chemicals will also be readily available in separate binders in the Construction Office. The Emergency phone numbers listed are preliminary. Immediately prior to mobilization the PM and SR shall verify all numbers, and document any changes in the Site Logbook.

In the event that personnel are required to enter a permit required confined space, Posillico will pre-arrange rescue services well in advance of the entry. Posillico will verify that the emergency service provider will be capable of providing adequate rescue equipment, personnel, availability and response time prior to any permit required confined space entry.

12.4 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it shall be reported to the PM immediately. First-aid equipment will be available on-site.

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that have been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, shall be followed closely.

12.5 Non-Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it shall be reported to the PM immediately. First-aid equipment will be available on-site.

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that have been set up. Injured personnel that do not require immediate emergency medical attention but require more care than can be provided by a first aid kit,

will be directed to a walk in medical clinic located nearby the site. The name, location and directions of the Posillico approved walk in medical clinic are listed in Appendix B.

12.6 <u>Emergency Site Evacuation Routes and Procedures</u>

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs at the work area, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, immediate evacuation of all personnel is necessary due to an immediate or impending danger. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble directly across Manida street.

If any task covered under this SSHASP has the potential for significant hazards, evacuation drills will be performed as deemed necessary by the PM, SP, SR and RPSM. Additionally an evacuation drill will be preformed prior to project startup and quarterly thereafter.

12.7 <u>Fire Prevention and Protection</u>

In the event of a fire or explosion, procedures will include immediately evacuating the work area. The Emergency Coordinator will then immediately notify the local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

Adhering to the following precautions will prevent fires:

- · Good housekeeping and storage of materials
- Storage of flammable liquids and gases away from oxidizers
- No smoking in the exclusion zone or any work area
- No hot work without a properly executed hot work permit
- Shutting off engines to refuel
- Grounding and bonding metal containers during transfer of flammable liquids
- Use of UL approved flammable storage cans
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities
- Monthly inspections of all fire extinguishers

The person responsible for the maintenance of fire prevention and/or control equipment is the SR. The person responsible for the control of fuel source hazards is the PM.

12.8 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet will be followed as necessary. If first aid or emergency medical treatment is necessary the Emergency Coordinator will contact the appropriate emergency facilities.

SKIN AND EYE CONTACT:	Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.
INHALATION:	Move to fresh air. Decontaminate and transport to hospital or local medical provider.
INGESTION:	Decontaminate and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION:	Decontaminate and transport to emergency medical facility.

12.9 <u>Decontamination During Medical Emergencies</u>

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or postponed. The PM or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on site, a plastic barrier between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material, which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

12.10 Accident/Incident Reporting

Incident reporting will be done following the guidelines established in the Incident Reporting Program presented in Appendix U.

Written confirmation of verbal reports shall be submitted within 24 hours. The accident/incident report can be found in Appendix U.

In addition to the incident reporting procedures and actions described in the HASP, the PM will coordinate with NYCDEP relative to reporting and notification for all environmental, safety, and other incidents.

If necessary, a site safety briefing will be held to discuss accidents/incidents and any findings from the investigation of the incident. The HASP will be modified if deemed necessary by the RPSM.

12.11 Adverse Weather Conditions

In the event of adverse weather conditions, the PM will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries
- Potential for cold stress and cold-related injuries
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds)
- Limited visibility (fog)
- Potential for electrical storms
- Earthquakes
- Other major incidents

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The PM will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

12.12 Spill Control and Response

Posillico Spill Prevention Plan (SPP) is attached to this document in Appendix C. Please note that the SPP was created to meet the requirements of the NYCDEP contract specification.

12.13 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained onsite with regularly scheduled inspections.

- Industrial first aid kit (2-24 piece kits at a minimum)
- · Portable eye washes
- Fire extinguishers
- Spill Kits
- Harness and lanyards
- Stretcher
- Direct reading instruments (DRI)
- Air Horn

12.14 Postings

The following information shall be posted or be readily visible and available at conspicuous locations throughout the site:

- Emergency telephone numbers
- Hospital Route Map

12.15 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers;
- Refilling medical supplies;
- Recharging eyewashes and/or showers
- Replenishing spill control supplies
- Replacing used air horns

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with New York City regulations all site workers will be required to have received the 10 hour OSHA Construction Occupational Health and Safety training course.

13.2 <u>Hazardous Waste Operations Training</u>

In accordance with 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the PM prior to the start of field activities.

13.3 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures.

13.4 <u>Supervisor Training</u>

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40 hours training.

13.5 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training (pre-work orientation) that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. Personnel that have not received site-specific training will not be allowed on-site.

13.6 Safety Disciplinary Policy

Posillico Civil believes that a safety and health Accident Prevention Program is unenforceable without some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be cognizant and aware of all company, State, and Federal safety and health regulations as they apply to the specific job duties required. The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be followed unless the seriousness of the violation would dictate going directly to Step 2 or Step 3.

- 1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible.
- 2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee's personnel folder.
- 3. A third time violation will result in time off or possible termination, depending on the seriousness of the violation.

13.7 Safety Meetings

For routine remediation tasks, a task-specific kick-off meeting to discuss safety issues will take place to review appropriate safety issues prior to starting fieldwork. This meeting will be held at an office location or occur in the field on the first day of work, depending on the complexity of issues to be discussed. Posillico will prepare and maintain documentation of these meetings.

Topics to be covered at these meetings will include:

- Safety plans and considerations for new job phases
- Results of safety inspections
- Review of accident history and the "Report of Accident/Incident" forms
- Any applicable safety training

Weekly toolbox safety talks, field inspections and periodic training will help to keep workers and supervisors continually to be aware of safe work practices, hazardous site conditions, and changes in site conditions that could alter or impact established work practices. Additional safety and planning meetings will be scheduled as needed to adequately address ongoing safety issues for the remediation of the site.

Listed below is an anticipated schedule of weekly toolbox talk topics:

Month 1

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Week 1	Job Orientation
Week 2	Drilling & Soil Testing
Week 3	Clearing & Grubbing
Week 4	Carpentry & small Tools
Month 2	
Week 5	Oxygen/ Acetylene Torches
Week 6	Sheet Piling Installation
Week 7	Heavy Construction
-	Equipment
Week 8	Rigging/ Steel Erection
Month 3	30 5
Week 9	HAZMAT Awareness
Week 10	Excavation
Week 11	Confined Space Permitted
	Entry
Week 12	Housekeeping
Month 4	
Week 13	HAZMAT Awareness
Week 14	Backfilling
Week 15	Electrical Work/ LOTO
Week 16	Housekeeping
Month 5	
Week 17	HAZMAT Awareness
Week 18	Rigging/ Steel Erection
Week 19	Oxygen/ Acetylene Torches
Week 20	Heavy Construction
	Equipment
Month 6	
Week 21	Sheet Piling Removal
Week 22	Safe Loading Practices
Week 23	Carpentry & small Tools
Week 24	Housekeeping
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13.8 First Aid and CPR

The PM will identify individuals requiring first aid and CPR training in order to ensure that emergency medical treatment is available during all work shifts. The training will be consistent with the requirements of the American Red Cross Association and will include training on blood borne pathogens.

13.9 Respirator Protection Training

In all areas of the site where respiratory protection is required, employees will be required to have completed annual respiratory use and care training. It is also necessary for the employee to meet the medical and fit testing requirements.

13.10 Emergency Evacuation Training

Emergency evacuation training is required for all employees on site in order to inform them of the site emergency evacuation procedure. Employees must know the two routes of egress as well as the designated assembly area.

13.11 Hazard Communication

Hazard communication training will be provided in accordance with the requirements contained in the Health and Safety Hazard Communication Program in Appendix C.

13.12 Confined Space Training

Posillico will provide training for all personnel whose duties involve entry, support or supervision for confined space entry.

14.0 QUALITY ASSURANCE (LOGS, REPORTS, AND RECORD KEEPING)

The following is a summary of required health and safety logs, reports, and record keeping. Posillico will maintain all copies of all required health and safety logs, reports and records on site during field activities.

14.1 Medical and Training Records

Copies or verification of training (40 hour, 8 hour, 10 hour, supervisor, and site-specific training) and medical clearance for hazardous waste site work and respirator use will be maintained by the SP or SR and copies provided to the PM prior to the initiation of work on-site.

14.2 On-Site Log

A log of personnel on-site each day including visitors will be kept by the PM in a logbook or as individual sheets maintained in a file.

14.3 Safety Inspection Logs

The SR and the SP will conduct safety inspections in order to maintain safe working conditions. The inspections will serve as a tool in identifying hazards and compliance issues that will be addressed. All deficiencies will be addressed and corrected by the field supervision.

Safety inspections will occur on the following schedule:

- Daily Inspections Preformed by the SR. Results will be recorded in the Daily Safety Form (Attached in Appendix U).
- Weekly Inspections Preformed by the SP. Formal inspection that will be recorded on the Weekly Safety Inspection Form (Attached in Appendix U).
- Monthly Report Prepared by the SP. A formal document that will be prepared by the 10th of each month and submitted to the NYCDEP for review (Attached in Appendix U).

14.4 Safety Equipment List and Log

A safety equipment list/log will be maintained on site by the SR and SP to ensure that adequate safety equipment is maintained on site at all times.

14.5 Exposure Records

All personal monitoring results, laboratory reports, calculations and air sampling data sheets will be maintained by the PM during site work. At the end of the project they may be maintained in employee files if deemed necessary by the SP.

14.6 Accident/Incident Reports and Investigation

The incident reporting and investigation during site work will follow the Incident Reporting Program in Appendix V. Accident investigations will determine the cause of an accident so that a similar accident will not occur in the future. Posillico will determine the nature of the accident, record the findings and correct the cause.

All accident reporting and investigation will be performed in compliance with contract specification section 01356 Item 2.2

14.7 Hazard Communication Program

Material Safety Data Sheets (MSDSs) and a list of hazardous chemicals will be obtained for applicable substances and included in separate binders located in the job trailer. The hazard communication program will be maintained on-site in accordance with 29 CFR 1910.1200 and the Hazard Communication Program in Appendix C.

14.8 Work Permits

All work permits, including confined space entry, hot work, lockout/tagout permits will be maintained in the project files. Copies of the work permits shall also be provided to the PM.

14.9 Quality Assurance Process

Posillico will maintain a Quality assurance program for the duration of the project in order to ensure that the above noted forms and controls are being properly implemented and utilized. The quality assurance process will include the following:

- Daily inspections will be performed by the SR. The results of the inspection will be documented on the daily inspection form attached in appendix U. Photographs should be attached as necessary;
- The SR or SP will discuss instances of non-compliance with the non-compliant party and the issue will be resolved within 24 hours;
- When the issue becomes resolved, proper documentation will be taken in order to prove that the issue has been closed out;
- The SP will review the daily inspection forms weekly and for accurateness and to
 ensure that the issues have been resolved and closed out properly. Additionally,
 the SP will review any related forms or permits (confined space, hot work, injury
 reports, MSDSs, chemical lists etc.) for accurateness. Delinquent items will be
 addressed as necessary;
- The SP will perform a weekly visual inspection of the site and including any areas/issues of non-compliance noted by the SR throughout the week;
- The SP will submit a monthly report to the NYCDEP including all daily, weekly, and monthly reports and appropriate backup documentation.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of this HASP for the Barretto Point Site located in Hunts Point, New York. It is maintained on-site by the PM as a project record. Each field team member shall sign this section after training in the contents of this HASP has been completed. Site workers must sign this form after site-specific training is completed and before being permitted to work on-site. See also (New Hire Orientation Checklist Appendix W)

I have read, or have been informed of, the Health and Safety Plan and understand the information presented. I have also completed site-specific training for the work detailed in the project Work Plan. I will comply with the provisions contained therein.

NAME (PRINT	(AND SIGN)		DATE
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APPENDIX A

CONTRACT SPECIFICATION

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APPENDIX B

SITE-SPECIFIC EMERGENCY INFORMATION

EMERGENCY INFORMATION

The appropriate telephone numbers are listed below for medical emergencies.

ANY SERIOUS EMERGENCY - DIAL 911

Nearest Hospital:

Bronx-Lebanon Hospital Center

853 Tiffany St Bronx, NY 10459

Hospital Main Telephone Number: (718) 590-1800

Directions to Hospital (road map with driving directions to hospital is on Figure 2)

1. Start at: Barretto St

- 2. Head north on Barretto St toward Viele Ave
- 3. Turn left at Viele Ave
- 4. Viele Ave turns right and becomes Tiffany St
- 5. Arrive at: 853 Tiffany St Bronx, NY 10459

Nearest Walk In Clinic:

First Med Immediate Medical Care

8217 Woodhaven Blvd Glendale, NY 11385

Directions to Walk In Clinic (road map with driving directions to hospital is on Figure 3)

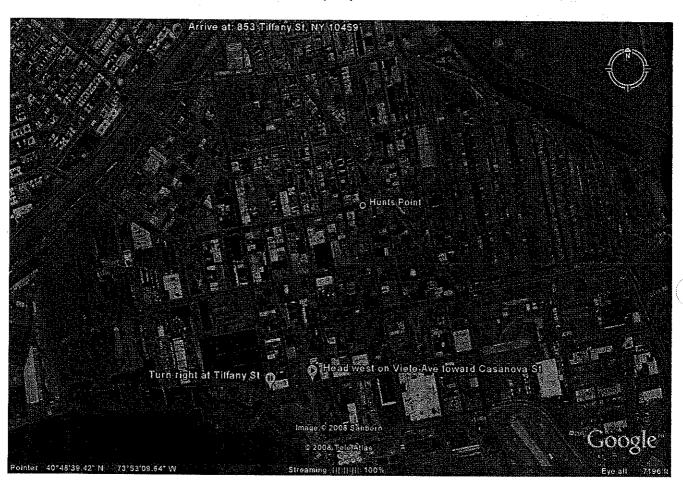
- 1. Head east on Viele Ave toward Manida St.
- 2. Turn left at Maida St.
- 3. Turn right at Lafayette Ave.
- 4. Turn left at Hunts Point Ave.
- 5. Turn right at Bruckner Blvd.
- 6. Merge onto Bruckner Expy/I-278 E via ramp on left.
- 7. Take the exit onto I-678 S toward Whitestone Bridge.
- 8. Take exit 7 for J Robinson Parkway.
- 9. Merge onto Jackie Robinson Pkwy W.
- 10. Take exit 4 toward Woodhaven Blvd/Myrtle Ave
- 11. Merge onto Forest Pkwy/Park Dr.
- 12. Turn Right at Myrtle Ave
- 13. Turn left at Woodhaven Blvd
- 14. Arrive at 8217 Woodhaven Blvd.

First Med Immediate Medical Care Telephone Number: (718) 805-9581

Other Emergency Numbers	
Police Emergency	011
Fire Emergency	911
Rescue Squad	911
NY Poison Control Center	911
	(212) 764-7667
NYSDEC Spill Hotline	(800) 457-7362
National Response Center and Terrorist Hotlin	
American Association of National Poison Cont	` '
Center for Disease Control	(800) 311-3435
Utility Mark-Out	(800) 272-1000
U.S. Coast Guard National Response Center	(800) 424-8802
Chemtrec (Chemical Spills)	(800) 424-9300
	연방이 그 불의 승규를 잃어보는데 다
<u>Utilities</u>	회관 시간 시간 가장 가장 가장 가장
Electric Consolidated Edison	Number: <u>(800) 752-6633</u>
Gas Consolidated Edison	Number: (800) 752-6633
Phone Verizon	Number: (718) 890-0910
Water NY DEP	Number: <u>311</u>
Other	Number:
[1] [1] [1] [1] [1] [1] [1] [1] [1] [1]	
Key Posillico Personnel (Name and Title)	Number:
Joseph Sheehan, Area Manager	(718) 353-9616
Dave Sposito, Project Manager	(516) 779-2437
Lee Kaplan, Senior Environmental Engineer	(718) 412-9670
Selso Salizar, Posillico Safety Director	(516) 315-3079
Key NYCDEP Personnel (Name and Title)	Number:
Wessam Fahmy, P.E. Resident Engineer	(917) 684-4177
Alkesh Patel, Construction Manager, DEP	(718) 629-5552
발발은 병역 기계의 사람이 작용하게 하는 지원들만 말했다고	

DRIVING DIRECTIONS FROM SITE TO Bronx-Lebanon Hospital Center

853 Tiffany St Bronx, NY 10459 Main Number: (718) 590-1800



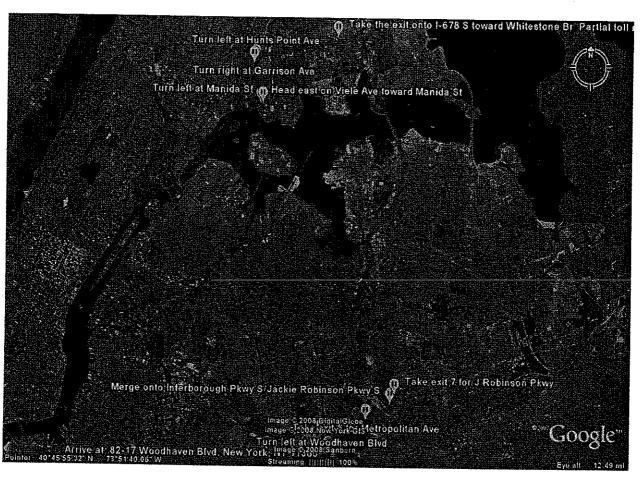
- 1. Start at: Barretto St
- 2. Head north on Barretto St toward Viele Ave
- 3. Turn left at Viele Ave
- 4. Viele Ave turns right and becomes Tiffany St
- 5. Arrive at: 853 Tiffany St Bronx, NY 10459

Total Est. Time: 5 minutes

Total Est. Distance: 1.0 miles

DRIVING DIRECTIONS FROM SITE TO First Med Immediate Medical Care

8217 Woodhaven Blvd Glendale, NY 11385 Main Number: (718) 805-9581



- 1. Head east on Viele Ave toward Manida St.
- 2. Turn left at Maida St.
- 3. Turn right at Lafayette Ave.
- 4. Turn left at Hunts Point Ave.
- 5. Turn right at Bruckner Blvd.
- 6. Merge onto Bruckner Expy/I-278 E via ramp on left.
- 7. Take the exit onto I-678 S toward Whitestone Bridge.
- 8. Take exit 7 for J Robinson Parkway.
- 9. Merge onto Jackie Robinson Pkwy W.
- 10. Take exit 4 toward Woodhaven Blvd/Myrtle Ave
- 11. Merge onto Forest Pkwy/Park Dr.
- 12. Turn Right at Myrtle Ave

13. Turn left at Woodhaven Blvd

14. Arrive at 8217 Woodhaven Blvd.

Total Est. Time: 30 minutes

Total Est. Distance: 16 miles

EVACUATION PROCEDURES FOR HUNTS POINT WATER POLLUTION CONTROL PLANT

INTRODUCTION

This procedure has been developed for use by DEP personnel and visitors at the Hunts Point facility in an emergency situation (for example, an uncontrollable FIRE or HAZARDOUS CHEMICAL RELEASE) when all personnel must evacuate the premises.

Refer to the Emergency Procedures Manual for other emergencies that do not require an evacuation.

Contractors working at the Hunts Point facility must have a written evacuation plan compatible with Hunts Point's. It must be submitted to DEP for review.

GENERAL GUIDELINES

1. The following signals will be used to alert all personnel to evacuate the facility.

IN THE PLANT: A verbal announcement will be heard by plant personnel. At the present time the plant does not have an emergency tone. Dewatering personnel will not hear the plant announcement.

IN DEWATERING: A verbal announcement will be heard by Dewatering personnel. The plant may not hear the emergency tone activated by Dewatering.

DEP personnel shall secure equipment (if it is safe to do so) before evacuating.

- 2. The Plant Shiff Engineer will function as the Emergency Response Director, with overall responsibility for the entire facility. Personnel working in Dewatering must report to the Dewatering Shift SSTW during off hours and the SSEE in charge of Dewatering during normal working hours. The supervisor in Dewatering will be responsible for personnel under his jurisdiction and will report directly to the Emergency Response Director (Plant Shift Engineer).
- 911 will be called by the Emergency Response Director for outside assistance as necessary (see pages 7 and 8).
- 4. All personnel will proceed immediately to the evacuation gathering point(s) designated by the announcement. There are two predetermined evacuation gathering points, E1 and E2. When both evacuation gathering points are being used, communication with the Emergency Response Director is especially critical.

- Refer to figure 1 to familiarize yourself with evacuation gathering points.
 - NOTE: DO NOT TAKE SHORT CUTS when evacuating the facility. Avoid the affected areas.
- 6. Head counts will be conducted at the evacuation gathering points. Report your presence immediately upon arrival and remain there until instructed to do otherwise.

DETAILED ASSIGNMENTS AND PROCEDURES

- 1. Upon notification of an emergency, the Emergency Response Director will determine whether a plant evacuation is necessary. The Emergency Response Director will wear a red hard hat labeled "Emergency Response Director" to help emergency response personnel identify him as the person in charge.
- 2. The Plant Shift Engineer will function as the Emergency Response Director. He is responsible for promptly notifying all city personnel, contractor personnel, and visitors in the Hunts Point facility that an immediate evacuation is necessary by making an announcement over the PA system. When necessary the Emergency Response Director will delegate specific tasks.
- 3. When an emergency occurs all lines of communications must be kept open in order for the full transmission of emergency announcements to be heard.
- 4. The following methods can be used to announce a plant evacuation:
 - A PA system.
 - B. Radios
 - C. Outside Phone line
 - A. Communication using the PA system:

Plant PA System

To use the Plant PA system to make an announcement that will be heard throughout the plant, press the page button on the following PA phones:

- All the phones located in the Plant Main Office (Temporary Trailers), 7:30 a.m. to 4:00 p.m.
- Shift Engineer's Control Room, located in Old Main Building, located by Blower #4 and #5

 All telephones located in the SEE and SSTW's Maintenance Office (Temporary Trailers by Aerator #5).

Dewatering PA system

To use the Dewatering PA system to make an announcement that will be heard throughout the Dewatering building, pick up the telephone (Femco) head set, depress the button on the head set and begin the announcement.

If the emergency occurred in the plant

The Emergency Response Director shall phone Dewatering supervisor to confirm that they have heard the announcement over the PA system. To inform Dewatering Watch personnel through the PA system, use any of the following numbers:

Dial 81 to reach the Dewatering Control Room Dial 84 to reach the second floor lunch room Dial 85 to reach the 3rd floor lunch room Dial 888 to reach the Dewatering General Office

If the emergency occurred in the Dewatering building

The Dewatering SSEE or SSTW shall phone the Emergency Response Director (Plant Shift Engineer) to confirm that he has heard the announcement over the PA system. To do this, use any of the following numbers:

Dial 15 to reach the main office, 8:00 a.m. to 4:00 p.m. Dial 69 to reach the Plant Shift Engineer's desk Dial 29 to reach the floor (Main sewage pump area) Dial 58 to reach the Senior Engineer's kitchen

 The Plant Shift Engineer's Control room is tocated by Blowers #4 and #5 in the old Main Building. During off-hours only the SSTW and Plant Shift Engineer can gain access to this room

B. Communication through the portable radios:

During off-peak hours plant watch personnel carry portable radios. During normal working hours (Monday through Friday, 7a.m.-3p.m.) watch personnel and

maintenance SSTW's carry portable radios.

When an emergency occurs, all lines of communication shall be kept open to insure the full transmission of announcements.

Plant and Dewatering personnel routinely use channel 5 to communicate within the plant facilities. If for any reason channel 5 is inoperative channel 4 is used as a backup.

Personnel with radios have the responsibility to notify others as they are evacuating the premises.

C. Communication using outside lines

Outside lines can be used to communicate with Dewatering personnel or the Plant Shift Engineer:

Plant outside lines

To reach the <u>Plant Shift Engineer</u> dial (718) 589-1120. This is a 24 hour line. During the day, if that number is busy call (718) 589-1145 (<u>days only</u>).

Dewatering outside lines

The Dewatering personnel, can be reached at the following locations:

- Dewatering Maintenance Office
- Kitchen
- Tool Room

Dial 718 842-8612

- The Emergency Response Director will alert all personnel (including contractors and visitors in the plant) to evacuate the premises. He will announce:
 - The evacuation gathering point(s) where all personnel are to meet. More than one
 evacuation gathering point may be used, depending on the location of incident and
 wind direction.

- Evacuation gathering point E1 is located outside the Construction Plant Gate (Old Main Plant gate) on Ryawa Avenue and Coster Street, Assembly will be across the street on the North West corner of Ryawa ave & Coster Street.
- Evacuation gathering point E2 is located outside the DEP Plant Main Gate (Dewatering Building's Main gate) on Ryawa Avenue and Halleck Street, just past the guardhouse. Personnel will gather by the east side walk of Halleck Street (Department of Correction's sign).
- The affected areas to avoid are _______ (Personnel shall avoid the affected areas completely if possible, even if it takes longer to get to the evacuation gathering point).
- The Emergency Response Director will repeat this message at least 3 times. The announcement will be made through the PA system and portable radios.
- Plant personnel will report to evacuation gathering point E1, dewatering personnel to evacuation gathering point E2, and wait there for instructions. Avoid areas that may potentially be dangerous; example substation.
- 8. Personnel shall notify others as they are leaving the facility. Stay out of tunnels, elevators and other enclosed areas. Walk quickly, do not run, do not drive out.
- The Emergency Response Director will direct the dewatering supervisor to evacuate the premises under his jurisdiction and account for his personnel.
- 10. The Emergency Response Director will communicate with outside authorities as the situation warrants. Refer to 911 procedures when calling for help.
- 11. The Emergency Response Director will designate and coordinate DEP supervisors to account for their personnel by conducting a head count at the evacuation gathering point(s).
- 12. Each designated supervisor is responsible for conducting a head count at the evacuation gathering point of all persons under his/her supervision, and will report directly to the Emergency Response Director. When possible, supervisors will use the sign-in sheet(s) to help account for personnel on site, including all support sections such as electricians, machinists, and instrument technicians.
- 13. The Emergency Response Director will refer to the Emergency Procedures Manual to determine if any additional calls must be made.

- 14. The Emergency Response Director will be contacted by the contractor's supervisors to notify him that their personnel have been accounted for.
- 15. If anyone is missing, the Emergency Response Director will notify responding agencies such as Fire Department, Police Department or EMS, and plant emergency response personnel.
 - NOTE: If hearing impaired personnel are in areas where strobe lights are not present, a searcher will be sent (if safe to do so) to instruct them to evacuate the plant,
- 16. CPR or first aid may be performed by Bureau personnel at their own discretion as a "Good Samaritan Act". Providing CPR or first aid is not mandatory or a job requirement for any Bureau of Wastewater Pollution Control employee.
- 17. The Emergency Response Director will assign two people (if possible) with radios to meet the emergency service(s) at each entrance of the plant or a safe distance.

SECURING PLANT EQUIPMENT:

The Emergency Response Director will identify equipment to be secured after personnel have been notified to evacuate the plant premises. If it is safe to do so, qualified personnel will be directed to secure this equipment. Refer to the <u>Emergency Procedures Manual</u> for details on electrical shut-down.

TESTING THE ALARM SYSTEM

Af present there is no emergency tone for Hunts Point. The dewatering emergency tone is not operating. When an alarm is installed the SSEE in charge of safety will be responsible for maintaining it.

<u>DRILLS</u>

Drills will be conducted bi-annually (twice a year). All DEP personnel, visitors and contractors shall participate in the drill. The SSEE in Charge of Safety will evaluate the effectiveness of the drill, make any necessary changes, and send a written evaluation of the drill to the Plant Chief, Division Chief, and Chief of the Safety and Health Section.

CALL 911 FOR EMERGENCIES REQUIRING EVACUATION OF THE HUNTS POINT FACILITY

- Use the phone located on the Shift Engineer's desk in the plant or the control room in Dewatering.
- Call 911
- Give your name
- Give the name and address of your location:
 DEP Hunts Point Water Pollution Control Plant
 Ryawa Avenue and Coster Street Bronx, N.Y. 10474

Cross-streets: To reach the Plant Main Building enter at Coster Street and Ryawa Avenue. To reach the Dewatering Building enter at Halleck Street and Ryawa Avenue.

- Give the phone number you are calling from.
- Describe the emergency (for example: fire, explosion, chemical spill).
 If there is a hazardous chemical involved make sure you specify the name of chemical, CAS number and (if known) amount spilled. If there is a confined space emergency, describe it to the 911 operator using the words "CONFINED SPACE EMERGENCY"
- Describe any known injuries. The 911 operator will ask the following questions:

Is the patient breathing?
Is the patient conscious (awake)?
Is the patient male or female?

How old is the patient? What is the chief complaint (what happened, why do you need help)?

The EMS operator will probably ask a few additional questions. He may also give you some instructions about how to care for the patient until help arrive.

DO NOT HANG-UP THE PHONE UNTIL THE OPERATOR DOES.

- Do not use the call-back phone until responding agencies arrive. They
 may need to call for additional information.
- Indicate if the emergency may effect the outside community.

KEY PERSONNEL

The Emergency Response Director will notify the following key personnel

Plant Superintendent or Assistants:

Harvey Nachson (Chief) In-house line dial 10 Outside line dial (718) 589-1145, 1120

Rodney Dietrich (Assistant Chief) Dewatering In-house line diat 80 Outside line diat (718) 589-1145, 1120

_(Assistant Chief) Maintenance,

In-house line dial 14 Outside line dial (718) 589-1145, 1120

During the day shift the Operations Engineer/Safety Officer will be responsible for notifying contractors working in Hunts Point.

Contractors

Picone McCulfagh JV (HP-1G)

Don Lund; Safety (718) 328-1100 ext. 17

Mike Soviero; Supervisor-Picone (718) 328-1100

Joe Sehested; Supervisor-McCullagh (718) 328-1100 ext. 11

John McCormick: Supervisor-Hamlet Electric (718) 328-1100

Conley Dickens, Supervisor-IAR (973) 600 -2228

Melvin Ramos; Supervisor-Fine Painting (516) 779-9601

Phil Vaizman; Supervisor-PLN TDB-(718) 328-1100 for now

Terraferma Electrical (HP-1E)

Kevin Horan, Safety (718) 620-4621

Pat Musitano, Alt. Safety/Supervisor (718) 620-4621

Crescent Contracting Corp. (HP-1H)

Tony Bonnano; Safety/Supervisor (718) 842-0309

Franco Belli (HP-1P)

George Murdock; Safety (718) 765-4976

Paul Gugliuzzo; Supervisor (516) 459-6479

H.P.-64 (CITY ENG.)

Resident of Engineers; Peter Marzziotti (718) 893-2710

The Contractor's list may change frequently and must be updated by the safety person.

To notify the Division Chief for this location, day or night:

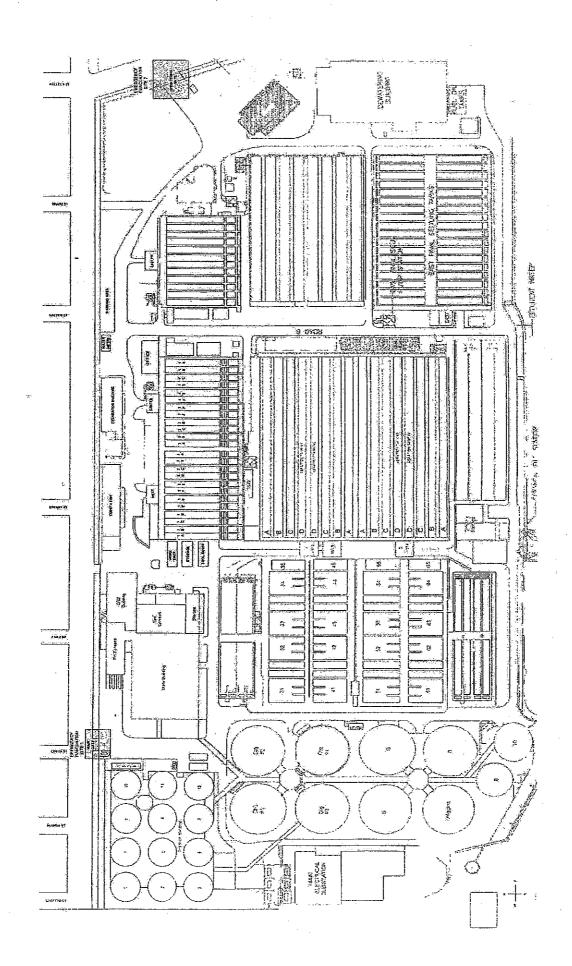
DAY

Mr. Paul Krasnoff, P.E. Chief, Division of North Operations (718):595-5136

NIGHTS/WEEKENDS/HOLIDAYS

Designated staff who are assigned to respond to off-hour emergencies are listed in the "Off-Hours Managerial Schedule." A copy of the current schedule shall be kept with this evacuation plan and updated whenever issued.

An additional list of key personnel and phone numbers can be found in the Emergency Procedures Manual.



DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF ENGINEERING DESIGN & CONSTRUCTION DIVISION OF HEAVY CONSTRUCTION WP-56-HUNTS POINT WPCP

Coster Street and Ryawa Avenue, Bronx, NY 10474

<u>Emergency Telephone Numbers</u> Contracts Phase I & Phase II Plant Upgrade

			en opgrade	
NYCDEP BWW		Business No.	Cell No.	Home No.
R. Durbin	Plant, Chief	718-589-1120	347-415-5454	<u> </u>
J. Weil	Deputy Chief	718-589-1120		
NYC BEDC	•			
M. Borsykowsky	Assistant Commissioner of Engineering	718-595-5921	646-784-0390	516-299-5202
D. Rizzo	Chief, Facilities Const. E	718-595-5984	347-461-7396	201-487-5263
A. Patel	Executive Project Manager	718-620-5552	347-585-5411	201-262-0096
J. Romano	Exe. Project Manager	718-595-6103	in in make with	74. rac 5500
H. Belovin	Director (EH&S)	718- 5 95-6003	917-513-7766	646-522-5927
A. Pecoraro	Safety Engineer	718-595-5607	646-784-3325	845-463-1633
URS Corporation	n (Const. Manager – Site T	railer)	2 % A : XXXA	0 1000
J. Devine	Construction Manager	718-620-5552	516-662-8389	516-798-6163
A. Bishop	Resident Engineer (16)	718-620-5552	347-537-9714	212-877-6784
S. Ali	Resident Engineer (2G)	718-620-5552	973-676-7879(H)	
J. Millers	Resident Engineer (1E)	718-620-5552	908-268-9223	732-469-1135
G. Nater	Resident Engineer (H, P)	718-620-5552	609-618-3046	973-942-7441
G. Gastiger	Resident Engineer (2E)	718-620-5552	860-303-1510	860-536-1241
Up do to	ta ima			· ·
J. Picone	Picone/McCullaugh JV President	e de Marie de Marie	End January 1	•
A. Maryin	* 1. (18-4-17/22/17/4-4)	516-293-1600	516-779-6596	•
N. Dewitte	Exec. Vice President	718-328-1100	516-779-5148	
R. Cacciola	Project Manager	718-328-1100	516-805-4001	732-607-0243
J. Sehested	Superintendent	718-328-1100	516-315-9477	
	Mech. Superintendent	718-328-1100	516-805-7817	* -
S. Spina	Terraferma Electric (Traile Principal		Part and Die	the second second
M. Montalbano	Sr. Project Manager	718-721-6008	914-843-3594	914-693-4470
P. Musitano	Superintendent	718-721-6008	Maria Hara Maria	718-948-4987
A. Spina	x 121	718-721-6008	917-681-4094	732-591-8929
HP-1H (HVAC) C	rescent Contracting (Traile	718-721-6008	646-261-3896	•
R. Rickman	Principal/Project Manager	718-220-4200		
B Rickman	Site Safety Officer	718-220-4200	017 047 4700	
C. Pica	Site Representive	718-220-4200	917-217-4709	
HP-1P (Plumbin	g) Franco Belli Plumbing	/ 10-220-4200	917-440-5491	
F. Belli	President	718-965-4976	917-217-0706	
P. Belli	Project Manager	718-965-4976	917-299-650	
G. Mc Dermott	Superintendent	718-965-4976	917-299-3929	
HP-2G (General)	Yonkers Contracting	. (4.556, 10.19	311-200-03 <u>25</u>	
W. Jordan	Project Executive	914-965-1500		
J. Merolla	Project Manager	718-620-8046	516-314-9462	516-931-8473
B. Szpynda	Civil Superintendent	718-620-8046	917-299-6366	914-248-4847
HP-2E (Electric)	Five Star Electric		2.17 222 5000	3:14-22-90-90-9
N. Hughes	Project Executive	718-641-5000	917-440-6300	
R. McCüsker	Project Manager Ext 451	718-641-5000	917-662-6084	
C. Cilenti	Gen. Superintendent	718-893-9213	347-865-5770	
2H (HVAC) WDF,				
C. Connor	Sr. Project Manager	914-776-8081	914-804-8811	
N. Marzigliano	Gen. Superintendent	914-776-8102	914-447-7605	
D. Communication) P.A.C. Plumbing			
P. Campione	Vice President	718-720-4980	917-720-9006	
Emergency Num	nerc			
Community Board		746 900 040F		44 · · · · · · · · · · · · · · · · · ·
Lincoln Hospital	91 &	718-328-9125		
Police Precinct # 4	à	718-579-5000	THE PERSON	
Fire Department	•	911	718-542-4771	
Hunts Point Field (Office	911		
Hunts Point Field (ver m	718-620-5552		
2	nan rasam it deficie	718-620-5555		

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APPENDIX C

HAZARD COMMUNICATION PROGRAM

POSILLICO HAZARD COMMUNICATION PROGRAM

1.0 INTRODUCTION

The intent of the Hazard Communication Program is to provide employees with information about the potential health hazards from exposure to workplace chemicals in accordance with the OSHA Hazard Communication Standard promulgated on August 24, 1987. In order to accomplish its goal of transmitting this information to its employees, a written hazard communication program specifying how this goal will be achieved has been formulated. This document represents Posillico's Hazard Communication Program (HCP).

Employee participation is the key ingredient to the HCP. It is extremely important that employees not only follow the procedures, but also understand the reasoning. The Hazard Communication Program is an integral part of Posillico's effort to provide its employees with a healthy and safe workplace.

Although most Posillico field projects do not involve the use of hazardous substances it is imperative that all hazardous materials be managed in accordance with this program. This applies to any usage of hazardous materials regardless of volume. Each Office must maintain a copy of this program and review it with affected employees.

1.1 Purpose

To make information available to employees concerning chemical hazards known to be present in the workplace (i.e., Posillico facilities or client locations) under normal conditions, or in a foreseeable emergency.

1.2 Scope

This Hazard Communication Program (HCP) applies to any chemical obtained in excess of retail amounts known to be present in the workplace that employees may be exposed to under normal conditions of use, or may be exposed to in a foreseeable emergency. The HCP describes procedures for: determining chemical hazards in Posillico operations; providing training on chemical hazards to employees; and transmitting chemical hazard information through proper labeling and Material Safety Data Sheets (MSDSs). A master compilation of MSDSs is maintained at the Posillico Headquarters and copies of applicable MSDSs are maintained at each office. Field staff are responsible for keeping MSDSs for work performed at each job site. A complete chemical inventory is included as Attachment C in this section. This inventory list is used to conduct annual inventory checks of Posillico's stored chemicals.

1.3 Responsibilities

The following individuals and groups are responsible for implementing the Hazard Communication Program (HCP).

1. Health and Safety Assessment Division

- a. Provide general training to all new and existing employees as appropriate under the HCP. This training will include hazardous material monitoring and recognition, emergency response and understanding labels.
- b. Maintain documentation for HCP training, inform division/section managers of annual training requirements.
- c. Periodically update and review Hazard Communication Program.
- d. Maintain file of current MSDSs and arrange for retention of all obsolete MSDSs.
- e. Review operations with division/section managers to determine what jobs require HCP training.
- f. Obtain all missing MSDSs.
- g. Audit job sites and work areas for compliance with the HCP.
- h. Annually audit chemical listing to ensure that the most current MSDSs are on file and maintain a complete chemical inventory of chemicals in use.
- i. Act as liaison to outside authorities responding to chemical emergencies or conducting inspections to verify compliance with the HCP.

2. Department/Section Manager

- a. Inventory and compile listing of chemicals used in Department/Section annually and each job site.
- b. Provide specific training as appropriate for Department/Section/Client location.
- c. Notify H&S Division of any changes in operations that could affect the way hazardous chemicals are handled.
- d. Identify all jobs requiring the use or handling of hazardous chemicals.
- e. Notify H&S Division of employees requiring hazard specific training.
- f. Notify H&S Division when new hazards are presented.
- g. Ensure proper labeling procedures and MSDS review is being followed.

Employee

a. Follow HCP procedures.

- b. Use PPE as instructed by training procedures.
- c. Inform division/section manager or H&S Division of:
 - Any symptoms of overexposure that may be related to handling hazardous chemicals.
 - Missing or inappropriate labels.
 - Missing or unavailable MSDSs.
 - Malfunctioning or unavailable safety equipment.
 - Read, understand and comply with information on labels and MSDSs.
 - Leave labels affixed to containers.
 - Use only approved containers for hazardous chemicals.
 - Know the location of emergency equipment on site and in the facility (if applicable).
 - Know your role in contingency plans.
 - Understand all changes in chemical handling and procedures.
 - Attend training sessions as scheduled.

4. Purchasing Department

- a. Request Material Safety Data Sheets (MSDS) from suppliers on each order of a chemical subject to this Program.
- b. Document the request for an MSDS on the purchase order.

1.4 <u>Training</u>

1. General Training: Training on this program will be part of Posillico's annual refresher training or supplied on an as-needed basis.

General training will consist of the following items:

- a. Requirement of OSHA HCS (29 CFR 1910.1200)
- b. Details of Posillico's HCP including:
 - Labeling
 - MSDSs
 - How employees can obtain and use appropriate hazard information.
- c. Detailed explanation on how to read and interpret an MSDS including:
 - Description
 - Sections
 - Explanations of each section
 - Usefulness of each section
 - Applicability of each section

2. Specific Training

- a. Listing of hazardous materials in each department/location/site.
- b. Location of MSDSs in each department/site.
- c. Written hazard evaluation procedures as referenced in Attachment A Posillico Hazardous Chemical Label.
- d. Methods and observations to detect hazardous materials in the workplace, including:
- Exposure monitoring
 - Continuous monitoring
 - Visual inspection
 - Odor
 - Other physical or unusual appearances
- e. Physical and health hazards of chemicals present in the workplace.
- f. Protection measures and procedures:
 - Appropriate work practices
 - Emergency procedures
 - PPE
- g. Field operations where hazardous chemicals are present.

1.4.1 Non-routine Tasks

Posillico typically uses low quantities of hazardous materials on job sites and in the laboratory. Posillico projects that involve large quantities of hazardous materials, extremely hazardous substances or exposure to a client's hazardous materials that are not on Posillico's inventory are to be reviewed on a case by case basis to determine the necessary training to safely work with these materials. Clients regulated under the Process Safety Management program require affected Posillico employees to attend the Client's site specific safety training program before being allowed access to the site. The Posillico Safety Department will provide training to employees when client training is not provided. All training will be documented and repeated as necessary. For example, Posillico does provide task specific training to DOT regulated employees for General Awareness, Shipping and Driving for workers involved in the shipping of hazardous materials and this training is provided every three years. Project Managers will notify the Safety Department when conducting non-routine tasks or when working with extremely hazardous substances in order to properly train employees before the project commences.

1.5 Training, Documentation

- 1. Record names of attendee(s).
- 2. Request that employees initial by their names.

- 3. Complete training documentation form.
- 4. Submit copies to H&S Coordinator for employee training file.

1.6 <u>Material Safety Data Sheets (MSDSS)</u>

1. MSDS Requirements

- a. An MSDS must be available for each hazardous material used in the workplace. A master compilation of MSDSs is maintained at the Posillico Headquarters and copies of applicable MSDSs are maintained at each site. Field staff is responsible for keeping MSDSs for work performed at each job site. Copies of
- MSDSs can be obtained by contacting the Safety Department. MSDSs for each office should be located near the area where hazardous materials are stored.
- b. The H&S Assessment Division will ensure that all MSDSs are complete, legible and in English. Employees that cannot read or understand English will be provided training as needed in a manner that the employee can understand.
- c. A file containing appropriate MSDSs for each Posillico facility will be readily available to all employees.
- d. A cover sheet will identify all MSDSs in the file Attachment B.
- e. The H&S Assessment Division will audit the file.
- f. The Facility Manager will keep a master list of chemicals by department and listed alphabetically, by division.
- g. The H&S Assessment Division will distribute, to each department, new or updated MSDSs as they become available and make changes in the master list.
- h. Old MSDSs will remain on file permanently.
- i. MSDSs must be capable of being cross-referenced to their container labels, where appropriate.
- j. Where a process or group of hazardous chemicals presents a health hazard greater than or not indicated by the individual MSDSs, written operating procedures will also be provided or readily accessible. Standard operating procedures by the manufacturer, job descriptions, etc. may be useful for this information.

2. Procedure for Obtaining MSDSs

a. The Purchasing Department will make an initial request for an MSDS from the manufacturer, either by phone, facsimile or mail. A copy of the request will be maintained with the name of the individual contacted and the date and included in the purchase order.

- b. Employees who are working at a manufacturing location should request a MSDS from the site contact for both raw materials and finished product.
- c. If MSDSs are not received within a reasonable time, approximately 30 days, the H&S Assessment Division or Facility Manager will send a second request to the manufacturer via certified mail, with a return receipt requested.
- d. If, after the second request, no MSDS is sent, the H&S Assessment Division will contact the appropriate local OSHA area office by telephone, informing them of Posillico's inability to obtain an MSDS from the manufacturer.
- e. The H&S Assessment Division will document the following information: date; name; title of OSHA contact; and, summary of conversation.
- f. A copy of this information will be placed in the master file with the H&S Division for a 30-day period.
- g. If the MSDS is not received or OSHA does not contact the H&S Assessment Division within 30 days, H&S Assessment Division will contact the local OSHA area office again.
- h. If the MSDS is not received within 60 days, the H&S Assessment Division will contact the regional OSHA office.

3. Labeling

- a. All manufacturers' labels will be left on containers.
- b. All container labels will be legible, prominently displayed, and in English as well as any other prevalent language. Posillico will provide interpretation to employees who do not read or understand English when necessary.
- c. Minimum label contents include chemical identity; appropriate hazard warnings; and the name and address of the manufacturer.
- d. All labels must contain the information described in Attachment A. Posillico has generated a label for use when portable containers are poured off from the original container to a compatible unlabeled container for field, laboratory or facility use. This label should also be used for samples and mixtures suspected of containing hazardous materials. The appropriate MSDS will be referenced in order to complete the "Hazard Warning" portion of the label and determine if the chemical is compatible with the container in which it is being stored.
- e. Posillico uses the International Air Transport Association/Department of Transportation Hazard Classification System for labeling hazardous material shipments by Posillico. Each office that ships hazardous materials must obtain appropriate labels for the shipment and transport of hazardous materials.

Copies of the labels for the nine classes of hazardous materials are included in Attachment A.

4. Outside Contractors

- a. Unless required by the nature of services to be provided, Posillico will attempt to restrict contractors from contact with hazardous chemicals on Posillico property or projects.
- b. The Office Manager will notify the H&S Coordinator of all outside contractors on Posillico property or subcontracted to perform on Posillico projects.
- c. The Project Manager will review the work and determine all hazardous chemicals to which the outside contractor's employees may be exposed.
- d. The Project Manager will provide to the contractor a list of hazardous chemicals to which their employees may be exposed, and copies of corresponding MSDSs.
- e. The Project Manager will inform the contractor of precautionary measures contained within the MSDS.
- f. The Project Manager will inform the contractor of the labeling system used in the location of the contractor's work.
- g. Records will be retained permanently with the H&S Coordinator.

5. References:

29 CFR 1910.1200, Hazard Communication.

OSHA Instruction CPL 2-2.38A, CH-1, July 18, 1986.

ACGIH, Threshold Limit Values and Biological Exposure Indices for 2004.

International Agency for Research on Cancer, *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, Supplement 7, pgs. 31-32, 41-46.

U.S. Department of Health and Human Services, <u>Fifth Annual</u> Report on Carcinogens, Public Health Service, National Toxicology Program, 1989.

Genium Publishing Corporation, MSDS Pocket Dictionary, August, 1988.

National Institute of Occupational Safety and Health, <u>Pocket Guide to Chemical Hazards</u>, June, 2002.

United States Department of Agriculture, <u>Hazard Communication: A Program Guide for Federal Agencies</u>; August, 1987.

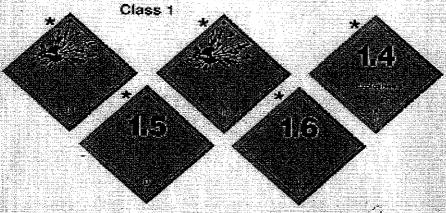
ATTACHMENT A

POSILLICO HAZARDOUS CHEMICAL LABEL

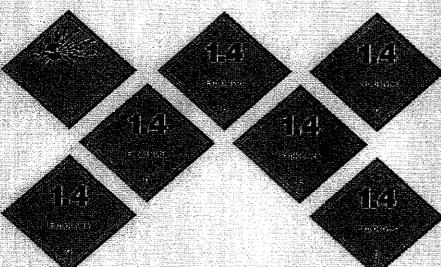
HAZARDOUS CHEMICAL	
IDENTITY:	
HAZARD WARNING:	
MANUFACTURER:	
ADDRESS: City	State
TELEPHONE:	

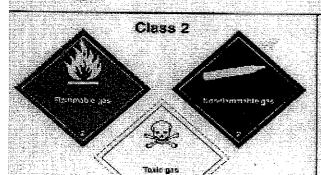


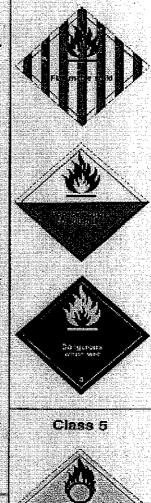




* Articles bearing the Explicated labels shown above end falling into Divisions 1:1, 1.2, 1.4F, 1.5 and 1.6 are normally forbilides.







Class 4



Class 3



Primary hazard labels (cont.) Class 6



RADIOACTIVE



Secondary hazard labels









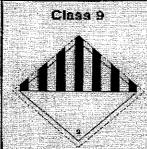














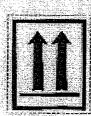


Handling labels











SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

DEVELOPED FOR THE

BARRETTO POINT REMEDIATION SITE

I. Purpose

Posillico Environmental recognizes the need to take proper measures to protect the environment. A Posillico project is a clean project in which the equipment is well serviced and maintained, supervisors are thoroughly trained and employees receive indoctrination and training on environmental protection. It is our goal to:

- A. Protect the environment on a daily basis through work site cleanliness, oil spill prevention and incorporating maintenance standards such that unattended equipment related spills are minimized.
- **B.** Develop a sense of environmental stewardship among the work force.

II. Scope

This plan will be in effect at the **Barretto Point** Project. This plan will also apply to the activities of any subcontractors and vendors who work on the site. The principle activity where this plan will be in effect is at the fuel storage area. Another area of concern is during the refueling process, which could take place at various locations on site.

III. General Information

- A. Name of Facility: Barretto Point Remediation Site
- **B.** Type of Facility: Vacant Land
- C. Location of Facility: Hunts Point, New York
- D. Name and Address of Owner/Operator: New York City Department of Environmental Protection
- E. Designated person accountable for oil spill prevention at facility:
 - 1. Project Manager: Dave Sposito
 - 2. Safety Professional: Lee Kaplan

IV. Facilities

- A. The petroleum products storage will be of an approved above-ground storage container.
- B. Drums will be compatible for the materials they hold. All tanks and containers within the storage area will be labeled as to contents. Appropriate warning signs, such as NO SMOKING OR OPEN FLAME, will also be posted. Fire control access will also be maintained on all sides of the storage area.

- C. Portable fire extinguishers will be displayed along the perimeter of the storage area. These extinguishers will be positioned so that the lateral distance from any point in the storage area is not closer than 25 feet but does not exceed 75 feet to an extinguisher. Vehicles delivering to, or loading from the storage area will be equipped with portable fire extinguishers.
- D. The diesel will be loaded and unloaded through a piping system. A positive connection, a cam lock or similar type, will be used for loading/unloading. The connection points for the piping system will be protected against damage caused by vehicles and equipment.
- E. The master flow and drain valves and any other valves that will permit outward flow of the tank's contents to the surface shall be securely locked in the closed position when in a non-operating or non-standby status. Fuel cutoff valves shall be checked for closure at the close of daily operation and during normal operations.
- F. Diesel fuel dispensing system will be powered by a combustible gasoline engine equipped with explosion proof spark plugs.
- G. All fuel dispensing nozzles shall be equipped with an automatic cutoff assembly to prevent inadvertent spillage. Each tank dispensing assembly shall be equipped with an anti-siphon device.

V. Procedures

- As for environmental impacts, our equipment maintenance programs will focus on three potential spill sources: fuel, oil and coolant.
 - 1) Prior to job site use, the equipment will be checked to eliminate such deficiencies as oil seepage at the hydraulic cylinders, pumps, engines, transmissions and hoses. Leaks will be evaluated as to cause rather than a quick fix, with dangers of a recurrence. Hoses will be evaluated as to deterioration and replaced as needed, (including seals).
 - 2) In addition to individual equipment operators conducting the 'Daily Safety Checklist,' maintenance and service personnel will visually inspect all working equipment daily. This effort is geared towards detecting certain conditions before they become problems.
 - 3) All drums and barrels brought into the site will be properly labeled. Visual checks will be made of drums to preclude receipt of a damaged, contaminated or leaking drum. Drums used for temporary storage of oily wastes will be correctly identified as to contents. Waste and rubbish of a non-oily nature will not be allowed in the petroleum storage area. All

waste materials shall be disposed of within one (1) year of the start of collection in any specific container.

D. Environmental infractions will be treated as any other job site infractions. They will be considered as serious as equipment abuse, unsafe practices, or other traditionally termination worthy offenses. Severity of the offense will determine the degree of disciplinary action. A primary goal will be to take necessary steps beforehand, such that predictable releases are contained.

VI. Spill Response

- A. Personnel, who cause, witness or discover a spill/release, will immediately report such to their supervisors.
 - 1) The name of the material spilled/released and its hazard rating.
 - 2) Date and time of spill/release discovery and its approximate duration.
 - 3) An estimate of the quantity released and the nature of the material it was released onto.
 - 4) Any anticipated health effects to involved employees or the public.
 - 5) Any necessary evacuation procedures.
 - 6) Contact information for the reporting person.
- **B.** In the initial assessment of a spill/release the primary goal is one of assessing the danger potential to personnel, safety is the starting point for any response. Isolating, securing, and stopping the point of discharge is the second priority. Containment is the third leg of the initial response effort.
- C. In the event of a spill/release, a variety of equipment and tools will be available to deal with the situation. If a spill were uncontained, earthmoving equipment would be used to contain and prevent further spread. This equipment includes dozers, motor patrols, backhoe/loaders and front-end loaders. Other tools available include shovels, absorbent pads and brooms. Any portion of a spill that is salvageable will be collected for use. Contaminated material will be stockpiled in a designate contaminated area.

- D. All spills/releases will be investigated for determination of cause. The primary goal of any investigation is to determine if any procedural changes are needed to prevent future spills/releases arising from the same or similar causes. The investigation will include information regarding:
 - 1) Chronological aspects of the incident.

· Andrew State (1984) · Andrew State (1984) · Andrew State (1984)

- 2) Names and positions of involved personnel.
- 3) Response measures (orders) and the issuing party(s).
- 4) Any exposure to general public and employees.
- 5) Types of soil, water or air samples taken and their results.
- 6) Any injuries or illnesses occurring during the response.

BULK CHEMICALS LIST

MATERIAL	VOLUME	CONTAINER TYPE	LOCATION
			·
	1		
£			

APPENDIX D

COLD STRESS PROGRAM

COLD STRESS PROGRAM

1.0 PURPOSE AND INTRODUCTION

The purpose of this document is to educate the employee about exposure to cold environments and the effects of hypothermia and other cold-related injuries. Through proper use of Personal Protective Equipment (PPE), engineering and administrative controls; and education, cold injury, both to the extremities and the body's core temperature, can be prevented.

1.1 Scope

This program is intended for use by employees engaged in work with the potential for exposure to cold environments. This program will be reviewed annually by the Health and Safety Division. Training will be provided annually to all those potentially affected, and will include this written program.

1.2 Working in Cold Environments

Metabolic Responses

The human body is designed to function best at a rectal temperature of 99-100F. The body maintains this temperature in two ways: by gaining heat from food and muscular work; or, by losing it through radiation and sweating. By constricting blood vessels of the skin and/or shivering, the body uses its first line of cold defense.

Temperature control of the body is better understood by dividing the body into two main parts: the shell; and, the core. The shell is comprised of the skin, capillaries, nerves, muscles and fat. Other internal organs such as the heart, lungs, brain and kidneys make up the core.

During exposure to cold, the skin is first affected. Blood in the peripheral capillaries is cooled, sending a signal to a portion of the brain called the hypothalamus. Regulating body temperature is one of the many basic body functions of the hypothalamus. Acting like a thermostat, adjustments are performed in order to maintain normal body temperatures. When a chill signal is received, two processes are begun by the hypothalamus: conserve heat already in the body; and, generate new heat.

Heat conservation is performed through constriction of the blood vessels in the skin (shell), thus reducing heat loss from the shell and acting as an insulator for the core. Sweat glands are also inhibited, thus preventing heat loss by evaporation.

Additional fuel for the body is provided in the form of glucose. Glucose causes the heart to beat faster, sending oxygen and glucose-rich blood to the tissue where needed. In an attempt to produce heat, the muscles rapidly contract. This process is better known as "shivering", and generates heat similarly to that created by strenuous activity, raising the body's metabolic rate.

During physical activity and fatigue, the body is more prone to heat loss. As exhaustion approaches, blood vessels can suddenly enlarge, resulting in rapid loss of heat. Exposure to extreme cold causes nerve pulses to be slowed, resulting in fumbling, sluggish and clumsy reactions.

1.3 Cold Injuries

Cold injuries are classified into two categories: local; or, general. Local injuries include frostbite, frostnip, chilblain and trenchfoot. General injuries include hypothermia and blood vessel abnormalities (genetically or chemically induced). Major factors contributing to cold injury are exposure to humidity and high winds; contact with wetness or metal; inadequate clothing; age; and, general health. Allergies, vascular disease, excessive smoking and/or drinking, and certain drugs and medicines are physical conditions that can compound the effects of exposure to a cold environment.

1. Hypothermia

Hypothermia is a condition of reduced body temperature. Most cases develop in air temperatures between 30-50°F, not taking windchill factor in consideration.

Symptoms of hypothermia are uncontrolled shivering and the sensation of cold. The heartbeat slows and sometimes becomes irregular, weakening the pulse and changing blood pressure. Changes in the body chemistry cause severe shaking or rigid muscles; vague or slow slurred speech; memory lapses; incoherence; and, drowsiness. Cool skin, slow irregular breathing, low blood pressure, apparent exhaustion, and fatigue after rest can be seen before complete collapse.

As the core temperature drops, the victim can become listless, confused, and make little or no effort to keep warm. Pain in the extremities can be the first warning of dangerous exposure to cold. Severe shivering must be taken as a sign of danger. At a core body temperature of about 85°F, serious problems develop due to significant drops in blood pressure, pulse rate and respiration. In some cases, the victim may die.

Sedative drugs and alcohol increase the risk of hypothermia. Sedative drugs interfere with the transmission of impulses to the brain. Alcohol dilates blood vessels near the skin's surface, increasing heat loss and lowering body temperature.

Table I, in Attachement A, provides information on the onset of hypothermia and metabolic responses at different body temperatures.

2. Raynaud's Phenomenon

Raynaud's Phenomenon is the abnormal constriction of the blood vessels of the fingers on exposure to cold temperatures, resulting in blanching of the ends of the fingers. Numbness, itching, tingling or a burning sensation may occur during related attacks. The disease is also associated with the use of vibrating hand tools in a condition sometimes called White Finger Disease. Persistent cold sensitivity, ulceration and amputations can occur in severe cases.

3. Acrocyanosis

Acrocyanosis is caused by exposure to the cold and reduces the level of hemoglobin in the blood, resulting in a slightly blue, purple or gray coloring of the hands and/or feet.

4. Thromboangitis Obliterans

Thromboangitis obliterans is clotting of the arteries due to inflammation and fibrosis of connective tissue surrounding medium-sized arteries and veins. This is one of the many

disabling diseases that can also result from tobacco use. Gangrene of the affected limb often requires amputation.

5. Frostbite

Frostbite is the freezing of the body tissues due to exposure to extremely low temperatures, resulting in damage to and loss of tissue. Frostbite occurs because of inadequate circulation and/or insulation, resulting in freezing of fluids around the cells of the body tissues. Most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes.

Frostbite can affect outer layers of skin or can include the tissues beneath. Damage can be serious, with permanent loss of movement in the affected parts, scarring, necrotic tissue, and amputation are all possibilities. Skin and nails that slough off can grow back.

The freezing point of the skin is about 30F. As wind velocity increases, heat loss is greater and frostbite will set in more rapidly.

There are three (3) degrees of frostbite: first degree, freezing without blistering and peeling; second degree, freezing with blistering and peeling; and, third degree, freezing with death of skin tissues and possibly the deeper tissues.

The following are symptoms of frostbite:

- a. Skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies;
- b. Pain may be felt at first, but subsides;
- c. Blisters may appear;
- d. Affected part is cold and numb.

The first symptom of frostbite is usually an uncomfortable sensation of coldness followed by numbness. Tingling, stinging, cramping and aching feelings will be experienced by the victim. Frostbite of the outer layer of the skin has a waxy or whitish look and is firm to the touch. Cases of deep frostbite cause severe injury. The tissues are cold, pale and solid. The victim is often unaware of the frostbite until someone else observes these symptoms. It is therefore important to use the "buddy system" when working in cold environments, so that any symptoms of overexposure can be noted.

Table II, in Attachement A, describes the cooling power of wind on exposed flesh. This information can be used as a guide for determining equivalent chill temperatures when the wind is present in cold environments.

6. Trench Foot and Chilblains

Trench foot is swelling of the foot caused by long, continuous exposure to cold without freezing, combined with persistent dampness or immersion in water. Edema (swelling), tingling, itching and severe pain occurs, followed by blistering, necrotic tissue and ulcerations. Chilblains have similar symptoms as trench foot, except that other areas of the body are affected.

7. Frostnip

Frostnip occurs when the face or extremities are exposed to a cold wind, causing the skin to turn white.

1.4 Prevention of Cold Stress

Cold Stress can be prevented through a combination of various factors: acclimation; water and salt displacement; medical screening, proper clothing selection; and, training and education. Through the use of engineering controls, work practices, work/rest schedules, environmental monitoring and consideration of the windchill temperature, the employee can be protected.

1. Acclimation

Acclimation can be achieved to some degree. Sufficient exposure to cold causes the body to undergo changes to increase comfort and reduce the risk of injury. But, these changes are minor and require repeated exposure to cold and uncomfortable temperatures to induce them.

2. Dehydration

The dryness of cold air causes the body to lose a significant amount of water through the skin and lungs. It is essential that caffeine-free, non-alcoholic beverages be available at the worksite for fluid replacement. Dehydration also increases the risk of injury due to cold and affects blood flow to the extremities.

3. Diet

A well-balanced diet is important for employees working in cold environments. Diets restricted only to certain foods may not provide the necessary elements for the body to withstand cold stress, leaving the worker vulnerable.

4. Control Measures

When the windchill factor results in an equivalent temperature of -26F, continuous exposure of the skin will not be permitted. Any worker exposed to temperatures of 36F or less who becomes immersed in water will be given dry clothing immediately and treated for hypothermia at the local hospital if any symptoms of hypothermia are present. Notification of this incident will be provided to the Health and Safety Division immediately after sending the worker to the hospital.

5. Engineering Controls

The following are some ways that environmental controls can be used to reduce the effects of a cold environment:

- a. General or spot heating should be used to increase temperature in certain areas in the workplace;
- b. Warm air jets, radiant heaters or contact warm plates can be used to warm the worker's hands if fine work is to be performed with bare hands for 10 to 20 minutes or more;

- c. Shield the work area if air velocity at the work site is increased by wind, draft or ventilating equipment;
- d. Metal handles of tools and control bars should be covered with thermal insulating material at temperatures below 30F;
- e. Unprotected metal chair seats will not be used in cold environments;
- f. When appropriate and feasible, equipment and processes will be substituted, isolated, relocated, or redesigned;
- g. Power tools, hoists, cranes or lifting aids will be used to reduce the metabolic workload;
- h. Heated warming shelters will be made available for continuous work being performed in an equivalent temperature of 20F or below. Workers will be encouraged to use the shelters regularly.
- 6. Administrative Work Practice Controls

Work practices and guidelines can be designed and developed to reduce exposure to cold stress. Some of these may include:

- a. Work-rest schedules to reduce the peak of cold stress;
- b. Enforce scheduled breaks;
- c. 'Enforce intake of caffeine-free, non-alcoholic beverages;
- d. Schedule work that has potential exposure to cold stress for the warmest part of the day;
- e. Move work to warmer areas, whenever possible;
- f. Assign extra workers for high-demand tasks;
- g. Provide relief workers for other workers needing breaks;
- h. Teach basic principles of recognizing and preventing cold stress;
- i. Use the buddy system for work at 10F or below, and keep within eyeshot;
- j. Allow new employees to adjust to the conditions before they work full-time in cold environments;
- k. Minimize sitting and standing in one place for long periods of time;
- 1. Include weight and bulkiness of clothing when estimating work performance requirements and weights to be lifted;

Table III, in Attachement A, provides a work/warm-up schedule for cold environments, with wind chill taken into account.

7. Special Considerations

Older workers and workers with circulatory problems should be extra careful in cold environments. Sufficient sleep and good nutrition are important preventive measures for maintenance tolerance to the cold. Double shifts and overtime work should be avoided when working in cold environments.

If any of the following symptoms are observed on site, the affected worker will immediately go to warm shelter:

- Onset of heavy shivering;
- Frostnip;
- Feeling of excessive fatigue;
- Drowsiness:
- Euphoria.

After entering the warm shelter, the outer layer of clothing should be removed. If the clothing is wet from sweat and perspiration, dry clothing should be provided. If this is not feasible, then the clothing should be loosened to allow sweat to evaporate.

Anyone working in cold environments and on prescribed medication should consult their physician concerning any possible side effects due to cold stress. Those individuals suffering from diseases and/or taking medication that interferes with normal body temperature regulation or reduces the tolerance to cold will not be allowed to work in temperatures of 30F or below.

1.5 <u>Personal Protective Equipment (PPE)</u>

In choosing PPE for cold environments, it is important to maintain airspace between the body and outer layer of clothing to retain body heat. The more air pockets, the better the insulation. The clothing should also allow for the evaporation of sweat if the skin is wet.

The most important parts of the body to protect are the feet, hands, head and face. Hands and feet become cooled most easily, because of their distance from the heart. Keeping the head covered is equally important. As much as 40% of body heat loss is through the head when it is exposed.

Ideal clothing for exposure to cold environments is made of cotton. Cotton picks up sweat off the body and brings it to the surface. Loosely fitted clothing also aids in sweat evaporation. Recommended clothing may include the following:

- a. Polypropylene under shirt and shorts under thermal underwear (preferably two-piece);
- b. Wool socks;
- c. Wool or thermal pants, lapped over boot tops to keep out snow and water;
- d. Suspenders (belts can constrict and reduce circulation);
- e. Insulated work boots, preferably waterproof. Safety toe, if necessary;
- f. Wool or cotton shirt;
- g. Parka;
- h. Knit cap/hard hat liner;
- i. Wool mittens or gloves (depending on the dexterity required);
- j. Face mask or scarf.

Dirty or greasy clothing loses much of its insulation value. Dirty clothing crushes air pockets, allowing air to escape more easily. Also, denim is not a good protective fabric. It is loosely woven and allows water to penetrate and wind to blow away body heat.

ATTACHMENT A

COLD STRESS GUIDANCE TABLES

TABLE I Progressive Clinical Presentation of Hypothermia*

Co	re		**
Tempe	rature		
_	Deg. F	Clinical Signs	
-	· ···· _		
37.6	99.6	"Normal" rectal temperature.	11
37	98.6	"Normal" oral temperature.	
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss.	
35	95.0	Maximum shivering.	
34	93.2	Victim conscious and responsive, with normal blood pressure.	200
33	91.4	Severe hypothermia below this temperature.	
32	89.6	Consciousness clouded; blood pressure becomes difficult to obtain;	
31	87.8	pupils dilated but react to light; shivering ceases.	• • .
30	86.0	Progressive loss of consciousness; muscular rigidity increases;	
29	84.2	pulse and blood pressure difficult to obtain; respiratory rate decreases.	
28	82.4	Ventricular fibrillation possible with myocardial irritability.	
27	80.6	Voluntary motion ceases; pupils non-reactive to light; deep tendon and	1
		superficial reflexes absent.	
26	78.8	Victim seldom conscious.	
25	77.0	Ventricular fibrillation may occur spontaneously.	4
24	75.2	Pulmonary edema.	
22	71.6	Maximum risk of ventricular fibrillation.	**************************************
20	68.0	Cardiac standstill.	
18	64.4	Lowest accidental hypothermia victim to recover.	:
17	62.6	Isoelectric electroencephalogram.	
9	48.2	Lowest artificially cooled hypothermia patient to recover.	1000
-			¥*

^{*} Presentations approximately related to core temperature. Reprinted from the January 1982 issue of <u>American Family Physician</u>, published by the American Academy of Family Physicians.

TABLE II
Cooling Power of Wind on Exposed Flesh as Equivalent Temperature (under calm conditions)*

		Actu	ıal Ten	perat	ure Re	ading	(Degre	es Fah	renhei	t)		
Estimated Wind Speed (mph)								:				
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
		Equi	ivalent	Chill '	Гетре	rature	(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	16	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	-148
(Wind speeds greater than 40 mph have little	In < Maxi	hr wit mum sense o	NGER th dry danger f securi	skin. of	DAN Dang freezi expos	er ng ed	from of flesh		may	NGER freeze	e with	in 30
additional effect).					within minut		one				-	
Trenchfoot and immersion foot may occur at any point on this chart.												

^{*} Developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA

Note #1: Wind speeds greater than 40 mph have little additional effect.

Note #2: Trenchfoot and immersion foot may occur at any point on this chart

TABLE III
Threshold Limit Values Work/Warm-up Schedule for 4 Hour Shift (*)

Air TempS	r TempSunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	
-26° to -28°	-15° to -19°	(Norm. Br	eaks) 1	(Norm.Bre	aks) l	75 min.	2	55 min.	3	40 min.	4	
-29° to -31°	-20° to -24°	(Norm. Br	eaks) 1	75 min	2	55 min.	3	40 min.	4	30 min.	5	
-32° to -34°	-25° to -29°	75 min	2	55 min.	3	40 min.	4	30 min.	5	Non-emerg		
-35° to -37°	-30° to -34° _	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease				
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emerg						
-40° to -42°	-40° to -44°	30 min.	5	Non-emerg								
-43° & below	-45° & below	Non-emerg work shou										

Notes for TABLE III:

- 1. Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For light to moderate work (limited physical motion), apply the schedule one step lower. For example, at -30F with no noticeable wind (step 4, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4 hour period.
- 2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph, light flag moves; 10 mph, light flag fully extended; 15 mph, raises newspaper sheet; 20 mph, blowing drifting snow.
- 3. If only the windchill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a windchill cooling rate of about 17 W/m2; 2) all non-emergency work should have ceased at or before a windchill of 2250 W/m2. In general the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges, since windy conditions prevail at extremely low temperatures.
- 4. TLVs apply only for workers in dry clothing.
 - * Adapted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

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APPENDIX E

HEAT STRESS PROGRAM

Heat Stress - How do you prevent heat illness?

- Supply adequate water and encourage workers who work in hot weather to drink regularly, even when not thirsty. A small amount of water every 15 minutes is recommended rather that a large amount after hours of sweating.
- · Learn the signs and symptoms of heat-related illness.
- Inform workers they should avoid alcohol or drinks with caffeine before or during work in hot weather.
- Try to do the heaviest work during the cooler parts of the day.
- Adjusting to work in heat takes time. Allow workers to acclimatize. Start slower and work up to your normal pace.
- Wear lightweight, loose-fitting, light-colored, breathable (e.g. cotton) clothing and a hat.
- Allow workers to take regular breaks from the sun. Loosen or remove clothing that restricts cooling.
- Watch workers for symptoms of heat-related illness. This is especially important for non-acclimatized workers, those returning from vacations and for all workers during heat-wave events.
- If exertion causes someone's heart to pound or makes them gasp for breath, become lightheaded, confused, weak or faint, they should STOP all activity and get into a cool area or at least into the shade, and rest.

The two major heat-related illnesses are heat exhaustion and heat stroke. Heat exhaustion, if untreated, may progress to deadly heat stroke. Heat stroke is very dangerous and frequently can be fatal. If workers show symptoms, always take this seriously and have them take a break and cool down before returning to work. Stay with them. If symptoms worsen or the worker does not recover within about 15 minutes, call 911 and have them transported and medically evaluated. Do not delay transport.

Heat Stroke or Heat Exhaustion? How do you tell the difference?

The telling difference is mental confusion or disorientation in ALL heat stroke victims You can ask these 3 questions: What is your name? What day is this? Where are we?

If a worker can't answer these questions, assume it is heat stroke.

What are the symptoms of heat exhaustion and heat stroke?

Heat Exhaustion	Heat Stroke
	the state of the s
 Heavy sweating 	 Sweating may or may not be present
 Exhaustion, weakness 	• Red or flushed, hot dry skin
• Fainting / Lightheadedness	 Any symptom of heat exhaustion but more severe
• Paleness	Confusion / Bizarre behavior
Headache	Convulsions before or during cooling
 Clumsiness, dizziness 	• Collapse
 Nausea or vomiting 	Panting/rapid breathing
• Irritability	• Rapid, weak pulse
	Note: May resemble a heart attack

What do you do if someone is suffering from heat exhaustion or heat stroke?

Heat Exhaustion	Heat Stroke (medical emergency)
 Move the worker to a cool, shaded area to rest; do not leave them alone. Loosen and remove heavy clothing that restricts evaporative cooling. Give cool water to drink, about a cup every 15 minutes. Fan the worker, spray with cool water, or apply a wet cloth to their 	 Get medical help immediately, call 911 and transport as soon as possible. Move the worker to a cool, shaded area and remove clothing that restricts cooling. Seconds count — Cool the worker rapidly using whatever methods you can. For example, immerse the worker in a tub of cool water; place the worker in a cool shower; spray the worker with cool water from a garden hose; sponge the worker with cool water; or, if the humidity is low, wrap the worker in a cool, wet sheet and fan them vigorously. Continue cooling until medical help arrives. If emergency medical personnel are delayed, call the hospital emergency room for further instruction. Do not give the worker water to drink until instructed by medical personnel.
wet cloth to their skin to increase evaporative cooling.	
• Recovery should be	

rapid. Call 911 if
they do not feel
better in a few
minutes.

• Do not further expose the
worker to heat that day. Have
them rest and continue to
drink cool water or
electrolyte drinks.

Heat Stress Check List

- Does the worksite have temperature extremes (above 85 degrees in higher humidity, above 90-95 degrees in lower humidity) that may cause heat stress?
- Do employees do heavy labor or wear heavy protective clothing? (increases heat stress conditions)
- Do employees have access to adequate drinking water at all times?
- Are employees allowed work breaks during prolonged heavy labor?
- Do workers have access to shade during breaks?
- Have employees been trained on the symptoms of heat-related illness (heat exhaustion and heat stroke)?
- Are employees trained on first aid measures for heat-related illness?

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APPENDIX F

HEARING CONSERVATION PROGRAM

Hearing Conservation Program

Purpose:

The purpose of the Hearing Conservation Program is to ensure that all employees are protected from exposure to noise hazards. Employers whose workers are exposed to high noise levels must have an active program for protecting their employees'hearing.

Procedure:

An effective hearing conservation program should first assess company wide noise exposures in order to identify any employee or group of employees exposed to noise. Noise is measured with a sound level meter or noise dosimeters, which measure average noise levels over time. Employees who are exposed to noise at or above an eight-hour time-weighted average of 85 dB (decibels) must be covered under a Hearing Conservation Program. For these employees, the employer must develop, implement, and maintain (at no cost to the employees) a program consisting of:

- 1. Mhdatory audiometric testing
- 2. Wring hearing protectors av ailable and ensuring their use.
- 3. Comprehensive training explaining hearing loss, hearing protective devices, and the employers hearing conservation program.
- 4. Wining signs for high noise areas (115 dBA or higher).
- 5. Keeping accurate records.
- 6. Ensuring employee access to their records.

Additionally, the employer must post a copy of the hearing conservation standard or post a notice to affected employees or their representatives that a copy of the standard is available at the workplace for their review.

Noise Exposure Program

Purpose

The purpose of this program is to establish a noise exposure program to prevent any temporary or permanent noise-induced hearing loss to our employees. Although the easiest way to prevent hearing loss is to provide hearing protection, we must examine the feasibility of engineering controls to reduce noise levels and administrative/work practice controls to reduce the time of exposure to noise by our employees. The use of hearing protection must only be implemented after all other controls have been ruled out to reduce noise levels.

Applicable Regulations OSHA 29 CFR 1926.52 OSHA 29 CFR 1910.95

Responsibilities

Project Management shall:

- Evaluate operations, equipment and tools for the presence of hazardous noise levels; when conditions warrant, monitor and identify workplace noise levels to determine which employees in specific areas have exposure to noise;
- Mitor noise levels in the course of day-to-day work, and when there is a change in production, equipment or controls to existing activities;
- Provide effective hearing protection, at no cost to employees, when monitored noise levels demonstrate their need:
- Train employees in topics identified in this program, and
- Enforce the rules of this program.

Safety Director shall:

Evaluate operations and noise monitoring compliance by Project Magement.

Employees shall:

- War hearing protection when deemed nec essary or appropriate by their supervisors; and
- be engineering and administrative contro Is as directed in construction plan(s).

Procedure

General

- Projects will monitor and identify workplace noise levels using a properly calibrated sound level meter in the course of day-to-day work, and whenever there is a change in production processes, equipment, or controls;
- The goal of monitoring noise levels is to determine if employees in specific areas have exposure to noise;
- Employees will wear hearing protection until noise monitoring demonstrates that there is no exposure;
- All employees exposed to sound levels greater than 85dBA shall use mandatory hearing protection complying with ANSIS3.19;
- Controlling noise at the source utilizing engineering controls must be considered first before any other tactics are implemented;

- Effective Wining Signs will be posted in conspicuous locations at worksites near the high noise level areas to ensure that hearing protection is worn when required; and
- Men the following tasks are being per formed, hearing protection is mandatory:
 - Pile driving;
 - ack hammering;
 - Chipping concrete or steel with power tools;
 - Operating gasoline chain or cut-off saws;
 - ARC gouging;and
 - Hoe Ram Operator.

Permissible Noise Exposure

Duration per Day (Hours)	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
.5	110
25 or less	115

Hearing Protection

- The project will order and provide a variety of adequate hearing protection for employees. All employees subject to work in those areas must be provided with appropriate hearing protection devices from among the types listed in the table below;
- Employees are required to wear company-provided hearing protection and at no time may an employee tamper with or modify any hearing protection equipment; and
- Damaged or defective equipment must be discarded and replaced immediately. Appropriate Hearing Protection Devices

Type	Advantages	Disadvantages
Ear Mffs	 One size fits most adults. Can easily be seen at a distance. Can be put on, adjusted, etc. while wearing gloves. Can be warming to the ears in cold environments. Better impact noise attenuation. Can be used in conjunction with earplugs. 	 Typically have a lower noise reduction rating than earplugs, but still can provide limited effective protection. They are bulky and cannot fit in pockets or stored in tool kits. My interfere with and not sit properly when glasses, hearing aids, etc. are worn. Because of their size, may not be suitable for

		the work quarters. Excessive heat and sweat accumulation may make them uncomfortable to wear in hot locations. Are more difficult to clean than earplugs.
Ear Plus (2 types) Pre-formed Expandable	 Have highest noise reduction rating and are very effective in protection your hearing when properly worn. Do not interfere with work in close quarters. Are easily carried and stored when not in use. Compatible with glasses or any other type of headgear without affecting performance. Disposable. 	 Fitting can be complicated. Ear canals vary in diameter and the left and right ear canals are not necessarily similar in size, shape or position. Can be easily left in other work clothes or fall out of the jacket or shift pocket and become lost. Cannot be seen at a distance that makes it difficult to evaluate if person is wearing them. Gloves must be removed and hands washing prior to putting in earplugs.

Training

General

- Training will be conducted for all employees during New Hire Orientation;
- Training will be conducted on an annual basis through means such as toolbox talks;and
- Retraining will be conducted when there are changes in the program, equipment, process, etc.

Topics

- Effects of noise on hearing, the human body's reaction to excessive noise is "hearing loss".
- The purpose of hearing protectors;
- The advantages, disadvantages, protection levels, various types of hearing protection;
- The proper use, care, cleaning and fitting of hearing protection;
- The purpose of audiometric testing; and
- The details of this program.

Retraining

- Retraining will be conducted at least on an annual basis, or sooner if required; and
- hformation provided on the retraining program will be updated to be consistent with changes in work processes and/or protective equipment.

Record keeping

General

- The project will maintain accurate records for all noise level surveys and employees exposures;
- Records of noise monitoring will be provided to employees, or designated representatives thereof, upon written request to the project.

APPENDIX G

HAND AND POWER TOOLS

1. Hand and Power Tools

1.1 Purpose

The purpose of this program is to establish safe work practices for the use of hand and power tools. Because we are reliant so heavily on this type of equipment and use it frequently, hand and power tools are the direct source of many injuries on our projects.

We must ensure our tools are used correctly, properly maintained and removed from service when no longer suitable for use.

Above all, only qualified and trained personnel will be permitted to use these tools.

1.2 Applicable Regulations

OSHA 29 CFR 1926.300

1.3 Responsibilities

1.3.1 Project Management shall:

- Purchase all hand and power tools according to company program specific to brand and model;
- Ensure that all tools requiring guards are equipped as such before they are put into service on the job; and
- Develop a procedure for the distribution of abrasive wheels for cutoff and chop saws.

1.3.2 Employees shall:

- Not remove any guard on a hand or power tool;
- Inspect hand and power tools prior to use to ensure safe operating condition; and
- Tag out, and report any damaged or defective tools to their foremen.

1.4 Procedural Overview

1.4.1 General Requirements

- Maintain all hand and power tools and similar equipment in a safe condition;
- When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use. Should the guard obstruct the work, it will not be removed:
- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard:
- Impact tools, such as drift pins, wedges and chisels, shall be kept free of mushroomed head; and

 The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

1.4.2 Power-Operated Hand Tools

- Electric power operated tools shall either be the approved double-insulated type or effectively grounded;
- Do not use a power tool with broken or defective insulation on the cord, broken or defective plugs, or loose or broken switches;
- The use of electric cords for hoisting or lowering tools is not permitted; and
- If the tool is provided with a side-mounted handle, it must remain on the tool to prevent wrist injuries should the tool bind during operation.
- Trigger locks must be removed from grinders or made inoperable by a qualified person

1.5 Powder Actuated Tools

1.5.1 Loading

- Tools shall not be loaded until just prior to the intended firing time; and
- The tool shall be tested each day before loading to see that the safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.

1.5.2 Use

- Use the lowest velocity on the tool until sufficient penetration is found;
- Any tool found not in proper working order, or that develops a defect during use, will be immediately removed from service, tagged out and not used until properly repaired;
- Neither loaded nor empty tools are to be pointed at any employees;
- Keep hands clear of the open barrel end:
- Do not leave loaded tools unattended:
- Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile;
- Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side;
- No fastener shall be driven into a spalled area caused by a prior unsatisfactory fastening;
- Tools shall not be used in an explosive or flammable atmosphere; and
- All tools shall be used with the correct shield, guard, or attachment recommended or supplied by the manufacturer.

1.5.3 Charge Storage

Live loads/cartridges must be stored in an approved, locked storage cabinet to meet applicable OSHA regulations. Pick up and dispose of unfired shots, do not throw explosive charges into trash containers or leave them lying around. Return them to your supervisor.

1.5.4 PPE

Personal protective equipment, including eye, ear, head, and hand protection is to be worn by all tool operators.

1.5.5 Training

Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool. Users shall possess a qualified operator's card that is issued by the manufacturer's representative.

1.6 Air Powered Tools

1.6.1 Hoses

- Air hoses will be inspected prior to use looking for bends, kinks, or swelled areas.
 Hoses that are not in good condition shall be removed from service. DUCT
 TAPE IS NOT TO BE USED FOR REPAIRS;
- Hoses used under compressed air conditions must be a reinforced wire braided type. Hoses used for water service may be standard airline hose;
- Hoses will not be placed in access ways or across ladder passage. Where this is unavoidable, lines should be blocked over, or at least flagged;
- Whip checks will be used on all airlines and tools to prevent against the hazards
 when uncoupling occurs. Whip checks shall be positioned on the hose rather than
 the fitting if the hose should break, the fitting may stay connected while the hose
 will whip around; and
- All air hose clamps must be crimped into place. Do not use worn gear clamps to attach couplings and fittings to air hoses.
- Chicago or Air King type pneumatic fittings must be pinned.

1.6.2 Use

- Air powered tools should be oiled via in-line air oil;
- Air powered tools and compressed air create certain health hazards where fine
 particles of dust, or chemicals are blown into the air. This air contamination
 should be eliminated by wetting agents, or exhaust ventilation;
- Loose clothing, which can get caught in the moving parts of equipment, should not be worn while working with rotary tools;
- Compressed air should not be used to clean off clothing. Air pressure against the skin can penetrate causing internal hemorrhaging and intense pain. Air that enters body openings can burst internal organs and lead to death;

- When air powered tools create hazards to others, warning signs or placards shall be posted detailing the type of hazard(s) and direction for protection; and
- Airlines must be turned off and bled of pressure before connecting/disconnecting an air tool, unless the connector is specifically designed for connection/disconnection under pressure.

1.6.3 PPE

- When silica or lead exposures are present when using air powered tools, use appropriate respiratory protection;
- Demolition operations may require steel-toed boots and/or metatarsal protection;
 and
- When performing any operation with an air powered tool that produces high vibration levels, carpal tunnel gloves should be used.

1.7 Abrasive Tools

1.7.1 Bench Grinders

- Grinders shall be labeled with maximum operation R.P.M.;
- Adjustable work rests shall be provided and kept at a distance not to exceed 1/8-inch from the surface of the wheel;
- Objects that may kick back must be braced using a clamp or any device that securely holds objects prior to cutting;
- Face shields shall be worn while using a bench grinder.

1.7.2 Hand-held Grinders

- Guards shall remain in place at all time, or the grinder is not to be used;
- Trigger locks must be removed from grinders or made inoperable by a qualified person. A positive pressure switch shall be used;
- Many grinders are supplied with handles designed to protect against wrist injuries, as well as support the tool. They shall not be removed, regardless if they interfere with the operation. A substitute tool should be considered;
- Arbor on the grinding wheel must be the exact same size as the arbor shaft on the grinder;
- Grinders shall be labeled with maximum R.P.M.;
- Only abrasive wheels, which are compatible with the rated RPM, will be used;
- A face shield must be used when using grinder plus safety glasses; and
- When grinders with blades 7' or bigger are used, chaps will be required at the discretion of the Project Management.

1.7.3 Abrasive Blades/Wheels

- Only approved blades will be used;
- Suitable Abrasive blades shall be used only on designated materials;
- Only a qualified person shall mount blades per manufacturer's instructions;
- Blades should be stored in a climate-controlled area (avoid freezing, extreme heat, or wet conditions);
- Use blades only on designated tool (i.e., do not use chop saw blades on a cut-off saw);
- Discard all abrasive blades with illegible/unreadable labels;
- Fully inspect all blades prior to use;
- The arbor hole should match the arbor of the tool, use only manufactured arbor adapters;
- The RPM of the wheel shall equal or exceed the RPM of the tool;
- Blades will be removed from the tool whenever, the tool is transported by vehicle, the tool is being stored, and the condition of the blade is suspect;
- Allow newly mounted wheels to run at full RPM for at least 1-minute prior to use;
 and
- Using the side of the "cutting" blade as a grinder is strictly prohibited.

1.8 Chainsaws

1.8.1 Equipment

- When purchasing chain saws, always buy those with anti-kickback chains. Regular chains should be disposed of and replaced with anti-kickback chains. Anti-kickback chains are designed to skim the surface of the work in the event that the upper part of the chain comes into contact with the work. Older chains have a flat link between each of the raised cutters while newer chains have either a triple thick raker in front of each cutter or an extra raised section between cutters.
- All chainsaws shall be equipped with a momentary finger contact or constant pressure "on/off" control switch that will shut off power when the pressure is released;
- Chain rotation will stop when saw is in idle;
- All saws must have spark-arresting mufflers; and
- Electric chain saws shall be approved, double insulated, or effectively grounded.

1.8.2 Inspection and Service

Equipment will be inspected before use for defects and broken or worn chains.
 Any chain saw that is broken or defective must be taken out of service, tagged and repaired immediately or removed from the job;

- Chains shall be kept sharp, well lubricated and properly tensioned at all times.
 The chain needs sharpening when it must be pushed through to cut or when it throws sawdust rather than wood chips;
- Chain saws shall be inspected before each day's use and during each refueling.
 Saws that are not in safe operating condition will not be used; and
- If electric chainsaws are used, disconnect the power source from the chain saw before making any adjustments or repairs.

1.8.3 Use

- Do not walk with a running chainsaw;
- Work "down" with the saw whenever possible;
- If electric chainsaws are used, never use the cord to hoist or lower the tool;
- Before refueling, saws must be cool to the point that spilled gas will not ignite;
- Keep the air filter clean and use the correct mixture of fuel and oil;
- Fully charged 20lb. ABC fire extinguishers shall be kept at all refueling areas;
- Saws must be kept clean of excess oil to prevent slipping or fire hazards. Any spills that occur must be cleaned up immediately;
- Chain saws will be carried or moved with the engine in the off position;
- When starting a chain saw, place it on the ground, hold the handle with one hand and pull the starter with the other hand. Never start a saw by "drop starting" in the air, or on your leg;
- Running saws must be gripped with both hands; and
- Maintain a clear work area free of tripping hazards and obtain firm footing before commencing any work. Keep your weight balanced on both feet and do not over reach.

1.8.4 Personal Protective Equipment

Employees using chain saws are exposed to flying debris, dust and noise. Kevlar fire resistant leg chaps, hard hats, safety glasses and face shields (mesh is acceptable), and gloves are required when working with chain saws. No loose or ragged clothing will be allowed. Additionally, effective hearing protection must be worn.

1.8.5 Training

- Always read and become familiar with the manufacturers instructions before use;
 and
- Operators shall be trained in the safe operation and maintenance of chain saws, proper tree falling procedures and the use of personal protective equipment.

1.9 Cut-Off Saws

1.9.1 Inspection

- Ensure the guard is installed and functioning as intended by the manufacturer;
- Handles are installed and functioning as intended by the manufacturer;
- Trigger releases freely when released;
- Muffler is installed;
- Ensure no bolts are missing and all bolts are tight and functioning as intended by the manufacturer;
- The pull cord handle is not broken or cracked;
- The RPM of the tool is clearly marked on the tool;
- The wheel flanges are clean and straight so the blade will spin true. The wheel flanges are recessed and are of the same diameter;
- The wheel flanges are at least one-fourth the size of the blade;
- The wheel arbor is the correct size for the blade. Never alter a wheel arbor to force a blade to fit the cut-off saw; and
- If there is a blade in the tool, remove the blade and follow blade inspection guidelines.

1.9.2 Personal Protective Equipment

- Employees using cut-off saws will wear a hard hat mounted full-face shield in addition to safety glasses;
- Proper, effective, hearing protection;
- Proper protection from silica (see Silica Exposure Program);
- Kevlar fire resistant leg chaps; and
- Suitable, Leather work gloves.

1.9.3 Abrasive Blade Storage

- Store blades on a level and firm surface;
- Do not subject the blades to heat, moisture, high humidity, rain or snow, freezing, or condensation;
- It is recommended that blades be stored in a controlled atmosphere such as the
 project office or tool crib and that a blade distribution and inventory program be
 put in place;
- Never transport the cut-off saw with the blade mounted; and
- Remove blades after each use and if serviceable, return them to a proper storage area. Do not store the cut-off saw with the blade installed.

1.9.4 Abrasive Blade Inspection

- Do not use broken, cracked, warped, wet or otherwise damaged blades. Do not use blades if the blade label is unreadable;
- Remove the blade from the cut-off saw for inspection. You <u>can not</u> properly inspect a blade while it is mounted; and
- Check the maximum operating speed for the blade as indicated on the blade label.
 The blade's maximum rated RPM must be equal to or greater than the maximum RPM of the cut-off saw.

1.9.5 Diamond Cutting Wheels

- The manufacturer's instructions for use of diamond cutting wheels must be reviewed prior to installing the blade;
- Following the minimum guidelines established for abrasive blades above to supplement the manufacturer's recommendations;
- Diamond cutting wheels are intended for use when cutting concrete, masonry, architectural stones and granite, clay pipe and other materials only as recommended by the manufacturer;
- Do not use diamond cutting wheels to cut metal or any other materials not recommended by the manufacturer;
- Consider using water when cutting to eliminate silica exposure; and
- Check the maximum operating speed for the blade as indicated on the blade label. The blade's maximum rated RPM must be equal to or greater than the maximum RPM of the cut-off saw.

1.9.6 Fueling

- Fuel the saw in a well-ventilated area, outdoors only;
- Always shut the engine off and allow it to cool before refueling.
- Relieve tank pressure by loosening the fuel cap slowly;
- Always use a funnel and avoid over filling the tank;
- Select bare-ground for fueling and move at least 10 feet from the fueling spot before starting the engine; and
- Use the manufacturer's recommended fuel mix of oil and gasoline.
- Have a suitable fire extinguisher ready for instant use.

1.9.7 Starting Instruction

- Do not drop start. Place the cut-off saw on level ground and have a firm grip on the handle to pull start the engine;
- Never attempt to start a saw that is in a cut, as it may rebound; and
- Position your body so that it is clear of the cutting attachment before pull starting. Adjust loose clothing to eliminate entanglement in the cutting attachment.

1.9.8 Cutting Operations

- Review and understand the job hazard analysis, (JHA), prior to using the cut-off saw;
- Check that the wheel arbor matches the blade arbor speed;
- Check that the blade's maximum RPM is equal to or greater than the maximum saw RPM. Select a blade specifically designed for use for the type of material you are going to cut;
- Tighten the wheel flanges to secure the blade;
- Allow the blade to spin freely at operating speed for at least one minute prior to use;
- If you feel unusual vibration, stop the saw, determine the reason for the unusual condition, and correct he problem before using the saw again;
- Maintain balance and solid footing while cutting. Do not over reach or position
 yourself in any way that could cause you to fall or lose control of the saw,
 particularly if the saw was to "kick back";
- Adjust the guard to throw sparks away from your body. Remove any flammable items prior to beginning the cut, warn others near-by;
- Do not attempt to cut anything above your shoulder height;
- Let the tool do the work. Do not force the blade into the cut;
- Make sure the blade has stopped spinning before letting go of the handles;
- Carry the saw with the blade to the rear;
- Do not transport the cut-off saw with the blade attached. Do not grind with the side of the cutting wheel. Inspect the tool and the blade before each use; and
- When you are done with the cut-off saw, remove the blade and return the saw, blade and PPE to its designated storage area.

1.10 Chop Saws

1.10.1 General

- Use only wheels designed for the saw (RPM rating on blade must meet or exceed that of the saw) and compatible with the material being cut;
- Be sure to follow lock-out/tag-out procedures when changing wheels or performing any repairs; and
- Do not remove the wheel guard.

1.10.2 Cutting Operations

- Make sure the tool is on a solid base and access to the tool is free of debris;
- Use a vice to clamp/hold the work when necessary;

- Never start the tool with a person directly in-line with the wheel, this includes the operator;
- Do not cut masonry or wood with a chop saw, and only use correct blade for the item being cut;
- Do not force the tool through the work; and
- The saw should return to an open position after a cut. If it does not, the spring assembly may need repair.

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APPENDIX H

MOTORIZED VEHICLES AND EQUIPMENT

Motorized vehicles and equipment

- 1. Do not ride on motorized vehicles or equipment unless a proper seat is provided for each rider.
- 2. Always be seated when riding authorized vehicles (unless they are designed for standing).
- 3. Do not operate any motorized vehicle or equipment unless you are specifically authorized to do so by your supervisor.
- 4. Always use your seat belts in the correct manner.
- 5. Obey all speed limits and other traffic regulations.
- 6. Always be aware of pedestrians and give them the right-of-way.
- 7. Always inspect your vehicle or equipment before and after daily use.
- 8. Never mount or dismount any vehicles or equipment while they are still in motion.
- 9. Do not dismount any vehicle without first shutting down the engine, setting the parking brake and securing the load.
- 10. Do not allow other persons to ride the hook or block, dump box, forks, bucket or shovel of any equipment.
- 11. Each operator must be knowledgeable of all hand signals and obey them.
- 12. Each operator is responsible for the stability and security of his/her load.
- 13. Any accidents or damage must be reported to your supervisor immediately.
- 14. The Operator is responsible for the safe operation of the vehicle, machine or equipment they are operating.
- 15. Do not transport workers and tools in the same compartment, there must be a physical separation to prevent tools and supplies from sliding into or falling on workers.
- 16. Vehicles or equipment must be physically inspected before being placed into use.

For other rules and regulations regarding motor vehicles, mechanized equipment and marine operations, please refer to OSHA construction Safety Standards..

Equipment Safety Inspection Checklist

Date.	
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Project:				
Equipment:		VI. 100 V. 1		
All guards and fer Brakes Lights – front, rea Back-up alarm – h Ladders, stairs, ha ROPS (Roll-over) Seat belts Fire extinguisher Glass Tires Electrical cords Ground fault circu Electrical hand too Powder actuated to Pneumatic condition	r, side, dash norn and holds protection) it interrupters ols	OK O		Needs Repai Needs Repai
Other Items Chec	ked:			
Oil level and leaks Hydraulic oil level and leaks	OK	Needs Repair Needs Repair	Add	Change
Anti-freeze level and leaks Fuel level and leaks First aid kit	ок	Needs Repair	Add	Change
	OK	Needs Repair Needs Repair		Change
Repaired by:				

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APPENDIX I

LOCKOUT/TAGOUT AND ELECTIRCAL SAFETY

1. Lockout/Tagout (General)

1.1 Lockout – General

- All energy sources of power-driven equipment will be locked and/or tagged in the off position when maintenance is being performed;
- Energy sources that must be locked out include but are not limited to electric, mechanic, hydraulic or pneumatic;
- It is the responsibility of the supervisor to ensure that the proper lockout/tagout procedures are followed;
- It is the responsibility of the person performing the maintenance to ensure that all equipment is properly locked and tagged out before starting any maintenance work;
- Both the supervisor and the maintenance employee must check the equipment before restarting it to make sure it is safe to operate;
- Posillico mandates that both lockout and tagout devices be used during equipment maintenance;
- All lockout devices must be:
 - Durable to withstand wear;
 - Substantial so they won't come off easily;
 - Capable of identifying the person who applied it; and
 - Designed for a single use application.
- Available lockout devices include:
 - A disconnect switch, circuit breaker, valve, or other energy isolating mechanism that is placed in the safe on or off position;
 - A device placed over the energy isolating mechanism to hold it in the safe position;
 and
 - A lock attached to the 'on' switch to ensure equipment cannot be energized without removal of the lock.

1.2 Tagout – General

- Tagout refers to a sign or tag posted on a switch that physically cannot be locked out;
- Once the switch has been placed in the "off" position, the tag is placed over the switch and warns other employees that the equipment is under maintenance and should not be started;
- This tag must also identify the person who applied it. In a tagout, the energy-isolating device is placed in the safe position and a written warning is attached to it;
- All tagout materials must be:'
 - Durable to withstand wear;
 - Substantial so they will not come off easily;

- Capable of identifying the person who applied it; and
- Designed for a single use application.
- A lockout or tagout is applied whenever maintenance is performed around any machine where injury could occur from:
 - Unexpected startup of the equipment; and
 - Release of stored energy.

1.3 Lockout/Tagout Situations

- Two situations are most likely to need lockout/tagout:
 - When a guard or other safety device must be removed; and
 - When any part of the body is placed where moving machinery could catch it.
- Some jobs for which lockout/tagout should be used are:
 - Repairing electrical circuits;
 - Cleaning or oiling machinery with moving parts; and

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Clearing jammed mechanisms.

2. Lockout/Tagout Procedures

2.1 General

- When a piece of equipment or machinery is to be inspected, cleaned, repaired or worked on by an individual, that piece of equipment must be immobilized by the individual prior to commencing work on the equipment;
- "Do not start" tags and locks must be placed at the control box or main switch by the
 employee who will perform the maintenance or repair in accordance with the following
 procedures; and
- An immediate supervisor must approve any deviations from these procedures.

The following lockout procedures are mandatory and shall be enforced without exception:

- Each employee shall own a personal lock with one key. Each employee must lockout at the disconnect switch and/or valve. Do not trust someone to lockout for you;
- The locks are to be used to lockout the switchgear at the circuit breaker or disconnect provided for this purpose. These locks will also be used with chains or other safety lockout devices to lock out valves or other controls;
- If more than one person is working on the same piece of equipment at the same time, each
 person is to have a personal lock on the lockout device. If the primary device will not
 accommodate each person's lock, multiple locking devices are to be used;
- When multiple locking devices are required, the shank of the multiple device must immobilize the equipment and must not merely be attached to the shank of another lock;
- All electrical equipment involving the use of disconnect switches as a source of power for their operation will be turned off, locked out in the "off" position and tagged with a "do not start" tag;
- After the electrical equipment has been locked out and tagged with a "do not start" tag, the
 employee will attempt to start the equipment to ensure that the proper switch has been
 locked out and equipment will not start;
- All equipment operated pneumatically or hydraulically will be rendered inoperable by:
 - Turning off the air or hydraulic supply to that piece of equipment; and
 - Locking and tagging the valve with a "do not start" tag.
- After the pneumatic equipment has been locked out and tagged out with a "do not start" tag, the employee will attempt to start the equipment to make sure that the proper switch and valve were locked out and the equipment will not operate;
- Make sure the equipment will not operate with residual or accumulated pneumatic or hydraulic pressure;
- Gravity is often the 'forgotten' energy. It may be necessary to lockout/tagout energy caused by gravity;
- Where a keyed switch controls the ignition, they key will be placed in the "off" position, removed and the switch tagged with a "do not start" tag;

- If standard lockout switches are not available to immobilize the machinery, fuses should be pulled, terminals disconnected, or other standard safety procedures applicable to the individual piece of equipment should be followed. "do not start" tags placed at the starter button or switch;
- In the event that tagging and removing the ignition key are not considered adequate protection, the battery cable that is connected to the starter shall be removed at the battery end and tagged with a "do not start" tag;
- All other necessary precautions, such as opening or closing valves, changing valves, tagging and locking valves, installing blind flanges, etc., will be performed prior to starting the job;

The supervisor conducting the lockout/tagout and maintenance will fill out the lockout/tagout evaluation form (see Lockout/Tagout Program);

- If it becomes necessary to operate the equipment during the work assignment, the following procedure will be followed:
 - Each employee's personal lock will be removed only after it is certain that
 everyone has been advised of the procedure, the entire area has been inspected, and
 everyone is in the clear; and
 - One person will be designated or assigned to operate the equipment.
- If employees must leave a job site, the following procedures will apply upon their return to the equipment:
 - Each employee's personal lock will be reinstalled to lockout equipment; and
 - After checking to ensure that everyone is clear of any danger, the employee will retest the equipment to ensure it is immobilized.
- No employee will remove another person's lock, lockout device or "do not start" tag.
 Before leaving the job for another assignment, at shift end or upon completion of that job, each employee will personally remove his/her own lock;
- After completing work on the equipment, the employee will notify the Supervisor in Charge that the equipment has been released. This will be done only after guards have been replaced and no hazardous operating or working conditions have been left;
- If an employee fails to remove a lock, that employee will be required to return to remove it in person. If the individual is not available, the lock will not be removed until the foreman in charge has made a thorough check of the equipment. The foreman will verify and make certain the equipment is safe to operate.

3. Training

3.1 General

- Employees who will be required to install three-prong, twist-lock plugs on electrical equipment will be trained in the correct procedure;
- Employees will be trained in the hazards of the electrical equipment with which they are required to work; and
- Employees required to perform continuity testing (assured grounding tests) on tools will be trained in the correct procedure.

3.2 Lockout/Tagout

• Employees performing any service or maintenance work must be made aware of the lockout and tagout program. (This also applies to any vendors or subcontractors doing work on Company job sites);

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• Employees will be trained as to the purpose, function and his/her responsibility in performing the lockout and tagout; and

Employees will receive periodic training to ensure they are up-to-date and knowledgeable on the lockout and tagout program and procedure.

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Lockout/Tagout Checklist

	<u>YES</u>	<u>NO</u>	COMPLETION DATE
1. Equipment, machinery and personnel:	·		
A list of equipment and machines that need to be locked out has been developed.		. ·	
 All new machinery (after Jan. 1990) has the ability to accept a lockout device. 	<u>.</u>		
 Specific <u>written</u> Energy Control Procedures are developed and used for each piece of equipment. 		· .	
 d. A list of all <u>authorized</u> employees has been developed. 			
e. A list of all <u>affected</u> employees has been developed.			
2. Energy Control Program:			in the second section of the section of the second section of the
 a. A <u>written</u> Energy Control Program has been developed. 			
b. Does the written program state the methods of compliance, including the:			
 Intended use of procedures. Steps for shut down, isolating, blocking and securing energy. Steps for placement, removal, and transfer of lockout/tagout devices. 			
 Requirements for testing to verify effectiveness of lockout/tagout. 		·	
c. Compliance with energy control procedures is verified at <u>least annually</u> . The results of the inspection are certified and kept on file.			
d. Lockout/tagout devices are provided. (locks, hasps, tags, etc.).			

e. Lockout devices are singularly identified, durable, standardized, substantial and employee identifiable.	
f. Lockout devices are used only for energy control.	
g. A tagout system is used only if a isolating device cannot be locked out.	
h. Tagout devices are located at the same location as lockout devices.	
 Tagout devices warn against hazardous conditions such as Do Not Start, Do Not Open. 	
j. Energy isolation is performed ONLY by authorized employees.	te de la companya de La companya de la companya de
k. Affected employees are notified before and after lockout/tagout.	i de la companya della companya della companya de la companya della companya dell
Group lockout/tagout procedures are used when needed.	
m. Information about each others' lockout program is exchanged with contractors.	
n. Continuity of lockout/tagout is provided during shift change and personnel changes.	
3. Training requirements:	
 a. <u>Authorized employees</u> - recognition of energy sources, type and magnitude of energy and methods and procedures necessary for isolation and control. 	
b. <u>Affected employees</u> - purpose and use of energy control procedures.	
c. Other employees - instructed on the procedures locked or tagged out.	
d. For tagout system - limitations of tags.	

e. Retraining - when change in job, assignment, equipment, process, procedure or the result of an inspection. f. Training is <u>certified</u> with names and dates. and the state of the state of the state of

4. Electrical Safety

4.1 Purpose

The purpose of this program is to protect employees from the hazards associated with electricity. Safeguards against electrical hazards will include an assured grounding program, lockout/tagout procedures and general requirements for work involving any type of electricity or electric tool.

4.2 Applicable Regulation

OSHA 29 CFR 1926.400

OSHA 29 CFR 1910.1477

4.3 Responsibilities

4.3.1 Project Management shall:

- Ensure electrical systems, tools, cords and lights meet the requirements of this program;
- Develop and maintain a site-specific Temporary Electrical Plan consistent with the requirements in this program;
- Institute the Assured Grounding Program according to the requirement of this program;
- Ensure that Ground Fault Circuit Interrupters are used according to the requirements of this program;
- Train employees according to the requirements of this program; and
- Ensure lockout/tagout measure is correctly carried out according to the requirements of this program.

4.3.2 Employees shall:

- Follow lockout/tagout procedures as stated in this program; and
- Not open, adjust, repair or modify electrical systems or tools unless they are authorized and qualified to do so.

4.4 General Requirements

4.4.1 Electrical Systems

- Electrical systems must be inspected by a competent person and maintained on a regular basis by a qualified person;
- Electrical equipment shall not be opened, adjusted, repaired, or other wise handles until it is de-energized and locked-out according to the lockout program;
- De-energized equipment shall be tested before anyone works on it;
- All metal panels, boxes, covers, conduit, etc., that are part of our electrical system shall be grounded;

- All electrical equipment that is exposed to flammable gases or vapors, combustible dust, or ignitable fibers must meet hazardous location requirements in order to prevent explosions;
- Label all circuit breakers to show what they control. Also, label all circuit breaker panes
 to show what voltage they contain;
- Panel covers must be kept in place whenever the panel is energized;
- All cables exiting metal panels or boxes shall be secured with stress relieving clamps;
- Waterproof clamps shall be used as necessary;
- All splices and repairs shall be made inside an approved box or sealed with epoxy or vulcanizing kits. Tape alone is not acceptable;
- Electric lines shall not be hung or secured by nails, staples, metal wire or any other conductive object;
- All panels shall be equipped with a lockable door so that power can be turned off and locked-out for repairs. Adequate space is needed to open the door at least 90 degrees;
- Do not unplug electric lines carrying more than 240 or 277 volts until they have been shut off;
- Circuit breakers that protect hand tool receptacles shall have a maximum rating of 20 amps; and
- Circuit breakers shall be matched as closely as possible to the electrical needs they supply.

4.4.2 Lights

- Light bulbs shall have guards unless deeply recessed in reflector housing;
- Fluorescent tube lights shall have guards or bulb covers, or otherwise effectively secured;
- Outdoor lights shall be of water resistant construction; and
- Light plants shall have bulb changing hazard stickers placed on each shade cover warning of electrical hazard while changing bulbs.

4.4.3 Electric Tools, Cords and Equipment

- All electric tools and equipment must be grounded or double insulated;
- All extension cords must be grounded regardless of where they are used, or what they are used for;
- Electric tools and extension cords shall be inspected before each day's use for proper grounding, cracked housings, damaged cords, non-standardized connectors, and any other electrical problem;
- Damaged tools and cords shall be tagged and removed from service immediately. Spare tools and cords should be readily available to replace damaged items;
- Only qualified personnel shall make repairs;
- A check for proper grounding and continuity shall be made after each repair;

- Cut, frayed, crushed, burned or otherwise damaged extension cords shall not be repaired with tape;
- Receptacles supplying more than 130 volts should be obviously marked;
- Twelve gauge, three wire, heavily insulated, SO cable shall be used for extension cords;
- Extension cords must be kept off stairways and out of walkways, roadways, rain, snow, ice, mud and water;
- Circular saws shall be provided with 10 foot cords so that they plug does not catch the edge of the wood when cutting 8 foot sheets of plywood; and

4.5 Temporary Electrical Plan

Each job shall develop a temporary electrical plan. The plan will include:

- Locations of all temporary services, spider boxes, circuit breaker panels, etc;
- Identification of qualified electricians;
- Labeling and barricading requirements;
- Emergency contact number;
- Inspections; and
- Lockout/Tagout Procedures.

4.6 Assured Grounding

4.6.1 General

- All portable electric tools, drop cords, extension cords, and similar items will be visually inspected daily before being put to use;
- Any items showing signs of possible damage will not be used until repaired as indicated and tested;
- All portable electric tools, extension and drop cords, fixed temporary wiring and receptacles will be tested for continuity of the conductors and for the connection to the exposed frame in the case of tools;
- All cord fittings and receptacles will be tested to make certain the conductors are connected to the proper terminals;
- Any items the test anytime during the periods listed below will be marked with tape in the color assigned to that period as follows:

Time Period	Color
January, February, March	White
April, May, June	Green
July, August, September	Red
October, November, December	Orange

Color coded electrical tape, such as Scotch #35, will be used to mark each item after it
passes the above tests;

- Loose cords, including those permanently attached to portable tools, will be marked by
 placing a wrap of the appropriately colored tape around the cord near the end having the
 male fitting;
- Placing a piece of the appropriate colored tape on the cover of the receptacle box will mark fixed temporary wiring; and
- Other items will be marked in a similar manner with the color-coded tape being attached in the manner and location that provides maximum protection.

Tests will be made at the following times:

- Before first use of any item;
- After repairing any item, before it is put back in service;
- After any incident which might reasonably be suspect of causing damage; and
- At intervals not to exceed 3-months, except that temporary wiring and receptacles fixed in a position where they are not subject to damage, will be tested at intervals not to exceed six (6) months.

4.7 Ground Fault Circuit Interrupters

4.7.1 General

- Ground Fault Circuit Interrupters (GFCI) are mandatory on our projects; whether used as pigtails on generators not having GFCI capacities or mandatory as we purchased portable generators (with GFCI installed) for use on our projects;
- When GFCI are used the following requirements must be met:
 - All 120-volt, single phase 15 and 20 ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground fault circuit interrupters for personnel protection;
 - Receptacles on two-wire, single phase portable or vehicle-mounted generators rated at no more than 5 KW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground fault circuit interrupters;
 - Even buildings that have permanent wiring of the structure cannot use the permanent outlet without proper ground fault protection either at the breaker or by use of a GFCI pigtail adapter.

4.8 Lockout/Tagout (General)

4.8.1 Lockout - General

- All energy sources of power-driven equipment will be locked and/or tagged in the off position when maintenance is being performed;
- Energy sources that must be locked out include but are not limited to electric, mechanic, hydraulic or pneumatic;

- It is the responsibility of the supervisor to ensure that the proper lockout/tagout procedures are followed;
- It is the responsibility of the person performing the maintenance to ensure that all
 equipment is properly locked and tagged out before starting any maintenance work;
- Both the supervisor and the maintenance employee must check the equipment before restarting it to make sure it is safe to operate;
- Posillico mandates that both lockout and tagout devices be used during equipment maintenance;
- All lockout devices must be:
 - Durable to withstand wear;
 - Substantial so they won't come off easily;
 - Capable of identifying the person who applied it; and
 - Designed for a single use application.
- Available lockout devices include:
 - A disconnect switch, circuit breaker, valve, or other energy isolating mechanism that is placed in the safe on or off position;
 - A device placed over the energy isolating mechanism to hold it in the safe position;
 and
 - A lock attached to the 'on' switch to ensure equipment cannot be energized without removal of the lock.

4.8.2 Tagout – General

- Tagout refers to a sign or tag posted on a switch that physically cannot be locked out;
- Once the switch has been placed in the "off" position, the tag is placed over the switch and warns other employees that the equipment is under maintenance and should not be started;
- This tag must also identify the person who applied it. In a tagout, the energy-isolating device is placed in the safe position and a written warning is attached to it;
- All tagout materials must be:'
 - Durable to withstand wear;
 - Substantial so they will not come off easily;
 - Capable of identifying the person who applied it; and
 - Designed for a single use application.
- A lockout or tagout is applied whenever maintenance is performed around any machine where injury could occur from:
 - Unexpected startup of the equipment; and
 - Release of stored energy.

4.8.3 Lockout/Tagout Situations

- Two situations are most likely to need lockout/tagout:
 - When a guard or other safety device must be removed; and
 - When any part of the body is placed where moving machinery could catch it.
- Some jobs for which lockout/tagout should be used are:
 - Repairing electrical circuits;
 - Cleaning or oiling machinery with moving parts; and
 - Clearing jammed mechanisms.

4.9 Lockout/Tagout Procedures

4.9.1 General

- When a piece of equipment or machinery is to be inspected, cleaned, repaired or worked on by an individual, that piece of equipment must be immobilized by the individual prior to commencing work on the equipment;
- "Do not start" tags and locks must be placed at the control box or main switch by the
 employee who will perform the maintenance or repair in accordance with the following
 procedures; and
- An immediate supervisor must approve any deviations from these procedures.

The following lockout procedures are mandatory and shall be enforced without exception:

- Each employee shall own a personal lock with one key. Each employee must lockout at the disconnect switch and/or valve. Do not trust someone to lockout for you;
- The locks are to be used to lockout the switchgear at the circuit breaker or disconnect
 provided for this purpose. These locks will also be used with chains or other safety
 lockout devices to lock out valves or other controls;
- If more than one person is working on the same piece of equipment at the same time, each
 person is to have a personal lock on the lockout device. If the primary device will not
 accommodate each person's lock, multiple locking devices are to be used;
- When multiple locking devices are required, the shank of the multiple device must immobilize the equipment and must not merely be attached to the shank of another lock;
- All electrical equipment involving the use of disconnect switches as a source of power for their operation will be turned off, locked out in the "off" position and tagged with a "do not start" tag;
- After the electrical equipment has been locked out and tagged with a "do not start" tag, the
 employee will attempt to start the equipment to ensure that the proper switch has been
 locked out and equipment will not start;
- All equipment operated pneumatically or hydraulically will be rendered inoperable by:
 - Turning off the air or hydraulic supply to that piece of equipment; and

- Locking and tagging the valve with a "do not start" tag.
- After the pneumatic equipment has been locked out and tagged out with a "do not start"
 tag, the employee will attempt to start the equipment to make sure that the proper switch
 and valve were locked out and the equipment will not operate;
- Make sure the equipment will not operate with residual or accumulated pneumatic or hydraulic pressure;
- Gravity is often the 'forgotten' energy. It may be necessary to lockout/tagout energy caused by gravity;
- Where a keyed switch controls the ignition, they key will be placed in the "off" position, removed and the switch tagged with a "do not start" tag;
- If standard lockout switches are not available to immobilize the machinery, fuses should be pulled, terminals disconnected, or other standard safety procedures applicable to the individual piece of equipment should be followed. "do not start" tags placed at the starter button or switch;
- In the event that tagging and removing the ignition key are not considered adequate protection, the battery cable that is connected to the starter shall be removed at the battery end and tagged with a "do not start" tag;
- All other necessary precautions, such as opening or closing valves, changing valves, tagging and locking valves, installing blind flanges, etc., will be performed prior to starting the job;
- The supervisor conducting the lockout/tagout and maintenance will fill out the lockout/tagout evaluation form (see Lockout/Tagout Program);
- If it becomes necessary to operate the equipment during the work assignment, the following procedure will be followed:
 - Each employee's personal lock will be removed only after it is certain that
 everyone has been advised of the procedure, the entire area has been inspected, and
 everyone is in the clear; and
 - One person will be designated or assigned to operate the equipment.
- If employees must leave a job site, the following procedures will apply upon their return to the equipment:
 - Each employee's personal lock will be reinstalled to lockout equipment; and
 - After checking to ensure that everyone is clear of any danger, the employee will retest the equipment to ensure it is immobilized.
- No employee will remove another person's lock, lockout device or "do not start" tag. Before leaving the job for another assignment, at shift end or upon completion of that job, each employee will personally remove his/her own lock;

- After completing work on the equipment, the employee will notify the Supervisor in Charge that the equipment has been released. This will be done only after guards have been replaced and no hazardous operating or working conditions have been left;
- If an employee fails to remove a lock, that employee will be required to return to remove it in person. If the individual is not available, the lock will not be removed until the foreman in charge has made a thorough check of the equipment. The foreman will verify and make certain the equipment is safe to operate.

4.10 Training

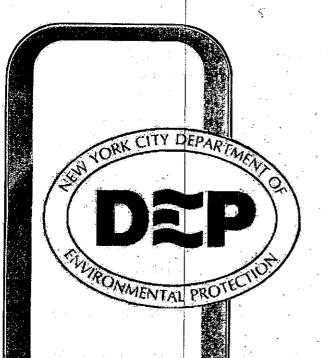
4.10.1 General

- Employees who will be required to install three-prong, twist-lock plugs on electrical equipment will be trained in the correct procedure;
- Employees will be trained in the hazards of the electrical equipment with which they are required to work; and
- Employees required to perform continuity testing (assured grounding tests) on tools will be trained in the correct procedure.

4.10.2 Lockout/Tagout

- Employees performing any service or maintenance work must be made aware of the lockout and tagout program. (This also applies to any vendors or subcontractors doing work on Company job sites);
- Employees will be trained as to the purpose, function and his/her responsibility in performing the lockout and tagout; and

Employees will receive periodic training to ensure they are up-to-date and knowledgeable on the lockout and tagout program and procedure



THE CITY OF NEW YORK

DEPARTMENT OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL, HEALTH & SAFETY POLICIES AND PROCEDURES

Vol. III
Control of Hazardous Energy
Lock-Out / Tag-Out

H&S Coordination Committee approval

The New York City Department of Environmental Protection's H&S Coordination Committee has reviewed this document and by the Chair's signing below agree that it adequately defines the program necessary to address regulatory requirements for their Bureau Office operations and commit to the policies and/or procedures contained within (or substantially equivalent procedures, if Bureau Office specific amendment is required and it is approved by the H&S Coordination Committee).

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1 Purpose

This procedure establishes the minimum requirements to ensure that machines or equipment are isolated, rendered inoperative and locked out where the unexpected energizing, start-up, release of stored energy (e.g., pressure, electrical, potential energy) could cause injury. Mechanisms for hazardous energy control must be in place before employees perform service or maintenance (e.g., constructing, installing, adjusting, inspecting, modifying, cleaning, lubricating, unjamming of machines and maintaining machines or equipment).

2 Scope

Lockout/tagout (LOTO) procedures to control hazardous energies shall be strictly followed when it is necessary to work on any equipment or system that may release any form of hazardous energy, including, but not limited to, electrical, rotational, mechanical, radiation, chemical, hydraulic, or pneumatic energy sources. All requirements of 29 CFR Part 1910.147, Control of Hazardous Energy Source (lockout/tagout), and 29 CFR Part 1910.333 (b)(2) (Electrical-Selection and Use of Work Practices) shall be met. All DEP employees shall comply with the requirements of this LOTO Program; however, only LOTO-Authorized Employees may apply DEP LOTO locks and tags.

This procedure, as written, meets the requirement of the OSHA regulations (29 CFR 1910.147(a)(3)) to establish a LOTO program and is sufficient for single-step LOTO tasks. DEP employees are required to follow additional written procedures for all activities that require multi-step lockout/tagout. Contractor activities also may fall under the scope of this procedure if they are working in operating facilities where there may be DEP Affected Employees. Contractors are required to establish and maintain their own LOTO programs, as specified in Section 5.9. Supplemental procedures applicable to energy control for aqueducts, water supply distribution system work and for BWT facilities are provided in Attachments E, F and G, respectively.

2.1 Exceptions

The following situations do not require LOTO:

- Minor tool changes, adjustments, and other minor servicing activities that take place during normal operations, provided that (1) such activities are routine, repetitive, and integral to the use of the equipment and that (2) the work is performed using alternative measures that provide effective personnel protection (e.g. changing bits on lathes or drill presses).
- Work on cord- and plug-connected electric equipment, provided that (1) exposure to the hazards of unexpected energization is controlled by unplugging the equipment from the energy source and that (2) the plug is under the exclusive control of the worker performing service or maintenance.

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- Pneumatic tools may also be exempt, provided that the tools can be completely isolated from their energy source by disconnecting the pressure hoses from the pressure sources.
- ➤ Hot ap operations (involving transmission and distribution systems) when they are performed on pressurized pipelines, provided that DEP staff demonstrates that:
 - Continuity of service is essential to the task,
 - Shutdown of the system is impractical,
 - Documented procedures are followed, and
 - Special equipment that provides proven, effective protection is used.

While not specifically listed as an exemption by OSHA, work on machines with self-contained power (e.g., rechargeable batteries) are similar to cord- and plug-connected electric equipment and do not require LOTO if (1) exposure to the hazards of unexpected energization is controlled by removing the energy source from the equipment and (2) the energy source or equipment is under the exclusive control of the worker performing service or maintenance.

3 Definitions

Affected Employee - an employee whose job requires him or her to operate or use a machine or equipment on which maintenance, servicing, or construction is being performed under lockout or tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee - an employee who locks out or tags out machines or equipment in order to perform servicing or maintenance, on that machine or equipment. An Affected Employee becomes an Authorized Employee when that employee's duties include performing servicing or maintenance covered under this program.

Capable Of Being Locked Out - An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Contract Supervisor - the DEP employee responsible for overseeing construction work by a Contractor. This will vary, depending on which organization is overseeing the work and will generally be the Lead Project Engineer for BEDC Design, the DEP Resident Engineer for BEDC Construction, the DEP employee directly responsible for overseeing the consultant Resident Engineer when a Construction Manager (CM) is responsible for resident engineering the Director of the Hiring Division or his/her designee (e.g., Project Manager) for Contracts managed by BWS, and the BWSO Manager (Director, Chief, Deputy Chief, etc.) responsible for managing and overseeing the Contract or his/her designee (e.g., Project Manager) for Contracts managed by BWSO.

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Contractors - non-DEP individuals or businesses that are retained to provide specific labor or services (e.g., construction, maintenance or repair, turnaround, renovation, or specialty work) on and around DEP facilities and distribution and wastewater collection systems. The term Contractors also applies to subcontractors and lower tier contractors, suppliers, contractor visitors, and field consultants.

Energized - being connected to an energy source or containing residual or stored energy.

Energy Isolating Device - a mechanical device that physically prevents the transmission or release of energy, including but not limited to: a manually operated electric circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot Tap - A procedure used in the repair, maintenance and service activities that involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout - the placement of a lockout device on any energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device - a device that provides a positive means, such as a lock to hold an energy isolating device in a safe position, to prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

LOTO-Authorized Employee - Refers to an employee having attended the appropriate training, and having knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy prior to locking or tagging equipment out.

Normal Production Operations - The utilization of a machine or equipment to perform its intended production function.

Servicing and/or Maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting Up - Any work performed to prepare a machine or equipment to perform its normal production operation.

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Tagout - the placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device - a prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Work Complete - Work is complete when the required maintenance is finished, personnel cleared, the machine guards have been restored, and tools and debris have been removed from the job site.

Zero Energy State the condition of a machine or equipment after isolation from all energy sources and after the release of any stored energy.

4 Responsibilities

4.1 Bureau EHS Personnel

- Provide support to the *Responsible Managers* of facilities and field operations to ensure that hazardous energies are properly isolated in accordance with this procedure; and
- > Provide technical support for the implementation of the LOTO program.

4.2 Responsible Manager

The highest ranking manager or supervisor within each DEP Bureau at each facility (or whose employees perform field operations outside of fixed facilities) is the "Responsible Manager" for that Bureau's operation. If a Bureau is working in a facility "owned" by another Bureau, all other Bureau Responsible Managers/Contract Supervisors must coordinate with the owning Bureau's Responsible Manager as necessary. The Responsible Manager's duties include:

- > Implementing this procedure;
- Maintaining written equipment-specific LOTO procedures, where required;
- Ensuring lockout/tagout requirements are met:
- Ensuring employees are trained and that employees are retrained when there are changes in job assignment, equipment, new hazards introduced, or new procedures implemented;
- Providing LOTO-Authorized Employees with any required equipment (including PPE and locks and tags) that is not available from the work supervisor;

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- Verifying that appropriate training has been provided to those Affected Employees working in the facility;
- For unique pieces of equipment, providing all required special chains, wedges, blank flanges, key blocks, adapter pins, or self-locking fasteners;
- Designating only Authorized Employees who are knowledgeable in the equipment, the hazards and the maintenance or repair procedures to write equipment and/or machine specific LOTO procedures (when required) that describe the techniques to lock-out and tag-out sources of hazardous energy for equipment in their area of responsibility;
- Ensuring that, whenever major replacement, repair, renovation, or modification of equipment is performed, the energy-isolating device is designed to incorporate a lockout device;
- Ensuring that all construction projects and capital equipment purchases have provisions in place to comply with the standard;
- Performing or delegating the performance of an inspection of the LOTO procedures at least annually to confirm that the procedure meets all regulatory requirements and the written procedure is being followed; and
- Reviewing and signing all completed Annual Inspections (Attachment C).

The Responsible Manager may delegate implementation tasks to a designee (e.g., to the EHS Liaison or other supervisors), as appropriate.

4.3 Supervisors

All DEP Supervisors are responsible for:

- Monitoring and enforcing the use of LOTO procedures;
- Ensuring that all employees required to perform lockout and tagout are trained to the level of "LOTO-Authorized Employee";
- Ensuring that LOTO-Authorized Employees under their supervision have the knowledge and skills required for the safe application, use, and removal of energy controls;
- Providing each "Authorized Employee" with required safety equipment and maintain records of distribution. This equipment shall include a distinct lock and single key, to be used solely for lockout, and be identifiable to the Authorized Employee;
- Ensuring that a lock and tag attached by an unavailable employee are removed only in accordance with Section 5.5 of this procedure;
- Ensuring that all personnel working on or near equipment requiring the use of lockout and tagout procedures are trained to the level of "Affected Employee";

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- Exchanging information about DEP LOTO procedures with outside Contractor supervisors; and
- Ensuring that their personnel understand and comply with outside Contractors' LOTO procedures.

4.4 LOTO-Authorized Employees

LOTO-Authorized Employees are responsible for:

- -> Locking out machines and equipment as required;
- > Performing LOTO procedures in accordance with the DEP LOTO Program;
- Coordinating their activities with other LOTO-Authorized Employees when using the guidance in Section 5.3 for group lockouts and in Section 5.4 for transferring locks and tags during personnel and shift changes; and
- Following equipment-specific LOTO requirements. This includes referring to applicable documentation to identify the type and magnitude of energy that the machine or equipment uses, understanding the hazards of the energy, and knowing the methods to control the energy.

4.5 Affected Employees

Affected Employees are responsible for:

- > Understanding the purpose and use of lockout/tagout procedures:
- > Never restarting or re-energizing equipment that has been locked/tagged out; and
- > Strictly adhering to all requirements of the LOTO program.

5 Procedure

All workers who perform servicing or maintenance tasks that fall under the scope of this document are required to affix a LOTO lock with their name identified on the device (e.g., their name affixed to a tag on the lock) to the equipment according to the procedures for general LOTO (Section 5.1), equipment-specific LOTO (Section 5.2), or group LOTO (Section 5.3), except as noted below. Therefore, all such workers are required to be trained and designated as LOTO-Authorized Employees. before performing any such servicing or maintenance activities.

Affected Employees are not required to apply LOTO locks. An Affected Employee is a worker who does not perform the servicing or maintenance tasks that fall under the scope of this document but who normally operates or works near equipment on which such servicing or maintenance is performed.

Exceptions to Lockout Requirement: A LOTO tag without a LOTO lock is not accepted by DEP as a means of energy control under the scope of this document, except for specialized

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aqueduct and distribution system work (if performed under Attachment E and F procedures) or if a lock cannot be applied and the tag is supplemented by other safety measures that provide a level of protection equivalent to a lock. Additional means to be considered "shall include the implementation of additional safety measures such as the removal of an isolating circuit element (by an electrician or qualified engineer), blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization". Facilities and workgroups that practice tagout without lockout must train and annually evaluate Affected Employees as noted in later Sections.

The three types of LOTO used at DEP are:

- General LOTO for any equipment or machine that is not required to have an equipment-specific written procedure. (See Section 5.1).
- > Equipment-specific LOTO (see Section 5.2).
- Group LOTO (see Section 5.3).

5.1 General LOTO Procedure

This section describes the requirements pertaining to general LOTO.

5.1.1 General (Single Point) LOTO Procedure

The general (i.e., single-point) LOTO procedure may <u>only</u> be used for equipment in which all of the hazardous energy is easily isolated with a single action, e.g., the operation of only one switch or one valve. If the equipment meets all of the criteria, the general procedure may be used, and a specific written procedure for that equipment is not required:

- The equipment has no potential for stored or residual energy (or reaccumulation of stored energy after shutdown) that could endanger workers.
- The equipment has a single energy source that can be readily identified and isolated.
- > The equipment is completely de-energized and deactivated by the isolation, lockout, and tagout of the energy source.
- > The equipment is isolated from the energy source and locked out and tagged out during service or maintenance.
- A single lock and tag achieves a locked out and tagged out condition.
- The lock is under the exclusive control of the LOTO-Authorized Employee performing the servicing or maintenance.
- > Service or maintenance of the equipment does not create hazards for other personnel.

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Accidents with the equipment involving unexpected activation or reenergization during service or maintenance have not been experienced and/or reported.

5.1.2 General LOTO Steps

The sequence of steps for locking out and tagging out equipment is as follows:

1. Prepare and notify.

- LOTO-Authorized Employee: If the isolation of the equipment/system is not routine or could significantly effect facility operations, ensure that the Supervisor on duty with responsibility for area operations has been notified that service or maintenance is to be performed on the equipment/system and that the equipment is to be shut down, locked out, and tagged out.
- > LOTO-Authorized Employee: Notify Affected Employees that service or maintenance is to be performed on the equipment/system and that the equipment is to be shut down, locked out, and tagged out.
- LOTO-Authorized Employee: Before proceeding with LOTO, (1) identify the type and magnitude of energy that the equipment uses, (2) understand the hazards of the energy involved, and (3) know the methods for controlling the energy sources.

2. Shut down the equipment.

If the equipment is operating, shut it down using the normal shutdown procedure (e.g., depress the stop button, open the switch, or close the valve).

3. Isolate the energy.

Isolate the energy by positioning the energy-isolating device (e.g., switch, circuit breaker, or valve) to positively isolate the equipment from the energy source.

4. Apply the LOTO devices.

- Before servicing or maintenance begins, lock-out the energy-isolating device with an approved LOTO lock and attach a completed LOTO ag (unless "Exceptions to Lockout Required" conditions above are met).
- Verify that the lock is effective, e.g., by attempting to turn on the switch or open the valve as appropriate.

5. Control stored energy.

> Relieve, disconnect, restrain, or otherwise render safe all sources of stored energy (e.g., capacitors; springs; elevated machine members;

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rotating flywheels; hydraulic systems; and air, gas, steam, or water pressure). Take steps to prevent the re-accumulation of stored energy, e.g., apply grounding devices to capacitors.

6. Verify and test.

- Ensure that the equipment is disconnected from all energy sources. First check that no one is exposed, and then verify that the equipment is isolated by (1) attempting to start the equipment and (2) testing the equipment with appropriate test instruments to verify that the equipment is de-energized.
- Whenever working near normally energized equipment or parts, use appropriate test instruments to verify de-energization. Test instruments shall be verified as operational both before and after use.
- Return all operating controls to the neutral (i.e., off) position after verifying that the equipment is isolated.
- Monitor energy isolation as frequently as necessary if there is a possibility of re-accumulation of stored energy.

5.2 Written Equipment-Specific LOTO Procedures

A written, equipment-specific LOTO procedure is required for any equipment or system that has more than one energy source or that does not otherwise meet all of the criteria in Section 5.1. (Examples of multiple energy sources include equipment that is fed by more than one circuit breaker or by equipment that exposes workers to a combination of energy hazards, such as electricity and pressurized gas).

Posted or other equipment instructions do not, by themselves, constitute a "procedure" but may be a component of a procedure that conforms to this requirement. Manufacturer's instructions may be useful references, but written LOTO procedures must consider the process environment typically not considered in equipment manuals.

A written LOTO procedure shall:

- ➤ Identify the equipment that is covered and incorporate steps 1 through 6 of Section 5.1.2 and the procedure specified in Section 5.8, as applicable.
- Provide specific information for each step about the equipment and the associated energy hazards.
- > Clearly identify all of the energy-isolating devices required for the equipment.
- Provide any other information that is necessary to safely shut down the equipment and to isolate, test, and control all hazardous energy sources.
- The written LOTO procedure shall be a separate document approved and maintained by the *Responsible Manager* or designee using the approach given in Attachment A (example LOTO procedure) and Attachment B

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(blank form) or an alternate approach that contains the same information. They shall be developed "as needed" and maintained for future use. Whenever an Authorized Employee identifies a deficiency in the procedure or there is a change in system configuration, the procedure must be reviewed and revised or re-verified (approved) by the Responsible Manager or designee prior to use (for deficiencies) or after any affected equipment or system modifications. Similar machines or pieces of equipment (i.e., those having the same type and magnitude of energy) that have substantially similar methods of energy control may be covered by a common procedure. A common procedure shall include a method of identification that ensures that the LOTO-Authorized Employee can determine which procedure applies to each piece of equipment.

5.3 Group LOTO

If the number of workers performing a maintenance activity makes it impractical for each of them to apply LOTO devices directly to the energy-isolating device(s), a group LOTO may be used. A Group LOTO may, or may not, require a written procedure in accordance with Section 5.2 above. Also see the related aqueduct and distribution system LOTO procedures in Appendices E and F.

When service or maintenance is performed by a crew, craft, department, or other group working together, the following procedures shall be followed to provide those personnel a level of protection equivalent to that of a personal LOTO device.

- One LOTO-Authorized Employee, designated as the LOTO Group Leader by the group's supervisor, shall have primary LOTO responsibility for a defined number of other personnel working under the protection of a group LOTO.
- The LOTO Group Leader shall ascertain the exposure status of individual group members with regard to the LOTO procedure for the equipment.
- The **LOTO** Group Leader shall disable the equipment and apply LOTO devices to the equipment in accordance with all of the steps in Section 5.1 or 5.2, as appropriate.
- The LOTO Group Leader shall place all keys in a group lockbox or comparable mechanism.
- Each LOTO-Authorized Employee shall apply a lock to the group lockout device, group lockbox, or comparable mechanism before beginning work, and shall remove the lock after stopping work on the machine or equipment. Each lock shall be equally effective in preventing energy flow to the equipment.
- When more than one crew, craft, or department is involved, the **LOTO**Group Leader shall be responsible for the overall job-associated LOTO procedure, which includes coordinating the various groups and ensuring

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continuity of protection. Each *LOTO-Authorized Employee* in each crew shall apply a lock to the group lockbox, as described above, or a subgroup lockbox shall be used, as described below.

A LOTO-Authorized Employee from each crew or subgroup shall apply a lock to the group's lockbox or comparable mechanism before work begins and remove the lock after work is completed. The key to this lock shall be placed in a subgroup lockbox. Each LOTO-Authorized Employee in the subgroup shall apply a lock to the subgroup lockbox as described. Each lock shall be equally effective in preventing the energy flow to the equipment.

5.4 Transfer of Locks and Tags

To maintain continuity of protection for those involved in a LOTO procedure, and to ensure the orderly transfer of LOTO devices, the following procedures shall be followed when personnel or shifts change and the arriving personnel or shift will be continuing the work on de-energized equipment.

- When personnel change, the arriving LOTO-Authorized Employee's lock and tag shall be applied before the departing LOTO-Authorized Employee's lock and tag are removed.
- The departing crew supervisor shall inform the arriving crew supervisor of the status of equipment and work in progress. The lock and tag of at least one LOTO-Authorized Employee on the arriving shift shall be applied before any locks and tags of the departing shift are removed. Alternatively, a special long-term "supervisory" lock will be applied, whose key is available only to the Responsible Manager or designees (e.g., shift supervisors or shift engineers), before the departing shift's locks and tags are removed. The arriving LOTO-Authorized Employee group of workers shall verify that isolation and deenergization have been effectively accomplished before applying their locks/tags and starting servicing/maintenance work.

5.5 "Supervisory" or Long-Term LOTO

If the equipment will be locked out for an extended time period, the above LOTO transfer procedure may not be feasible. If the equipment needs to be rendered inoperable and secured to await future repair, a special long-term "supervisory" lock will be applied whose key is available only to the *Responsible Manager or designees* (e.g., shift supervisors or shift engineers). When ready for repair, those *LOTO-Authorized Employees* involved shall verify that isolation and deenergization have been effectively accomplished and apply their locks/tags before starting servicing/maintenance work.

If the repair will be suspended (e.g., pending receipt of parts or equipment rehabilitated off-site), supervisory locks will be applied replacing all of the locks of the departing work crew. The departing work crew will brief the supervisor on the work status and the

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supervisor will summarize the status in the work ticket or a LOTO log. Prior to resumption of work, the supervisor on duty shall consult the work ticket or LOTO log and brief those LOTO-Authorized Employees involved. The LOTO-Authorized Employees involved shall verify that isolation and deenergization have been effectively accomplished and apply their locks/tags before starting servicing/maintenance work.

Whenever supervisory locks are used for long-term work, the *Responsible Manager (or designee)* shall verify that the work is complete and both the equipment and affected upstream and downstream process areas (e.g., tanks, basins, etc.) are safe for restart prior to removal of long-term supervisory locks by:

- Interviewing employees operating and maintaining the locked out equipment and upstream/downstream process areas.
- Inspecting both the locked out equipment and all affected process areas immediately upstream and downstream of the equipment to confirm that the equipment is safe to restart and that no employees are working in a location where they may be harmed.
- Notifying affected employees that the equipment will be restarted.

When the above steps are completed, the locks and tags may be removed by the Responsible Manager (or designee).

5.6 Removing Locks and Tags

LOTO locks and tags shall be removed only by the *LOTO-Authorized Employee* who applied them.

Exception: When the LOTO-Authorized Employee who applied a lock and tag is not present, the lock and tag may be removed by the LOTO-Authorized Employee's work supervisor only after obtaining permission from the Responsible Manager or designee, provided that all of the following conditions are satisfied:

- The LOTO-Authorized Employee's supervisor and Responsible Manager (or designee) shall verify that the LOTO-Authorized Employee who applied the lock and tag has left the facility through direct knowledge of the employee's departure or interview of other employees with direct knowledge of departure.
- All reasonable efforts shall be made to contact the LOTO-Authorized Employee who applied the lock and tag (by calling the employee) to:
 - a. Inform the LOTO-Authorized Employee that the lock and tag are to be removed, and
 - b. Determine the operational and safety status of the equipment.
- The supervisor visually determines that the equipment or area is safe and all employees are in the clear before the lock and tag are removed.

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Furthermore, when a lock and tag applied by a LOTO-Authorized Employee are removed during the applying employee's absence, the supervisor shall not allow the returning employee to resume work until informing that employee that the lock and tag were removed.

5.7 Testing or Repositioning Equipment or Components

If a lock and tag need to be temporarily removed from an energy-isolating device to energize and test equipment or to reposition any equipment components, the **LOTO-Authorized Employee(s)** shall:

- > Clear the equipment of tools and materials, and ensure that all personnel are located safely away from the equipment.
- Remove the locks and tags from the energy-isolating devices in accordance with the procedure in Section 5.8, steps 1-4.
- Energize the equipment and then proceed with testing of the equipment or repositioning of the components.
- De-energize all systems, perform the steps in Section 5.1.2 or follow the equipment specific LOTO procedures, as appropriate, and then continue with service or maintenance.

5.8 Restoring Equipment to Service

When service or maintenance is completed and the equipment is ready to be returned to a normal operating condition, the LOTO-Authorized Employee(s) shall:

- Check the equipment and the immediate area to ensure that nonessential items are removed, that all components are operationally intact, and that all guards or other protective features are restored.
- Check the work area to ensure that all personnel involved in the LOTO procedure are accounted for and located safely away from the equipment.
- > Verify that equipment controls are in the neutral position.
- > Remove the lock and tag, and then reenergize the equipment. (Some blocking devices may require reenergizing of the machine before the blocking device can be safely removed.)
- Notify Affected Employees that service or maintenance has been completed and that the equipment is ready for use.

5.9 LOTO Requirements for Contractors

Contractors working in areas turned over for construction with no DEP operations and Contractors performing electrical distribution system work may follow their programs to comply with applicable 29 CFR 1926 regulations.

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Contractors (and their subcontractors) engaging in activities requiring LOTO where there are DEP Affected Employees working in the area shall be required to follow this DEP procedure or LOTO procedures that at minimum conform to the requirements in this procedure. Contractors must submit their procedure and examples of their LOTO hardware and its use is subject to DEP approval. All Contractors are responsible for coordinating with the DEP facility Responsible Manager (including obtaining DEP equipment-specific LOTO procedures, if they exist, and providing DEP with any Contractor generated procedures) and for personally locking out and tagging out the equipment that they handle. The Contractor shall supply all of the required hardware and other materials to effectively implement the LOTO procedure.

Each Contractor shall train its employees (i.e., Contractor company's workers) in the LOTO procedures being used. All Contractor workers (even those who do not personally lock and tag equipment) are potentially exposed to LOTO-related hazards and shall therefore be trained to understand the procedure for, and the importance of, using LOTO.

The immediate supervisor of DEP Affected Employees shall ensure that DEP workers understand and comply with the outside Contractor's procedures and are able to recognize the Contractor's LOTO devices.

The immediate supervisor of DEP Affected Employees must advise the Contractor and the DEP employee responsible for oversight of the Contractor if the Contractor is not capable of properly working on or operating a system or equipment. The Contractor should stop work in either of the following cases:

- The Contractor does not know how to appropriately lock-out and test a particular piece of equipment, or
- The equipment/system to be locked out in association with the contract work remains under DEP control.

In the above cases, Contractors are not relieved of their LOTO responsibilities. Furthermore, a LOTO-Authorized Employee of the DEP group responsible for maintenance shall apply a Group Lock and Tag as specified in Section 5.3 of this procedure. The lock and tag shall be applied to a multiple lockout hasp on the energy-isolating device after securing the system and demonstrating to the Contractor's satisfaction that responsible for working on that locks and tags to the multiple lockout hasp before working on that locks have been and tag.

5.10 Protective Materials and Hardware

Personnel shall use the appropriate personal protective equipment (PPE) when performing LOTO activities

All lockout devices and tagout devices shall be clearly identifiable. Devices shall be standardized for each facility in at least one of the following color; shape; or size; and

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additionally, in the case of tagout devices, print and format shall also be standardized". They shall be the only devices(s) used for controlling energy and shall not be used for other purposes. All locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware needed for isolating, securing, or blocking of machines or equipment from energy sources by DEP personnel shall be provided by DEP. They shall meet all regulatory requirements, be specifically designed for the intended task, be durable and resistant to corrosive or wet conditions, be standardized at each facility, and be accepted as adequate by general industry. Devices meeting the preceding requirements are commonly available from numerous retail sources. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or metal cutting tools.

Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. The means of attaching a Tagout device shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s). Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as one of the following: Do Not Start; Do Not Open; Do Not Close; Do Not Energize; or Do Not Operate.

Locks shall be individually keyed, or the LOTO-Authorized Employee may have a set of locks that are all keyed alike. The lock shall indicate the identity of the employee applying the lock (e.g., their names may be marked on the lock). When locks are from a central source or are exchanged between employees, the identity of the employee using the lock/key on the device shall be changed accordingly (e.g., their names may be affixed to a tag on the lock). No other person shall have the same key unless the LOTO-Authorized Employee decides to give a second key to the work supervisor for use only as described in Section 5.5, under "Exception." Under no circumstances shall there be more than two keys for a lock.

Lock mechanisms built into equipment are acceptable; provided that (1) such mechanisms isolate energy to the unit and that (2) the *LOTO-Authorized Employee* controls the keys.

5.11 Limitations of Energy-Isolating Devices

A lockable energy-isolating device shall be installed on equipment before personnel begin any service or maintenance work that could result in the unexpected release of hazardous energy. Non-lockable energy-isolating devices shall be designed or modified to accept a lock whenever:

- > Equipment is replaced.
- New equipment is installed.
- A major modification is performed.

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If an energy-isolating device cannot physically accept a lock:

Use a lockable energy-isolating device (e.g., a panel board or switchboard feeding the non-lockable device) that has been approved by the **Responsible Manager** and that effectively isolates the device. Properly isolate, lock, and tag the device.

OR

A LOTO-Authorized Employee shall install a suitable lockout attachment or adapter on the energy-isolating device and then proceed with the LOTO process.

OR

A LOTO-Authorized Employee shall open (or close) the energy-isolating device (i.e., the circuit breaker or valve), disconnect the wiring or piping from the device (or insert a blank flange), tag the wiring or piping (or blank flange) and the energy-isolating device, and then proceed with the LOTO process described in Section 5.1.2.

(Any tag used with disconnected wiring, as described above, or any tag used with a blank flange or physically disconnected piping shall indicate the point of disconnect or the location of the blank flange.)

OR

Deen (or close) and tag the energy-isolating device. Designate one person as a safety watch to ensure that the energy remains isolated for the duration of service or maintenance, and then proceed with the LOTO process. A person designated as a safety watch shall have no other duties and shall not leave the station for any reason except when formally relieved from duty or for personal safety.

5.12 Annual Inspections

The annual LOTO inspection shall be performed for each facility by the *Responsible Manager* or designee. The inspection must be performed by an individual or individuals familiar with the facility, experienced as a *LOTO-Authorized Employee*, and must be someone other than the person(s) utilizing the LOTO procedure being inspected. The purpose of this inspection is to identify and correct any deviations or inadequacies in the use of the LOTO procedure.

The Responsible Manager or designee shall maintain a list of energy control procedures that includes the inspection schedule, and shall schedule the annual inspection(s).

OSHA recognizes that a single LOTO procedure may be developed to apply to a group of similar machines or equipment (OSHA Standard Interpretation – Lock out/Tag out periodic inspection requirement dated 3/9/04). If individual procedures for every piece of

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equipment are voluntarily developed, the inspection obligations are the same as for those who chose not to develop such individual procedures and inspections can be performed for each group of related procedures applicable to similar types of machines or equipment (e.g., pumps, cranes; etc.) for inspection purposes.

Each facility should develop and implement their inspection plan by grouping equipment with the same type and magnitude of hazardous energy and the same or similar type of controls. Procedures in the grouping must have the same or similar:

- 1. Intended machine/equipment use;
- 2. Procedural steps for shutting down, isolating, blocking, and securing;
- 3. Procedural steps for placement, removal, and transfer of the lockout or tagout devices and the responsibility for them; and
- 4. Requirements for testing to determine and verify the effectiveness of lockout/agout devices and other control measures.

A representative number of authorized employees implementing a procedure within each group should participate in the inspection. The inspector should:

- Include all groups of LOTO procedures typically used once or more per year. Identify groups that are used less than once per year and inspect when the LOTO procedure is performed.
- Include a representative number of employees from each different group that performs LOTO (e.g., electricians, mechanics, operators, etc.).
- Reasonably reflect plant maintenance and repair operations and hazardous energy control practices for the procedure being inspected.
- Conduct the inspection while an authorized employee is performing service and/or maintenance activities on the machine or equipment.
- Consider selecting different equipment falling under each group of procedures and different employees each year so that each would eventually be inspected.
- Inspect more regularly on any subset of a group that is more likely to be deficient or incorrectly implemented by employees, based on frequency of use, incidents or a wider range of staff using the procedure.
- Perform another inspection during a major outage (if feasible) because additional measures or additional personnel from outside the operation may be needed which could possibly affect compliance.
- Review the results with all other employees who are reasonably expected to implement the procedures during the year, as described below.

The Responsible Manager must communicate the results of the inspections to all other Authorized Employees and, when applicable, Affected Employees that work on the

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inspected equipment groups or processes. The Responsible Manager may choose one of the following methods of communicating inspection results:

- For the Group meeting between the inspector and all "Authorized Employees" who are reasonably expected to implement the procedures during the year.
- Include the inspection review in regularly scheduled safety training (if the training is scheduled prior to the employees' next use of the LOTO procedure).
- Include the inspection review in a pre-job briefing (e.g., if the LOTO must be performed before a scheduled review or for small groups).

Where tagout without lockout is practiced, the inspector shall interview a representative number of Affected Employees regarding their responsibilities under the LOTO procedure. A review of the results shall be conducted for all Affected Employees with responsibilities similar to that described above, although it may focus solely on the Affected Employee responsibilities.

The content of the review may be adjusted based on the results of the inspection. If no deficiencies exist, then this review may involve positive reinforcement communications. Employee retraining is not required when inspections do not reveal any deficiencies.

A more comprehensive review is necessary if the inspection reveals deviations from or inadequacies in employee knowledge of the energy control procedure or its application. Corrective actions must be taken (e.g., enforcement of existing procedures) and retraining must be performed whenever an inspection reveals inadequacies in the employees knowledge or use of the energy control procedure. Retraining of all employees must be performed whenever there is a change in an energy control procedure due to inadequacies revealed in the inspection.

This inspection shall be documented by completing Attachment C or alternative inspection record that includes the same information. Records of the reviews or communication sessions (e.g., sign in sheets and summary of materials discussed) with all other Authorized Employees and, if applicable, all other Affected Employees shall be retained with the inspection record.

6 Training

The following provides a brief overview of the LOTO training provided to DEP employees.

6.1 Affected Employees

DEP employees whose work operations are or may be in an area where energy control procedures may be utilized (Affected Employees), will be instructed about the LOTO procedure and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out as part of safety orientation or EHS awareness training.

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6.2 LOTO-Authorized Employees

Each LOTO-Authorized Employee shall receive training to recognize applicable hazardous energy sources, the types and magnitude of the energy available in the workplace, the methods and means necessary for energy isolation and control and the requirements of this procedure.

6.3 Retraining

LOTO-Authorized Employees and LOTO-Affected Employees shall complete, "Lockout and Tag--Refresher" training whenever there is a change in job assignment, machines, equipment or processes that present a new hazard or when there is a change in existing equipment, processes, or energy-control procedures.

Retraining shall be conducted if a periodic inspection reveals, or if the work supervisor has reason to believe, that a LOTO-Authorized Employee is deviating from the LOTO procedures or there are inadequacies in the employee's knowledge or use of the energy control procedures. Retraining shall reestablish personnel proficiency and introduce new or revised control methods and procedures, as necessary.

DEP may conduct the above refresher as on-the-job training and may also periodically voluntarily offer refresher training to LOTO-Authorized Employees.

7 Record Keeping

All completed LOTO Procedure Forms (e.g., Attachment B or equivalent) shall be maintained by the *Responsible Manager* (or their designee identified on the form) for at least 1 year after all locks have been properly removed and equipment returned to service. LOTO Procedure Forms will be maintained indefinitely if the activity is expected to be reoccurring.

The Annual LOTO Inspection records (Attachment C or equivalent) and records of communication to other *Authorized Employees* and *Affected Employees* (where tagout is practiced) shall be maintained with the written procedure at each facility. Completed inspection records shall be maintained for at least 5 years.

Training records, including employees name and dates of training for all LOTO-Affected Employees and LOTO-Authorized Employees, will be maintained by Bureau EHS. The Responsible Manager (or their designee) will maintain a list of trained LOTO-Authorized Employees. These records will include a certification, with each employee's name and date of training that employee training has been accomplished and is being kept up to date.

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- 8 Attachments
 - 8.1 Attachment A Example Written LOTO Procedure
 - 8.2 Attachment B LOTO Procedure Form
 - 8.3 Attachment C LOTO Annual Inspection Form
 - 8.4 Attachment D Examples of Hazardous Energy Potential
 - 8.5 Attachment E LOTO Requirements for Aqueducts
 - 8.6 Attachment F LOTO Requirements for Water Supply Distribution System Work
 - 8.7 Attachment G LOTO Requirements for the Bureau of Wastewater Treatment

ATTACHMENT A

Equipment-specific LOTO Procedure (Example)

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Control of Hazardous Energies - Lock out / Tag out Attachment A

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	EXAMPL	E LOCKOUT PROC	GEDURE
Facility/Location:	,		
Equipment/System Nam	e/No.:		
Job or Task Description			
· -			
Notify Responsible Man	ager	Name:	*
<u>.</u> •		Title:	
¥		Phone:	
Notify affected workers:		Note: list individual name or groups personnel.	of people notified. Include all affected contract
		·*	•
s			-
		nd magnitude(s) of energ	1
Identify type(s) and magnitude(s) or	f energy, its hazards and	d the methods to control the energy. Spi required.	ecifically identify any special lockout devices
Type of Energy	<u> </u>	Magnitude	Control Method
Electrical	12	0 V .	Lock
Pneumatic	12	5 psi	Valve cap
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Shut down equipment

If the equipment is operating, shut if down using the normal shutdown procedure (e.g., depress the stop button, open the switch, or close the valve).

Types of operating control (valve, switch, controller)	Location	Position (open, off, shut)
Breaker	Panel L-01-11, second floor Bld. 101	Open/off
Valve	1st floor Bld. 101 north wall machine shop	Closed
	"	

Isolate energy sources and attach lockout devices

Isolate the energy by positioning the energy-isolating device (e.g., switch, circuit breaker, or valve) to positively isolate the equipment from the energy source.

Lock-out the energy isolating device(s) with assigned individual lock(s) and attach a completed LOTO tag. Verify that the lock is effective, e.g., by attempting to turn on the switch or open the valve as appropriate

Type of lockout device (List in sequence to be isolated)	Location	ID number (i.e., valve or breaker ID)
Lock	Panel L-500	2-25-10
Valve Cap	1st floor Bld. 101 north wall mach. shop	None

Control stored energy

Types of stored energy			Methods to dissipate or restrain	
None		None		
	1			

Verify and test

Method of verification	Check points	
Press start button	Machine point of operation .	
Volt meter	Motor contacts	
Open downstream air valve	Pressure gauge	

When the possibility of reaccumulation of stored energy to a hazardous level exists, continuously verify adequacy of isolation until there is no accumulation of energy.

THE EQUIPMENT OR SYSTEM IS NOW LOCKED OUT.

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Control of Hazardous Energies - Lock out / Tag out
Attachment A

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1 Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
- 3. Verify that the controls are in neutral.
- 4. Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
- 5. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

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3 Approval

At the time this procedure was prepared or revised, the *Responsible Manager* (or employee they have designated as having responsibility for control of hazardous energy) has verified that this procedure is accurate and complete by signing and dating below.

Name	Signature	Date Rev. No. or Re-Verification

Note: This procedure shall be reviewed by the Authorized Employee prior to use. If a deficiency is identified and after any affected equipment or system modifications, the procedure must be reviewed by the Responsible Manager or designee and either revised/approved or revalidated before use.

ATTACHMENT B

LOTO Procedure Form

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LOCKOUT PROCEDURE				
Facility/Location:				
Equipment/System Nam	e/No.:			
Job or Task Description			· · · · · · · · · · · · · · · · · · ·	
•				
Notify Responsible Man	ager	Name:		
		Title:		
		Phone:	· ·	
Notify all affected works	rs:	Note: list individual name or groups of peopersonnel.	ple notified. Include all affected contract	
e •			· · · · · · · · · · · · · · · · · · ·	
			4 4	
identify type(s) and magnitude(s) of		nd magnitude(s) of energy. In the methods to control the energy. Specifical required.	ly identify any special lockout devices	
		soquitou.		
Type of Energy		Magnitude	Control Method	
· · · · · · · · · · · · · · · · · · ·				
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If the equipment is a same in a last it do	Shut down equipment	
Types of operating control	using the normal shutdown procedure (e.g., depress the stop button Location	, open the switch, or close the valve). Position
(valve, switch, controller)		(open, off, shut)
A A CONTRACTOR		
•		
Isolate the energy by pos Lock out the ene Verify that the lock is	solate energy sources and attach lockout disting the energy-isolating device (e.g., switch, circuit breaker, of equipment from the energy source, ergy isolating device(s) with assigned individual lock(s) and attach effective, e.g., by attempting to turn on the switch or open the valve	r valve) to positively isolate the a completed LOTO tag. e as appropriate
Type of lockout device List in sequence to be isolated)	Location	ID number (i.e., valve or breaker II
		(i.e., valve of breaker in
٤ ،		
		:
	Control stored energy	
Types of stored energy	1	
Types of stored energy	Methods to dissipate o	r restrain
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
. '3		
	Verify and test	
Method of verification	Check points	
	L	
hen the possibility of re-accumula	tion of stored energy to a hazardous level exists, plation until there is no accumulation of energy.	continuously verify adequac

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1 Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
- 3. Verify that the controls are in neutral.
- 4. Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
- 5. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

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3 Approval

At the time this procedure was prepared or revised, the *Responsible Manager* (or employee they have designated as having responsibility for control of hazardous energy) has verified that this procedure is accurate and complete by signing and dating below.

Name	Signatur	'e		Date	Rev. N	o. or Re-Verification
			;			
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				-		
<u> </u>			4.			

Note: This procedure shall be reviewed by the Authorized Employee prior to use. If a deficiency is identified and after any affected equipment or system modifications, the procedure must be reviewed by the Responsible Manager or designee and either revised/approved or revalidated before use.

Attachment C

LOTO Annual Inspection

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Policies and Procedur	es Manual	Envi	ronmental, Health & Safety
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	LOTO An	nual Inspection	
Facility/Location:			
Date of inspection:			
Person performing the	inspection:		
Equipment/System Nat LOTO procedure was	me/No. on which the being utilized:		÷
All energy sources pro locked out: Yes / No	perly isolated and	(If No, describe deficiency)	
Employees included in additional page if need		1. 2. 3.	
Each Authorized Empl understands his/her res Yes / No		(If No, describe deficiency)	
Each Affected Employ (required where tagout understands his/her res Yes / No	is practiced)	(If No, describe deficiency)	•
DEP LOTO procedure followed: Yes / No	understood and	(If No, describe deficiency)	
Any other discrepancie	s identified (e.g., procedure ve action(s):	requires revision):	
Responsible Manager's		ature	Date

Attachment D

Examples of Hazardous Energy Potential

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Attachment D

EXAMPLES OF PLANT EQUIPMENT WITH HAZARDOUS ENERGY POTENTIAL

AIR COMPRESSOR

General Procedures:

- Air pressure will be released
- Electricity will be either unplugged or locked out in the panel box

PUMPS

Pumps can build up internal pressure of air or water (compressors, sludge pumps) in the pump itself or in the connected lines. Disassembly before releasing the pressure could cause injury by flying parts.

GATES AND VALVES

The unexpected opening of a gate could cause an engulfment hazard for employees working in the area. When working on a line with a valve locked out, care must be taken to be sure the line cannot receive back flow from the other direction.

CRANES AND HOISTS

In addition to the general hazards of electrical equipment, cranes and hoists must be made secure against the unexpected descent of the lifting device or a load attached to it.

> On cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. A means of opening this switch or circuit breaker shall be located within easy reach of the operator

ELECTRICAL

- A. Shut off power at machine and disconnect.
- B. Disconnecting means must be locked or tagged.
- C. Press start button to see that correct systems are locked out.
- D. All controls must be returned to their safest position.
- E. Points to remember:
 - If a machine or piece of equipment contains capacitors, they must be drained of stored energy.
 - Possible disconnecting means include the power cord, power panels (look for primary and secondary voltage), breakers, the operator's station, motor circuit, relays, limit switches, and electrical interlocks.

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NOTE:

- 1. Some equipment may have a motor isolating shut-off and a control isolating shutoff.
- 2. If the electrical energy is disconnected by simply unplugging the power cord, the cord must be kept under the control of the authorized employee or the plug end of the cord must be locked out or tagged out.

HYDRAULIC/PNEUMATIC

- A. Shut off all energy sources (pumps and compressors). If the pumps and compressors supply energy to more than one piece of equipment, lockout or tagout the valve supplying energy to this piece of equipment.
- B. Stored pressure from hydraulic/pneumatic lines shall be drained/bled when release of stored energy could cause injury to employees.
- C. Make sure controls are returned to their safest position (off, stop, standby, inch, jog, etc.).

FLUIDS AND GASES

- A. Identify the type of fluid or gas and the proper means of controlling it.
- B. Close valves to prevent flow, lockout/tagout.
- C. Determine the isolating device, close, and lockout or tagout.
- D. Drain and bleed lines to zero energy state.

NOTE: Some systems may have electrically controlled valves; if so, they must be shut off, locked or tagged out.

E. Check for zero energy state at the equipment.

MECHANICAL ENERGY (Gravity activation, or stored in springs, etc)

- A. Block out or use die ram safety chain.
- B. Lockout or tagout safety device.
- C. Shut off, lockout or tagout electrical system.
- D. Check for zero energy state.
- E. Return controls to safest position.

Attachment E

LOTO Requirements for Aqueducts

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LOTO REQUIREMENTS FOR AQUEDUCTS

When work, such as debris removal or an inspection, is to be performed inside an aqueduct, the location of the lockout point to stop the flow of water is often remote from the work location. It can be nearly impossible to shut down the system for the time required so that individuals at the site may have personal lockout at the gates controlling water. Continuity of water flow must be restored within a short and specific time frame. In those cases, written procedures are to be developed and followed which will provide effective protection for employees. The following general procedure shall be followed, with changes and additions that may be necessary for a specific site insofar as any change does not compromise effective protection, to provide those personnel a level of protection equivalent to that of a personal lockout:

- As described in the Group LOTO section, primary responsibility will be vested in one LOTO-Authorized Employee who will control the lockout, designated as the LOTO Group Leader by the group's supervisor. The LOTO Group Leader will ascertain the exposure status of individual members of the potentially exposed group working at the site, coordinate between work groups at the site and remotely and ensure continuity of lockout protections as long as any employee may be exposed.
- A Supervisor at the remote site where the lockouts are applied will be designated the LOTO Remote Site Leader. The Remote Site Leaders are the primary people responsible for the remote lockout. It is only through their communications that LOTO devices are engaged/removed. These Remote Site Leaders are typically Supervisors, and will communicate through radio, telephone, or other direct means. The employee at the worksite could be any place downstream of the aqueduct and would be protected by the Group Leader at the worksite.
- Two LOTO-Authorized Employees familiar with the area of work will document all sources of potential energy release and ensure that they are properly locked out by LOTO-Authorized Employees and that all Affected Employees are notified at the remote lockout site.
- Information as to lockout (points of lockout and time applied) will be given to the LOTO Group Leader by direct contact (phone or radio).
- > The LOTO Group Leader will maintain a roster of personnel who are in the aqueduct.
- > LOTO Group Leader will personally verify the identity of each person who enters and leaves that space.
- > LOTO Group Leader will exercise care that no one enters or leaves the space without his or her knowledge.
- Personnel leaving their ID card at the entrance for pick-up when leaving the aqueduct may be used as a check as to who is in the space at any given time.
- LOTO Authorized Employees responsible for remote lockout will not release lockout until they have verification from the LOTO Group Leader that all affected personnel are out of the space. Verification will be by direct contact (phone or radio).

Attachment F

LOTO Requirements for Water Supply Distribution System Work

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LOTO REQUIREMENTS FOR WATER SUPPLY DISTRIBUTION SYSTEM WORK

When work is to be performed in the distribution system, multiple valve closures remote from the work location are required to stop the flow of water. These valves are not capable of being locked in a practical manner (e.g., without excavation, installation of new enclosures) because the valves are several feet below the ground in a narrow access box.

The following general LOTO procedures shall be followed or any modifications must provide a level of protection equivalent to the procedure below and changes or additions that may be necessary for a specific site (e.g., LOTO device other the orange valve cap, unique position/location of valve, any irregularity, etc.) must be noted in the Comments section of Water Valve LOTO form.

For the purposes of this procedure, the *Repair Supervisor* is the supervisor in charge of the repair and can be from any DEP operations or construction group or a contractor. The term LOTO device as used in this procedure refers to an orange "valve can" or an equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520".

Shutdown:

- The Repair Supervisor or their designee will be the LOTO Group Leader and will ascertain the exposure status of individual members of the group working at the site, coordinate between work groups at the site and ensure continuity of lockout protections as long as any employee may be exposed to potential harm from repressurization.
- After shutdown is complete, the *Repair Supervisor* will verify that the system is closed and all employees are out of the way of potential harm and that an orange "valve can" or an equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520" has been placed over the appropriate valves.
- A Water Valve LOTO form will be completed with date, time, location of all valves closed and signature of the *Repair Supervisor* (or their designee).
- The Repair Supervisor will notify the Emergency Call Center (ECC, 212-689-1520) that he/she has set up a distribution system LOTO and that no valve openings shall be performed in the area until Repair Supervisor on duty authorizes it.
- Figure 1. If work continues through shift changes, the departing *Repair Supervisor* will review the LOTO form, valve locations and job status with and turn over the Water Valve LOTO form to the relieving *Repair Supervisor* who will assume responsibility for the LOTO. Both supervisors must sign the LOTO transfer section.

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Reopening the Shutdown:

- The **Repair Supervisor** will verify that all employees are out of the way of potential harm and will repressurize the system.
- The Repair Supervisor confirms the removal of all LOTO devices, marks which valves have been reopened on the form, signs off on the LOTO "Release" at the bottom and forwards a copy to the Maintenance Yard. When the shutdown is reopened, the Repair Supervisor notifies the ECC (212-689-1520) that the LOTO has been terminated and water service has been restored.
- The Repair Supervisor must account for all LOTO devices that were removed and will ensure their eventual return to the Maintenance Yard.
- All additional valves that may need to be opened after a LOTO is released by the *Repair Supervisor* will be reopened by the on-duty *Maintenance Supervisor* (or designee) as time allows.

Partial Reopening for Advancing Work Zones:

- The **Repair Supervisor** will verify that the system is closed and all employees are out of the way of potential harm.
- The Repair Supervisor will reopen the selected valves after confirming the removal of selected LOTO devices, marks those valves reopened on the form, marks all remaining valves "used for next LOTO" signs off on the LOTO "Release" at the bottom and forwards a copy to the Maintenance Yard.
- The Repair Supervisor will repeat the "Shutdown" steps above for the next work zone.

Training:

All distribution system employees are Affected Employees and are trained not to remove "valve cans" or open valves under "valve cans" (or equivalent devices) without confirming that all LOTO work in the area has been completed and that the Repair Supervisor has closed out the LOTO.

Work by a Contractor Under DEP Supervision:

The Repair Supervisor will be the person assigned by the Construction Unit to supervise the Contractor during the construction/repair project and will meet all the requirements above.

Work by Any Contractor Under Another Agency's Supervision (e.g., DDC):

The contractor will identify the person who will serve as **Repair Supervisor** for construction who will be advised of the DEP procedure and will meet all the requirements above except as noted below.

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The contractors must use their own tagged valve cans (or equivalent devices) with their 24 hour/day emergency contact information and must remove all cans after the LOTO is released.

Water Valve Lock-Out/Tag-Out (LOTO) Field Checklist

Shutdown (by Maintenance Supervisor):

- The Maintenance Supervisor will identify the valves that must be closed.
- Document the date, time, and location of each valve closed under the supervision of the Maintenance Supervisor on the Water Valve LOTO form.
- After the Maintenance supervised shutdown is complete, the Water Valve LOTO form will be given to the *Repair Supervisor*.
- Use maps for scheduled repairs to facilitate location of closed valves and spray paint to mark the valve cover, when possible.

Completing the Tagout (by Repair Supervisor):

- Repair Supervisor must ensure and verify that an orange "valve can" or equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520" has been placed over all appropriate valves and all employees are out of the way of potential harm whether or not the valves were closed under their supervision.
- Document the LOTO with date, time, and location of all valves closed on the Water Valve LOTO form and sign.
- If the Water Valve LOTO form was initiated by and received from the Maintenance Supervisor, the Repairs Supervisor will record (check off on form) and verify that the system is indeed closed and ensure that a properly tagged LOTO device has been placed over the appropriate valves.
- Notify the Emergency Call Center (ECC, 212-689-1520) of distribution system LOTO in the area and that no valve openings shall be performed in the area until **Repair Supervisor** on duty authorizes it.
- If a crew is replaced by another, prior to handing over the Water Valve LOTO Form and the responsibility for the job, the responsible Repairs supervisor will review the LOTO form, valve locations and job status with the relieving *Repair Supervisor*.
- Both supervisors must sign the LOTO transfer section.

Reopening the Shutdown (by Repair Supervisor):

- Verify that the system is ready to be repressurized and all employees are out of the way of potential harm.
- Remove all valve cans (or equivalent devices), mark all valves that were reopened on the form, sign off at the bottom as "job completed" and fax a copy to the Maintenance Yard that initiated the LOTO.
- Account for all LOTO devices removed and return them to the Maintenance Yard.

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Final Steps for Reopening Valves (by Maintenance Supervisor):

If additional valves need to be opened, the on-duty *Maintenance Supervisor* can have them opened as time allows.

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Attachment G

LOTO Requirements for Bureau of Wastewater Treatment

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Revision: 1
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LOTO REQUIREMENTS FOR BUREAU OF WASTEWATER TREATMENT

Lockout/tagout performed in any active operating areas within Bureau of Wastewater Treatment (BWT) Water Pollution Control Plant (WPCP) facilities (i.e., areas not completely turned over for construction) will follow additional BWT requirements, summarized below. Employees violating the procedures outlined in this policy are subject to disciplinary charges.

- A number 47 lock and key will never be used.
- Color Coding scheme used for locks identifying the trades involved shall be as follows:

Color	Title
Yellow	Electricians
Red	SSEE/SEE
Blue	SSTW/STW/Oiler
Green	Machinists

- When isolating electrical energy, to verify the deenergization of power, the plant electrician and either the SEE or SSEE will use test equipment to test the circuit elements and electrical parts of the equipment to which employees will be exposed, and shall verify that the circuit elements and equipment parts are deenergized. The test will also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and are presumed to be safe. The test equipment shall be checked for proper operation immediately before and immediately after this test.
- An entry will be made in the Equipment Lock-Out Summary Log that the equipment has been deenergized and locked out.
- Operations engineers, electricians and machinists will store their keys and filledout hold-off tags in their own respective lock-out device cabinets.
- Emergency phone numbers of electrical foremen, electricians, electrician's helpers, machinist foremen, machinists, and machinist's helpers will be kept on file at the WPCP Operations Engineer's desk.
- Locks and lock-out devices will be issued when needed to STWs, SSTWs, and Oilers by the Operations Engineer.
- > STWs, SSTWs, and Oilers will maintain direct control of their keys during the shift.
- > STWs, SSTWs, and Oilers keys and locks will be returned to the Engineer by the end of the shift if the lock-out has been removed from the equipment. An entry will be made in the Equipment Lock-Out Summary Log that the equipment is no

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longer locked out, and whether it has been placed back in service (is running) or is not in service but may be restored to service if needed.

- ➤ If the STW's, SSTW's, or Oiler's lock must be kept on the locked out equipment past the end of the shift, their key will be tagged and placed in the Safety Lock-Out Device Cabinet.
- When shifts change and the arriving personnel or shift will be continuing the work on de-energized equipment, locks may be transferred by applying supervisory locks and following Section 5.4 of the procedure.
- > If the equipment will be locked out for an extended time period, supervisory locks may be used following Section 5.5 of the procedure.
- When supervisory locks are used, any changes in the status of the LOTO will be communicated from the departing Shift Engineer to the arriving one in writing using the LOTO log or work ticket and, when feasible, by direct communication.
- After completely restoring equipment and service per the LOTO procedure, an entry will be made in the Equipment Lock-Out Summary Log that the equipment is no longer locked out, and whether it has been placed back in service (is running) or is not in service but may be restored to service if needed. The key(s), lock(s), and lock-out device(s) will be returned to the Safety Lock-Out Device Cabinet.

ATTACHMENT A

Equipment-specific LOTO Procedure (Example)

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EXAMPLE LOCKOUT PROCEDURE					
Facility/Location:					
Equipment/System Name/No.:					
Job or Task Description:					
Notify Responsible Manager	Name:				
en de la transferior de la Miller de la Mill	Title:				
	Phone:				
Notify affected workers:	Note: list individual name or groups of people notified. Include all affected contract personnel.				

Type(s) and magnitude(s) of energy.

Identify type(s) and magnitude(s) of energy, its hazards and the methods to control the energy. Specifically identify any special lockout devices required.

Type of Energy	Magnitude	Control Method
Electrical	120 V	Lock
Pneumatic	125 psi	Valve cap
	·	- A

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Shut down equipment

If the equipment is operating, shut if down using the normal shutdown procedure (e.g., depress the stop button, open the switch, or close the valve

Types of operating control (valve, switch, controller)	Location	Position (open, off, shut)
Breaker	Panel L-01-11, second floor Bld. 101	Open/off
Valve -	1 st floor Bld. 101 north wall machine shop	Closed

Isolate energy sources and attach lockout devices

Isolate the energy by positioning the energy isolating device (e.g., switch, circuit breaker; or valve) to positively isolate the equipment from the energy source.

Lock out the energy isolating device(s) with assigned individual lock(s) and attach a completed LOTO tag.

Verify that the lock is effective, e.g., by attempting to turn on the switch or open the valve as appropriate.

Type of lockout device (List in sequence to be isolated)	Location	ID number (i.e., valve or breaker ID)
Lock	Panel L-500	2-25-10
Valve Cap	1 st floor Bld. 101 north wall mach. shop	None

Control stored energy

Types of stored energy	Methods to dissipate or restrain		
None	None		

Verify and test

Method of verification	Check points
Press start button	Machine point of operation
Volt meter	Motor contacts
Open downstream air valve	Pressure gauge

When the possibility of reaccumulation of stored energy to a hazardous level exists, continuously verify adequacy of isolation until there is no accumulation of energy.

THE EQUIPMENT OR SYSTEM IS NOW LOCKED OUT.

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Control of Hazardous Energies - Lock out / Tag out Attachment A

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1 Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
- 3. Verify that the controls are in neutral.
- 4. Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
- 5. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

2 Remarks:

3 Approval

At the time this procedure was prepared or revised, the *Responsible Manager* (or employee they have designated as having responsibility for control of hazardous energy) has verified that this procedure is accurate and complete by signing and dating below.

Name	Signature	Date	Rev. No. or Re-Verification
			
			1
			<u> </u>
	<u> </u>		

Note: This procedure shall be reviewed by the *Authorized Employee* prior to use. If a deficiency is identified and after any affected equipment or system modifications, the procedure must be reviewed by the *Responsible Manager* or designee and either revised/approved or revalidated before use.

Lock-Out / Tag-Out Control of Hazardous Energy

ATTACHMENT B

LOTO Procedure Form

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Attachment B

Revision: 1

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	CROOT PROCEDURE	
Facility/Location:		
Equipment/System Name/No.:	·	
Job or Task Description:		
Notify Responsible Manager	Name: Title: Phone:	
Notify all affected workers:	Note: list individual name or groups of peop personnel.	le notified. Include all affected contract
Type(s) Identity type(s) and magnitude(s) of energy, its hazards	and magnitude(s) of energy; and the methods to control the energy. Specificall required:	y identify any special lockout devices
Type of Energy	Magnitude	Control Method
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Effective Date: 10/31/06

	Attachment B	Effective Date: 10/31/06
	Shut down equipment	
If the equipment is operating, shullif down using the		
Types of operating control (valve, switch, controller)	Location	Position (open, off, shut)
•		
	<u> </u>	
Isolate Isolate the energy by positioning	energy sources and attach loc the energy-isolating device (e.g., switch, circuit	kout devices
Lock out the energy isola	equipment from the energy source, ting device(s) with assigned individual lock(s).	and attach a completed LOTO tag
Type of lockout device (List in sequence to be isolated)	, é.g., by attempting to turn on the switch or op Location	ID number (i.e., valve or breaker ID)
ε.		
	Control stored energy	
Types of stored energy	Methods to diss	ipate or restrain
		··
	Verify and test	
Method of verification	Check	points
		,
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When the possibility of re-accumulation of stored energy to a hazardous level exists, continuously verify adequacy of isolation until there is no accumulation of energy.

THE EQUIPMENT OR SYSTEM IS NOW LOCKED OUT.

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Attachment B

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1 Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
- 3. Verify that the controls are in neutral.
- 4. Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
- 5. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

2 Remarks:

3 Approval

At the time this procedure was prepared or revised, the *Responsible Manager* (or employee they have designated as having responsibility for control of hazardous energy) has verified that this procedure is accurate and complete by signing and dating below.

Name	Signature	Date	Rev. No. or Re-Verification
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Note: This procedure shall be reviewed by the *Authorized Employee* prior to use. If a deficiency is identified and after any affected equipment or system modifications, the procedure must be reviewed by the *Responsible Manager* or designee and either revised/approved or revalidated before use.

Lock-Out / Tag-Out Control of Hazardous Energy

ATTACHMENT C

LOTO Annual Inspection

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LOTO Aı	nnual Inspection
Facility/Location:	
Date of inspection:	
Person performing the inspection:	
Equipment/System Name/No. on which the LOTO procedure was being utilized:	
All energy sources properly isolated and locked out: Yes / No	(If No, describe deficiency)
Employees included in the inspection (use additional page if needed):	1.
	3.
Each Authorized Employee interviewed understands his/her responsibilities: Yes / No	(If No, describe deficiency)
Each Affected Employee interviewed (required where tagout is practiced) understands his/her responsibilities: Yes / No	(If No, describe deficiency)
DEP LOTO procedure understood and followed: Yes / No	(If No, describe deficiency)
Any other discrepancies identified (e.g., procedu	re requires revision):
Recommended corrective action(s):	
Responsible Manager's Review: Note: Also retain record of communication sessions. Signature of the session of	gnature Date

Lock-Out / Tag-Out Control of Hazardous Energy

ATTACHMENT D

Examples of Hazardous Energy Potential

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EXAMPLES OF PLANT EQUIPMENT WITH HAZARDOUS ENERGY POTENTIAL

AIR COMPRESSOR

General Procedures:

- > Air pressure will be released
- > Electricity will be either unplugged or locked out in the panel box

PUMPS

Pumps can build up internal pressure of air or water (compressors, sludge pumps) in the pump itself or in the connected lines. Disassembly before releasing the pressure could cause injury by flying parts.

GATES AND VALVES

The unexpected opening of a gate could cause an engulfment hazard for employees working in the area. When working on a line with a valve locked out, care must be taken to be sure the line cannot receive back flow from the other direction.

CRANES AND HOISTS

In addition to the general hazards of electrical equipment, cranes and hoists must be made secure against the unexpected descent of the lifting device or a load attached to it.

➤ On cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. A means of opening this switch or circuit breaker shall be located within easy reach of the operator

ELECTRICAL

- A. Shut off power at machine and disconnect.
- B. Disconnecting means must be locked or tagged.
- C. Press start button to see that correct systems are locked out.
- D. All controls must be returned to their safest position.
- E. Points to remember:
 - 1. If a machine or piece of equipment contains capacitors, they must be drained of stored energy.

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2. Possible disconnecting means include the power cord, power panels (look for primary and secondary voltage), breakers, the operator's station, motor circuit, relays, limit switches, and electrical interlocks.

NOTE:

- 1. Some equipment may have a motor isolating shut-off and a control isolating shutoff.
- 2. If the electrical energy is disconnected by simply unplugging the power cord, the cord must be kept under the control of the authorized employee or the plug end of the cord must be locked out or tagged out.

HYDRAULIC/PNEUMATIC

- A. Shut off all energy sources (pumps and compressors). If the pumps and compressors supply energy to more than one piece of equipment, lockout or tagout the valve supplying energy to this piece of equipment.
- B. Stored pressure from hydraulic/pneumatic lines shall be drained/bled when release of stored energy could cause injury to employees.
- C. Make sure controls are returned to their safest position (off, stop, standby, inch, jog, etc.).

FLUIDS, AND GASES

- A. Identify the type of fluid or gas and the proper means of controlling it.
- B. Close valves to prevent flow, lockout/tagout.
- C. Determine the isolating device, close, and lockout or tagout.
- D. Drain and bleed lines to zero energy state.
 - **NOTE:** Some systems may have electrically controlled valves; if so, they must be shut off, locked or tagged out.
- E. Check for zero energy state at the equipment.

MECHANICAL ENERGY (Gravity activation, or stored in springs, etc)

- A. Block out or use die ram safety chain.
- B. Lockout or tagout safety device.
- C. Shut off, lockout or tagout electrical system.
- D. Check for zero energy state.
- E. Return controls to safest position.

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ATTACHMENT E LOTO REQUIREMENTS FOR AQUADUCTS

When work, such as debris removal or an inspection, is to be performed inside an aqueduct the location of the lockout point to stop the flow of water is often remote from the work location. It can be nearly impossible to shutdown the system for the time required so that individuals at the site may have personal lockout at the gates controlling water. Continuity of water flow must be restored within a short and specific time frame. In those cases, written procedures are to be developed and followed which will provide effective protection for employees. The following general procedure shall be followed, with changes and additions that may be necessary for a specific site insofar as any change does not compromise effective protection, to provide those personnel a level of protection equivalent to that of a personal lockout:

- As described in the Group LOTO section, primary responsibility will be vested in one LOTO-Authorized Employee who will control the lockout, designated as the LOTO Group Leader by the group's supervisor. The LOTO Group Leader will ascertain the exposure status of individual members of the potentially exposed group working at the site, coordinate between work groups at the site and remotely and ensure continuity of lockout protections as long as any employee may be exposed.
- A Supervisor at the remote site where the lockouts are applied will be designated the LOTO Remote Site Leader. The Group Leaders are the primary people responsible for the remote lockout. It is only through their communications that LOTO devices are engaged/ removed. These Group Leaders are typically Supervisors, and would communicate through radio, telephone, or other direct means. The employee at the worksite could be anyplace downstream of the aqueduct and would be protected by the Group Leader at the worksite.
- Two LOTO-Authorized Employees familiar with the area of work will document all sources of potential energy release and ensure that they are properly locked out by LOTO-Authorized Employees and that all Affected Employees are notified at the remote lockout site.
- Information as to lockout (points of lockout and time applied) will be given to the LOTO Group Leader by direct contact (phone or radio).
- > The LOTO Group Leader will maintain a roster of personnel who are in the aqueduct.
- > LOTO Group Leader will personal verify the identification of each person that enters and leaves that space.
- LOTO Group Leader will exercise care that no one enters or leaves the space without his or her knowledge.
- Personnel leaving their ID card at the entrance for pick up when leaving the aqueduct may be used as a check as to who is in the space at any given time.

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LOTO Authorized Employees responsible for remote lockout will not release lockout until they have verification from the LOTO Group Leader that all affected personnel are out of the space. Verification will be by direct contact (phone or radio).

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ATTACHMENT F

LOTO REQUIREMENTS FOR WATER SUPPLY DISTRIBUTION SYSTEM WORK

When work is to be performed in the distribution system, multiple valve closures remote from the work location are required to stop the flow of water. These valves are not capable of being locked in a practical manner (e.g., without excavation, installation of new enclosures) because the valves are several feet below the ground in a narrow access box.

The following general LOTO procedures shall be followed or any modifications must provide a level of protection equivalent to the procedure below and changes or additions that may be necessary for a specific site (e.g., LOTO device other the orange valve cap, unique position/location of valve, any irregularity, etc.) must be noted in the Comments section of Water Valve LOTO form.

For the purposes of this procedure, the *Repair Supervisor* is the supervisor in charge of the repair and can be from any DEP operations or construction group or a contractor. The term LOTO device as used in this procedure refers to an orange "valve can" or an equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520".

Shutdown:

- The *Repair Supervisor* or their designee will be the *LOTO Group Leader* and will ascertain the exposure status of individual members of the group working at the site, coordinate between work groups at the site and ensure continuity of lockout protections as long as any employee may be exposed to potential harm from repressurization.
- After shutdown is complete, the *Repair Supervisor* will verify that the system is closed and all employees are out of the way of potential harm and that an orange "valve can" or an equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520" has been placed over the appropriate valves.
- A Water Valve LOTO form will be completed with date, time, location of all valves closed and signature of the *Repair Supervisor* (or their designee).
- The *Repair Supervisor* will notify the Emergency Call Center (ECC, 212-689-1520) that he/she has set up a distribution system LOTO and that no valve openings shall be performed in the area until *Repair Supervisor* on duty authorizes it.
- If work continues through shift changes, the departing *Repair Supervisor* will review the LOTO form, valve locations and job status with and turn over the Water Valve LOTO form to the relieving *Repair Supervisor* who will assume responsibility for the LOTO. Both supervisors must sign the LOTO transfer section.

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Reopening the Shutdown:

- The *Repair Supervisor* will verify that all employees are out of the way of potential harm and will repressurize the system.
- The *Repair Supervisor* confirms the removal of all LOTO devices, marks which valves have been reopened on the form, signs off on the LOTO "Release" at the bottom and forwards a copy to the Maintenance Yard. When the shutdown is reopened, the *Repair Supervisor* notifies the ECC (212-689-1520) that the LOTO has been terminated and water service has been restored.
- The *Repair Supervisor* must account for all LOTO devices that were removed and will ensure their eventual return to the Maintenance Yard.
- All additional valves that may need to be opened after a LOTO is released by the *Repair Supervisor* will be reopened by the on-duty *Maintenance Supervisor* (or designee) as time allows.

Partial Reopening for Advancing Work Zones:

- The *Repair Supervisor* will verify that the system is closed and all employees are out of the way of potential harm.
- The *Repair Supervisor* will reopen the selected valves after confirming the removal of selected LOTO devices, marks those valves reopened on the form, marks all remaining valves "used for next LOTO" signs off on the LOTO "Release" at the bottom and forwards a copy to the Maintenance Yard.
- The *Repair Supervisor* will repeat the "Shutdown" steps above for the next work zone.

Training:

All distribution system employees are Affected Employees and are trained not to remove "valve cans" or open valves under "valve cans" (or equivalent devices) without confirming that all LOTO work in the area has been completed and that the Repair Supervisor has closed out the LOTO.

Work by Any Contractor:

- The contractor will identify the person who will serve as *Repair Supervisor* for construction who will be advised of the DEP procedure and will meet all the requirements above except as noted below.
- The contractors must use their own tagged valve cans (or equivalent devices) with their 24 hour/day emergency contact information and must remove all cans after the LOTO is released.

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Water Valve Lock Out Tag Out (LOTO) Field Checklist

Shutdown (by Maintenance Supervisor):

- □ The *Maintenance Supervisor* will identify the valves that must be closed.
- Document the date, time, and location of each valve closed under the supervision of the Maintenance Supervisor on the Water Valve LOTO form.
- □ After the Maintenance supervised shutdown is complete, the Water Valve LOTO form will be given to the *Repair Supervisor*.
- Use maps for scheduled repairs to facilitate location of closed valves and spray paint to mark the valve cover, when possible.

Completing the Tagout (by Repair Supervisor):

- □ Repair Supervisor must ensure and verify that an orange "valve can" or equivalent blocking/tagging device with a tag saying "DO NOT REOPEN VALVE WITHOUT RECEIVING AUTHORIZATION FROM REPAIR SUPERVISOR. CALL 212-689-1520" has been placed over all appropriate valves and all employees are out of the way of potential harm whether or not the valves were closed under their supervision.
- Document the LOTO with date, time, and location of all valves closed on the Water Valve LOTO form and sign.
- If the Water Valve LOTO form was initiated by and received from the Maintenance Supervisor, the Repairs Supervisor will record (check off on form) and verify that the system is indeed closed and ensure that a properly tagged LOTO device has been placed over the appropriate valves.
- Notify the Emergency Call Center (ECC, 212-689-1520) of distribution system LOTO in the area and that no valve openings shall be performed in the area until *Repair Supervisor* on duty authorizes it.
- ☐ If a crew is replaced by another, prior to handing over the Water Valve LOTO Form and the responsibility for the job, the responsible Repairs supervisor will review the LOTO form, valve locations and job status with the relieving *Repair Supervisor*.
- Both supervisors must sign the LOTO transfer section.

Reopening the Shutdown (by Repair Supervisor):

- Verify that the system is ready to be repressurized and all employees are out of the way of potential harm.
- □ Remove all valve cans (or equivalent devices), mark all valves that were reopened on the form, sign off at the bottom as "job completed" and fax a copy to the Maintenance Yard that initiated the LOTO.
- □ Account for all LOTO devices removed and return them to the Maintenance Yard.

Final Steps for Reopening Valves (by Maintenance Supervisor):

□ If additional valves need to be opened, the on-duty *Maintenance Supervisor* can have them opened as time allows.

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Lock Out - Tag Out of Water Valves

Bor	ough:			Yard:			•	
Mai	ntenance Supv:			Signature	:			
Date	Shut:		Tir	ne Shut:				
	LOCATION – Stre	eet / Cross Street		Valve #	Size	Shut/ Tagged (Initial)	Tag Removed (Initial)	Valve Opened (Initial)
1							()	(
2								
3			:					
4								
5		-						
6								
7		• ,		:				
8								
Con	ıments, modifica	tions and/or change	s:	<u>[</u>				
					+1			
								:
 LOI	O Supervision 7	Transfer When Crev	w Chai	ngee.	. <u>,</u>			
	(Name)	From (Signature)	1	Name)	То	(Signature)	Date:	Time:
		÷						
					f	1		
	O Terminated:	two.						(-
	ir Supv. Release:			nature:	Date Released:			
Main	t. Supv. Closeout	:	_ Sign	nature:		Date All	Open:	

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ATTACHMENT G LOTO REQUIREMENTS FOR BUREAU OF WASTEWATER TREATMENT

Lockout/tagout performed in any active operating areas within Bureau of Wastewater Treatment (BWT) Water Pollution Control Plant (WPCP) facilities (i.e., areas not completely turned over for construction) will follow additional BWT requirements, summarized below. Employees violating the procedures outlined in this policy are subject to disciplinary charges.

- > A number 47 lock and key will never be used.
- Color Coding scheme used for locks identifying the trades involved shall be as follows:

Color	Title		
Yellow	Electricians		
Red	SSEE/SEE		
Blue	SSTW/STW/Oiler		
Green	Machinists		

- When isolating electrical energy, to verify the deenergization of power, the plant 'electrician and either the SEE or SSEE will use test equipment to test the circuit elements and electrical parts of the equipment to which employees will be exposed, and shall verify that the circuit elements and equipment parts are deenergized. The test will also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and are presumed to be safe. The test equipment shall be checked for proper operation immediately before and immediately after this test.
- An entry will be made in the Equipment Lock Out Summary Log that the equipment has been deenergized and locked out.
- Operations engineers, electricians and machinists will store their keys and filledout hold-off tags in their own respective lock-out device cabinets.
- Emergency phone numbers of electrical foremen, electricians, electrician's helpers, machinist foremen, machinists, and machinist's helpers will be kept on file at the WPCP Operations Engineer's desk.
- ➤ Locks and lock-out devices will be issued when needed to STWs, SSTWs, and Oilers by the Operations Engineer.
- > STWs, SSTWs, and Oilers will maintain direct control of their keys during the shift.
- > STWs, SSTWs, and Oilers keys and locks will be returned to the Engineer by the end of the shift if the lock out has been removed from the equipment. An entry

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will be made in the Equipment Lock Out Summary Log that the equipment is no longer locked out, and whether it has been placed back in service (is running) or is not in service but may be restored to service if needed.

- ➤ If the STW's, SSTW's, or Oiler's lock must be kept on the locked out equipment past the end of the shift, their key will be tagged and placed in the Safety Lock Out Device Cabinet.
- When shifts change and the arriving personnel or shift will be continuing the work on de-energized equipment, locks may be transferred by applying supervisory locks and following Section 5.4 of the procedure.
- > If the equipment will be locked out for an extended time period, supervisory locks may be used following Section 5.5 of the procedure.
- > When supervisory locks are used, any changes in the status of the LOTO will be communicated from the departing Shift Engineer to the arriving one in writing using the LOTO log or work ticket and, when feasible, by direct communication.
- After completely restoring equipment and service per the LOTO procedure, an entry will be made in the Equipment Lock Out Summary Log that the equipment is no longer locked out, and whether it has been placed back in service (is running) or is not in service but may be restored to service if needed. The key(s), lock(s), and lock out device(s) will be returned to the Safety Lock Out Device Cabinet.

APPENDIX J

PERSONAL PROTECTIVE EQUIPMENT (PPE)
PROGRAM: SELECTION AND USE

PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM: SELECTION AND USE

1.0 PURPOSE

This program has been written to help the worker choose the correct Personal Protective Equipment (PPE) for the job. Familiarity with the different levels of protection (A, B, C and D) will help speed up the selection process. Careful selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, body and hearing. Posillico employees may work at a variety of job sites and locations which may require different types of protective equipment. Client specific requirements will always be adhered to. Posillico will supply all PPE or reimburse the employee for the costs of PPE if the PPE is required as part of the project.

2.0 SCOPE

This program establishes criteria for the selection, use, donning and doffing, inspection, maintenance, storage, decontamination of PPE, and evaluation. This information is general, and specific PPE use should be included in the site-specific health and safety plan (SSHSP) prepared for each project.

3.0 <u>OSHA REQUIREMENTS (29 CFR 1910.120)</u>

A written personal protective equipment program, which is part of the employer's safety and health program and also part of the site-specific health and safety plan shall be established. The PPE program shall address the elements listed below.

- PPE selection based upon site hazards;
- PPE use and limitations of the equipment;
- Work mission duration;
- PPE Maintenance and storage;
- PPE decontamination and disposal;
- PPE training and proper fitting;
- PPE donning and doffing procedures;
- PPE inspection procedures prior to, during and after use;
- Evaluation of the effectiveness of the PPE program; and
- Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

OSHA Standard 29 CFR 1910.132 requires employers to assess the employer's workplace and determine if hazards are present that necessitate the use of personal protective equipment (PPE). This assessment must be certified in writing and documented.

Due to the variety of job sites and situations that Posillico personnel may be involved in, it is important that Posillico maintain a consistent approach in complying with health and safety procedures. The project manager and/or site supervisor are responsible for ensuring that all personnel wear the appropriate PPE. Failure to comply with these requirements may result in disciplinary action. Employee safety is a paramount concern for all Posillico managers and employees. We all must make every effort to protect ourselves and each other from harm. These procedures will now require the following:

- 1. Protective footwear must be worn by all field personnel working in the field. Footwear must at a minimum include steel toe and shank protection. Posillico will reimburse employees up to \$90 for the purchase of protective footwear which must be dedicated for work. Protective footwear must meet ANSI Z41-1991. Additionally, chemical protective footwear may also be required if the potential for contaminated materials exists. This type of protection will be required on a site-specific basis.
- 2. Eye protection must be worn by all personnel, subcontractors and visitors at all times. Eye protection should be in place as the job site is entered and remain on until the work area is exited. Eye protection does not have to be work inside enclosed cabs, automobiles or job trailers. Eye protection must include side shields. Prescription lenses worn as eye protection and other protective eyewear must meet ANSI Z87.1.
- 3. Hardhats are to be worn by all field personnel when in the field. New hardhats must meet ANSI Z89.
- 4. Hi-visibility ANSI II approved Vests are to be worn at all times. Vests should be closed in front and back.
- 5. Hand protection is to be worn on a site-specific basis. The hand protection must be selected based on the chemical hazards expected to be encountered. Posillico maintains a stock of a variety of gloves including:

Best:

Nitrile N-Dey

PVC

Latex

Vinyl

Solvex, Nitrile

Leather Work Gloves

Additionally, nitrile coated Kevlar gloves or other types of puncture resistant gloves are to be worn by all personnel working with or cleaning glass impingers. Manufacturers that supply these gloves include Ansell Edmont, Jomac and Wells Lamont. Insulated electrical gloves with outer leather gloves is required when working around high-voltage systems.

Posillico is responsible for supplying all personal protective equipment required for Posillico's projects

4.0 WORK MISSION DURATION

Before donning any PPE ensembles, workers will estimate their anticipated work duration. There are several limiting factors that affect the length of work time. These factors must be addressed:

- Air supply consumption
- Permeation and penetration of the Chemical Protective Clothing/ensemble;
- Ambient temperature; and
- Coolant supply (ice or chilled area to keep the worker's body temperature at a normal temperature).

5.0 LEVEL OF PROTECTION

The following section describes the different levels of protection (A through D). Each level is described in the following manner: the protection provided; when this particular level of protection should be used; recommended and optional equipment; and, any limiting criteria.

1. Level A

- a. Protection provided:
 - Level A provides the highest available level of respiratory, skin and eye protection.

b. Should be used when:

- The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on any of the following circumstances;
- Measured (or potential for) high concentration of atmospheric vapors, gases or particulates;
- Site operations and work functions involving a high potential for splash, immersion, or exposure to unexpected vapors, gases or particulates of materials that are harmful to skin or capable of being absorbed through intact skin;
- Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible;
- The Operations must be conducted in confined, poorly ventilated areas until absence of conditions requiring Level A protection is determined.

c. Recommended equipment:

 Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;

- Fully-encapsulating, chemical-resistant suit (pressure-tested immediately before use);
- Inner chemical-resistant suit;
- Inner chemical-resistant gloves;
- Chemical-resistant safety boots/shoes; and
- Two-way radio communications.

d. Optional equipment:

- Cooling unit;
- Coveralls;
- Long cotton underwear;
- Hard hat; and
- Disposable gloves and boot covers.

e. Limiting criteria:

• Fully encapsulating suit material must be compatible with the substances involved.

2. Level B

- a. Protection provided:
 - The same level of respiratory protection, but less skin protection than Level A.

b. Should be used when:

- The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres with IDLH concentrations of specific substances that do not represent a severe skin hazard, or that do not meet the criteria for use of air purifying respirators;
- Atmospheres contain less than 19.5% oxygen; and
- Presence of incompletely identified vapors or gases indicated by directreading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

c. Recommended equipment:

• Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;

- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical-resistant gloves;
- Chemical-resistant safety boots/shoes;
- Hard hat; and
- Two-way radio communications.

d. Optional equipment:

- Coveralls;
- Disposable boot covers;
- Face shield; and
- Long cotton underwear.

e. Limiting criteria:

- Use only when the vapors or gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin.
- Use only when it is highly unlikely that the work being done will generate either high concentrations of vapors, gases or splashes of material that will affect the exposed skin.

3. Level C

- a. Protection provided:
 - Level C provides the same level of skin protection as Level B, but a lower level of respiratory protection.

b. Should be used when:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin;
- The types of air contaminants have been identified, concentrations measured, and a canister/ cartridge is available that can remove the contaminant; and
- All criteria for the use of air-purifying respirators are met.

c. Recommended equipment:

- Full facepiece or half facepiece air-purifying negative pressure respirator;
- Chemical-resistant clothing;
- Inner and outer chemical-resistant gloves;

- Chemical-resistant safety boots and shoes;
- Disposable boot covers;
- Hard hat; and
- Two-way radio communications.

d. Optional equipment:

- Coveralls;
- Face shield;
- Escape bottle; and
- Long cotton underwear.

e. Limiting criteria:

- Atmospheric concentration of chemicals must not exceed IDLH levels; and
- The atmosphere must contain at least 19.5% oxygen.

4. Level D

- a. Protection provided:
 - No respirator protection and minimal skin protection.
- b. Should be used when:
 - The atmosphere contains no known hazard; and
 - Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

c. Recommended equipment:

- Coveralls;
- Safety boots/shoes;
- Safety glasses or chemical splash goggles; and
- Hardhat.

d. Optional equipment:

- Gloves;
- Escape bottle; and
- Face shield.

e. Limiting criteria:

- This level should not be worn in the exclusion zone; and
- The atmosphere must contain at least 19.5% oxygen.

6.0 LEVEL OF PROTECTION UTILIZED

Due to the nature of our work, it can be reasonably expected that personnel will not be performing any work that will require the use of Level A protection. Posillico will not directly undertake assignments and Posillico does not generally train or equip its personnel to handle circumstances involving Level A protection. If Posillico is working on a site and Level A is deemed necessary, the work will be subcontracted to a qualified firm. Posillico personnel should not directly undertake these tasks.

Sites where Posillico is working often require the use of Level C or D, with Level B equipment available on-site for emergency rescue. Any questions concerning the level of protection necessary to complete a certain task will be directed to the Health and Safety Assessment Division before setting up the job.

7.0 TYPES OF PPE TO BE POTENTIALLY UTILIZED BY POSILLICO

The following list contains types of PPE utilized by Posillico and their uses on the job, as they may apply to a specific site.

- 1. Respiratory Equipment:
 - a. SCBAs:
 - Used for emergency rescue and exposures greater than maximum use concentration limits set for canister/cartridge type negative pressure respirators.
 - b. Supplied-air respirators:
 - MSA Premaire system.
 - c. Negative pressure respirators:
 - Half face and full face, used for exposure to certain types of acid gases, organic vapors and particulates not greater than the canister/cartridge maximum use concentration limit.
- 2. Chemical protective apparel suits:
 - a. Polycoated Tyvek, Saranex, Chemrel and Tyvek (porous). Provide protection against certain liquid chemicals.
 - Tyvek provides protection against particulates only.
 - b. Fire/flame retardant coveralls:
 - Provide protection against flash fires.
- 3. Insulated clothing (Provides protection against exposure to the cold:

- a. Chemical resistant gloves:
 - Provide protection for the hands against chemical splashes.
- b. Disposable boot covers:
 - Protect safety boots from contamination and feet from contact with chemicals.

4. Eye protection:

- a. Safety glasses and chemical splash goggles.
 - Safety glasses protect the eyes against large particles and projectiles.
 - Chemical splash goggles protect the eyes against vaporized chemicals, splashes, large particles, and projectiles.
- b. Vented goggles do not provide protection against vapors and are not adequate for splashes, as material may seep inside the goggles.

5. Hard hat:

- a. Provides protection against blows to the head. When worn with a liner, provides protection against the cold.
- 6. Construction safety boots:
 - a. Steel-toe and shank construction boots with chemically resistant soles protect the feet from heavy and sharp objects, and contact with chemicals.
- 7. Safety harnesses and lifelines:
 - a. Enable the individual to work in elevated areas or enter confined spaces to prevent falls and aid in rescue.
- 8. Hearing protection:
 - a. Provides protection against physiological damage and psychological effects.
- 9. Canvas work gloves:
 - a. Provide protection for the hands against abrasions and slivers.

8.0 SELECTION OF CHEMICALLY PROTECTIVE CLOTHING

- 1. Chemically-protective clothing (CPC) will be chosen in the following manner:
 - a. Determine what chemicals are present on the site.
 - b. CPC chosen must be resistant to permeation, degradation and penetration of the chemical(s).

- Permeation Process by which a chemical dissolves in and/or moves through a protective clothing material on a molecular level.
- Degradation The loss of or change in the fabric's chemical resistance or physical properties due to exposure to chemicals, use or ambient conditions (e.g., sunlight).
- Penetration The movement of chemicals through zippers, stitched seams or imperfections (e.g., pinholes) in CPC.
- c. c. Review manufacturer's permeation data to determine the performance characteristics of the material to the specific chemical.
- d. d. Select CPC that protects against the greatest range of chemicals on the site and has the longest breakthrough time.
- e. e. Discuss choice of CPC with the Health and Safety division prior to setting up the job.

9.0 DONNING AND DOFFING PROCEDURES

The following procedures will be used by Posillico employees and Posillico subcontractors for donning and doffing PPE at protection Levels B and C. Donning and doffing will be performed with the assistance of an individual(s) located in the Support Zone and Contamination Reduction Zone, respectively. This individual will help the worker tape up and adjust PPE for proper fit, as well as remove PPE after decontamination.

1. Donning PPE

- a. Inspect the clothing and respirator before donning.
- b. Unzip the suit.
- c. Step into the legs of the suit, slipping the feet through the legs. Push arms through the sleeves.
- d. Pull leg cuffs over the feet.
- e. Put on chemical-resistant safety boots over the feet. Tape the leg cuff over the tops of the boots.
- f. Pull over chemical-resistant boot covers and tape over the leg cuff.
- g. If suit contains protective feet, wear chemical-resistant safety boots inside the suit with chemical-resistant boot covers over the suit and taped securely to the leg.
- a. If wearing a SCBA, don the facepiece and adjust it to be secure, but comfortable. Do not connect the breathing hose. Open valve on the air tank.

- b. If wearing a negative pressure respirator, pull hood over the head and perform positive and negative pressure facepiece seal test (procedures are written in the Posillico's Respiratory Protection Program).
- c. Pull on chemical protective inner gloves.
- d. Pull on chemical protective outer gloves and tape securely to the sleeve of the suit.
- e. Securely tape the suit to protect all exposed skin around the neck area, and if wearing a full facepiece, tape around the edge of the hood-to-facepiece junction.
- f. Put on hardhat, if needed, and tape securely on top of head so that the hard hat does not slide off.

2. Doffing PPE

- a. Doffing of PPE will not take place until the individual has been properly decontaminated by a suitably attired assistant. Both the worker and assistant will make every effort to avoid any direct contact with the outside of the suit.
- b. If the individual is wearing a SCBA, the hose connection to the diaphragm will be disconnected, leaving the facepiece on the wearer. The remainder of the unit will be removed and decontaminated before proceeding further.
- c. If the individual is wearing a half-face or full-face negative pressure respirator, she/he will be instructed to leave it on until the doffing procedure is complete.

NOTE: Decontamination is to be performed in accordance with the Site-Specific Health and Safety Plan for the site.

10.0 <u>DECONTAMINATION OF PPE</u>

Whenever possible, disposable PPE will be used on-site. Disposable PPE includes the following:

- Chemical protective suits;
- Gloves; and
- Chemical protective boot covers.

After decontaminating the worker, PPE is disposed of on-site in labeled disposal containers. Complete procedures for the decontamination, cleaning, inspection, maintenance and storage of respiratory equipment is covered under Posillico's Respiratory Protection Program. All PPE must be cleaned and properly stored. If Posillico-owned PPE cannot be cleaned or disinfected or is damaged it will be replaced by Posillico.

11.0 <u>INSPECTION OF PPE</u>

PPE will be inspected prior to, during and after each use according to the procedure outlined below.

- 1. Prior to use (Reusable and Disposable PPE):
 - a. Through reviewing available literature, determine that the clothing material is correct for the task.
 - b. Visually inspect for:
 - Imperfect seams;
 - Non-uniform coatings;
 - · Tears or holes; and
 - Malfunctioning closures.
 - c. Hold up to the light and check for pinholes (inflate gloves and check for leaks).
 - d. Flex and check for:
 - Cracks; and
 - Shelf deterioration.
 - e. If previously used, check for:
 - Discoloration;
 - Swelling;
 - Stiffness and cracking; and
 - Holes and tears.
- 2. During use (Reusable and Disposable PPE), check for:
 - a. Evidence of chemical attack.
 - b. Discoloration, swelling, stiffening, softening and/or cracking.
 - c. Tears.
 - d. Punctures.
 - e. Seam discontinuities.

Note: Report any sense of breakthrough to the Health and Safety Assessment Division. Medical monitoring may be necessary to determine the extent of exposure.

- 3. After use (Reusable PPE), check for:
 - a. Malfunctioning parts.
 - b. Evidence of chemical attack.
 - c. Punctures.
 - d. Tears.
 - e. Cracks.

Note: Posillico's Respirator Protection Program addresses complete inspection procedures and will be consulted for inspection of all respiratory equipment.

12.0 MAINTENANCE AND STORAGE OF PPE

PPE, other than respiratory equipment (covered under Posillico's Respiratory Protection Program), will be maintained and stored in accordance with the manufacturer's recommendations at a minimum to prevent damage due to exposure to dust, moisture, sunlight, chemicals, temperature extremes and sudden impact.

PPE will be stored in Field Operations Equipment bags. Before and after each use, the PPE will be inspected to determine whether or not it is still "field worthy". Any PPE found to be defective will be reported to the Health and Safety Assessment Division and either discarded or repaired, as appropriate. Under no circumstances will defective PPE be used in the field.

- 1. The Health and Safety Assessment Division will periodically inspect PPE issued for individual use.
 - a. Unless the equipment can be repaired, any PPE found to be defective will be removed from service and discarded immediately.
 - b. Repairable PPE will be tagged, returned to the Facility Manager and sent out for repair.

13.0 TRAINING

Posillico will provide the proper equipment to employees and train them on the proper use. At a minimum, each employee using PPE must know:

- When PPE is necessary
- What PPE is necessary and which PPE has been selected for each process the employee operates
- How to properly put on, take off, adjust and wear PPE
- The limitations of PPE
- How to determine if PPE is no longer effective or is damaged
- How to get replacement PPE
- How to properly care for, maintain, store and dispose of PPE

After employees have been trained, periodic assessment of the process/equipment will be conducted ensure that the PPE is adequate and training is appropriate.

Retraining employees will occur whenever:

- Changes in the workplace render the previous training obsolete
- Changes in the type of PPE render previous training obsolete
- Employer observed inadequacies in an employee's knowledge or use of assigned PPE indicates that an employee has not retained the necessary understanding or skill

Posillico verifies that each employee who is required to use PPE has received and understood the required training. Training is confirmed by written certification which included the employee name, the dates of training, and the certification subject.

14.0 EVALUATION OF PPE PROGRAM

Posillico's Personal Protection Equipment Program will be reviewed annually by the Health and Safety Assessment Division. Any program deficiencies that are identified by a Posillico employee will be reported to the Health and Safety Assessment Division, so that changes will be made immediately. All employees affected by the change(s) will be notified in writing.

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Review of the PPE Program will include, but not be limited to, the following:

- Accident and illness experience on various job sites.
- Type and degree of exposure.
- Adequacy of equipment selection process.
- Degree of fulfillment of program objectives.
- Employee acceptance.
- Coordination with overall health and safety program elements.
- Recommendations for program improvements and modifications.
- Adequacy of program records.

15.0 EMPLOYEE OWNED EQUIPMENT

Posillico does not allow the use of employee-owned equipment on job sites.

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APPENDIX K

RESPIRATORY PROTECTION PROGRAM

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Respirator Program

Purpose:

The purpose of the Respirator Program is to ensure that all employees are protected from exposure to respiratory hazards. Engineering controls such as ventilation and substitution of less toxic materials are the first line of defense. However, engineering controls are not feasible for some operations or do not completely control the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also utilized for protection during emergencies.

Procedure:

This program applies to all employees who are required to wear respirators during normal work operations and during certain non-routine or emergency operations. Employees participating in the respiratory protection program do so at no cost to them. The expense associated with medical evaluations, training, and respiratory protection equipment will be borne by the company.

 Respirator equipment is required in areas where health hazards may exist due to accumulations of dusts, fumes, mists or vapors. If your job requires the use of a respirator see your supervisor for training and the proper respirator for the working conditions at hand.

Employees who voluntarily choose to use a cartridge style respirator when the respirator is not required are subject to the medical evaluation, cleaning, maintenance, and storage elements only of this program. These individuals will also receive training covering proper procedures for cleaning, maintenance and storage of their respirators.

Posillico has a full written Respiratory Program as listed below.

Respiratory Protection

Purpose

The purpose of this program is to establish, implement and maintain an appropriate Respiratory Protection Program to protect employees from respiratory hazards on our jobsites. Respiratory Protection is an area of Safety and Health that Posillico Inc. takes extremely seriously.

Through education and training, we believe that working in and around respiratory hazards and environments can be managed safely and effectively. As a company, we believe in engineering out or administratively controlling respiratory hazards and environments. When these controls cannot be instituted, we will use appropriate respiratory protection. Posillico Inc. shall ensure that respiratory hazards within our sites

are evaluated and that information concerning these hazards is transmitted to all effected employees through our construction planning process.

Applicable Regulations OSHA 29 CFR 1910.134

Responsibilities

- The Posillico Safety Director is responsible for respiratory protection program and has the authority to make necessary decisions to ensure its -implementation and maintenance. The Safety Director has the authorization to halt any company operation where there is danger of serious personal injury or unnecessary exposure;
- A corporate respiratory program administrator shall be appointed and shall approve all site specific respiratory programs prior to implementation at the site, and thereafter review as required;
- The program shall be reviewed and evaluated on an annual basis, or when changes occur to 29 CFR 1910.134, that prompt revision of this document or when facility operational changes occur that require a revision to the program;
- The corporate respiratory program administrator shall conduct routine evaluations to ensure the written program is being followed. Topics to be considered during the evaluation shall consist of: respirator fit, selection, maintenance, interference with job performance, discomfort, employee concerns; and
- Provide a database of Medical Evaluation Questionnaire and Fit Test results of each employee required to wear respiratory protection.

Project Management shall:

- Evaluate work activities for the presence of respiratory hazards and prepare construction plans for each activity;
- Institute engineering and administrative controls, as a first line of defense against respiratory hazards;
- Shall appoint a qualified individual to be the Site Respiratory Program
 Administrator who shall prepare the Work Site Respiratory Programs
 (WSRP) for each substantially unique airborne exposure at the jobsite.
 The Site Respiratory Program Administrator shall submit the WSRP(s) to
 the Corporate Respiratory Program Administrator for approval before the
 use of respirators begins. And shall ensure the successful implementation
 of the WSRP(S) on the jobsite;

- Purchase suitable, effective, respirators to protect employees from respiratory hazards;
- Ensure each employee wearing respiratory protection has the required medical clearance and fit test record prior to wearing the respirator;
- · Train employees in topics identified in this program; and
- Effectively enforce the use of respirators.

Employees shall:

- Correctly wear respirators in accordance with instructions and training during operations designated by their supervisor;
- Not have facial hair of any type that interferes with the correct fit of a respirator;
- Properly clean, store and maintain respirators according to the direction of the manufacturer or their supervisor; and
- Guard against damage to the respirator and shall immediately replace suspect respirators and shall report such damage or malfunction of the respirator to their supervisor.

Procedure

Site-Specific Respiratory Protection Program

- In addition to meeting the requirements of this program, all projects that use respirators will be required to have a site-specific respiratory protection program;
- In order to have an effective program, address the following questions in the development stage:
 - Who is the program administrator?
 - What procedures are used to select respirators for use in the workplace?
 - Who will be doing the medical evaluations for the employees (which facility or facilities)?
 - What are the fit testing procedures for tight fitting respirators?
 - What are the procedures for proper use of respirators in normal and foreseeable emergencies?
 - What are the procedures and schedules for cleaning, disinfecting, storing, inspection, repairing, discarding and otherwise maintaining respirators?

- What are the procedures to ensure adequate air quality, quantity and flow of breathing for atmosphere supplying respirators?
- What are the methods to be used to ensure that the employees are trained the in respiratory hazards to which they are potentially exposed during routine and emergency situations?
- What are the methods of training employees in the proper use of respirators including, donning and removing a respirator, cleaning, positive/negative pressure fit testing, limitations of their use and maintenance and cleaning of a respirator?
- What are the procedures of regularly evaluating the effectiveness of a program?
- When respirator use is not required, but are provided at the request of the employees or permit employees to use their own respirators, the following criteria will be met:
 - (a) Determine that such respirator use does not create a hazard;
 - (b) Review 29 CFR 1926.134; and
 - (c) Training on cleaning, storage and maintenance of the respirator to prevent it from being a hazard.

Surveillance of Work Area Conditions

- As each activity progresses, surveillance of work area conditions and degree of employee exposure or stress shall be monitored and measured;
- The site Safety Representative will make a reasonable estimate of employee exposure by conducting a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency.

The evaluation may include:

- Identification and review of a list of hazardous substances used in the work area;
- Review of work processes to determine source of potential hazardous substances;
- Review of process records;
- Employee interviews;
- Air Monitoring (may be mandatory if the contaminant is regulated by a separate OSHA Standard e.g. Asbestos, Lead, Silica, Methylene chloride, etc.);
- Published studies by safety associations, manufacturers, historical data;

- Mathematical approaches using physical & chemical properties of the contaminant;
- If a reasonable estimate cannot be obtained then IDLH atmosphere must be assumed; and
- The site Safety Representative will revise and update the hazard assessment as needed.
- Air Sampling will be conducted as per the requirements in this section.

Air Sampling Procedure

- Baseline sampling shall commence at the beginning of each operation, which is identified as a potential for airborne exposure. Historical data from similar operations producing airborne exposure can be used as baseline exposure monitoring, when feasible, but must be evaluated according to activity, length of operation, conditions in which the samples were taken, etc;
- Personal air sampling shall always be the first method to determining actual employee exposure. Area monitoring shall be used to supplement personal air sampling but shall not be the only method of determining exposure;
- Air Sampling will be representative of the exposure that the employee is exposed to throughout his daily shift;
- An Air Monitoring Worksheet shall be completed for each sample taken on any given day. If several different samples are taken on the same day then one Air Monitoring Worksheet can be filled out providing the conditions for each employee are the same, otherwise a separate worksheet is required;
- A Chain of Custody will be completed for each batch of samples that are to be sent to the Laboratory for analysis, along with the Air Monitoring Worksheet. Both these documents are to remain with analysis received back from the Laboratory;
- If the initial baseline results demonstrates employee exposure to be below the action level, then;
- Personal and Area Air Sampling will take place thereafter on at least three consecutive measurements taken at least seven (7) days apart;

Air Sampling Frequency

- Results will be dealt with as follows:
 - Where results demonstrate that the employee exposure is below the action level, monitoring shall be continued until sampling shows no exposure on at least three consecutive measurements taken at least seven (7) days apart;
 - Where results demonstrate that the employee exposure is above the action level, but below the permissible exposure limit, monitoring

- shall be repeated at least every 6 months. The monitoring shall continue until at least two consecutive measurements, taken at least 7 days apart, are below the action level, at which time the monitoring for that employee or operation may be discontinued; and
- If the initial monitoring reveals that employee exposure is above the
 permissible exposure limit, the monitoring shall be repeated
 quarterly. The monitoring shall continue until at least two
 consecutive measurements, taken at least 7 days apart, are below
 the permissible exposure level, at which time the monitoring for that
 employee or operation may be discontinued.
- Whenever there has been a production, process, control or personnel
 -change which may result in new or additional exposure to any contaminant,
 or whenever Posillico Inc. has any reason to suspect a change which may
 result in new or additional exposures, additional monitoring shall be
 conducted; and
- The Corporate Respiratory Program Administrator shall supervise air monitoring results and exposure assessment.

Medical Evaluation

- Persons shall not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and effectively use the equipment;
- The Corporate approved physician(s) will be used in all instances for medical evaluate and clearance for respirator use;
- Prior to work commencing, each required employee shall complete a Medical Evaluation Questionnaire (MEQ) in accordance with CFR 1910.134. This shall be sent to the approved physician for clearance;
- The examining physician will then evaluate the employee, based on their answers, and certify clearance for respirator use under any conditions that they see fit. This may involve clearance by MEQ alone, consultation with the Physician and/or a medical examination;
- This clearance will be forwarded to the Corporate Respiratory Program
 Administrator and the Site Respiratory Program Administrator for
 processing and record keeping. Any conditions stated on the clearance
 will be followed; and
- Additional medical evaluations shall be provided when:
 - An employee has any change in medical status;
 - An employee reports medical signs or symptoms that are related to ability to use a respirator; and
 - The physician states that the employee needs to be re-evaluated.

Fit Test Procedure

- The procedures in Appendix A in section 29 CFR 1926.103 are to be followed. A medical evaluation needs to be completed prior to fit testing an employee;
- Fit testing will be performed using Quantitative Fit Testing measures. If this is not available, then qualitative means may be used until the quantitative means are available;
- Select respirators from a sufficient number of respirator models and sizes to assure that the respirator is acceptable to, and correctly fits, the user;
- Fit tests will be done before using the respirator in the field and will be repeated annually, when a different type or brand of respirator is worn or when there is a significant physical difference in the employee such as body weight, facial scarring, dentures, broken jaw;
- The absence of one or both dentures can seriously affect the fit of a face piece. The worker's diligence in observing these factors shall be evaluated by periodic checks;
- To assure proper protection, each wearer will complete positive and negative checks to ensure seal;
- Hair. Fit testing shall not be conducted if there is any hair growth between the skin and the facepiece seal surface.
- Respiratory Difficulty during Tests. If an employee exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties;
- Respirator Use Determination. The test subject shall be given the
 opportunity to wear the assigned respirator for one week. If the respirator
 does not provide a satisfactory fit during actual use, the test subject may
 request another fit test, which shall be performed immediately;
- Filter Replacement. Filters used for qualitative or quantitative fit testing shall be replaced weekly, whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily or sooner if there is any indication of breakthrough by the test agent.
- Because the sealing of the respirator may be affected, quantitative fit testing shall be repeated immediately when the test subject has a:
 - Weight change of 20 pounds or more;
 - Significant facial scarring in the area of the facepiece seal;
 - Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures;

- Reconstructive or cosmetic surgery; and
- Any other condition that may interfere with the facepiece seal.
- Fit Test Record keeping Requirements. A summary of all test results shall be maintained for 3 years. The summary shall as minimum include:
 - Name of test subject;
 - Date of testing;
 - Name of the test conductor; and
 - Fit factors obtained from every respirator tested (indicate manufacturer, model, size and approval number).

Selection of Respirators

- Dust masks are not permitted for use as a respirator on any project under any circumstances;
- The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed;
- All filter cartridges and canisters shall be labeled with the appropriate NIOSH approval label that has been certified under the NIOSH 42 CFR Part 84. This label is not to be removed, obscured, or defaced while in service. Only series 100 filters certified under 42 CFR Part 84 shall be used when HEPA filters are called for;
- Gas or Vapor protection If a respirator with an End of Service Life Indicator (ESLI) is not available; a change-out schedule will be specified on a site-specific basis. Every effort will be made to obtain objective information and data to assure that the cartridges are changed out prior to end of service life;
- Respirators will be selected based on the specific hazard involved and shall be selected in accordance with the manufacturer's instructions or other related requirements (OSHA or ANSI Standards, NIOSH, etc.). The criteria specified in the following table shall be used:

Hazard	Respirator*
Oxygen Deficiency	Self-contained breathing apparatus. Hose mask with blower. Combination airline respirator with auxiliary self-contained air supply or an airstorage receiver with alarm.
Gas & Vapor (Contaminants immediately dangerous to life and health)	Self-contained breathing apparatus. Hose mask with blower. Air purifying full-face piece respirator with chemical canister (gas mask). Self rescue mouthpiece respirator (for escape only). Combination airline respirator with auxiliary self-contained air supply or an airstorage receiver with alarm.

Gas & Vapor (Contaminants NOT immediately dangerous to life and health)	Airline respirator. Hose mask without blower. Air purifying half-mask or mouthpiece respirator with chemical cartridge.
Particulate Contaminants (Contaminants immediately dangerous to life and health)	Self-contained breathing apparatus. Hose mask with blower. Air purifying full-face piece respirator with chemical canister (gas mask). Self rescue mouthpiece respirator (for escape only). Combination airline respirator with auxiliary self-contained air supply or an airstorage receiver with alarm.
Particulate Contaminants (Contaminants NOT immediately dangerous to life and health)	Air-purifying half-mask or mouthpiece respirators with filter pad or cartridge. Airline respirator. Airline abrasive-blasting respirator. Hose mask without blower.
Combination Gas, Vapor & Particulate (Contaminants immediately dangerous to life and health)	Self-contained breathing apparatus. Hose mask with blower. Air purifying full-face piece respirator with chemical canister (gas mask with filter). Self rescue mouthpiece respirator (for escape only). Combination airline respirator with auxiliary self-contained air supply or an airstorage receiver with alarm.
Combination Gas, Vapor & Particulate (Contaminants NOT immediately dangerous to life and health)	Airline respirator. Hose mask without blower. Air purifying half-mask or mouthpiece respirator with chemical cartridge and appropriate filter.

^{*} For the purpose of this part, "Immediately Dangerous to Life and Heath", (IDLH), is defined as a condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants, such as radioactive materials, which are likely to have adverse delayed effects on health.

Use of Respirators

- The correct respirator shall be specified for each job, the respirator type shall be specified in the site specific respiratory plan, by the Site Safety Representative or designated individual, who supervises the respiratory protection program. This shall be specified through each and every Construction Plan.
- Each employee will be assigned his or her own respirator. Sharing respirators is not permitted.
- Dangerous Atmospheres. Written procedures and/or checklists for specific routine tasks/jobs shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies:

- In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least on additional person shall be present. Communications (visual, voice, or signal line) shall be maintained between both individuals present. Planning shall be such that one individual shall be unaffected by any likely incident and have the proper rescue equipment to be able to assist other(s) in case of an emergency; and
- When a self-contained breathing apparatus (SCBA) or hose masks with blowers are used in atmospheres immediately dangerous to life or health (IDLH), standby personnel must be present with suitable rescue equipment.
- Respirators shall not be removed while inside a work area that requires respiratory protection. Employees shall be permitted to leave the work area to maintain, clean, change filters, replace parts, or to inspect their respirator if it is impeding their ability to work or if the respirator stops functioning as intended. Employees shall notify supervisor of when leaving the work area.
- To assure the continuing respirator effectiveness, appropriate surveillance shall be maintained of the work area conditions and the degree of employee exposure or stress. This shall include a fit check evaluation to assure proper protection. The Site Safety Representative shall accomplish this.
- Hair / Apparel. If hair growth or apparel interferes with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit before the worker is allowed to proceed with work utilizing a respirator;
- Corrective Vision. If an employee wears corrective glasses or goggles or
 other personal protective equipment. A check shall be made to ensure that
 such equipment when worn does not interfere with the seal of the face
 piece to the face of the user. If the employees wear other safety
 equipment with their respirators, the employee must pass an appropriate fit
 test while wearing the equipment to determine a correct seal.
- Corrective vision requirements (Full-Face Respirators). Full-Face
 respirators having provisions for optical inserts shall be reviewed. These
 inserts when used shall be used according to the manufacturer's
 specification. The face piece and lenses shall be fitted by qualified
 individuals to provide good vision, comfort and a satisfactory face seal.
- Conventional eyeglasses shall not be used with full-face respirators. A
 proper seal cannot be established if the temple bars of eyeglasses extend
 through the sealing edge of the full face piece.

- Contact lenses shall not be used with full-face respirators. Wearing contact lenses in contaminated atmospheres with a respirator shall not be allowed.
- Identification of chemical cartridges is by means of its label. The secondary means is by color code. All cartridges purchased or used shall be properly labeled and/or color-coded in accordance with 29 CFR 1910.134 before they are placed into service. The labels and colors shall be properly maintained at all times until disposal.
- Color-coding. Each cartridge is painted a distinctive color or combination of colors indicated in Table 1-1 below. All colors used are such that they are clearly identifiable by the user and clearly distinguishable from one -another.

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TABLE I-1 from 29 CFR 1910.134

ATMOSPHERIC CONTAMINANT(S)	COLOR(S) ASSIGNED
Acid gases	WHITE
Hydrocyanic acid gas	WHITE with a 1/2 inch GREEN stripe completely around the canister near the bottom
Chlorine gas	WHITE with a 1/2 inch YELLOW stripe completely around the canister near the bottom
Organic vapors	BLACK
Ammonia gas	GREEN
Acid gases and ammonia gas	GREEN with 1/2 inch WHITE stripe completely around the canister near the bottom
Carbon monoxide	BLUE
Acid gases and organic vapors	YELLOW
Hydrocyanic acid gas and chloropicrin vapor	YELLOW with 1/2 inch BLUE strip completely around the canister near the bottom
Acid gases, organic vapors, and ammonia gases	BROWN
Radioactive materials, excepting tritium and noble gases	PURPLE (Magenta)
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the gases or vapors	Canister color for contaminant as designated above, with 1/2 inch GRAY stripe completely around the canister near the top
All of the above atmospheric contaminants	RED with 1/2 inch GRAY stripe completely around the canister near the top

NOTE: GRAY is not assigned as the main color for a canister designed to remove acids or vapors.

NOTE: ORANGE is used as a complete body or stripe color to represent gases not included in this table. The user shall need to refer to the canister label to determine the degree of protection the canister shall afford.

Identification of Particulate Filters

The 42 CFR Part 84 standards create three new series of particulate filters ("disposable") designated by NIOSH as **N**, **R**, and **P**. The N series is tested against sodium chloride (NaCl) and is limited to use in atmospheres containing non-oil based particulates. Both the R and P series are tested against dioctyl phthalate (DOP) and are intended for filtering any solid or oil-based liquid particulates.

FILTER SERIES	FILTER TYPE DESIGNATION	MINIMUM EEFIGENCY
The second secon	N95	95%
"N" Series: Non-oil	N99	99%
	N100	99.97%
"R" Series: oil-Resistant	R95	95%
	R99	99%
	R100	99.97%
"P" Series: oil-Proof	P95	95%
	P99	99%
-	P100	99.97%

Air Quality

- Compressed air, compressed oxygen, liquid air and liquid oxygen used for respiration shall be of high quality/Purity;
- Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen;
- Cylinders of purchased breathing air shall meet at least the requirements of the specification for Type 1 – Grade D breathing air as described in Compressed Gas Association Commodity Specifications G-7.1-1989;
- Cylinders of purchased breathing air should have certificate of analysis from the supplier that the breathing air meets the requirements of Type 1 – Grade D air;
- · Compressed oxygen shall not be used;
- Oxygen must never be used with airline respirators. Breathing air may be supplied to respirators from cylinders or air compressors;
- Cylinders shall be tested and maintained as prescribed in the shipping Container Specification Regulations of the Department of Transportation (49CFR PART 173 and 178);
- Oxygen concentrations greater than 23.5% are to be used only in equipment designed for oxygen service distribution;
- Moisture content in the cylinder shall not exceed a dew point of -50 degrees F at 1 atmosphere;
- Supplied Air compressors purchased or rented by Posillico Inc. for supplying air shall be equipped with the necessary safety and standby devices. A breathing—air type compressor shall be used. The type compressor used shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable inline air purifying absorbent beds and filters installed to further assure breathing air quality. The filter panel must have a tag indicating the last absorbent bed, filter change out

and PM work, as well as the signature of the person authorized to perform the change. A receiver of sufficient capacity to enable the respirator wearer to escape from the contaminated atmosphere in the event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil-lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high temperature alarm is installed in the system, the air from the compressor shall be frequently tested for carbon monoxide to ensure that levels are below the exposure limit for carbon monoxide (currently 10 ppm);

- Air-line couplings used shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air-line respirators with nonrespirable gases or oxygen;
- Compressor shall be set up to minimize moisture content; and
- Breathing gas containers shall be properly marked and stored in accordance with NIOSH respirator certification standard 29 CFR 1910.101.

Cleaning and Disinfecting

- Respirators shall be regularly cleaned and disinfected using the procedures in Appendix B-1 of the Respirator standard or in accordance with the manufacturers written instructions
- Respirators are required to be cleaned prior to each use, and thereafter as required;
- Respirators used in fit testing and training shall be cleaned and disinfected before and after each use.
- Respirator cleaning will take place prior to the shift ending.
- All cleaning supplies will be provided.
- The following procedure is recommended for cleaning and disinfecting respirators:
 - Remove any filters, cartridges or canisters;
 - Wash face piece and breathing tube in cleaner-disinfectant or detergent solution (see following paragraphs). Use a hand brush to facilitate removal of dirt;
 - Rinse completely in clean, warm water;
 - Wipe off excessive water, then air dry in a clean area;
 - Clean other respirator parts as recommended by manufacturer;
 - Inspect valves, head straps and other parts, replace with new parts if defective;
 - Insert new filters, cartridges or canisters, make sure seal is tight; and
 - Place in a sealable plastic bag or container for storage.

- Cleaner-disinfectant solutions shall be used to effectively clean respirators.
 The respirator should be immersed in the solution, rinsed in clean, warm water and air-dried; and
- Strong cleaning and disinfecting agents can damage respirator parts.
 Temperatures above 185 degrees Fahrenheit and vigorous mechanical agitation should not be used. Solvents, which affect elastnomer or rubber parts, should be used with caution.

Storage

- Respirators shall be stored in a convenient, clean and sanitary location;
- After inspection, cleaning and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture or damaging chemicals;
- Respirators placed at stations and work areas for emergency use should be stored in weather tight compartments built for the purpose, be quickly accessible at all times and be clearly marked;
- Respirators should not be stored in such places as lockers or toolboxes unless they are in carrying cases or cartons;
- Respirators should be packed or stored so that the face piece and exhalation valve will rest in a normal position and function will not be impaired by the elastnomer setting in an abnormal position;
- Instructions for proper storage of emergency respirators, such as gas
 masks and self-contained breathing apparatus, are found in "use and care"
 instructions usually mounted inside the carrying case lid; and
- Emergency use respirators placed at stations and work areas for emergency use shall be immediately accessible at all times and shall be stored in compartments built for the purpose and in accordance with the manufacturer's recommendations. These compartments shall be clearly marked. Instructions for proper storage of emergency respirators, such as gas masks and SCBA, can be found in use and care instructions typically mounted inside the carrying case lid.

Routine Inspections

- All respirators shall be inspected routinely before and after each use. The manufacturer's inspection criteria shall be used as the basis for the inspection.
- Emergency escape respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in working condition. Emergency escape only respirators shall also be inspected before being carried into the work area. The respirator manufacturer's inspection criteria shall be used as the basis for

the inspections. A record shall be kept of inspection dates and findings for respirators maintained for emergency use.

- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer's instructions. It shall be determined that the regulator and warning devices function properly.
- Respirator inspection shall include a check of the tightness of connections and the condition of the face piece, headband, valves, connecting tube and canisters;
- Rubber or elastnomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber of elastnomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage;
- Random inspections shall be conducted to assure that respirators are properly selected, used, cleaned and maintained. The respirator manufacturer's inspection criteria shall be used as the basis for inspections. Each jobsite will identify and document the employees who will perform random inspections; and
- Replacement or repair. Only the site Safety Representative or designated individual, with NIOSH approved parts designed for the respirator, shall do replacement or repairs. No attempt shall be made to replace components or make adjustments or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair. Respirators that have failed inspection will be taken out of service.

Training

General

- For safe use of any respirator, it is essential that the user be properly instructed in his/her selection, use and maintenance and use.
- Training shall be provided to each affected employee:
 - Before the employee is first assigned duties that require respiratory protection and at a minimum, annually thereafter;
 - Before there is a change in assigned duties;
 - Whenever there is a change in operations that present a hazard for which an employee as not previously been trained;
 - Whenever there is a reason to believe that there are deviations from established respiratory procedures required by this instruction or inadequacies in the employee's knowledge or use of these procedures; and

- The training shall establish employee proficiency in the duties required by this instruction and shall introduce new or revised procedures, as necessary, for compliance with this instruction or when future revisions occur.
- Training topics shall include, as a minimum:
 - Respiratory Protection Program;
 - The OSHA Respiratory Protection standard;
 - Respiratory hazards encountered within the scope of work and their health effects; whether acute, chronic or both, and an honest appraisal of what may happen if the respirator is not used;
 - Need for respiratory protection and the consequences of improper fit, use, or maintenance;
 - Proper selection and use of respirators;
 - Inspection and seal checking of respirators;
 - Limitations and capabilities of respirators;
 - Respirator donning and user seal (fit) checks;
 - Emergency use procedures; Classroom and field training to recognize and cope with emergencies. This will include situations where the respirator malfunctions;
 - Maintenance and storage procedures;
 - Medical signs and symptoms limiting the effective use of respirators;
 - Explanation of why more control that is positive is not immediately feasible. This shall include recognition that every reasonable effort is being made to reduce or eliminate the need for respirators; and
 - Fit Evaluation: the wearer shall be trained how to check the facepiece's fit each time they put on the respirator by conducting a positive/negative pressure seal check as specified In appendix B -1 of the respiratory protection standard.

Record keeping

The following records shall be kept at the jobsite:

- Medical Evaluation Questionnaire result(s);
- Fit Test Records;
- · Air Sampling Worksheets for each sample;
- Chain of Custody for each sample;
- Laboratory sample analysis for each sample;
- · Calculations of exposure;

- Employee exposure notification records; and
- · Training records.

The following records shall be kept at the Corporate Safety and Environmental Department:

- Medical Evaluation Questionnaire result(s);
- · Fit Test Records;
- Air Sampling Worksheets for each sample;
- Chain of Custody for each sample;
- Laboratory sample analysis for each sample; and
- Calculations of exposure.

APPENDIX L

MONITORING INSTRUMENTS: USE, CARE AND CALIBRATION

MONITORING INSTRUMENTS: USE, CARE, AND CALIBRATION

1.0 INTRODUCTION

Prior to beginning any work at Posillico sites, a preliminary site evaluation must be conducted to identify the hazards or suspected hazards of the site. Through area and personal monitoring with direct-reading instruments and personal sampling pumps, hazardous conditions can be evaluated, and the proper level of protection chosen for the specific type of work activity. Monitoring equipment used by Posillico personnel includes the following: Oxygen/Combustible Gas Meters (CGM); Organic Vapor Analyzers (OVA); Photoionization Detectors (PID); Personal Sampling Pumps; and, Colorimetric Tubes. This program contains a description of each type of monitoring equipment; hazards for which it can be used to monitor; Applications; Care and Maintenance; Limitations; and, Calibration.

2.0 SCOPE-

This program covers the use, application, care and maintenance, limitations and calibration of CGMs, OVAs, PIDs, Personal Sampling Pumps and Colorimetric Tubes used by Posillico employees in hazardous materials operations. Posillico employees engaged in activities involving hazardous materials includes the Hazardous Waste Division and the Air Division.

3.0 <u>INSTRUMENTATION</u>

1. Photoionization Detectors (PIDs)

Introduction

PIDs measure a variety of gases in many industrial, as well as hazardous material, operations. These analyzers employ the principle of photoionization, which is the absorption of ultraviolet light by molecules, for detection.

The sensor consists of a sealed ultraviolet light. The energy ionizes many trace species (particularly organics) but does not ionize the major components of air, such as O_2 , N_2 , CO, CO_2 , or H_2O . A chamber adjacent to the ultraviolet source contains a pair of electrodes. When a positive potential is applied to one electrode, the field created drives any ions, which are formed by absorption of the UV light, to the collector electrode, where the current (proportional to the concentration) is measured.

To minimize absorption of various sample gases, the ion chamber is made up of an inert fluorocarbon material, located at the sampling point, and a rapid flow of sampling gas is maintained through the small ion chamber volume.

The analyzer will operate either from a rechargeable battery for up to 10 hours, or continuously from the AC battery charger.

The useful linear range of the instrument is from a fraction of a part per million to about 2000 PPM.. A Summary of relative FID responses can be found in Attachment B. Calibration logs are in Attachment A.

Theory

Posillico utilizes the MiniRAE meter or equivalent as its PID. The MiniRAE is a portable, non-specific vapor/gas detector. The MiniRAE employs the principle of photoionization to detect a variety of chemical compounds, both organic and inorganic.

The MiniRAE contains an ultraviolet light source within its sensor chamber. Ambient air is drawn into the chamber with the aid of a small fan or positive displacement pump. If the ionization potential (IP) of any contaminant present in the ambient air is equal to or lower than the energy of the UV light source, ionization will take place, causing a deflection in the meter.

Response time for the MiniRAE is approximately 90% at 3 seconds. The meter reading is expressed in parts per million (PPM) relative to the calibration gas. All readings must be stated as equivalent readings that depend on the calibration gas being used to calibrate the MiniRAE. The calibration gas used is Isobutylene. Formerly, benzene was used as the calibration gas, but due to its hazard it is no longer used. Isobutylene, used as an equivalent in place of benzene, allows the instrument to provide results in benzene equivalents.

A list of IPs for various gases is provided in the latest edition of the <u>NIOSH Pocket Guide to Chemical Hazards</u>.

Basic Operation of the MiniRAE

A sample of air is drawn through a chamber and an ultraviolet light causes certain contaminants present to be broken apart into positive and negative charged particles. These charged particles are passed between electrodes and converted into an electrical impulse displayed on the readout.

Field Applications/Limitations

- a. The MiniRAE will only detect organic materials with an ionization potential less than 10.2eV.
- b. It is a non-specific detection device, but provides continuous information on airborne concentrations.
- c. It will not respond equally to all contaminants, and does not detect methane.
- d. High humidity will cause the instrument to give lower readings than the actual airborne concentration.
- e. Transfer of the instrument from a cold to a warm environment may cause condensation to form on the UV light source window, causing erroneous results.
- f. The readout may also be affected by electrical power lines or power transformers.
- g. Total concentrations are relative to the calibration gas used (isobutylene). Therefore, true concentrations cannot be identified. And, while the instrument scale reads 0-2000 ppm, response is linear (to isobutylene) from 0-600 ppm.

h. Wind speeds of greater than 3 mph may affect the pump and readings, depending on the position of the probe relative to wind direction.

Calibration Procedure

Calibration Checklist: MiniRAE; Span gas (HNu Manufactured); Regulator; Tygon tubing.

Cleaning and Calibration Checklist: Same materials as above; MiniRAE cleaning compound; Fine screwdrivers, flat and Phillips head; Sonnicator; Drying/Toaster oven.

Inventory Items: Battery; Lamp; ION chamber; O-Rings; Screws.

- a. Obtain calibration gas, Isobutylene at Span 9.8 with 10.2 eV, manufactured by MiniRAE.
- b. Connect the calibration gas to the end of the probe extension. Open the gas flow valve.
- c. Turn the selection knob to the 0-200 range and observe the meter needle. The concentration should read the same as that listed on the cylinder. If not, the span should be adjusted until the meter reads accurately.
- d. The above procedure can be used until the span reading is approximately 5. At this time, the meter needs to be cleaned and internally calibrated. See Step 5.
- e. For cleaning and internal calibration:
 - Disassemble the probe, carefully removing the lamp.
 - Clean the lamp.
 - Clean the ION chamber and probe extension.
 - Remove the instrument from its housing to expose the calibration screw, located on the side of the instrument.
 - Once the probe parts have cooled (assuming it has been used), assemble the probe and connect it to the instrument.
 - Connect the calibration gas to the end of the probe extension and open the gas flow.
 - Turn the selection knob to the 0-200 range and observe the needle. The concentration should read the same as the concentration listed on the cylinder. If not, then the calibration screw must be adjusted with a fine screwdriver.

Maintenance and Calibration Records

- a. Protect the instrument from excessive abuse, such as moisture, shock, vibration, etc.
- b. Maintenance and calibration records will be recorded in a logbook specific to the MiniRAE meter. See PID Calibration Log in Attachment A.

Troubleshooting

Below are some points that should be considered if the instrument is not running appropriately:

- Check the battery condition. Recharge it if necessary.
- b. If unstable readings are obtained, a faulty probe cable or electrical connection could be the problem. To check this, hold the probe normally and flex the cable firmly. Watch the meter needle for fluctuations as the cable is flexed. Individual wires in the readout can be checked in a similar way.
- c. Check the coaxial connector on the amplifier board in the probe for any separation.
- d. Determine whether or not the meter is being used in close proximity to AC power lines or power transformers. This can cause the instrument to read erroneously. To check for this interference, zero the instrument in an electrically quiet area in the standby position, and then move the instrument into the area in question. If AC pick-up is a problem in the area, then the meter will indicate the magnitude of the problem.
- e. No response on any setting may mean that the meter movement is broken. Tip the instrument from side-to-side. The needle should move freely and return to zero.
- f. No response may mean that the electrical connection to the meter is broken. Check all wires leading to the meter and clean the contacts of the quick-disconnects.
- g. No response may mean that the battery is completely dead. Disconnect the battery and check the voltage with a volt-ohm meter. Also check the 2-amp fuse.
- h. If the meter responds in the BATT CHK mode, but reads zero or near zero for all other modes, the power supply may be defective.
 - Replace the power supply.
 - Check the input signal connection, which may be broken in the probe or readout.
 - Check the input connector on the printed circuit board inside the probe. It should be firmly pressed down.
 - Check the components on the backside of the circuit board. All connections should be solid and no wires should touch any other object.
 - Check all wires in the readout for solid connections.
- i. When the instrument responds appropriately in the "BATT CHK" and "STANDBY" positions, but not in the measuring mode, check to see that the light source is on.
- j. If the instrument responds correctly in all settings, but the signal is lower than expected:
 - Check the span setting.

- Clean the window of the light source.
- Check the fan for proper insertion.
- k. If the instrument response is slow and/or not reproducible, either the fan is operating improperly (check the fan voltage), or the instrument needs to be recalibrated.
- I. A low battery indication comes on if the battery charge is low. It will also come on if the ionization voltage is too high.

2. Flame Ionization Detector

Introduction

The Flame Ionization Detector (FID) is a sensitive instrument designed to measure trace quantities of organic materials in air. It is essentially a flame ionization detector such as that utilized in laboratory gas chromatographs and has similar analytical capabilities. The FID is an almost universal detector for organic compounds with the sensitivity to measure in parts per million range in the presence of atmospheric moisture, nitrogen oxides, carbon monoxide and carbon dioxide.

The instrument has broad application since it has a chemically resistant air sampling system and can be readily calibrated to measure almost all organic vapors. Designed for use as a portable survey instrument, it can also be readily adapted to fixed remote monitoring or mobile installations. It is ideal for the determination of many organic air pollutants and for monitoring the air in potentially contaminated areas.

Theory

The FID analyzer is designed to detect and measure hazardous organic vapors and gases found in most industries. It has broad application since it has a chemically resistant sampling system and can be calibrated to almost all organic vapors. It can provide accurate indication of gas concentration. While designed as a lightweight portable instrument, it can be permanently installed to monitor a fixed point.

The instrument utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors. The instrument measures organic vapor concentration by producing a response to an unknown sample, which can be related to a gas of known composition to which the instrument has previously been calibrated. During normal survey mode operation, a continuous sample is drawn into the probe and transmitted to the detector chamber by an internal pumping system.

The sample stream is metered and passed through particle filters before reaching the detector chamber. Inside the detector chamber, the sample is exposed to a hydrogen flame which ionizes the organic vapors. When most organic vapors burn, they leave positively charged carbon-containing ions. An electric field drives the ions to a collecting electrode. As the positive ions are collected, a current corresponding to the collection rate is generated. This current is measured with a linear electrometer preamplifier which has an output signal proportional to the ionization current. A signal-conditioning amplifier is used to amplify the signal from the pre-amp and to condition it for subsequent meter or external recorder display. The display is an integral part of the probe/readout assembly and has 270-degree scale deflection.

In general, the hydrogen flame ionization detector is more sensitive for hydrocarbons than any other class of organic compounds. The response of the FID varies from compound to compound, but gives repeatable results with all types of hydrocarbons, i.e. saturated hydrocarbons (alkanes), unsaturated hydrocarbons (alkanes) and aromatic hydrocarbons.

Applications

- a. Measurement of most toxic organic vapors present in industry for compliance with OSHA requirements.
- b. Evaluation and monitoring applications in the air pollution field.
- c. Source identification and measurement for fugitive emissions (leaks) as defined by the EPA.
- d. Forensic science applications.
- e. Controlling and monitoring atmospheres in manufacturing and packaging operations.
- f. Leak detection related to volatile fuel handling equipment.
- g. Monitoring the background level of organic vapors at hazardous waste sites.
- h. Quality control procedures geared to leak checking, pressurized system checks, combustion efficiency checks, etc.

Limitations

- a. The FID will not detect any inorganic compounds.
- b. The FID will see methane, which is explosive, but relatively non-toxic in other than high concentrations. The user should determine if the contaminant involved is or is not methane.
- c. DOT shipping regulations are strict for the FID when shipping pressurized oxygen.
 - d. A relative humidity greater than 95% will cause inaccurate and unstable responses.
 - e. A temperature of less than 40 deg. F will cause poor and slow response.
 - f. Actual contaminant concentrations are measured relative to the calibration gas used. Therefore, specific contaminants and their quantities cannot be easily identified.

Battery Charging

- a. Plug charging connector into mating connector on battery cover and insert AC plug into 115V AC wall outlet.
- b. Move the battery charger switch to the ON position. The lamp above the switch button should illuminate.

- c. Battery charge condition is indicated by the meter on the front panel of the charger; meter will deflect to the left when charging. When fully charged, the pointer will be in line with "CHARGED" marker above the scale.
- d. Approximately 1 hour of charging time is required for each hour of operation. However, an overnight charge is highly recommended. The charger can be left on indefinitely without damaging the battery. When finished, move the battery charger switch to "OFF" and disconnect from the SIDE PACK ASSEMBLY.

Calibration

The FID is capable of responding to nearly all organic compounds. At the time of manufacture, the analyzer is calibrated to mixtures of methane in air.

The instrument is calibrated by using a mixture of a specific vapor in air, with a known concentration. After the instrument is in operation and the normal background is zeroed, draw a sample of the calibration gas into the instrument. The GAS SELECT knob on the panel is then used to set the readout meter indication to correspond to the concentration of the calibration gas mixture.

The instrument has now been calibrated to the vapor mixture being used. After this adjustment, the setting on the DIGIDIAL should be recorded for that particular organic vapor compound. This exercise can be performed for a variety of compounds, thereby generating a library which can be used for future reference without need for additional calibration standards.

To read a particular compound, the GAS SELECT control is turned to the predetermined setting for the compound. Calibration on any one range automatically calibrates the other 2 ranges.

Startup Procedure

- a. Connect the Probe/Readout Assembly to the Sidepack Assembly by attaching the sample line first, then connect electronic jack to the side pack.
- b. Select the desired sample probe (close area sampler or telescoping probe) and connect the probe handle. Before tightening the knurled nut, check that the probe accessory is firmly seated against the flat seals in the probe handle and in the tip of the telescoping probe.
- c. Move the instrument/BATT switch to the test position. The meter needle should move to a point beyond the white line, indicating that the integral battery has more than four (4) hours of operating life before recharging is necessary.
- d. Move the instrument/BATT switch to the "ON" position and allow a five (5) minute warm-up.
- e. Move PUMP switch to "ON" position, then place instrument panel in vertical position and check SAMPLE FLOW RATE indication. The normal range is 1.5 2.5 units. If less, check filters.
- f. Perform a leak test. (See "Sampling Fixtures")

- g. Activate audible alarm:
 - Use the CALIBRATE ADJUST knob to set the meter needle to the level desired for activating the audible alarm. If this alarm level is other than zero, the CALIBRATE SWITCH must be set to the appropriate range.
 - Turn the VOLUME knob fully clockwise.
 - Using the ALARM LEVEL ADJUST knob, turn the knob until the audible alarm is activated.
- h. Move the CALIBRATION SWITCH to X1 and adjust the meter reading to zero using the CALIBRATE ADJUST (zero knob).
- i. Open the Hydrogen TANK VALVE one or two turns and observe the reading on the HYDROGEN TANK PRESSURE INDICATOR. Approximately 150 psi of pressure is required for each hour of operation.
- j. Open the HYDROGEN SUPPLY VALVE one or two turns and observe the reading on the HYDROGEN SUPPLY PRESSURE INDICATOR. The reading should be between 8 and 12 psi.
- k. After approximately 10 seconds, depress the IGNITER BUTTON until the hydrogen flame lights. The meter needle will travel upscale and begin to read "TOTAL ORGANIC VAPORS".
 - **CAUTION:** Do not depress the igniter for more than 6 seconds. If the flame does not ignite, wait <u>one minute</u> and try again.
- 1. Calibrate instrument (see "Calibration").
- m. The instrument is ready for use.

NOTE: If the ambient background organic vapors are "zeroed out" using the CALIBRATE ADJUST KNOB, the meter may move off scale in the negative direction when the OVA is moved to a location with lower background levels. If the OVA are to be used in the 0-10 ppm range, it should be "zeroed" in an area with very low background.

Shut Down Procedure

- a. Close the HYDROGEN SUPPLY VALVE.
- b. Close the HYDROGEN TANK VALVE.
- c. Move the INSTR switch and PUMP switch to OFF.
- d. Instrument is now in the shut down configuration.

Operation Procedure

Set the CALIBRATE switch to the desired range. Survey the areas of interest while observing the meter and/or listening for the audible alarm indicator. For ease of operation, carry the SIDE PACK ASSEMBLY positioned on the side opposite the hand which holds the PROBE/READOUT ASSEMBLY. For broad surveys outdoors, the pick-up fixture should be positioned several feet above ground level. When making quantitative readings or pinpointing, the pick-up fixture should be positioned at the point of interest.

When organic vapors are detected, the meter pointer will move upscale. If the audible alarm is utilized, it will sound when the set point is exceeded. The frequency of the alarm will increase as the detection level increases.

If a flameout occurs, check that the pump is running, then press the igniter button. Under normal conditions, flameout results from sampling a gas mixture that is above the Lower Explosion Limit (LEL) which causes the hydrogen flame to extinguish. If this is the case, reignition is all that is required to resume monitoring. Another possible cause for flameout is restriction of the sample flow line which would not allow sufficient air into the chamber to support combustion. The normal cause for such restriction is a clogged particle filter.

It should be noted that the chamber exhaust port is on the bottom of the case and blocking this port with the hand will cause fluctuations and/or flameout.

Maintenance and Troubleshooting

IMPORTANT NOTE: This section describes a routine maintenance procedures for troubleshooting instrument malfunctions. Maintenance personnel should be thoroughly familiar with instrument operation before performing maintenance. All written portions of this section must be thoroughly understood relating to safety of operation, servicing and maintenance. There should be no potential ignition sources in the area when filling, emptying or purging the hydrogen system and the instrument should be turned off.

Replacement parts that are specified by Foxboro must be used for repair. No modifications are permitted. Disassembly of the instrument must take place in a non-hazardous atmosphere only.

Primary Filter Cleaning

This filter is located behind the sample inlet connector (fitting assembly) on the SIDE PACK ASSEMBLY and is removed for cleaning by using a 7/16" thin screwdriver to unscrew the fitting assembly. The filter cup, "O" ring and loading spring will then come out. The porous stainless filter cup can be cleaned by blowing out. Reassemble in reverse order, ensuring that the "O" ring seal on the fitting assembly is intact.

Secondary Filter Cleaning

A particle filter is located in each pick-up fixture. One of these filters must be in the sample line whenever the instrument is in use. The OVA 128 uses a porous metal filter which can be replaced and cleaned.

Mixer/Burner Assembly Filter

A porous metal particle filter is incorporated in the Mixer/Burner Assembly, which screws into the Pre-Amp Assembly. This filter is used as the sample mixer and inlet flame arrestor in the chamber. The filter should not become contaminated under normal conditions but can be cleaned or the assembly replaced, if necessary.

Access to this filter or output surface does not require removing the instrument from the case. For access, remove the safety cover using a hex key wrench (supplied) then unscrew the exhaust port. The Filter Assembly can now be seen on the side of the chamber (Pre-Amp Assembly) and can be cleaned with a small wire brush.

Exhaust Flame Arrestor

A porous metal flame arrestor is located in the exhaust port of the detector chamber (Pre-Amp Assembly). It acts as a particle filter on the chamber output and restricts foreign matter from entering the chamber. This filter may be cleaned by removing the exhaust port. For access, see Mixer/Burner section above. Note that the filter is captive to the exhaust port.

Sampling Fixtures

Sampling fixtures should be periodically cleaned with an air hose and/or detergent solution to eliminate foreign particle matter.

The OVA is equipped with a flow gauge that provides a method to check for air leaks. Assemble the pick-up probe selected for use to the readout assembly and then position the side pack vertically so the flow gauge may be observed. Cover the end of the pick-up probe with your finger and observe that the ball in the flow gauge goes to the bottom, indicating no air flow (If the ball has a slight chatter while on the bottom, this is acceptable). Cover the center of the chamber exhaust port with your thumb and again observe the ball going to the bottom. Another simple check is to expose the pick-up probe to cigarette smoke or a light vapor (butane) and observe that the meter responds in approximately 2 seconds. It should be noted that the slow meter response might also indicate restriction in the air sampling.

Failure of the ball to go to the bottom when the inlet is blocked indicates a leak in the system between the probe and the pump inlet or the inlet check valve. To isolate the problem, remove the parts, one at a time, and again block off the air inlet. Remove the pick-up probes and cover the air inlet at the readout assembly. If the ball goes to the bottom, check that the "readout to probe" seal washer is in place and replace the probes, holding them back against this seal while tightening the nut. Recheck, and if leakage is still present, it is probably in the probe (pick-up fixture), which should be repaired or replaced.

If leakage is indicated as being past the readout handle when the connection to the sidepack is tight, disconnect the sample line at the fitting on the sidepack and cover this inlet with your finger. If the flow gauge ball goes to the bottom, the problem should be a leak in the umbilical cord/readout assembly. which should be investigated and repaired. There is also the possibility of a leaking check valve in the pump which would not show up on this test. If the leakage is not found in the umbilical cord, it is most likely in the pump check valve. If the ball does not go to the bottom following these corrective actions, contact the manufacturer for further instructions, and do not use the instrument.

Using Empirical Data

Relative response data can be used to estimate the concentration of a vapor without need to recalibrate the analyzer. With the instrument calibrated to methane, obtain the concentration reading for a calibration sample of the test vapor. The response factor (**R**) in percent for that vapor is:

R = <u>Actual Conc.</u> Measured Conc.

To determine the concentration of an unknown sample of that vapor, multiply the measured concentration by **R**. See the alphabetical list of compounds and Relative Response values in Attachment B.

3. Colorimetric Indicator Tubes

Colorimetric indicator tubes are used to measure concentrations of specific gases and vapors, both organic and inorganic. When used appropriately, an indicator tube specific to a certain compound will produce a stain in the tube. The length of the stain (or color change) is proportional to the compound's concentration. Minimal operator training and expertise is required to operate this type of sampling instrument.

Limitations

Colorimetric indicator tubes are cross-sensitive, meaning that other compounds may trigger a similar response, which will give the user a false reading. The user must take this fact into account when he/she dealing with a situation containing unknowns.

Other limitations include individual interpretation concerning the length of the stain, the limited accuracy of the tube, and use in high humidity. The greatest sources of error occur in different interpretations that are obtained between individuals as to how far the stain has gone on the tube, and the tubes limited accuracy. Users must remember that the tubes are 25% accurate. A simple calculation will tell the user the range in which the correct reading could possibly occur.

With this in mind, any discoloration on the tube should alert the user as to the appropriate protection required for the site. High humidity also affects the readings. Use in humid environments tends to clog the filtering medium, not allowing the gases or vapors to be drawn properly through the tube.

Maintenance and Calibration

Posillico utilizes the Draeger Model 31 Bellows-type pump for colorimetric tube sampling. General maintenance for this type of instrument includes: avoiding rough handling which may cause channeling; performing a leakage test before sampling each day (including documentation); calibrating the unit at least quarterly; providing an inventory of tubes, with expiration dates; and, appropriate storing.

Rough handling of this instrument may cause erroneous results due to channeling (leakage). Therefore, the unit must be handled carefully and not be stored outside of its protective carrying case when not in use.

It may be necessary to clean the rubber bung (tube holder) if a large number of tubes have been taken with the pump. A mild soap and water solution can be used.

Leak Test

Before each day's use, the user will perform a leak test on the instrument. This is a simple test and includes the following:

- a. Squeeze the bellows of the pump and insert an unopened detector tube, attempting to draw 100 ml of air.
- b. After a few minutes, examine the bellows for any expansion. Document the findings in the Site Monitoring Log Book. If the pump does not pass the leak test, it will be removed from service immediately and returned to the Facility Manager, to be sent out for repair.

Calibration Test

At least quarterly, the instrument will be calibrated for proper volume measurement. Equipment needed for the calibration test is: 100 ml burette and ring stand; stopwatch; soap solution; detector tube with both ends broken off; and, tygon tubing.

The calibration test is performed as follows:

- a. Break both ends of a colorimetric tube and connect it in-line with the pump.
- b. Connect the instrument directly to a bubble burette, and create a bubble inside the burette by touching the bottom of the burette to the soap solution.
- c. Squeeze the bellows to exhaust all the air out of the unit.
- d. Release the bellows and wait 5 minutes for the full volume of air to be drawn into the bellows. The bubble should stop between the 95 and 105 cc marks. Errors of 5% are permissible; if the error is greater than 5%, return the pump to the Facility Manager, to be sent out for repair.

Inventory and Storage Requirements

To inventory the tubes, check the expiration date marked on the storage container. No tubes will be allowed for use past the manufacturer's expiration date. A listing of tubes that are readily available will be maintained by the Health and Safety Coordinator. This list will contain the name of the tube and the expiration date of those available. The list will be updated monthly and provided to the Facility Manager and each Field Division. All colorimetric tubes will be stored in the refrigerator in the Chemical Storage Area. Refrigeration helps to maintain shelf life. Any tubes that have been previously opened and inadvertently stored in the refrigerator will not be used in the field. Colorimetric tubes are not reusable, and any reuse will result in erroneous results.

4. Personal Monitoring Pumps

Personal monitoring involves the collection of an air sample by a sampling device worn by the worker. The sampling device is worn as close as possible to the breathing zone of the individual so that the data collected closely approximates the concentration inhaled. Personal monitoring pumps are used when it is necessary to monitor the workers' exposure to air contaminants.

Personal monitoring pumps can be classified into three basic categories:

- a. Low-Flow Pumps (0.5 500 ml/min);
- b. High-Flow Pumps (500 4500 ml/min);
- c. Dual Range Pumps.

Low-flow pumps are used for gas and vapor sampling. For example, the common flow rate for organic vapors is 200 ml/min.

High-flow pumps are used for particulate sampling as well as gas and vapor sampling. A common flow rate for fumes or dust sampling (i.e. zinc fume or asbestos) is 2 L/min.

Limitations

The major disadvantage in personal monitoring is the lag time between sampling and obtaining analysis results, which may take weeks, days or months if a remote laboratory is used. If a situation requires an immediate decision concerning worker safety, this can be a serious problem. Therefore, personal monitoring is rarely used for site characterization. Its main purpose is to assure effectiveness of work practice and engineering controls.

A second disadvantage is that multiple exposures may require the use of a variety of sampling media. Unfortunately, workers cannot carry multiple sampling media because of the added strain. Also, it is not usually possible to draw air through different sampling media using a single, portable battery operated pump. Several days may be required to measure the exposure of a specific individual to the variety of chemicals on site. Alternatively, if workers are in teams, a different monitoring device can be assigned to each team member.

Calibration

The following procedure will be used for calibration with a primary calibration source for all personal monitoring pumps used by Posillico. It has been taken from OSHA Instruction CPL 2-2.20B, Appendix 1-C, Manual Bubble Meter Technique.

Electronic bubble meters are also used as primary calibration sources. These meters have a digital read-out and the ability to give a printed copy for documentation of the pump flow rate. Posillico uses a Spectrex Model BFM-4000 for this purpose.

NOTE:

When calibrating with a bubble meter (either manual or electronic), the use of adapters can cause moderate to severe pressure drop in the sampling train, which will affect the calibration result. If adapters are used for sampling, then they should be used when calibrating.

- a. Connect the collection device, tubing, pump and calibration apparatus (see figure 4.1).
- b. Conduct a visual inspection on all tygon tubing connections.
- c. Wet the inside of a one-liter burette with a soap solution.

- d. Turn on the pump and adjust the pump rotameter to the appropriate flow rate setting.
- e. Momentarily submerge the opening of the burette in order to catch a film of soap.
- f. Draw 2 or 3 bubbles up to the burette in order to insure that the bubbles will complete their run.
- g. Visually capture a single bubble and time the bubble from 0 1000 ml for high flow pumps or 0 100 ml for low flow pumps.
- h. The timing accuracy must be within 1 second of the time corresponding to the desired flow rate.
- i. If the time is not within the range of accuracy, adjust the flow rate and repeat steps g and h until the correct flow rate is achieved.
- j. While the pump is running, mark the pump or record on the air sampling worksheet the position of the center of the float in the pump rotameter as a reference.
- k. Repeat bubble timing for 3 times. Calculate the average time given by these measurements.
- l. Calculate the flow rate as follows: (NOTE: 1L = 1000 ml)

Measured Volume (L) X 60 Seconds = L/min
Average Seconds 1 Min

For Example:

 $\frac{1 \text{ L}}{38 \text{ sec}}$ $\frac{60 \text{ Sec}}{\text{min}}$ = 1.6 L/min (round to m)

Repeat the procedures for all pumps to be used for all calibrations involving the same sampling method.

Different contaminants have different sampling protocols, which may result in different calibration protocol. Contact the Posillico Certified Industrial Hygienist or Health and Safety Coordinator for chemical-specific calibration protocols.

Checklist for Using Personal Monitoring Pumps

- a. Look at measurement method in NIOSH <u>Pocket Guide to Chemical Hazards</u> (Latest edition).
- b. Calibrate with a primary calibration source, as described in the calibration procedures.
- c. Record information of air sampling worksheet and calibration logbook.

- d. Make sure battery is fully charged. Air pumps have NiCd battery, which creates a memory. Care needs to be used so as to not recharge a battery that has been used for only a few hours. Recharge a battery only if it has been used for at least 8 hours. There are chargers which will completely discharge a battery before recharging; or, the pumps can be left running until the battery is rundown completely and then recharged to eliminate this memory, also.
- e. Check sample requirement sheet or NIOSH method to see the minimum time/volume for the sample. An 8-hour sample period would allow for the best measure, giving an 8-hour TWA exposure.

5. Combination Oxygen and Combustible Gas Meter

Combination meters measure the concentration of combustible gas or vapor present in an area, as well as the oxygen content. The concentration is reported as a percent, with 1% equal to 10,000 ppm. Although it is an easy instrument to operate, its effective use requires that the operator understand the operating principles and procedures behind the instrument. Certain atmospheres may cause erroneous readings or damage to the instrument. Typically, the instrument can be used as long as the battery lasts, or for the recommended interval between calibrations.

Maintenance

Maintenance of combination meters is fairly simple. Batteries must be recharged at the end of a continuous day's use. Occasionally, the rechargeable battery must be replaced. Most batteries last for approximately 2 years of continued use. Also, oxygen and combustible gas sensors will need to be replaced periodically. These sensors last approximately 6 months with continued use. Sensors that can no longer be calibrated within the manufacturers' acceptable range indicate the need for replacement.

If, after an attempted calibration, the instrument cannot be calibrated due to problems other than the need for battery or sensor replacement, the problem must be reported to the Facility Manager immediately, so that the instrument can be sent out for repair.

Detection Method

The instrument contains 2 analyzers: 1 for combustible gases and vapors; and 1 for oxygen content. The combustible gas analyzer contains a battery operated electrical circuit called a Wheatstone Bridge. Basically, the Wheatstone Bridge is a filament, usually made of platinum, that is exposed to the air in the instrument. When heated by a burning combustible gas or vapor, the increase in heat over the filament is measured as electrical resistance. Another part of the bridge contains similar filaments, but it has been sealed. They are heated in the same fashion, but not directly in the air stream. Thus, this filament is not capable of causing combustion of the gas or vapor, because it is sealed. The net effect of the change in resistance to the electrical current flow in the air stream is due only to the presence of a combustible gas. These changes in electrical current are registered as "percent LEL" (Lower Explosion Limit) on the instrument.

The oxygen analyzer senses oxygen concentration by a galvanic cell. The cell contains 1 gold and 1 lead electrode, and is encapsulated in inert plastic. Oxygen diffusing through the plastic initiates a redox reaction, which generates a small electrical current that is proportional to the oxygen partial pressure. The instrument contains a temperature-

compensated electronic circuit that converts the electrical current to a proportional voltage. This voltage is displayed on the instrument as the concentration of oxygen.

Limitations

The combination meter contains some inherent limitations. Knowledge of these limitations will help the user make an educated decision regarding the accuracy of the instrument.

Accuracy of the instrument depends, in part, on the difference between the calibration and sampling temperatures. Differences in temperature may cause a lack of sensitivity in the instrument when brought from a warm to a cold environment.

Another aspect of sensitivity of the instrument is a function of the differences in the chemical and physical properties between the calibration gas (pentane) and the gas being sampled. The chemical and physical properties of the calibration gas are slightly different from those being sampled, so all gases being sampled are compared to the combustion of pentane. In order to get a true reading of the LEL, the gas that is present must also be used as the calibration gas.

The filament can be damaged by certain compounds such as silicones, halides, tetraethyl lead, and oxygen enriched atmospheres. Each manufacturer's instrument handbook should contain a listing of compounds that should not be sampled with this instrument, or serious damage could result.

Under oxygen deficient atmospheres, the oxygen analyzer must be read first. Otherwise, the CGM analyzer may not provide a valid reading and give the user a false sense of security.

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ATTACHEMENT A

PID AND FID CALIBRATION LOGS

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POSILLICO ENVIRONMENTAL, INC.

PID CALIBRATION LOG

IMP	ΛR	TA	NT.
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Instruments that do not pass calibration will not be used in the field. Contact the Facility Manager IMMEDIATELY for the instrument to be sent out for repair.

Model #:_		Serial #:	· · · · · · · · · · · · · · · · · · ·
Date	Calibrated By	Repair Necessary (Y or N)	Initials
Span	Reading	Reading	Setting
	•		
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POSILLICO ENVIRONMENTAL, INC.

MICRIOFID CALIBRATION LOG

IMPORTANT:	Instruments that of the Facility Mana repair.	lo not pass calibration will not be used in the field. Contact ager IMMEDIATELY for the instrument to be sent out for		
Model #:		Serial #:		
	orated By	Repair Necessary (Y or N) Initials		

ATTACHMENT B

FID RELATIVE RESPONSE VALUES FOR VARIOUS COMPOUNDS

COMPOUND	RELATIVE RESPONSE	23.3	
Acetone	60	<u> </u>	
Acetonitrile	70		
Acrylonitrile	70 70		
Allyl Alcohol	30		
Allyl Chloride	50		
Benzene	150		
2-Bromo-2-Chloro-1,1,1-Trifluoroethane (Halothane)	45		
Bromoethane	43 75		
1-Bromopropane			
2-Butane	75 60		
N-Butanol -			
2-Butanol	50		
N-Butyl Acetate	65		
N-Butyl Acrylate	80		
2-Butyl Acrylate	60 70		
N-Butyl Formate	70	4	
2-Butyl Formate	50		
N-Butyl Methacrylate	60		
2-Butyl Methacrylate	60		
Carbon Tetrachloride	80		
Chlorobenzene	10		
Chlorodifluoromethane (FREON)	200		
Chloroform	40		
1-Chloropropane	65 75		
2-Chloropropane	75 00		
2-Dichloro-1,1,2-Trifluoroethyl-	90		
Difluoromethyl Ether (Ethrane)	150		
Cumene	100		
Cyclohexane	100 85		
Cyclohexanone			
N-Decane	100		
o-Dichlorobenzene	75 50		
Dichlorodifluoromethane (FREON 12)			
1,1-Dichloroethane	15		
1,2-Dichloroethane	80		
trans-1,2-Dichloroethylene	80		
Dichlorofluoromethane (FREON 21)	50 70		
Dichloromethane	70 100		

COMPOUND RELATIVE RESPONSE		SPONSE
1,2-Dichloropropane	90	182 12 ² 2 ² 4
1,3-Dichloropropane	80	
1,2-Dichloro-1,2,2-Tetrafluorethane (FREO)	N 114) 110	
Diethyl Ether	50	
Diethyl Ketone	80	
p-Dioxane	30	
Ethane	80	
Ethanethiol	30	g Special Control
Ethanol	25	
Ethyl Acetate	65	
Ethyl Acrylate	40	
Ethyl Benzene	100	
Ethyl Butyrate	70	
Ethyl Formate	40	
Ethyl Methacrylate	70	
Ethyl Propionate	65	e i sestant fratik re-
Ethylene Dibromide	50	- Committee Artistantial Artistantial Artistantial Artistantial Artistantial Artistantial Artistantial Artista - Artistantial Artista
Ethylene Dichloride	60	e fre districted (1940-195) The control of the control
Ethylene Oxide	70	
Fluorotrichloromethane (FREON 11)	10	
Heptane	75	and the Arman San Ar Arman San Arman San
Hexane	70	n in de la faction de la f La faction de la faction de
Isoprene	50	
Methane	100	
Methyl alcohol	12	
Methyl Acetate	41	
Methyl Acrylate	40	See
Methyl Cyclohexane	100	
Methyl Cyclopentane	80	
Methyl Ethyl Ketone	80	
Methyl Isobutyl Ketone	80	
Methyl Methacrylate	50	
Methyl Propyl Ketone Nitromethane	70	
	35	
1-Nitropropane	60	
2-Nitropropane Nonane	70	Section 1985
Octane	90	
Octalic	80	

COMPOUND	RELATIVE RESPONSE	
Pentane	65	
Pentanol	40	
Propane	80	
N-Propanol	40	
2-Propanol	65	
N-Propyl Acetate	75	
N-Propyl Ether	65	
N-Propyl Formate	50	
Pyridine	128	
Styrene	85	
1,1,1,2-Tetrachloroethane	100	
1,1,2,2-Tetrachloroethane	100	
Tetrachloroethylene	70	
Tetrahydrofuran	40	
Toluene	110	
1,1,1 Trichloroethane	105	
1,1,2-Trichloroethane	85	
Trichloroethylene	70	
Trichlorotrifluoroethane (FREON 113)	80	
Triethylamine	70	
Vinyl Acetate	50	
Vinylidene Chloride	40	
m-Xylene	111	
o-Xylene	116	
p-Xylene	116	

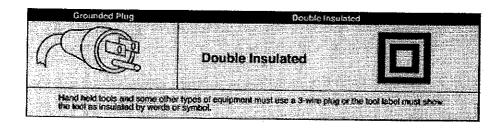
APPENDIX M

GENERAL HEALTH AND SAFETY WORK RULES

General Safety Rules for Construction

- 1. Always store materials in a safe manner. Tie down or support piles if necessary to prevent falling, rolling, or shifting.
- 2. Shavings, dust scraps, oil or grease should not be allowed to accumulate. Good housekeeping is a part of the job.
- 3. Trash piles must be removed as soon as possible. Trash is a safety and fire hazard.
- 4. Remove or bend over the nails in lumber that has been used or removed from a structure.
- 5. Immediately remove all loose materials from stairs, walkways, ramps, platforms, etc.
- 6. Do not block aisles, traffic lanes, fire exits, gangways, or stairs.
- 7. Avoid shortcuts use ramps, stairs, walkways, ladders, etc.
- 8. Standard guardrails must be erected around all floor openings and excavations must be barricaded. Contact your supervisor for the correct specifications.
- 9. Fall Protection must be properly worn whenever there is a fall exposure of more than 6 foot to the next lower level.
- 10. Do not remove, deface or destroy any warning, danger sign, or barricade, or interfere with any form of protective device or practice provided for your use or that is being used by other workers.
- 11. Get help with heavy or bulky materials to avoid injury to yourself or damage to material.
- 12. Keep all tools away from the edges of scaffolding, platforms, shaft openings, etc.
- 13. Do not use tools with split, broken, or loose handles, or burred or mushroomed heads. Keep cutting tools sharp and carry all tools in a container.
- 14. Tools and equipment must be inspected for use at the start of the shift and as often as necessary during the shift.
- 15. Know the correct use of hand and power tools. Use the right tool for the job.

- 16. Know the location and use of fire extinguishing equipment and the procedure for sounding a fire alarm.
- 17. Flammable liquids shall be used only in small amounts at the job location and in approved safety cans, properly labeled.
- 18. Proper guards or shields must be installed on all power tools before use. Do not use any tools without the guards in their proper working condition. No "homemade" handles or extensions (cheaters) will be used!
- 19. All electrical power tools (unless double insulated), extension cords, and equipment must be properly grounded.
- 20. All electrical power tools and extension cords must be properly insulated. Damaged cords must be immediately replaced.
- 21. Do not operate any power tool or equipment unless you are trained in its operation and authorized by the company to do so.
- 22. All electrical power equipment and tools must be protected by a GFCI and grounded, (unless double insulated). All extension cords must have a continuous ground, (3-wire cords only).



- 23. Use tools only for their designed purpose.
- 22. Power tools must not have a manual lock-on switch.
- 23. Only qualified riggers are allowed to rig loads for hoisting.

APPENDIX N

SAFE OPERATION OF CRANES, DERRICKS AND HOISTING EQUIPMENT

1. Cranes and Rigging

1.1 Purpose

The purpose of this program is to implement safe working procedures for working on or around cranes and rigging systems. This program will encompass not only company employees, but subcontractor crane requirements as well.

1.2 Applicable Regulations

OSHA 29 CFR 1910.180

OSHA 29 CFR 1926.550

OSHA 29 CFR 1926.251

1.3 Responsibilities

1.3.1 Project Management shall:

- Ensure that operators of cranes meet the requirements of this program;
- Ensure that the manufacturer's, federal, state, local regulatory agency requirements are met in the operation and servicing of cranes and selection of operators;
- Ensure that cranes are operated safely according to the specifications of this program;
- Train employees designated to signal crane operators according to this program;
- Purchase crane hardware and rigging specific to corporate specifications;

1.3.2 Job Superintendent shall:

- The job superintendent is responsible for ensuring that the manufacturer's, and regulatory agency requirements are met in the operation an servicing of cranes and selection of operators; and
- Ensure that all rigging is used, maintained and stored by only trained, experienced and competent personnel.

1.3.3 Designated Operators shall:

- Only operate cranes to which they have been assigned;
- Operate cranes safely according to this program;
- Perform a daily visual inspection on the crane to which they are assigned;
- Practice good housekeeping in and around the crane to which they are assigned;
 and
- Be responsible for maintaining inspection and service records as well as proper load charts and operators manual inside their crane.

1.4 General Requirements

1.4.1 Manufacturer's Requirements

- The operator must read and understand the Operator's and Maintenance Manual supplied with and considered part of the machine;
- The operator must be skilled and experienced in the operation of cranes and must be thoroughly familiar with the controls, power system and capability of the specific model;
- At all times, operation of the machine must be in accordance with the capacity charts, rigging drawings, and wire rope chart applicable to that machine;
- Booms, jibs and pendants must be properly assembled and maintained as described in the Operator's and Maintenance Manual;
- The machine must receive regular maintenance and inspection as outlined in the Operator's and Maintenance Manual; and
- When land cranes are mounted on barges, a reduced marine load chart must be used as supplied by the manufacturer.

1.4.2 Operator's Requirements

- Operators must make thorough daily visual inspections and repair any deficiency or replace any defective part impairing safe operation before continued use;
- Operators must practice good housekeeping on our cranes;
- Outriggers must be fully extended and tires lifted free of the ground before making any lifts;
- When traveling a crane, the load block must be tied back to the machine's rotating bed;
- When cranes are rigged with more than one line, the unused lines must be tied back using special double tieback cable;
- When traveling crawler cranes up and down slopes, use a tractor as an auxiliary brake;
- Use a signalman when traveling or maneuvering in tight quarters;
- When using two or more cranes for a single lift, careful planning is mandatory;
- Always try to use two cranes of the same manufacturer, size, model and rugging;
- Avoid swinging over people whenever possible;
- Use taglines to control loads;
- Use only one man to give standard crane signals;
- Never leave the cab with a load suspended;
- Do not leave the cab with the engine running;
- Attachments used with cranes shall not exceed manufacturer recommendations;

- Cranes must be located so that no part of the machine will come within 10 feet of high voltage lines, or as required by law;
- A hydraulic crane boom must be telescoped equally at all times;
- With hydraulic cranes, we discourage traveling with a load. Follow manufacturer guidelines;
- All cranes are to use the shortest boom possible for the work at hand;
- Use jibs only when inward reach is required, remove when not required;
- Purchase pendant lines only from the original equipment manufacturer;
- Handle all booms with nylon slings;
- Booms are to be repaired per manufacturer recommendations, but under no circumstances will a cord member be repaired;
- Purchase only wire rope recommended by the crane manufacturer; and
- Wire rope will be taken out of service when any of the following conditions exist:
 - In running ropes, six randomly distributed broken wires in one lay, or three broken wires in one strand in one lay;
 - Wear of one-third of the original diameter of outside wires;
 - Kinking or crushing resulting in distortion of the rope structure;
 - Evidence of any heat damage; and
 - In standing ropes, such as pendants, more than one broken wire.

1.4.3 Regulatory Agency Requirements

- Consult the agency holding jurisdiction on safe working rules for cranes, hoists
 and derricks in the area being worked for regulations that apply to that area; and
- This must include requirements of OSHA, state, city, and owner's regulations on type of work being done with crane, hoist, or derrick being used.

1.4.4 Subcontractor Requirements

- The following shall be procured prior to subcontract crane work commencing on site:
 - Annual crane inspection;
 - Double tie-back chokers;
 - Operator license (where applicable);
 - Proof of daily visual inspection;
 - Proof of load chart specific to crane; and
 - Walk around of crane, by a competent superintendent.

1.5 Designated Operator Requirements

1.5.1 Designated Operator Program

- Trained, competent and careful operators are essential;
- Only the following personnel shall operate this type of equipment:
 - Designated Operator an operator assigned to the equipment after it has been determined the operator is qualified.
 - Trainees under the direct supervision of the designated operator.
 - Maintenance and Test Personnel when it is necessary in the performance
 of their duties, they should be checked out on the equipment the same as
 the designated operator.
- No one other than personnel specified above shall operate this equipment;
- Each designated operator shall be indoctrinated in the manufacturer, and regulatory agency rules applying to the equipment prior to starting work;
- Names of designated operators shall be posted in a visible location in or on the cab;
- Refer to the following Designated Operator's Requirements for more information;
- Any standard attachments to the boom such as jibs and auxiliary or whip lines shall be considered as affecting stability, and a deduction shall be made from load ratings in accordance with the manufacturer's instructions; and
- The effect of lights, pile lead adapters, or other nonstandard attachments shall also be deducted from load ratings.

1.6 Crane Signaling

1.6.1 Precautions

- Only one person is to be a signalman at any one time;
- The signalman must be either in full view of the operator or in constant uninterrupted radio contact at all times;
- He must be fully qualified and his supervisor must brief him on procedures;
- The signalman must warn others in the area when loads are hoisted. He must also keep all unauthorized persons outside the crane's operating radius;
- Communication is the key element;
- Constant communication must be kept between the signalman and the crane operator, either visually with hand signals or audibly by radio; and
- If the operator loses contact with the signalman for any reason, he must stop the movement of the crane until communication is restored.

1.6.2 Radio Crane Signals

The following crane signals will be used when directing cranes by radio. The use of this standard set of signals will prevent miscommunication and help ensure a safe, smooth operation. Sometimes signalmen may wish to supply distances in feet (like "down easy two feet").

- Swing crane say, "swing right" or "swing left";
- To stop swing of crane say, "stop", or "hold that", or "hold your swing";
- To boom crane say, "boom up" or "boom down";
- To stop boom say, "stop", "hold that", or "hold that boom";
- To lower load fast say, "hoist down, you are clear";
- To lower load slow say, "hoist down easy";
- To stop load say, "stop", "hold that" or "hold your hoist";
- To raise load slowly say, "hoist up easy";
- To raise load fast say, "hoist up, you are clear";
- To hold load at same elevation say, "boom up and float the load";
- While booming up or down say, "boom down and float the load";
- When swinging fast say, "easy on the swing", "stop", "hold that", or "hold your swing"; and
- When coming down on the load fast say, "easy" before stop.
- In addition, the following signals are to be used with hydraulic cranes:
- To telescope out say, "scope out";
- To telescope in say, "scope in";
- To stop telescoping say, "stop", or "hold that"; and
- When your load is in place say, "dog-off everything".

1.7 Safe Operating

1.7.1 General

- Do not alter the machine by adding extra counterweight;
- Have the operator check the controls before making the first lift each shift;
- Never attempt to make adjustments, repairs, or replacements without first stopping the engine;
- Use taglines to control loads;
- Provide a level place to work;
- Never leave the cab with the load suspended, and secure the machine at the end of the shift;

- When a new moving rope is first installed, it should first be run for a time with no load and then a light load to enable the wires and strands to adjust themselves;
- Caution must be used at all times to prevent "two-blocking" when telescoping the boom;
- Extra caution must be observed on units equipped with an auxiliary hoist. Due to
 the caution that is required to avoid "two-blocking", only one winch should be
 reeved unless both lines are required for the work;
- Position the machine so the shortest boom possible can be used and booming is kept to a minimum;
- Use standard crane signals given by one person only;
- Test the brakes and machine stability, check the boom-up and boom-down with the load in a safe position. This is not a method to check the load weight;
- Keep swing speeds slow when handling heavy loads;
- Never lift loads of unknown weight;
- Make vertical lifts only; and
- Never attempt to drag a load.

1.7.2 Capacities

- Analyze every lift, and never exceed the rated capacity. Take the time to be sure, don't guess;
- Determine the weight of the load and the working radius and consult the capacity chart;
- Be aware of the lifting capacity of the equipment for various operating radii and the weight of all loads to be lifted;
- Before lifting capacity loads that are in dangerous positions, a test lift should be made either with the load in question or a comparable load;
- Use only the 360-degree rotation, outriggers set, load chart;
- Always operate within the rated capacity of the crane and keep booming and telescoping to a minimum while making a lift; and
- Knowing the weight of the lift and the radius is an absolute must.

1.7.3 Outriggers

- Use all outriggers on every lift and make sure the machine is level;
- Outrigger beams are not to be used to carry material or to move objects;
- To aid our operations people, paint a two inch white strip on the outrigger beams to indicate whether the outriggers are fully extended;
- Outriggers extend just as far with the engine running at one-half throttle as they
 do at full throttle. The use of full throttle to set the outriggers or telescope the

boom should be avoided, as it only increases engine wear, wastes fuel and creates additional noise;

- Outriggers should be firmly set and, when necessary, firmly blocked with wooden blocking;
- Always block under the pads, never under the outrigger arms;
- Be sure the boom is a crane boom and not a dragline boom;
- Operate with the boom above 30-degree angle boom;
- Never lift loads by telescoping the boom or booming up. Where additional line pull is required to lift the load, add additional part of line;
- The boom sections must be telescoped equally and only out far enough to accomplish the work;
- Booms are designed for vertical lifts only and they will not withstand side loading;
- On machines equipped with manual boom sections, these should be used only when required for additional reach. When not required, they should not be extended; and
- A boom must not have any damaged structural members, (Chords or Lacings)...

1.7.4 Jibs

- Never travel with any load on the jib;
- Use jibs only when required for inward reach; and
- Jibs shall be removed from all Posillico cranes unless otherwise approved for use.

1.7.5 Crane Traveling with Loads

- The foreman is responsible for obtaining approval from his superintendent prior to traveling with a load;
- The operator has responsibility for the rig and is not to walk with loads or under conditions that may cause the rig to become unstable or create any hazard to personnel or equipment;
- The superintendent or engineer shall determine a crane movement plan that addresses equipment and personnel safety;
- The plan should include consideration of load size, shape, weight, position, security of rigging, terrain, soil, outrigger position, ground personnel, boom angle and radius, traffic, speed of movement, POWERLINES and all other variable that might affect safety;
- Traveling with loads that risk the safety of personnel or equipment is not permitted;
- Crane safety is common sense and no rule can cover all situations. If we error, then it must be on the safe side. Routine handling of small tool boxes, welder boxes, bottles, etc., that in general weigh less than 1,000 pounds are exempt from

the above unless the terrain, soil, or other circumstances require additional considerations;

- However the following guidelines shall always apply:
 - Boom retracted as far as possible;
 - Load tied off;
 - Load carried over the front;
 - Travel speed slow;
 - An individual walking with the load will accompany loads extended 20 feet beyond the retracted boom; and
 - The load should be kept as close to the ground as possible.
- When traveling is complete, before the boom is swing or telescoped, the outriggers must be fully out and fully extended with daylight visible under the tires.

1.7.6 Load Handling

- All loads are to be properly rigged by a qualified person to prevent the dislodgment of any part;
- Suspended loads must be securely slung and properly balanced before set in motion;
- The load must be kept under control at all times. Guide or tag lines must be used on all loads to prevent rotation and maintain control of the load at all times;
- Loads must be safely landed and properly blocked before removing the rigging;
- Any lifting device used must be plainly marked with its weight, designed working load, and should only be used for its designed purpose;
- The hoist rope must never be wrapped around the load. The load should be attached to the hook by other slings or other rigging devices that are adequate for the load being lifted;
- Multiple part lines must never be twisted around each other;
- The load line must be brought over the center of gravity of the load before the lift is started;
- If a slack rope condition has occurred, it must be determined that the rope is properly seated on the drum and in the sheaves prior to continuing with the lift;
- Keep hands away from any pinch points at all times and especially when the slack is being taken out of the hoist rope;
- Wear leather gloves when handling wire rope;
- Make all people aware of loads being hoisted by using horns and audible alarms whenever load is in motion;
- Never ride on a load that is being lifted;

- Never work under a suspended load unless the load has been adequately supported from the floor and the supervisor in charge of the operations has approved all conditions;
- Remove or secure all loose material from the load before it is moved; and
- Lower the loads onto adequate blocking to prevent damage to the slings.

1.7.7 Wire Rope Capacities

- To calculate the safe working load of wire rope, use the rule of thumb method which is:
 - Take the diameter of the cable and change it to eights;
 - Square the top number; and
 - Divide that answer by the bottom number and the result is a safe working load (in tons).

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Example: \frac{1}{2}" cable – \frac{4}{8}"

\frac{4 \times 4}{8} = \frac{16}{8} = 2 tons safe working load

\frac{7}{8}" cable =

\frac{7 \times 7}{8} = \frac{49}{8} = 6 tons safe working load
```

1.8 Operating Near Overhead Power Lines

1.8.1 General

This section applies to all boom-type equipment procedures should be distributed to ALL company employees who may have occasion to operate equipment that is capable of coming within 10 feet or high voltage lines.

1.8.2 Working near Overhead Power Lines

- Adherence to company program that cranes be located so that no part of the rig can come within 10 feet of any energized power line, unless the state code requires a greater separation be maintained;
- A complete job survey must be made of all high-voltage lines within the job limits prior to beginning work;
- On all jobs where cranes are in use, all POWERLINES crossing the work area, shop areas and access roads will be signed;
- Signs must be placed on either side of the POWERLINES (and on both sides of roads) denoting "Overhead Lines - Boom Down";
- The signs must be placed on either side of the lines a sufficient distance away so
 that the longest boom on the job can not come within 10 feet of the lines from the
 point where the sign is installed;

- Supervisors, operators, and oilers should be instructed that booms will not be raised while the crane is located between the signs;
- Flagging should be suspended from a rope or wire strung between the signs;
- Where traffic is anticipated to be heavy or continuous, serious consideration should be given to the use of messenger cables;
- They should be suspended across the road, on either side of the high line, at a height 10 feet below that of the energized power line; and
- They should also be of sufficient distance from the power line to give adequate warning that the equipment or load is too high to allow proper clearance of the power line.

If it is necessary work a crane in close proximity to energized electrical conductors, the following will also apply:

- Before starting operations near energized power lines, notify the power company
 and determine if it is at all possible to have the lines relocated or, at least, deenergized for the period of time you will be working close to them;
- In cases where the power company will not relocate power lines at their expense, serious consideration should be given to relocating the lines at our expense not only in the interest of safety, but to greatly increase the efficiency of a long-term operation;
- If it is not possible to have the lines de-energized, consideration must be given to the use of one or more of the following:
 - The erection of physical barriers to prevent any portion of the rig or load making contact with the line;
 - The use of cage-type boom guards, boom insulators, insulated hooks, proximity warning devices, swing limiters, and positive tie-downs to prevent swinging into the lines; and
 - The nature of your operation, the length of time and the number of power lines in the area should dictate which device or devices are to be used.

Caution: the use of any of the devices described above does not mean that you can relax your procedures. Since these devices are not fail-safe, the same precautions normally used in these circumstances must be followed regardless of what safety devices may be installed on your equipment.

- The foreman will act as signalman and the oiler's sole responsibility will be to stand alongside the signalman and watch the boom and wires;
- If the oiler is otherwise engaged (such as moving a truck crane forward), a reliable member of the crew will be given this responsibility; and
- Supervision, operators, oilers, and all other members of the crew must be thoroughly familiar with the proximity to energized power lines and thoroughly indoctrinated on the correct procedures to follow in the event the crane does not make contact with the power line.

1.9 Multi-Crane Lifts

The use of two or more cranes to make a lift is not allowed, unless the following occurs:

- All alternated ways of making lift must be checked and determined that the only way to complete job is to use a multi-crane lift;
- Complete drawings, layout plans of jobsite, complete with boom locations, swing paths, walk path, load being lowered path shown on drawing and accounted for within the drawings;
- During the planning stages of all multicrane lifts only 80% of rated load chart can be used;
- Hazard analysis done and gone over with the supervisors and crew;
- Crane(s) must be inspected and found in safe working order, all OSHA and local regulations followed;
- The list is approved by:
 - Project Manager, Equipment Manager; and
- Before lift begins, all supervisors and persons involved with the operation must have pre-lift meeting to what is being done and how it should take place along with what everyone will be doing and what safety issues are involved; and
- This applies to sub-contractors and rental cranes.

1.10 Crawler Cranes

Due to the size and restricted mobility of crawler cranes, it is imperative that every move be planned:

- Never travel a machine on a job site, in a congested area or around people without first assigning a qualified person to signal;
- The signalman will be responsible for determining and controlling speed of the move;
- The operator should signal his intentions to move by sounding the horn; two blasts for forward, three for reverse;
- Never travel or swing the crane without first making sure that everyone is clear and a safe distance away from the rig;
- Never get on or off the crane while it is in motion;
- Watch for narrow spots and low clearances, ensure that the signalman is safely out in front of the machine in full view of the operator at all times;
- Reduce speed when maneuvering in tight quarters;
- After the crane has been positioned, accessible areas within the swing radius of the super structure of the crane should be barricaded to prevent employees from being struck or crushed by the crane;
- Watch out for overhead obstructions such as low bridges, overhangs and power lines;
- Operators should not "cut-too-sharp" when positioning their equipment;
- Turning should be gradual;

- During turning or pivoting, travel forward and backward until positioning is complete; and
- After the crane is positioned, the tracks and chains should be checked and cleaned
 if necessary.

1.10.1 Double Tie-Back Choker

- If more than one line must be reeved for a particular operation, then the idle line
 must be tied back to the revolving portion of the crane with a double tie-back
 choker; and
- The double tieback choker should be matched to the crane size.

1.10.2 Wire Rope

Rope diameter is specified by the equipment manufacturer and must be followed. Stay with the manufacturer's recommendations for wire rope. Wire rope certifications must be received with every rope put on equipment. This certification should show working strength, minimum/maximum breaking strength of wire rope. These certifications should be kept in equipment file on jobsite and at the Maspeth office.

1.10.3 Non-Spin/Rotation Resistance Ropes

- In the past, it has been the program that no non-spin or rotation resistance ropes would be used on Posillico or rental cranes on our jobsites. As the industry changes we must re-look at this statement, we still feel that standard ropes do most of the requirements asked in the construction industry. We recognize that there are special applications that the standard ropes fall short, and in these cases, we need to look into the problem; and
- Approval can be received to use rotation resistance ropes from the Equipment Manager.

1.10.4 Crane Swing Radius Barriers

- All truck mounted and crawler cranes working in the company should provide swing radius protection barriers. This applies to all cranes, company owned and rentals;
- Rough terrain cranes may require swing protection should counter weight pose a
 safety hazard. Radius protectors should be attached to the crane, as temporary
 swing protectors tend to not be moved with when crane moves; and
- This applies to all sub-contractors rental cranes.

1.11 Job Made Lifting Devices

The scope of our contracts call for a considerable quantity of lifting, hoisting and rigging. The uniqueness of many of the lifts means we will fabricate lifting devices here on the job. These are items such as skip boxes, bottle racks, beam clamps, spreader bars, etc. To ensure both quality and safety, our fabrication and operation must be flawless. These steps are to be followed when considering the use of every job-made lifting device:

The design must be reduced to paper;

- A qualified engineer must approve the design using the following criteria:
 - Device will function as designed;
 - Structurally sound;
 - The device must have a built-in safety factor (safety factor of 4 when people will be on the device);
 - Consult the local safety regulations;
 - Welding procedures, fabrication notes, design requirements and testing methods must be specified if applicable to the design. Weld engineers should be consulted:
 - Load test at 125% of rated load;
 - The rated load shall be legibly marked on it;
 - Where instructions are needed for safe operation, these shall be written and made available to those who will use the lifting device; and
 - Design should have the approval from a professional engineer and all paper work stamped accordingly.

1.12 Suspension Personnel Platform

1.12.1 General

- The use of suspension personnel platforms <u>is not allowed</u>, unless there is no other way to access the work area;
- Should a suspension personnel platform be used, the requirements below must be followed:
 - All alternate ways of accessing the work must be checked and determined that the personnel platform is the only way to complete the work;
 - Complete drawings, layout plans, swing radius and hazard analysis must be done;
 - Suspension personnel platform must meet or exceed all requirements in OSHA requirement 1926.550. All state, city and owners requirements must be met also;
 - Cranes used to suspend personnel platform must meet or exceed all requirements set down in OSHA requirement 1926.550;
 - Prior approval by the Project Manager and Safety Office,
 - Before use of suspension personnel platform begins, all supervisors and
 persons involved with the operation must have pre-lift meeting to inform
 what is being done and how it should take place along with what everyone
 will be doing along with safety issues involved;
 - Must work with Crane Operations protocol, crew using personnel platforms must have Trial Test-Lift before use; and
 - This applies to sub-contractors and rental cranes.

1.13 Rigging Safety

1.13.1 General

- Knowledge of the equipment and materials with which we work is one of the most important factors in accident prevention. Each piece of equipment and material has been designed and developed to serve a specific purpose and knowledge of what it can and cannot do, not only improves efficiency, but also eliminates hazards;
- It is the responsibility of management and supervision to ensure that the men who
 prepare, use and work with or around equipment are well trained in both safety
 and operating procedures;
- Management and supervision must also ensure that the men who direct, rig and handle loads have received training in the principles of the operation, and that they are able to establish weights and proper rigging gear suitable for the loads to be lifted and are capable of directing the movement of the crane and load to ensure the safety of all personnel;
- All rigging operations must be planned and supervised by competent personnel to ensure that the best methods and most suitable equipment are used; and
- The supervisor is responsible for:
 - Proper rigging of the load by a qualified person;
 - Supervision of rigging crew;
 - Assuring rigging equipment meets the load criteria for the job and is in safe condition;
 - Ensuring correct assembly of rigging material or equipment as required during the operation, such as the correct installation of lifting bolts, etc.;
 and
 - Safety of the rigging crew and other personnel as they are affected by the rigging operation.

1.13.2 Rigging Equipment

- Know the safe working load of all your rigging equipment and never exceed its limit'
- Determine the load weight before rigging it;
- Inspect all rigging equipment before using it;
- Destroy defective equipment;
- Never commence with a rigging or hoisting operation when any doubt exists as to the safety of the personnel affected by the lift;
- When weather conditions are such that the safety of the crew is affected, all
 rigging and hoisting must stop immediately. When winds approach 30mph or
 lightning is in the area, serious consideration should be made to stop operations;

- The safe working loads of rigging and hoisting equipment apply onto to freely suspended loads on plumb hoist lines;
- If the hoist line is not plumb at all times when handling loads, a side load will
 occur and cause a hazardous condition, affecting the stability of the equipment
 and introducing stresses for which is has not been designed, when conditions such
 as this occur, structural failure can result without any warning;
- The load must be kept directly below the boom point or upper load block;
- The maximum safe working loads of most rigging and hoisting equipment are
 determined from static loads only. For this reason, it is essential to avoid sudden
 snatching, swinging and stopping of suspended loads since rapid movements will
 greatly increase the stresses imposed on the rigging equipment; and
- Never weld or alter load block hooks in anyway. This includes cranes, mechanic trucks, loader booms, chain and cable hoist, rigging and all hooks.

1.13.3 Shackles

- Posillico only purchases and uses Crosby Brand Shackles;
- All rigging hardware such as shackles and eyebolts must be made of forged alloy steel. Shackles, like most other rigging hardware, are sized by the diameter of the steel in the bow section, rather than the pin size. Never replace the shackle pin with a bolt and never allow a shackle to be pulled at any angle, because this would tremendously reduce its capacity;
- Shackles worn in the crown or the pin by more than 10% of the original diameter must be destroyed. Screw pin shackles should not be used if the pin could roll under the load and unscrewed;
- Eyebolts of the shoulder less type are to be used for vertical loads or pulls only.
 Even when equipped with shoulders, the safe working loads of eyebolts and ringbolts are substantially reduced with angular loading; and
- To keep bending and stress to a minimum, the load should always be applied to the plane of the eye, never in the other direction. Never insert the point of a hook in an eyebolt, always use a shackle.

1.13.4 Turnbuckles

- Turnbuckles can be equipped with eye, hook, jaw or stub end fittings. Each are rated equally with the exception of the book type that has a reduced rating; and
- All hook types must have a safety latch installed. Turnbuckles, as with all rigging
 appliances, should be inspected frequently and replaced immediately if defective.

1.13.5 Wire Rope Slings

- Use only wire rope slings made with flemished eyes and steel swages;
- The life and safety of slings and their contribution to the overall safety and security of rigging operations can be greatly increased by taking care in their application;

- Never use damaged slings or chokers;
- All slings, chokers and other rigging equipment must be given thorough periodic inspections, as well as daily inspections, for signs of wear and abrasion, broken wires, worn or cracked fittings, loose sizing and splices, kinking, crushing, flattening and corrosion;

Special care should be taken when inspecting areas around thimbles and fittings, since these areas are the most likely to become damaged;

- All slings must be identified with their maximum capacity rating;
- All slings over ¾" diameter must have certification with sling at time of purchase;
- Never used flemished eye sling made with aluminum swags;
- Loops, thimbles and softeners must be used to prevent the sling from being sharply bent or cut;
- Never allow wire rope to lie on the ground for any length of time;
- Avoid dragging rope slings from beneath loads;
- Never use a wire rope sling that D to D is less than 1 to 1;
- Keep all rope away from flame cutting and electric welding operations;
- Avoid contact with solvents and chemicals;
- Never use slings that are knotted or kinked;
- Never wrap a wire rope completely around a hook, the sharp radius will damage the sling;
- Avoid, if possible, bending the eye section or wire rope slings around corners.
 The bend will weaken the splice
- No bending should be attempted near or on any attached fitting: and
- When using multi-legged slings to lift loads, any two of the slings must be capable of supporting the total load.

1.13.6 Nylon/Synthetic Slings Program

- Nylon/synthetic slings are not to be used for general rigging. They are to be used only for those lifts that require special handling, such as tubular or angle booms, piping, etc;
- While nylon/synthetic slings are easy to use, they have some definite
 disadvantages that can lead to serious problems, such as, subject to deterioration
 from weather. Nylon/synthetic slings are harder to inspect due to the external
 cover that is on many of the slings. The cover gets worn and torn but too often
 the sling itself is not inspected and we end up with slings that have internal
 damage;
- Nylon/synthetic slings cannot be used to handle objects with sharp corners, as they tend to cut the slings. Since the majority of the objects we rig have sharp corners we must not use nylon/synthetic slings;

- Another important consideration is the cost. The nylon/synthetic sling cost approximately 70% more than a compatible wire rope sling;
- All nylon/synthetic slings must have indenture thread or indicator system when damaged;
- All nylon/synthetic slings must be identified with their maximum capacity rating;
- Loops, thimbles and softeners must be used to prevent the sling from being sharply bent or cut;
- Never use nylon/synthetic slings to handle rebar or iron with sharp edges which could damage or cut sling;
- Never allow nylon/synthetic sling to lie on the ground for any length of time;
- Avoid dragging nylon/synthetic slings from beneath loads;
- Keep all nylon/synthetic away from flame cutting and electric welding operations;
- Avoid contact with solvents and chemicals;
- Never use slings that are knotted or kinked;
- Never allow nylon/synthetic slings to be in prolonged periods of sunlight (as Ultraviolet light adversely effects the slings);
- Lifting chains will not be used.

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APPENDIX O

AERIAL LIFT SAFETY USAGE

1.0 Introduction

Various aerial lifts are used by Posillico Civil, such as self-propelled elevating work platforms (e.g., scissor lifts), manually-propelled elevating aerial lifts (e.g., uprights), extensible and articulating boom-supported elevating work platforms (e.g., aerial man-lifts), and vehicle-mounted elevating and rotating aerial devices and work platforms (e.g., bucket trucks). Many different codes and standards govern the use of this equipment to ensure the safety of operators and other workers. This Health and *Safety Plan Manual* document is based on codes and standards adopted in the Work Smart Standard (WSSs) for aerial lifts, along with manufacturers' recommendations and other standards that apply for Posillico activities.

This document contains requirements for aerial lifts that lift workers and tools to elevated work sites. See Appendix A for definitions of terms used in this document.

All workers must comply with the requirements set forth in this document. Any deviation from these requirements will require approval by the appropriate management chain.

2.0 Hazards

The following conditions occurring during aerial lift operations can result in property damage, personal injury, or death:

- A fall from an elevated level.
- Falling objects or items falling out of lifts.
- Exceeding the load capacity of the lift, which may result in tip-over or structural failure.
- Electrical hazards (e.g., overhead power lines, extension cords, bridge crane bus bars).
- Entanglement hazards (situations that may cause the lift to be caught on or snagged against other objects).
- Contact with stationary objects (e.g., walls, buildings, other vehicles, ceilings, floors, piping) that may result in an entrapment or crushing hazard.
- Uneven terrain that may cause the vehicle to tip, topple over or eject the operator.
 Some examples may include slopes, holes, drop-offs, bumps, debris, and utility vault covers.
- High winds or inclement weather such as rain, hail, snow, or lightning.
- Operation of an internal combustion engine vehicle indoors, which can cause asphyxiation or toxic exhaust-gas exposure.

 Unapproved use of equipment in unusual environments or the use of inadequate controls for operations or maintenance activities, which can cause a fire or explosion.

3.0 Controls

3.1 General Discussion

The following sections provide requirements and best management practices for the various types of aerial lifts used by Posillico Civil. When in doubt, default to the manufacturer's instructions for the particular make and model of the lift for more detailed guidance.

The information in this document shall be supplemented by good judgment, safety control, and caution in evaluating each situation. Since the operator is in direct control of the aerial lift, conformance with good safety practices is the responsibility of the operator. The operator shall make decisions on the use and operation of the aerial lift with due consideration for the fact that his or her own safety as well as the safety of others is dependent on those decisions.

All operators shall be trained before operating aerial lifts. Training requirements can be found in Section 4.0 of this document.

Operators are qualified to use lifts to the rated capacity of the equipment for which they are trained and evaluated. All operations shall be done safely and in accordance with accepted work practices. Posillico Management may impose additional restrictions on their operations as necessary.

3.2 Maintenance

Frequent, annual and/or periodic (depending on activity, severity of service and environment) maintenance inspections shall be performed by the owner of the lift on a timely basis by qualified mechanics. Inspection items listed in the maintenance manuals shall be tested, evaluated and, if applicable, corrected by qualified personnel before the unit is returned to service. Lifts shall not be operated if they are out of compliance.

Replacement parts shall be identical or equivalent to the original parts, or provide a greater level of safety. Markings on the aerial lift shall not be removed, defaced or altered. Missing or illegible markings shall be replaced promptly. Altering or disabling of safety devices, such as warning beepers, guards or interlocks is prohibited, and modifications shall be done only with the permission of the manufacturer.

3.3 Operations

This section discusses various phases of operation such as prestart inspections, workplace inspections, operating requirements, and post operation requirements.

Operators shall be effectively trained before using any aerial lift. The training shall include familiarization with the specific group of lifts to be used and alerting the operators to their responsibilities with respect to the lifts. When an operator is directed to operate an unfamiliar aerial lift, the operator shall receive instructions regarding the location of the manufacturers' manuals, the purpose and function of all controls, and the safety devices and operating characteristics specific to the group of aerial lifts prior to operating. Operators shall also be afforded the opportunity to familiarize themselves with the operation of the lifts.

The Safety Office Team shall review and concur with all indoor work that involves lifts with internal combustion engines. Pre-task Hazards Analysis (PHA), Safe Work Plan or other form of written communication, which will be attached to the paperwork completed for the specific job.

3.3.1 Before Operation

Before operation, the operator shall:

- Perform a pre-start inspection (see Section 3.3.3).
- Practice with the aerial lift (if unfamiliar with the lift) until comfortable/proficient with its operation.
- Read and understand the manufacturers' manuals.
- Understand all labels, warnings and instructions on the lift.
- Ensure that all occupants of the platform wear appropriate personal safety
 equipment for the conditions under which the platform will be operated, per the
 applicable Safe Work Plan (SWP) (e.g., fall protection, hard hats).
- Have been instructed by a qualified person in the intended purpose and function of each of the controls.

3.3.2 Workplace Inspections

Operators will inspect the workplace to mitigate hazards before <u>and</u> during aerial lift use. Areas will be inspected for hazards such as:

- Drop-offs, holes, or untamped earthfills.
- Slope(s), ditches, bumps, and floor obstructions.
- Debris.
- Overhead obstructions and high voltage hazards.
- Other hazardous locations and atmospheres.
- Inadequate support (The working surface that the lift is sitting on cannot support the weight of the machine, men, etc. for the operation).

- · Wind and weather conditions.
- Presence of unauthorized persons or other hazardous conditions.

The operator's supervisor, determine if there are any unusual hazards in areas where lifts will be used.

3.3.3 Prestart Inspection

The aerial lift shall be inspected for defects prior to each shift's operation. The prestart inspection shall be performed and documented by the operator on each shift and will include items in accordance with manufacturer's recommendations for each specific aerial lift, such as:

- Operating and emergency controls.
- · Safety devices.
- Personal protective devices.
- Hydraulic, air, pneumatic, fuel and electrical systems for wear, leakage, excessive dirt, moisture or any other condition which may impair the use of these systems.
- Fiberglass and other insulating components for visible damage or contamination.
- Missing or illegible placards, warnings, operational, instructional, and control markings.
- Visual inspection of all mechanical fastenings.
- Cables and wiring harnesses.
- Loose or missing parts.
- Wheels and tires.
- Operating manual(s), and their placement in weatherproof containers on the lift, or in the cab of the truck.
- Outriggers, stabilizers, and other structures.
- Guardrail systems.
- Other items specified by the manufacturer.

The aerial lift shall not be operated if the prestart inspection indicates that repair is necessary. See Appendices B, C, D, and E for sample inspection sheets.

3.3.4 Operation

The operator shall perform all prestart and workplace and operating inspections as specified in Sections 3.3.1, 3.3.2, and 3.3.3. When operating the lift, the operator shall follow the Operator

Warnings and Instructions as specified in Appendix E.

The lower controls of aerial lifts shall not be used for continuous operation with personnel in the platform.

Aerial lifts are not normally insulated for use near electrically energized circuits such as power lines or exposed bus bars. In general, scissors lifts are not electrically insulated and will not provide protection from contact with or proximity to electrical current. Any aerial lift intended for use around electrically energized circuits shall meet the electrical requirements of American National Safety Institute/Scaffold Industry Association (ANSI/SIA) A92.2-2001, "Vehicle-Mounted Elevating and Rotating Aerial Devices." Refer to the manufacturer's owner's manual and identification plate affixed to the machine for the category of insulating aerial device (if applicable). Operators shall maintain safe distances from electrical power lines and apparatus in accordance with governmental regulations and the Minimum Safe Approach Distance (MSAD) chart provided in Appendix F.

Aerial lifts are not normally designed for use in hazardous locations, including, but not limited to the hazards listed in Section 3.3.2. Do not operate an aerial lift in hazardous locations or areas where potentially flammable or explosive gases or particles may be present. Refer to the manufacturer's owner's manual and identification plate affixed to the machine to determine whether it is permissible to operate the machine in hazardous locations (if applicable).

3.4 Documentation

Maintenance records shall be retained for three years (or longer if specified elsewhere) and include written records of frequent, annual, and periodic inspections and repairs performed, including deficiencies found, corrective actions taken, and the person(s) performing the inspections/repairs.

Inspection sheets shall be kept for two years. If an inspection shows the need for maintenance or repair, the documentation shall be kept for at least three years.

4.0 Training

Only those workers, who have received instructions regarding the inspection, application, and operation of an aerial lift, including recognition and avoidance of hazards, shall operate that aerial lift.

- For scissor lifts, operators shall take "Scissor Manlift Operator Training," and "Scissor Lift Certification."
- For aerial man-lifts, operators shall take, "Aerial Platform Operator Training," and "Aerial Lift Certification."
- For bucket trucks, operators shall take, "High-Reach Bucket Truck Training," and "High-Reach Bucket Truck Certification."

The operator shall be prohibited from using an aerial lift until effectively retrained, if management notes any performance deficiencies, or every three years for aerial man-lifts or five years for scissor lifts or bucket trucks, whichever comes first.

Records of operators' training shall be kept in Safety Office Database

5.0 Responsibilities

5.1 Operator

Before operation, the operator shall:

- Ensure that their training is current.
- Read and understand the manufacturers' manuals, per Section 3.3.1.
- Understand all labels, warnings and instructions on the lift, per Section 3.3.1.
- Ensure all occupants of the platform wear appropriate personal safety equipment for the conditions under which the platform will be operated (e.g., fall protection, hard hats), per Section 3.3.1.
- Have been instructed by a qualified person in the intended purpose and function of each of the controls, per Section 3.3.1.
- Ensure that manufacturers' machine manuals, such as operations manuals, the
 maintenance manuals for each make and model of lift owned, and the manual of
 responsibilities (if it is a scissor lift) are in the weatherproof containers located on the
 lifts or in the mobile unit, per Section 3.3.3.
- Be retrained, if necessary, based on the owner's or user's observation and evaluation of the operator or every three years for aerial man-lifts or five years for scissor lifts or bucket trucks, whichever comes first, per Section 4.0.
- Perform written prestart inspections before use of the lift each day or shift, and perform a visual and functional test, per Section 3.3.3. See Appendix B, C, D, or E for sample inspection sheets.
- Conduct workplace inspections before and during aerial lift use. See Section 3.3.2 for a list of inspection items.
- Observe operator warnings and instructions to be used before and during each movement of the platform. See Appendix E for a list of these warnings and instructions.
- Shut down lift operations in case of any observed or suspected malfunction, or if a
 hazard or potentially unsafe condition exists. Notify the work supervisor about any
 problems or malfunctions that affect the safety of operations. These problems or
 malfunctions shall be repaired prior to the continued use of the lift.

Perform pre-start activities as described in Section 3.3.3 prior to performing work.

5.2 Owner/User

Posillico Civil or the machine Owner, (if a rented unit), or the end user, shall ensure that:

- Aerial lift safety programs are developed, documented and utilized as required.
- Manufacturers' manuals, such as the manual of responsibilities, operations, and maintenance manuals, are available and stored in the weatherproof containers on the lifts or in the mobile units, per Section 3.3.3.
- Frequent, annual and/or periodic maintenance inspections shall be performed on a timely basis (taking into account the severity of use and environment) by qualified mechanics trained for this purpose.
- Inspection items listed in the maintenance manuals shall be tested, evaluated and, if applicable, corrected by qualified personnel before the unit is returned to service.
- There is distribution of and compliance with all safety bulletins received from manufacturers.
- Assistance shall be rendered to operators who have questions concerning lifts.
- Modifications of the aerial lift equipment shall be made only by the manufacturer or with their prior written permission.
- If the location of the intended operation has the hazards listed in Section 3.3.2, the Safety Office shall be consulted and safety measures discussed with, selected, and passed on to the operator by Project Management before use of the lift.
- That operators comply with all requirements as specified in operator responsibilities in Section 5.1.

5.3 Work Supervisors

Work supervisors (e.g., Direct Work Supervisor, Job Site Supervisor) shall:

- Ensure that the aerial lift is used only for intended applications as defined in the operating manual, and that recognized safety practices are followed, per Sections 3.3 to 3.3.4.
- Select operators based on their experience and physical qualifications, per Sections 3.3 to 3.3.4.
- Ensure that operators' training is current, per Section 4.0.
- Monitor the performance of lift operators to ensure that they comply with safety rules.
- Ensure that unauthorized persons do not operate the lifts.
- Monitor daily written prestart inspections.
- Ensure that lifts are equipped with required safety equipment (e.g., overrides, backup beepers, anchorage points for personal fall arrest systems), per Section 3.3.3.

- Ensure that lifts are maintained and that qualified personnel perform frequent, annual, and periodic inspections, per Section 3.2.
- Ensure that lifts are not operated if they are out of compliance with their applicable maintenance schedules, per Section 3.2.

5.4 Safety Office

The Safety Office Team shall:

- Determine, in conjunction with the supervisor, the safety measures to be taken if the lift will be used in a location that has unusual hazards, as discussed in Section 3.3.2.
- Review and approve indoor work that involves lifts with internal combustion engines.
- Make recommendations for alternatively powered lifts.
- Stay current with regulations governing the operation of lifts and transmit changes to the appropriate parties.

6.0 Work Standards

6.0 Work Standards

- 29 CFR 1910, Subpart F, "Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms," (1910.66 to1910.68), (current version); specifically Standard 1910.67, Vehicle-mounted elevating and rotating work platforms (Bucket trucks and Aerial lifts). A338
- 29 CFR 1926, Subpart L, "Scaffolds," 1926.450 to 1926.454, (current version); Standard 1926.453 addresses aerial lifts. A388

6.1 Other Requirements

ANSI/SIA A92.2-2001, for Vehicle-Mounted Elevating and Rotating Aerial Devices (Bucket Trucks). After repair, insulating systems on units shall be dielectrically tested in accordance with Section 5.4.3 of ANSI/SIA A92.2-2001. Insulated replacement boom shall be tested to ensure conformance to Section 5.3.3. of ANSI/SIA A92.2-2001. For bucket trucks used in electrical work, see Part 4, ANSI C2-1997, NEC, as cited in ANSI-SIA A92.2-2001. Other rules and regulations may apply; see departments performing the work for more information.

ANSI/SIA A92.3-1990, for Manually Propelled Elevating Aerial Platforms.

ANSI/SIA A92.5-1992, for Boom-Supported Elevating Work Platforms (Aerial Platform Manlifts).

ANSI/SIA A92.6-1999, for Self-Propelled Elevating Work Platforms (Scissor lifts), plus Manual of Responsibilities.

Appendix A

Definitions

Aerial lifts

Devices/equipment designed to lift workers and tools to an elevated worksite. Includes scissors lifts, aerial man-lifts, and bucket trucks.

Bare-handwork

A technique of performing live-line maintenance on energized conductors and equipment whereby one or more authorized persons work directly on an energized part after having been raised and bonded to the energized conductors or equipment.

Category A Aerial Device

An aerial lift (usually a bucket truck) that has dielectric properties in order to resist electrical hazards. The dielectric components shall be certified annually to assure dielectric value.

Lower controls

Controls situated at ground level that can control the lift platform.

MSAD

Minimum Safe Approach Distance (to 'live' electrical lines, equipment and components.). See Appendix G. This does not apply to line trucks. See the manufacturer's manuals for more information.

Operators "

Qualified persons who directly control the movement of the aerial lift. These persons are authorized, trained, and engaged in the lift operation. This could include any employee or subcontractor using a lift owned, rented, or leased by Posillico Civil.

Owners

Persons or entities who have possession of an aerial lift. Posillico Civil and/or departments, such as Fleet Management, that own, lease, or rent the equipment can be considered owners. Owners do maintenance inspections.

Owner/User

Situations in which the owner is also the user of the lift. See the definitions for owners and users.

Upper controls

Controls situated in the platform, man-lift or bucket part of the aerial lift that also controls the movement of the lift.

Users

Persons or entities who have care, control and custody of the aerial lift. This person or entity may also be the employer of the operator, an owner, or lessee. At Posillico Civil, all employees could be considered users.

Appendix B

Posillico Owned Platform Lift Equipment Inspection Checklist

To be completed by operator when checking out and checking in company owned equipment.

- · Inspect equipment periodically.
- · Use only equipment that is in safe working condition.
- <u>DO NOT</u> operate equipment if any items inspected need repair.
- Notify Equipment Department of any needed repairs.

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SMALL, (SINGLE PERSON) – RENTED LIFT

Equipment Number/Type of	Vehicle				
Location of Use	···				
Operators Name (Please Pri	int)		Phone#		
Inspection Date/Out			Inspection Da	ate/ <i>In</i>	
Hour Meter/Out		Hour Meter/In			
Check (Add if necessary)	OUT O.K.	Repair Needec		IN O.K.	
Oil Level					
Fuel Level					
Coolant Level (DO NOT CHECK IF HOT)					
Tire Pressure					
Hydraulic Level					
Leaks					
CHECK OPERATIONS:		A lanced residence I			
Horn		Call Service Control of the Ca			
Gauges			<u> </u>		
Brakes					
Lights					
Steering					
Upper and Lower Controls					
Electrical & Accessories					
Backup Alarm					
Warning Lights					
Warning Buzzer					
	1		1	İ	

RECORD MALFUNCTIONS, DAMAGE, OR PROBLEMS:

Scissors Lift Equipment Inspection

Equipment #	OUT O.K.	Repair Neede	d	IN O.K.
PLATFORM				
1. Controller				
2. Switches				
3. Placards and Decals				
4. Control Tags				
5. Handrails and Chains				
CHASSIS	· · · · · · · · · · · · · · · · · · ·	·		
1. Batteries				
2. Battery Charger				
3. Hydraulic Pump/Motor				
4. Valves				
5. Hydraulic Hoses and Tubing				
6. Hydraulic Oil Tank				
7. Lift Cylinder				
8. Limit Switch				* *
9. Placards and Decals			·	•
10. Wheel and Tire Assemblies				
11. Steer Cylinder				ar i
12. Steer Components			:	
13. Scissor Arms				
14. Safety Prop				·
15. Pivot Pins/Bolts				
16. Switches, Ground Control				
17. Control Tags				
18. Hose and Cable 19. Tire Pressure/Condition (If Applicable)				

RECORD MALFUNCTIONS, DAMAGES, OR PROBLEMS:

Appendix C

Aerial Lift Daily Safety Inspection Checklist

To be completed prior to each use

wake.			ID Numbe	er;			
Wee	ek Ending:	*				· · · · · · · · · · · · · · · · · · ·	- .
					<u> </u>	:	:
Inspector Initial/Tim	ie						
ITEM	SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
1. Check Load Char	ts	As a N	z -	em em em l			
2. Capacity							
3. Appearance							
Hazard Warning Signal							
5. Brakes							
6. Safety Chains							
7. Tire Condition							·
8. Electrical							
9. Baskets							
10. Steering							·
11. Safety Override							
12. Control Operation							
Comments:							-
Superintendent							
	Please Pr	rint	-				
Signature							
Date and Time							

Appendix D

Aerial Lift Equipment Inspection Checklist

- To be completed by operator when checking out and checking in equipment.
- · Inspect equipment periodically.
- · Use only equipment that is in safe working condition.
- DO NOT operate equipment if any items inspected need repair.
- · Notify Equipment Department of any needed repairs.

SAMPLE

Equipment Number/Type of	Vehicle		-			
	. :	v e				
Location of Use						
			:			
Operators Name (Please Pri	nt)		Phone # Inspection Date/In			
Inspection Date/Out						
Hour Meter/Out			Hour Meter/In			
•						
Check (Add if necessary)	OUT O.K.	Repair Needed	d	IN O.K.		
Oil Level						
Fuel Level						
Coolant Level (DO NOT CHECK IF HOT)						
Tire Pressure/Condition						
Hydraulic Level						
Leaks						
CHECK OPERATIONS:			aliana a sa sa sa			
Horn						
Gauges						
Brakes			i en la la la la la la la la la la la la la			
Lights						
Steering						
Attachments						
Accessories						
Backup Alarm						
Warning Lights						
Warning Buzzer						

RECORD MALFUNCTIONS, DAMAGE, OR PROBLEMS:

Appendix E

Operator Warnings and Instructions

The aerial lift is used only for intended applications as defined in the equipment's operating manual. The following recognized safety practices shall be used:

- 1. Operators shall not use the lift in an unauthorized manner.
- 2. All platform occupants shall use fall protection (e.g., full body harness, shock-absorbing lanyard) connected to the anchorage point(s) provided at the platform position.
- 3. A hard hat shall be worn at all times when operating aerial lifts.
- 4. Other personal protective equipment, (e.g., eye, foot, hand, clothing) shall be worn as required.
- 5. The slope and grade for which the platform is rated shall not be exceeded. Aerial lifts may be equipped with tilt or other motion/capacity warning alarms. These alarms shall be operational. The limit switch shall not be altered or disabled. Operators shall not depend upon the tilt alarm as a level indicator.
- 6. The deployment of stability-enhancing means, such as outriggers, outrigger pads, stabilizers or extendible axles, shall be utilized.
- 7. The guardrail system shall be used per manufacturer's specifications. Entry gates or chains shall be closed before operating the lift.
- Operators shall not overload an aerial lift. Occupants and equipment shall not exceed the maximum platform capacity (or the maximum capacity of the platform extension when so equipped).
- 9. Safe distances, including overhead clearance, shall be maintained between the operator, the machine and other objects. Electrocution hazards shall be avoided. Operators shall maintain safe distances from electrical power lines, conductors or bus bars. They shall allow for boom or platform movement or electrical line sway or sag. Operators shall follow minimum safe approach distances (MSAD); see Appendix G.
- 10. Operators shall not drive the mobile chassis close to an obstruction. The operator shall place his/her machine, then use the raise, swing, and boom functions to get in close. Operators shall use the slowest speed for such movements to avoid "bounce" of the platform.
- 11. Only Category "A" aerial lifts shall be used for bare-hand electrical work. Check manufacturer's instructions for testing, locking, tagging, and grounding.
- 12. Workers on the ground associated with the aerial lift operation shall wear appropriate head protection.

- 13. Operators shall not sit, stand, or climb on the platform guardrails or edge of the bucket. They shall maintain a firm footing on the platform floor at all times.
- 14. The use of railings, planks, ladders, scaffolds or any other device in or on the work platform for achieving additional working height or reach are prohibited.
- 15. Areas around aerial-lift operations shall be barricaded to prevent injury to pedestrians and other workers. When other moving equipment is present, precautions, such as warnings, barriers, or flashing lights shall be used as appropriate.
- 16. Observations shall be conducted on an ongoing basis to detect any deficiencies in equipment or method of use. Operator shall cease operation of the lift if any suspected malfunction occurs. Problems or malfunctions shall be reported to the supervisor as soon as possible. Any problems or malfunctions shall be repaired before using the platform.
- 17. Potentially hazardous locations shall be reported to the supervisor as soon as possible.
- 18. Aerial lifts with internal combustion engines operating inside a building, or other unusual operating support conditions, are prohibited unless specifically evaluated and permitted by the supervisor and the ES&H safety team member.
- 19. Care shall be taken to avoid entanglement.
- 20. Work area shall be kept clear of workers, equipment, and other obstructions before lowering the platform.
- 21. The engine shall be shut down and equipment refueled in a well-ventilated area.
- 22. Battery charging shall be conducted in a well-ventilated area.
- 23. Operators shall not use batteries that weigh less than the original equipment. Operators shall always wear protective clothing and eyewear when working with batteries.
- 24. The platform shall not be steadied by positioning it against another object.
- 25. Operators shall not attempt to increase the stability of a lift by attaching it to an adjacent structure. Operators shall not tie or attach lifts to any adjacent structures.
- 26. Operators shall not modify or alter an aerial lift. Mounting attachments for holding tools or other materials onto the bucket, platform, toeboards, or guardrail system can increase the weight in the bucket or platform.
- 27. Operators shall not place or attach fixed or overhanging loads to any part of the machine.
- 28. Operators shall not place loads outside the platform perimeter.
- 29. The platform shall not be used as a jack, unless the manufacturer has **specifically** approved these operations.
- 30. Operators shall not use the machine to push or pull another object.
- 31. Operators shall never use the boom to push the aerial lift along the ground or attempt to free a machine by lifting the wheels off the ground with the boom.

- 32. Operator shall limit travel speed according to conditions.
- 33. Traveling 50 feet or more with an aerial lift shall be done with the platform in the lowered or stowed position. Extensible or articulating booms shall be retracted or folded.
- 34. Elevated driving requirements and repositioning of the aerial lift while elevated shall include maintaining a clear view of the support surface and route of travel, ensuring the safety of workers in the area and maintaining safe distances from hazards and overhead obstacles that could present crushing hazards. Operators shall not drive over 0.5 mph with the platform elevated.
- 35. Stunt driving is prohibited.
- 36. When the aerial platform is unattended, it shall be secured to protect against unauthorized use.
- 37. The altering of safety devices is prohibited.
- 38. Personnel shall leave the lift before attempting to free a snagged platform.
- 39. Entering or exiting the elevated platform shall be done per the manufacturer's instructions.
- 40. Operators shall use the three (3) point contact method (3 out of 4 arms and legs in contact with the machine) when mounting and dismounting the platform or bucket. Never attempt to mount or dismount a moving machine or climb down the frame or boom from the platform or bucket when raised.
- 41. When required to exit or climb out of an elevated aerial lift to a location not otherwise protected by guardrails, floors, or other continuous means of fall protection, operators shall use a **second shock-absorbing lanyard** to connect to the new location before disconnecting from the aerial lift. When entering an aerial lift from an unprotected location, operators shall connect a shock-absorbing lanyard to the anchorage point in the aerial lift before entering.
- 42. Modifications will only be approved with or by the prior written permission of the manufacturer.
- 43. Materials shall be carried on the platform as specified in the manufacturers' recommendations for load capacity.
- 44. The rated horizontal force on the platform shall not be exceeded.
- 45. Operators shall not exceed the manufacturers' limits when pushing on or pulling toward any object outside of the lift or platform.
- 46. Steps shall be taken to avoid collision of the platform with any crane or overhead equipment, moving or not.
- 47. Support requirements for the platform shall be adequate before work begins.
- 48. The aerial platform shall be leveled using the manufacturers' outriggers and leveling devices and the brakes set.

- 49. Operators shall not use lifts as a ground for welding.
- 50. Operators shall not increase the surface area of a platform or the load. By increasing the area exposed to the wind, the stability of the machine is decreased.
- 51. Only one designated person should operate the controls. Operators shall never allow anyone to tamper with, service, or operate a machine from the lower control station while workers are in the bucket or platform except in an emergency.
- 52. Operators shall not operate lifts during inclement weather, unless approved by the manufacturer for this purpose (i.e., bucket/line trucks).
- 53. The Aerial Lift shall never be used as a crane.

Appendix F

MSAD (Minimum Safe Approach Distance) to Energized (Exposed or Insulated) Power Lines

-	<u> </u>	and the second second
Voltage Range (Phase to Phase)	Minimum Safe A (Feet)	approach Distance (Meters)
O to 300V	AVOID	CONTACT
Over 300 to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

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APPENDIX P

TRENCHING AND EXCAVATION

Trenching and Excavating

Purpose

The purpose of this program is to establish guidelines for jobs requiring the trenching and excavation operations. Trenching and excavation is not only potentially hazardous but is almost always a component of a project. The precautions necessary for a safe excavation must be considered in the planning process and continually monitored during the actual operation. We will take these precautions, and any other deemed necessary to keep our employees, the environment and the public safe during trenching and excavation operations.

Applicable Regulations

OSHA 29 CFR 1926.650-652

Responsibilities

Project Management shall:

- Ensure that there is a competent person supervising all trenching and excavation operations;
- Identify a qualified person as the Competent Person for trenching and excavation; this person's knowledge of trenching and excavation will be consistent with the specifications listed in this program;
- Ensure that subcontractors have identified a qualified person whose knowledge of trenching and excavation is consistent with the requirements listed in this program; and
- Enforce the requirements of this program.

Subcontractors shall:

- Identify their competent person prior to starting any trenching or excavation operation; and
- Train their employees in the requirements identified in this section.

General Requirements

Competent Person

- · A competent person must supervise all trenching and excavations; and
- A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Surface Encumbrances

 All surface encumbrances such as signs, poles, and foundations that create a hazard shall be removed or supported to safeguard employees.

Underground Utility Precautions

- Reviewing drawings and contacting One Call or other entity shall determine all utilities expected to be encountered during excavation work;
- Utility companies and owners shall be given adequate time based on local practice to respond;
- If they do not, work can proceed provided detection equipment is used;
- If any damage occurs to any line, work shall be terminated and the utility owner contacted;
- Work may only proceed after the utility company gives authorization;
- When approaching the estimated location of the underground installation, hand digging or alternative safe method will be used; and
- While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

Access and Egress

- A stairway ladder or ramp shall be provided in all trench excavations 4 feet or more in depth. Employees must not have to travel more than 25 feet to obtain the access;
- If a ramp is selected, the employee must be able to exit the excavation in an upright posture without having to scale the slope; and
- All structural members of ramps and runways shall be of uniform thickness.

Exposure to Vehicular Traffic

Employees exposed to vehicular traffic will wear high visibility vests.

Exposure to Falling Loads

- Employees shall not be under any loads handled by equipment; and
- Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

Warning System for Mobile Equipment

If the operator has an obstructed view or is adjacent to the excavation, a barricade or signaling system will be utilized.

Hazardous Atmospheres

 Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet in depth;

- A ventilation system will be utilized and monitored by the competent person should hazardous atmospheres be encountered; and
- Emergency rescue equipment such as a harness, stokes basket, or breathing apparatus will be available where hazardous atmospheric conditions exist or may reasonably be expected to develop.

Water Accumulation

- Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating;
- Employees may re-enter the excavation only after adequate precautions have been taken to protect employees against the hazards;
- Controls may include support or shield systems, pumps, or safety harness and lifeline; and
- A competent person will monitor these controls.

Stability of Adjacent Structures

- All adjacent structures such as buildings, sidewalks, pavement, etc. shall be shored, braced, or underpinned; and
- Excavations below footings or foundations are not permitted unless they are supported, in stable rock or designed by a registered professional engineer.

Protection of Employees from Loose Rock or Soil

- All excavations shall be scaled to remove loose material that could pose a hazard by falling or rolling into the excavation; and
- All spoil piles shall be kept in a minimum of 2 feet from the edge of the excavation, or by the use of a sufficient retaining device, or by both.

Inspections

- The competent person shall inspect all excavations daily and when conditions of the excavation have changed; and
- No employee shall be allowed to work in any excavation that the competent person deems unsafe.

Fall Protection

- Walkways over excavations shall have proper guardrails; and
- Adequate barriers shall be provided around the perimeter of remote excavations.

Soil

General

- All soil shall be considered Type C until otherwise determined by a competent person; and
- The classification of the deposits shall be made on the results of at least one visual and one manual analysis.

Visual Tests

A visual test must be performed and include observing the soil during excavation specifically looking for cohesiveness, cracks, layered systems, surface water, vibration, other existing underground structures, etc. which can affect the stability of the excavation.

Manual Analysis

- One of the following tests shall be performed along with the visual test:
 - Plasticity mold a moist or wet sample of soil into a ball and attempt
 to roll it into threads as thin as 1/8-inch in diameter. Cohesive
 material can be successfully rolled into threads without crumbling.
 For example, if at least a two-inch length of 1/8-inch thread can be
 held on one end without tearing, the soil is cohesive;
 - Dry Strength if the soil is dry and crumbles on its own or with moderate pressure into individual grains of fine powder, it is granular. If the soil is dry and falls into clumps that break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into smaller clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured;
 - Thumb penetration the thumb penetration test can be used to estimate the unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of soil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences;

- Pocket penetrometer this device will provide the compressive strengths of soils and can be obtained by contacting the Safety Director.
- After performing a visual and manual test you can then determine the soil classification. They include:
 - Stable rock natural solid mineral matter that can be excavated with vertical sides remaining intact while exposed;
 - Type A cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater. This soil is highly cohesive and generally contains a significant clay content or is a cemented soil;
 - Type B cohesive soil with an unconfined compressive strength greater than 0.5 tsf, but less than 1.5 tsf. This soil is less cohesive than Type A and can include certain angular gravel as well as previously disturbed soils that are well compacted; and
 - Type C cohesive soil with an unconfined compressive strength of 0.5 tsf or less. This soil is the least stable, having little or no cohesive properties and includes most granular soil.

Protective Systems

General

- All employees shall be protected while working in an excavation by the use
 of a protective system unless the excavation is to be measured as its
 greatest vertical dimension;
- Trenches less than five (5) feet in depth must be sloped or shored if they are in unstable soil;
- Although a three (3) foot trench is less than the height of a worker, it still can pose a threat to workers in a stooped or kneeling position;
- No sidewalk or structure shall be undermined unless shored; and
- A registered professional engineer must design any protective system.

Slopes

 Sloped trenches and excavations shall be consistent with the following table:

Maximum Allowable Slopes				
Stable Rock	Vertical	90 Degrees		
Type A	3/4 h : 1 v	53 Degrees		
Type B	1h:1v	45 Degrees		
Type C	1½h:1v	34 Degrees		

 A short term maximum allowable slope of ½h:1v (63°) is allowed in excavations in Type A soil that are 12 feet or less in depth;

- Short term maximum allowable slopes for excavations greater than 12 feet in depth shall be 3/4h:1v (53°); and
- Refer to sloping diagrams.

Timber Shoring and Aluminum Shoring

- When selecting either timber or aluminum shoring systems the competent person shall use Tables C and D*;
- When using manufacturers data it will be built in accordance to specifications and recommendations. Any deviation will only be allowed with the manufacturers approval;
- All data must be kept on the jobsite during construction and use of the system; and
- Refer to all diagrams.

Designs by a Registered Professional Engineer

- Designs shall be in written form and include sizes, types and configurations of the materials to be used; and
- The design must be properly stamped and at least one copy kept at the jobsite during construction and use of the system.

Materials and Equipment

- Material used for the systems must be free from damage that may impair their function;
- Manufactured material shall be used per their recommendations;
- The competent person shall examine material that has been damaged and evaluate if it can be used. If not sure, a Professional Engineer must be utilized;
- Installation and removal of support members of support systems shall be securely connected;
- * See OSHA Standards
- Support systems shall be installed and removed in a manner that protects employees;
- Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand;
- Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system;
- Removal shall begin at, and progress from, the bottom of the excavation;
- Backfilling shall progress together with the removal of support systems from excavations; and

 Do not excavate more than 2 feet below the bottom member of a support system unless it is so designed.

Shield System / Trench Box

- Shield systems shall not be subjected to loads exceeding those that the system was designed to withstand;
- Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads;
- Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields;
- Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically;
- Do not excavate more than 2 feet below the bottom of a shield unless it is so designed; and
- The manufacturers data sheet for all rented trench boxes will be kept on site during their use. The data sheets for all owned trench boxes will be kept on site and a copy forwarded to the Safety Office.

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APPENDIX Q

UNDERGROUND UTILITY SAFETY

1. Exposing Underground Utilities Procedure

1.1 Responsibilities:

The Area Manager, the Project Manager, Project Superintendent and foremen, combined or individually, has the responsibility to ensure that all underground utilities are properly marked at the start of work and throughout the duration of the project.

1.2 Known Utilities:

Normal Procedure for locating utilities:

- Call the One-Call Center 48 hrs (minimum), before digging.
- Wait the required time.
- Confirm the utility response.
- Respect the marks.
- Consider the possibility of unknown utilities.
- Take appropriate safety precautions to effectively protect the workers.
- · Dig with care.
- If you suspect that something is wrong, or the utility is not where it's supposed to be, STOP and review.

1.3 Unknown Utilities:

Underground utilities such as municipal water and sewers and underground power cables are not always associated with the One Call System. The individual utility company must be contacted to assure discovery of all utilities that may be on the site. Follow the same guidelines for contacting these utilities as you would in dealing with One Call.

- Call at least 48 hours before you dig.
- Call every ten-business days for update and re-mark.
- If there are numerous utilities and the project is working 24 hours a day and disturbing the mark-outs, request an update and a re-mark every morning.

Locating Underground Utilities by hand using the following practice:

Excavators maintain a reasonable clearance, to include the width of the utility line, plus 24 inches between the marked or staked location of an underground utility line and the cutting edge or point of mechanized equipment. Consider the Operator's control of the machine's cutting edge or point, to avoid damaging underground utility lines.

- 1. Don't take for granted that a utility line will be at a certain depth.
- 2. Not using mechanical equipment within two feet of the extremities of the markout.
- 3. Ensure that marks are visible and reference numbers are correct.

- 4. Depending on the utility, worker protective equipment must be provided and effectively worn.
- 5. The use of insulated tools is required for any potential electrical source contact.
- 6. Use only rounded or blunt edged tools when hand digging in the vicinity of utility lines. The use of axes, posthole diggers, picks, mattocks and pry or probing bars may result in utility damage.
- 7. Attempts to locate utilities should be done perpendicular to the line marks.
- 8. Attempts to locate utilities should extend a minimum of 24 inches from the outside of the marks on either side.
- 9. Dig with the shovel into the ground perpendicular to the utility marks, (24 inches on both sides).
- 10. Carefully use the mechanized equipment to clean/peel away only the material at the depth of the hand shovel. Repeat the process until the utility is located.
- 11. Once the utility line is visible, keep the face of the shovel parallel with the utility line, and use all precautions to remove the soil from around the utility line.
- 12. If the utility is not located within the minimum tolerances of the outside of the markings down to the depth of the excavation, take a picture of the conditions, hole measurements, time and all the steps taken to uncover the utility.
- 13. If the utility location process is deeper than 5 feet, or the soil cannot support itself, protective measures such as shoring or sloping must be used in addition to all other trenching and excavation requirements.

Utilities can also be located by using a Hydro-Vac System, Follow the same procedure for locating as doing hand digging. This method eliminates many safety issues created by conventional exposure techniques.

If you damage a utility in any way, you must immediately call the operator whose facilities have been damaged, even if only a scrape or small gouge in the protective coating. Left unreported, this type of damage can lead to catastrophic failure.

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APPENDIX R

CONFINED SPACE

CONFINED SPACES

Fatalities and injuries constantly occur among construction workers who, during the course of their jobs, are required to enter confined spaces. In some circumstances, these workers are exposed to multiple hazards, any of which may cause bodily injury, illness, or death. Workers are injured and killed from a variety of atmospheric factors and physical agents.

The OSHA construction standard requires that companies follow the requirements when working in confined spaces. There is an exception for work on sewer systems under construction.

All information required by the Confined Space Standard must be available to employees affected by the standard (or their authorized representatives).

You must first determine if you have any confined space situations. A confined space has three characteristics; it must have **all three** characteristics to be considered a confined space:

- 1. Large enough to get your body entirely inside to do your work
- 2. Not designed or intended for continuous occupation
- 3. Restricted entry or exit

If you do have any confined spaces, you must not enter them until you have carefully evaluated the hazards inside to determine what type of entry procedure may be used for each confined space you have:

- Non-permit-required confined space (NPRCS)
- Permit-required confined space (PRCS)
- Alternate Entry

Confined Spaces/Permit Required Confined Spaces Policy

Purpose

The purpose of this program is to protect our employees from the hazards associated with Permit Required Confined Spaces on our job sites. We will take the necessary steps to correctly evaluate confined spaces and permit required confined spaces in order to safely enter and perform our work.

All employees taking part in an entry will be trained according to the requirements of this program.

Applicable Regulations

OSHA 29 CFR 1926.21 OSHA 29 CFR 1910.146 **Definitions Applicable to this Program**

Attendant:

Is an individual stationed outside one or more permit space(s) who monitors the authorized entrants and who performs all assigned attendant's duties.

Authorized entrant: Confined Space:

Is one who is authorized by the supervisor to enter a permit space.

A space that is:

- Large enough and so configured that an employee can bodily enter and perform work;
- · Has limited or restricted means for entry and exit; and
- Is not designed for continuous human occupancy
 Means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Double block and bleed:

Emergency:

Means any occurrence or event, internal or external to the permit space that could endanger entrants.

Entry:

Means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening in the space. Must exist in a permit space to allow entry and to ensure that employees involved with permit-required space entry can

Acceptable entry conditions: Entry supervisor:

safely enter into and work within the space. Is the person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required.

Hazardous atmosphere:

An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL);
- Airborne combustible dust at a concentration that meets or exceeds its LEL or obscures vision at a distance of five (5) feet;
- Atmospheric oxygen concentration below 19.5% or above 23.5%; and
- Atmospheric concentration of any substance at or above its published PEL.

Hot work permit:

Is the written authorization to perform operations capable of providing a source of ignition such as riveting, welding, cutting, burning, etc.

Immediately

IDLH means any condition that poses an immediate or

dangerous to life or health (IDLH): Inerting:

delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Is the displacement of an atmosphere in a permit space by a noncombustible gas such as nitrogen, to such an extent that

the resulting atmosphere is noncombustible.

Isolation:

Is the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as, blanking or blinding, misaligning or removing sections of lines, pipes, or dusts, a double block and bleed system,

lockout and tagout all mechanical linkages.

Line breaking:

Is the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature

capable of causing injury.

Non-permit confined space:

Means a confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazard capable to causing death or serious harm. Is an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen deficient atmosphere: Oxygen enriched atmosphere: Permit required confined space:

Is an atmosphere containing more than 23.5 percent oxygen by volume.

A space that meets all three criteria of a confined space and that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.

Permit system:

Means written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Testing:

Is the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Responsibilities

Project Management shall:

- Evaluate worksites for the presence of Permit Required Confined Space;
- Inform employees of the presence and location of Permit Required Confined Spaces on the work site;
- Mark Permit Required Confined Spaces with signs reading "Danger Permit Required Confined Space – Do not Enter";
- Implement the measures necessary to prevent unauthorized entry;
- Train all employees who take part in the entry operations in the requirements of this program;
- Provide all equipment necessary for safe entry into and rescue from Permit Required Confined Spaces;
- Establish space specific, written procedures for Permit Required Confined Space entry.
- Designate the persons who have active roles in entry operations, such as, authorized entrants, attendants, entry supervisors, or persons who test and monitor the atmosphere in a permit space.
- NOTE: Identify the duties of each employee, and provide each employee with the required training;
- Develop and implement emergency procedures, including, emergency services, rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue;
- Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required;
- Request a review of entry operations when they believe that the measures taken under the permit space program may not protect employees. Then revise the program to correct the deficiencies before subsequent entries are authorized; and
- Review the permit-required confined space program annually by using the retained canceled permit.

Authorized Entrants shall:

- Not enter Permit Required Confined Spaces unless authorized to do so;
- Follow all entry procedures including but not limited to:
 - Verification of acceptable entry conditions;
 - Continuous air monitoring;
 - Implementation of effective forced air ventilation;

- Proper use of equipment required;
- Communication with attendant and other entrants; and
- Any other procedures deem necessary for safe operations.
- · Alert attendant when:
 - He or she recognizes any warning sign or symptom of exposure to a hazard; or
 - He or she detects a prohibited condition.
- Exit the Permit Space immediately when:
 - An order to evacuate is given by the attendant or the entry supervisor;
 - He or she recognizes any warning sign or symptom of exposure to a hazard;
 - He or she recognizes detects a prohibited condition; or
 - An evacuation alarm is sounded.

Authorized Attendant(s) shall:

- Follow all entry procedures including, but not limited to:
 - Verification of acceptable entry conditions;
 - Continuous air monitoring;
 - Implementation of forced air ventilation;
 - Communication with entrants; and
 - Any other procedures deemed necessary for safe operations.
- Continuously maintain an accurate count of authorized entrants in the permit space, noting time of entry and exit;
- Take the following actions when unauthorized persons approach or enter a permit space while entry is in progress:
 - Warn the unauthorized person(s) that they must stay away from the permit space;
 - Advise the unauthorized persons that they must exit immediately, if they have entered the permit space; and
 - Inform the authorized entrants and the entry supervisor if an unauthorized person(s) has entered the permit space.
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

- If the attendant detects a prohibited condition;
- If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
- If the attendant detects a situation outside the space that could endanger the authorized entrants; or
- If the attendant cannot effectively and safety perform all the required duties.
- Conduct air monitoring and enter the results on the air-monitoring log throughout the duration of the entry;
- Remain outside the permit space during entry operations until reviewed by -another approved attendant;
- Summon rescue and other emergency services as soon as he/she determines that authorized entrants may need assistance to escape from permit space hazards; and
- Perform non-entry rescues with retrieval equipment.

Entry Supervisor shall:

- Coordinate the entry and establish entry procedures including, but not limited to:
 - Evaluation of the permit space to determine known and potential hazards;
 - Identification of acceptable entry conditions;
 - Select appropriate equipment (retrieval, personal protective equipment, air monitors etc) based on hazards in the permit space;
 - Verifying that rescue services are available and the means for summoning them are operable; and
 - Assigning qualified and trained individuals as authorized entrants and attendants.
- Verify, by checking, that the appropriate entries have been made on the
 permit, that all tests specified by the permit have been conducted and that
 all procedures and equipment specified by the permit are in place before
 endorsing the permit and allowing entry to begin;
- Terminate the entry and cancel the permit:
 - When a prohibited condition is detected;
 - When a condition that is not allowed under the entry permit criteria arises inside or near the Permit Required Confined Space; or
 - When operations covered by the entry permit have been completed.

- Ensure all Material Safety Data Sheets (MSDS) for hazardous chemicals involved with entry are kept available for emergency personnel in the event an employee must receive treatment for overexposure to a substance;
- Remove unauthorized persons who enter or who attempt to enter the permit required confined space during entry operations; and
- Determine when responsibility for a permit required confined space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, when entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained.

Rescue Services shall:

Follow all procedures identified for safe entry according to this program.

Entry Procedures

Pre-entry Procedures

- Isolate the space and implement the measures necessary to prevent unauthorized entry;
- Evaluate the space to determine if it fits the definition of a permit required confined space;

NOTE: regardless of type of confined space, an air-monitoring log is to be filled out and maintained at the job site for inspection.

- If the space meets the requirements of a permit required confined space, test the space for atmospheric hazards in this order: oxygen content, combustible gases, vapors and dusts, and then for toxic gases and vapors Implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to the following:
 - Specifying acceptable entry condition;
 - Isolating the permit space;
 - Purging, inverting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazard (purging to be done for at least 30 minutes prior to retesting air quality)
 - NOTE: No employee shall be allowed to enter a confined space with an oxygen deficient or potentially toxic/explosive atmosphere, until contacting and receiving approval of Posillico Inc.'s Safety Manager or designated Safety Supervisor or the Project Manager.
 - Identification of work tasks to be performed in the space and their potential hazards;
 - Selection of rescue and retrieval methods (if these functions will be performed by site personnel) or notification of proper emergency services who may be required to respond; and

- Selection of communication method based on configuration of space and work task to be performed.
- Provide the following equipment to employees, maintain the equipment properly, and ensure that employees use the equipment properly:
 - Testing and monitoring equipment;
 - Ventilation equipment needed to obtain acceptable entry conditions;
 - Any necessary communications equipment;
 - Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;
 - Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency;
 - Barriers and shields as required;
 - Rescue and emergency equipment needed to comply with this program, except to the extent that the equipment is provided by rescue services;
 - Communication means or equipment; and
 - Any other equipment necessary for safe entry into and rescue from permit required confined spaces.
- Fill our pre-entry checklist and Entry Permit, post entry permit at entrance to space (permit must be authorized by the Supervisor before entry may begin); and
- Ensure space attendant is at his/her post outside the space opening.

During Entry

- Ensure continuous communication between attendant(s) and entrant(s) to monitor entrant(s) status;
- Attendant must remain outside the space for the duration of the entry unless relieved by another authorized attendant;
- Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained;
- Evacuate the space immediately when:
 - A prohibited condition is detected inside or outside the space;
 - Entrant(s) exhibit signs of exposure to a hazard;
 - When the order to evacuate is given; or
 - When work in the space is concluded and occupation of the space is no longer necessary.

Post Entry

- Remove all entrants and equipment from space;
- Cancel the permit and file it for program review; and
- Replace the cover, hatch, door etc. in space to prevent unauthorized entry.

Permit System

- Before entry is authorized, the supervisor must complete the entry permit before entry begins, the entry supervisor whose name appears on the permit must sign the entry permit to authorize entry;
- The completed permit must be posted at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed;
- The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit. Permits shall be valid for a period of eight hours of less;
- The entry supervisor must terminate entry and cancel the entry permit when:
- The entry operations covered by the entry permit have been completed; or
- A condition that is not allowed under the entry permit arises in or near the permit space.
- The supervisor must save and provide the Safety Department each canceled entry permit, which will be maintained for one year to facilitate a review of the permit required confined space program. If any problems are encountered during an entry operation, they must be noted on the permit so appropriate revisions can be made to the permit required confined space program.

Training

Authorized Entrants must be trained in:

- The hazards that may be faced during entry including the mode, signs or symptoms and consequences of exposure;
- The proper use of equipment for entry;
- · Procedures for safe entry; and
- The behavioral affects of hazard exposure in authorized entrants;
- The proper use of equipment for entry including retrieval equipment, if the Attendant will be responsible, according to this program.

NOTE: Trained and Authorized Entrants will be listed on the Entry Permit. Only those employees may enter the space.

Authorized Attendants must be trained in:

- The hazards that may be faced during entry including the mode, signs or symptoms and consequences of exposure;
- Required to perform non-entry rescue in the event of an emergency;
- Procedures for safe entry; and
- Their responsibilities according to this program.

NOTE: Trained and Authorized Attendants will be listed on the Entry Permit.

Entry Supervisors must be trained in:

- The hazards that may be faced during entry including the mode, signs, or symptoms and consequences of exposure;
- Procedures for safe entry;
- Procedures for verifying acceptable entry conditions as well as issuing the authorizing an entry permit; and
- Their responsibilities according to this program.

NOTE: Trained and Authorized Supervisors will be listed on the Entry Permit

Rescue and Emergency Services must be trained in:

- These requirements apply to supervisors who have employees enter permit required confined spaces to perform rescue:
 - The proper use of personal protective equipment necessary for making rescues into confined spaces;
 - Performing assigned rescue duties. Each member of the rescue team must also receive the training required of "authorized entrants";
 - Each member of the rescue team will practice making permit space rescues at least once every twelve months, by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from the permit space;
 - Basic first-aid and CPR, at least one member of the rescue team must hold a current certification in both;

NOTE: Trained and Authorized Rescuers will be listed on the Entry Permit

- These requirements apply to Posillico supervisors who allow subcontractors to perform permit space rescue:
 - Inform the rescue team of the hazards that may confront them when called upon; and
 - Provide the rescue team with access to all permit spaces from which rescue may be necessary so the rescue team can develop appropriate rescue plans.

NOTE: Subcontractor Trained and Authorized Entrants will be listed on the Entry Permit.

Non-Entry Rescue

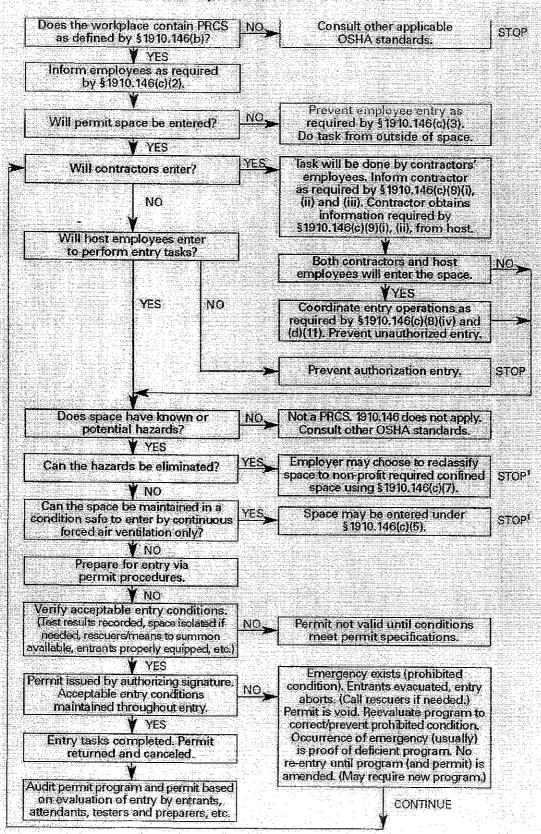
Application

- To facilitate non-entry rescue, retrieval systems or methods must be used whenever an authorized entrant enters a permit space; and
- The only circumstance retrieval equipment is not required is when its use
 would increase the overall risk of entry or would not contribute to the
 rescue of the entrant such as with confined spaces with side openings.
 Note: Side openings in a confined space are those within 3½ feet of the
 bottom.

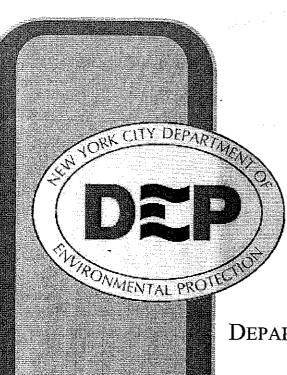
Retrieval systems must meet the following requirements:

- Each authorized entrant must use a chest or full body harness, with the
 retrieval line attached at the center of the entrant's back near shoulder
 level, or above the entrant's head. Wristlets may be used in lieu of the
 chest or full body harness if the use of a full body harness is infeasible or
 creates a greater hazard. The wristlets must be the safest and most
 effective alternative in this case.
- The other end of the retrieval line must be attached to an inspected and approved mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device must be available to retrieve personnel from vertical type permit spaces more than five feet deep.

Permit-Required Confined Space Decision Flow Chart



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	Atmospheric checks:	Oxygen Explosive Toxic	% O ₂ % L.F.L. ppm	Acceptable conditions 19.5 % to 23.5 % <10% L.E.L./L.F.L. 0-35 ppm Carbon Monoxide
	Atmospheric Tester's Ir	nitials:	Time:	0-10 ppm Hydrogen Sulfide
	Isolation of pumps/line		/A Yes No	
	Pumps or lines block blinked, or disconned	(0)) () ()	
	Ventilation:		/A Yes No	
	Mechanical		1 (1)	
	Natural ventilation or	nly .		
	Hot work permit require	ad () () () () () () () () ()	
*	Atmospheric checks af	ter isolation and vo	entilation, if applicabl	le:
	Oxygen:	% O ₂		
	Explosive: Toxic:	The second secon		
	Communication proced	PPM		
	Lockout procedures, if	anniicahl <i>e</i>		
	Entrant(s), attendant(s),	and rescue person	mel (if applicable) has	ve Yes No
	successfully completed	required training.		ve Yes No
¥ III	Equipment:			N/A Yes No
	Direct reading sampling	g device which is p	roperly calibrated	
	Salety harnesses and life	elmes for entrants	and attendants	
	Mechanical retrieval/ho	sting equipment		
	Communication equipm SCBA or Type C air lin			
	Personal protective equi	inment and alathin		
	Electrical equipment/Li	ohting/Non-cnarbi	15 na Toola	
	Traffic barriers/entrance	C Shrion phones		
	Trainic Daniers/enirance	covers		



THE CITY OF NEW YORK

DEPARTMENT OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL, HEALTH & SAFETY POLICIES AND PROCEDURES

Vol. III Confined Space Entry Program

Health and Safety Coordination Committee Approval

The New York City Department of Environmental Protection's Health and Safety Coordination Committee has reviewed this document and by the Chair's signing below agree that it adequately defines the program necessary to address regulatory requirements for their Bureau/Office operations and commit to the policies and/or procedures contained within (or substantially equivalent procedures, if Bureau/Office specific amendment is required and it is approved by the Health and Safety Coordination Committee).

•	Signature of Committee Chair
Revision 0, Authorization	Date:
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Responsible Managers

The Responsible Manager for each facility where employees enter confined spaces, listed below, has reviewed this document and fully understands their responsibilities and duties as described.

Name:	Facilities/Worksites:		
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their responsibilities ensured that all attac	Administrators listed below have reviewed this docume for ensuring that this program is implemented and chments and site-specific requirements have been comy program at these facilities/worksites:	maintained and has	
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Facilities/Worksites:___

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Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Confined Space Entry Program

Revision: 1
Effective Date: 09/28/05

1 Purpose

It is Department of Environmental Protection (DEP) policy to provide a workplace free from recognized safety and health hazards. The purposes of this Confined Space Entry Program are to protect DEP employees from the hazards of entering and working in confined spaces and, after completion of site-specific requirements, to serve as a Permit-Required Confined Space Program that complies with OSHA Standard 29 CFR 1910.146 (Permit-Required Confined Space).

2 SCOPE

DEP may require employees to enter aqueducts, manholes, water tanks, vaults, shafts (those spaces not designed for continuous employee occupancy), water mains, sewer lines, below grade hatches, regulator chambers, process and storage tanks, chemical storage bins, etc. Hazards faced by DEP employees when entering such areas may include atmospheric hazards (oxygen deficient, toxic, and explosive), physical hazards (e.g., engulfment) and/or any other recognized hazard. DEP's Confined Space Entry Program applies to all DEP employees who enter DEP confined spaces, and applies to contractors as described in Section 10. If a confined space entry cannot be made safely and according to procedures, no entry shall be permitted.

This DEP Confined Space Entry Program applies to all Bureaus and Offices within DEP; however, supplemental procedures may be developed for individual Bureaus/Offices (because of unique hazards and circumstances encountered at diverse locations). Procedures developed by individual Bureaus/Offices shall be consistent with the approach used in this program.

This program includes provisions for confined space inventory, evaluation and classification, employee training, hazard identification and control, entry permit system, labeling, reclassifying, and emergency and rescue procedures. Supervisors will assure that these procedures are followed and that employees entering confined spaces are properly trained and equipped to perform their duties safely.

Other hazards may be encountered when working in confined spaces such as hot work and respiratory hazards. These hazards are addressed in other OSHA Standards that also apply to work in confined spaces.

3 DEFINITIONS

Acceptable Entry Conditions - Conditions that must exist in a permit space when hazards are sufficiently controlled and/or eliminated to assure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant – An individual stationed outside a permit-required confined space who monitors the activities of the authorized entrants and who performs all attendant's duties assigned in this program.

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Environmental, Health & Safety

Volume III

Confined Space Entry Program

Revision: I Effective Date: 09/28/05

Authorized Entrant – An employee who is authorized, in accordance with this program, to enter a permit-required confined space.

Confined Space - Any space that:

- 1. Is large enough and so configured that an employee can bodily enter and perform assigned work, and
- 2. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, pits, aqueducts, and manholes), and
- 3. Is not designed for continuous employee occupancy.

Emergency - Any occurrence (including any failure of hazard control or monitoring equipment) or an event internal or external to the permit space that could endanger entrants.

Engulfment - The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

(Note: Example of a confined space with engulfment hazard is an alum hopper or an empty reservoir basin with a full basin on the other side of a dividing wall).

Entry - The action by which an authorized entrant passes any part of his/her body through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry permit - the written or printed document that is provided by the employer to allow and control entry into a permit required coinfined space and that contains the information specified in 1910.146(f) and Attachment C of this program.

Entry Supervisor - The person responsible, in accordance with this procedure, for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations and for terminating the entry operation as required by the regulations.

Note: An Entry Supervisor may serve as an Attendant or as an Authorized Entrant, as long as that person is trained and equipped as required by this procedure for each role that the person fills. Also, the duties of Entry Supervisor may be passed from one Entry Supervisor to another during the course of an entry operation.

Hazardous Atmosphere - An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness. Examples of hazardous atmospheres include:

- > Flammable gas, vapor or mist, in excess of 10% of its Lower Flammable Limit (LFL), also known as Lower Explosion Limit (LEL);
- Airborne combustible dust at a concentration that meets or exceeds its LFL (can be approximated as when dust obscures vision at 5 ft or less);

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Environmental, Health & Safety

Volume III

Confined Space Entry Program

Revision:_		. 1	
Effective D	ate:_	09/28/05	

- > Atmospheric oxygen concentration below 19.5% or above 23.5%;
- Airborne contaminant concentrations that could result in employee exposure in excess of its dose or Permissible Exposure Limit for any substance for which a dose or OSHA Permissible Exposure Limit (PEL) is published (29 CFR 1910.1000); and

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury or acute illness due to its health effects is not covered by this provision.

Any other atmospheric condition that is Immediately Dangerous to Life or Health (IDLH).

Note: Use other documents (such as MSDS, published information, and internal documents) for guidance in establishing acceptable atmospheric conditions where no OSHA dose or PEL exists.

Hot Work Permit - Employer's written authorization to perform operations (such as riveting, welding, grinding, cutting, burning, or heating) capable of providing a source of ignition. See more details in DEP's Hot Work Program.

Immediately dangerous to life or health (IDLH) - any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Lockout/Tagout - Lockout is the placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed. Tagout is the placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. See more details in DEP's Control of Hazardous Energy Lockout/Tagout procedures.

Lower Flammable Limit (LFL) - The lowest concentration of flammable gases or vapors in air, below which ignition will not occur. The mixture is "too lean to burn".

Lower Explosive Limit (LEL) – An alternative and more widely known term for the Lower Flammable Limit (LFL). See above definition.

Non-Permit Confined Space - A confined space that <u>does not contain or</u>, with respect to atmospheric hazards, <u>have the potential to contain</u>, any hazard capable of causing death or serious physical harm.

Note: Confined spaces can be permanently classified as Non-Permit Confined Space (PRCS) if hazard control measures are permanent. They can be temporarily reclassified PRCSs if they revert back to PRCSs when hazard elimination measures are removed. DEP calls this latter case a "PRCS with Procedure for Non-Permit Reclassification".

Permit-Required Confined Space (PRCS) - A confined space which has one or more of the following characteristics:

> Contains or has the potential to contain a hazardous atmosphere, or

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- > Contains a material that has the potential for engulfing an entrant, or
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section, or
- > Contains any other recognized or potential serious safety or health hazard.

Rescue Service - Personnel designated to rescue employees from Permit Spaces.

4 RESPONSIBILITIES

4.1 Responsible Manager

The Responsible Manager (highest ranking manager or supervisor) for each Bureau/Office at each facility is responsible for selecting a Local Program Administrator and ensuring that required equipment is available, employees are trained, and all other requirements of this program are met. The Responsible Manager must coordinate with any DEP staff managing contractor activities involving permit-required confined space entry at their facilities. The Responsible Manager may delegate implementation tasks, as appropriate.

4.2 Local Program Administrator

Each facility/workgroup that maintains or enters permit-required confined spaces is required to have at least one person designated as a *Local Program Administrator*. The *Local Program Administrator* is responsible for ensuring that this program is implemented and maintained at the facility/workgroup level. Responsibilities include:

- > Interfacing with the *Bureau EHS* staff;
- > Maintaining the site's written program and its associated documentation;
- > Identification of confined spaces with Bureau EHS;
- Establishment and implementation of a regular calibration, inspection and maintenance schedule for gas monitoring/detection devices;
- > Ensuring that all affected employees under the program are trained and training records are maintained;
- Reviewing entry operations whenever there is reason to believe that hazard control measures may not protect entrants and revising measures for subsequent entries;
- Annually reviewing the Confined Space Program cancelled entry permits and correcting any deficiencies in hazard control measures, with *Bureau EHS* staff; and
- Coordinating all activities with outside agencies or suppliers as they relate to this program.

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The Local Program Administrator may delegate implementation tasks, as appropriate.

4.3 Bureau EHS

It is the responsibility of Bureau or Office EHS staff (Bureau EHS) to coordinate procurement of adequate and approved equipment and to facilitate and foster adherence to this program. Responsibilities include:

- Identification (with the *Local Program Administrator*), evaluation, and classification of confined spaces;
- Annually reviewing the effectiveness of the Confined Space Entry Program with the *Local Program Administrator* and making recommendations for changes to the Office of Environmental, Health and Safety Compliance;
- Notifying *Local Program Administrators*, *Responsible Managers* and supervisors of changes in the program and/or policy;
- Coordinating and implementing initial and refresher training for affected employees;
- Coordinating the procurement of adequate and appropriate safety equipment to facilitate the adherence of this program;
- Facilitating the servicing of equipment; and
- Communicating DEP procedures, Bureau expectations and the hazards of confined space, to the *Local Program Administrator*.

4.4 Entry Supervisor

Responsibilities of the Entry Supervisor include:

- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Verifying, by checking entries on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Terminating the entry and canceling the permit when required;
- Verifying that rescue services are available and that the means for summoning them are operable;
- Being familiar with all emergency procedures and equipment, as well as ensuring that rescue equipment is adequate to carry the weight of those authorized to enter the PRCS (typical equipment is rated for 310 lbs., including personal protection equipment; however, equipment ratings vary so each unit should be checked);
- Removing unauthorized individuals who enter or who attempt to enter the permit space during entry operations;
- Determining, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed

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within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained; and

Ensuring the entry permit is properly completed and filed after entry is complete.

4.5 Attendant

Each Attendant has a responsibility to adhere to this program when and where required and in the manner in which he is trained. Attendants must also:

- > Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Be aware of possible behavioral effects of hazard exposure in authorized entrant(s);
- Continuously maintain an accurate count of authorized entrants in the PRCS and ensure accurate identification of who is in the PRCS;
- Remain outside the PRCS during entry operations until relieved by another *Attendant*;
- Be in continuous communication with authorized entrants to monitor entrant status and to alert entrants of the need to evacuate the PRCS;
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the PRCS and order the authorized *Entrants* to evacuate the space immediately under any of the following conditions:
 - ◆ If the Attendant detects a prohibited condition,
 - ◆ If the *Attendant* detects the behavioral effects of hazard exposure in an authorized *Entrant*,
 - If communication is compromised,
 - ◆ If the *Attendant* detects a situation outside the space that could endanger the authorized *Entrant*, or
 - If the Attendant cannot effectively and safely perform all of his duties;
- Summon rescue and other emergency services as soon as the *Attendant* determines that authorized *Entrants* may need assistance to escape from PRCS hazards;
- Take the following actions when unauthorized persons approach or enter a PRCS while entry is underway:
 - Warn the unauthorized persons that they must stay away from the PRCS;
 - ♦ Advise the unauthorized persons that they must exit immediately if they have entered the PRCS; and
 - ◆ Inform the authorized entrants and the *Entry Supervisor* if unauthorized persons have entered the PRCS;
- Perform non-entry rescues, if needed, using available equipment such as a tripod retrieval system (Note: <u>Attendant</u> entry is prohibited); and

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Perform no duties that might interfere with the primary duty of monitoring and protecting the authorized entrants.

Note: Attendant and Entry Supervisor may be the same person

4.6 Entrant

Each *Entrant* has a responsibility to adhere to this program when and where required and in the manner in which he is trained. *Entrants* must also:

- Now the hazards that may be faced during entry, including information on the mode, signs and/or symptoms, and consequences of the exposure.
- Properly use equipment per manufactures specifications and training.
- Be in continuous communication with the *Attendant* to enable the *Attendant* to monitor entrant status and to enable the Attendant to alert entrants of the need to evacuate the space.
- Alert the *Attendant* whenever:
 - Any warning sign or symptom of exposure to a dangerous situation is recognized, or
 - A prohibited condition is detected.
- > Exit from the permit space as quickly as possible whenever:
 - ◆ An order to evacuate is given by the *Attendant* or the *Entry Supervisor*,
 - ◆ Any warning sign or symptom of exposure to a dangerous situation is recognized,
 - A prohibited condition is detected, or
 - An evacuation alarm is activated.

4.7 All Supervisors and Employees

All supervisors and employees (other than those working in an office environment without normally accessible confined spaces) must understand what confined spaces are and that they should not enter confined spaces unless they are trained and follow the Confined Space Entry Program. Supervisors must prevent employees under their supervision from entering confined spaces without the appropriate training and procedures.

5 CONFINED SPACES

5.1 Identification

Bureau EHS will work with the Local Program Administrator to inventory all spaces they feel could potentially meet the definition of confined spaces (see Section 3 and Figure 1) as identified by the facility staff. The first two columns of the Confined Space Inventory (Attachment A) should be completed for each facility and field location. Where there are numerous spaces with similar characteristics (e.g., sewers), they may be listed by category.

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Whenever equipment or process changes or any other modifications change the classification of a space, the facility must re-evaluate the space (see Section 5.2), revise the Confined Space Inventory (*Attachment A*) and take any other actions required by the new classification (e.g., signs, training, etc.).

5.2 Evaluation and Classification

For all potential confined spaces (or categories of spaces) on the inventory, complete a Confined Space Hazard Identification/Evaluation Form (Attachment B) using Figure 1 as a guide. Identify and evaluate the potential hazards inside and outside the workplace during normal operations expected during entry such as, but not limited to, the following:

- Atmospheric
 - Engulfment
- Electrical
- Chemical
- Mechanical

- Pneumatic
- Steam
- Heat
- Noise

- Potential Energy (Gravity)
- Stored Energy (e.g., spring tension)

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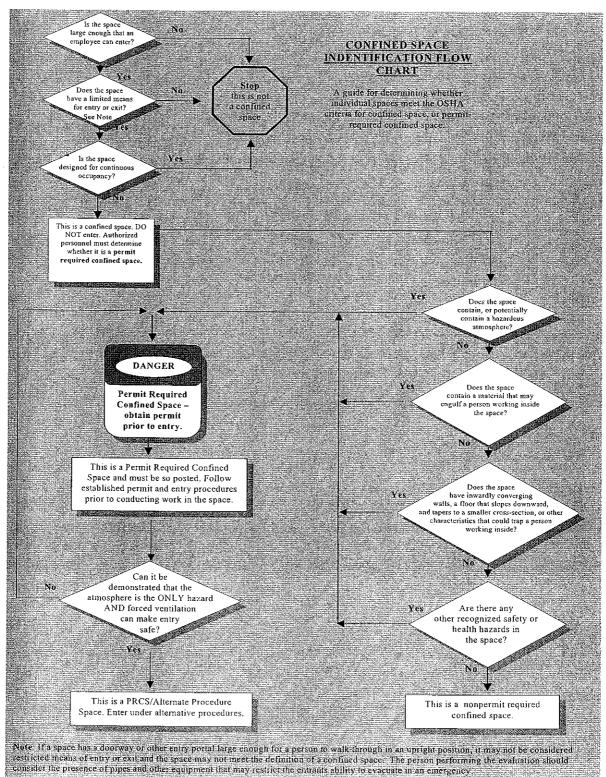
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Figure 1 - Confined Space Identification & Classification



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This evaluation form (Attachment B) is to be completed by Bureau EHS or a designated EHS person trained in confined space entry and this program and considered qualified by Bureau EHS. If a newly identified space must be entered for the first time and Bureau EHS or a designated EHS person is not available to evaluate the space, the space must be entered as a PRCS until a designated person completes the evaluation.

This initial evaluation **need not** attempt to anticipate every hazard that may be introduced as a result of work that may be performed in the space during future entries (e.g. welding or cutting). Any additional hazards or changes in existing hazards will be identified and evaluated by the *Entry Supervisor* when the entry permit is completed prior to entry.

Confined spaces are classified as one of the following:

Permit-Required Confined Space (PRCS)

Permit-required confined spaces are defined in Section 3 and in Figure 1. At a minimum, entry requires an entry permit, *Entry Supervisor*, *Attendant* (for a permit required confined space entry the *Attendant* can also act as an *Entry Supervisor*), atmospheric monitoring, forced ventilation as needed to eliminate or control atmospheric hazards, and provision in advance for rescue (see Section 7.1).

<u>Permit-Required Confined Space – Atmospheric Hazard Only (Potential Alternate Procedure)</u>

Where the only hazard is atmospheric and this can be controlled by ventilation, a permit-required confined space may be entered by following simplified <u>alternate entry procedures</u> that do not require providing in advance for rescue (see Section 7.1). Alternate entry procedures can only be used when:

- > DEP has determined that the only hazard in the space is an actual or potential hazardous atmosphere; AND
- > This hazard can be controlled through the use of continuous forced air ventilation; AND
- DEP is able to demonstrate (with air monitoring) that continuous forced air ventilation is sufficient to maintain the space safe for entry.

 Note: To accomplish this, the space may have to be initially entered as a Permit-Required Confined Space.

At a minimum, entry requires an entry permit, *Entry Supervisor*, *Attendant* (may be same as *Entry Supervisor*), atmospheric monitoring, and forced ventilation.

Non-Permit Confined Space

Non-permit confined space meets the definition of a confined space but <u>does not contain</u> or, with respect to atmospheric hazards, <u>have the potential to contain</u>, any hazard capable of causing death or serious physical harm. Examples of "permanent" non-permit spaces include drop ceilings and maintenance corridors. Under normal conditions:

There is no sewage present;

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- > There are no chemicals or toxic atmosphere present;
- > The chamber has no equipment that can generate exhaust;
- The chamber is not connected to open channels that could carry contamination from another area;
- > The chamber is free of debris that can obstruct entry or exit; and
- There are no unusual odors suggesting a hazardous atmosphere may exist.

The standard work to be performed will not create a hazardous atmosphere (e.g., meter reading or basic maintenance). Activities such as painting or operation of power tools can create a hazardous atmosphere in a confined space and may temporarily change the designation of the space to a PRCS.

At a minimum, entry requires atmospheric monitoring, and two persons (although regulations allow entry without an *Attendant*, DEP policy requires both one *Attendant* and one *Entrant*). The advantage of having a space identified as "non-permit" is that they can be entered without a permit, rescue or other procedural requirements, such as continuous air monitoring (see Section 7.2).

A confined space can be permanently classified as a non-permit confined space if hazard control measures are permanent (and there are no atmospheric hazards) or can be a temporarily reclassified PRCS that reverts back to PRCS when hazard elimination measures are removed. Bureaus can track which PRCSs have an established procedure for eliminating hazards (e.g., by lockout/tagout, blanking or blinding, disconnecting, etc.) to temporarily reclassify a space by designating it a "PRCS with Procedure for Non-Permit Reclassification." If it is a "Temporarily Reclassified PRCS", an entry permit must also be completed that documents: (a) all hazard elimination steps applied, and (b) all testing that confirms all hazards are eliminated.

5.3 Labeling Confined Spaces

Permit-Required Confined Spaces

The *Responsible Manager* must ensure that all identified PRCSs (except for manholes, which are <u>all</u> PRCSs) are posted with a sign alerting employees to the hazard (e.g., "DANGER -- PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER") which conforms to the DEP Hazard Markings and Color Coding Procedure. Alternatively, the *Responsible Manager* may inform exposed employees by any other equally effective means (e.g., issuing a memorandum to employees identifying all reservoir building floor slabs as PRCSs and including this in new employee training or posting it at the facility).

Non-Permit Confined Spaces

Responsible Managers may label non-permit spaces as a good management practice, but these should be clearly distinguished from PRCSs. Bureau EHS will assist the Responsible Manager in procuring acceptable signs.

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5.4 Space Re-Identified for Alternate Entry or Non-Permit Required Entry

Whenever possible, reduce or eliminate PRCS hazards to the fullest extent possible. By doing so, some of the equipment, personnel, and training associated with the higher levels of confined space entries can be eliminated. The following sections describe how PRCSs can either be permanently re-identified as alternate procedure spaces, permanently reclassified as non-permit spaces or temporarily reclassified as non-permit spaces.

5.4.1 Re-Identifying a Permit-Required Confined Space by Alternate Procedure

Bureau EHS can permanently re-identify a PRCS to an "alternate procedure space", if atmospheric hazards can be controlled by forced ventilation and <u>all</u> other hazards can be eliminated. Lockout/tagout, blanking/blinding of lines, and guarding are considered means of eliminating hazards.

Note: Controlling atmospheric hazards with forced air ventilation is a control measure but does not eliminate the hazard. It is important to monitor the atmosphere within the space to verify ongoing conditions acceptable for entry.

In order to re-identify a PRCS to an alternate procedure space, entry must be under a PRCS permit to collect the data demonstrating that the atmospheric hazards are adequately controlled to within oxygen and LEL limits and below Permissible Exposure Limits (PELs) by forced ventilation. Then, *Bureau EHS* may make a determination that re-identification is appropriate (Note: Re-identification is NOT REQUIRED) by completing *Attachment D*. The *Local Program Administrator* is required to maintain a file on each alternate procedure space containing ALL ORIGINAL PRCS entry forms used to reclassify the space and the entry permits going back at least 1 year. *Bureau EHS* must amend the Confined Space Inventory (*Attachment A*) with the date of this reclassification.

5.4.2 Reclassifying a Permit-Required Confined Space or Alternate Procedure Space to a Non-permit Confined Space

If the permit space poses <u>NO</u> actual or potential atmospheric hazards and if <u>ALL</u> hazards within the space are eliminated without entry into the space, *Bureau EHS Group* may reclassify the permit-required confined space as a non-permit confined space.

All determinations for reclassifying a space to non-permit status (including permanent or temporary reclassification) shall be documented using *Attachment D*. This shall be made available to the employees entering the space upon request. Any air monitoring data supporting this determination should be retained as long as the site is required to have a PRCS program.

If hazards arise within a non-permit space, the employees inside shall exit the space immediately and the *Entry Supervisor* shall be notified and the space re-evaluated.

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Permanent Reclassification

Reclassification to non-permit confined space can be permanent if the hazard is permanently eliminated. Permanent non-permit spaces do not require a permit for entry.

Temporary Reclassification

A space can be temporarily reclassified to a non-permit confined space for as long as all hazards remain eliminated (i.e., if the hazard returns after the work is complete).

NOTE: Temporary reclassification to a non-permit confined space is terminated if hazard control measures are removed and a hazard returns after the entry is terminated. Hazard control procedures should be recorded for repeated use.

NOTE: Control of atmospheric hazards through **forced** air ventilation does **NOT** allow reclassification to a non-permit confined space.

In addition to a one-time completion of *Attachment D* documenting the reclassification, an entry permit (*Attachment C* or *OEHSC* approved equivalent) must be completed for each entry in order to document the hazard elimination steps applied and the testing that confirms all hazards are eliminated.

6 HAZARD CONTROL AND PROTECTIVE EQUIPMENT

6.1 Air Monitoring

Testing is required to devise and implement adequate control measures for the protection of an authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during entry.

Tests for oxygen deficiency or enrichment, flammability, and toxicity must be conducted by an *Entrant/Attendant* who has been trained and has demonstrated competence in monitoring in the field under the supervision of an *Entry Supervisor*. The sampling results shall be recorded on the entry permit and should be posted outside the space so entrants can confirm that a safe atmosphere is maintained before any reentry.

For spaces that have been permanently classified as non-permit spaces Attachment E may be used to document air monitoring results. Use of Attachment E is not a regulatory requirement but is required by some Bureaus to support the classification of the space and/or as a means of ensuring that readings are taken. It is available for voluntary use by other Bureaus.

In all DEP confined spaces, you must:

Use only calibrated air monitors that have a current calibration date on the instrument.

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Have at least one calibrated monitor for the entry. If *Entrants* will be separated by significant distances where a single reading is not representative of the occupied space, more than one calibrated meter will be necessary.

MEASURE oxygen, LEL, carbon monoxide, and hydrogen sulfide (in this order). Air sampling results must be within the following limits for every confined space entry:

◆ OXYGEN (O₂)

19.5% – 23.5% (concentration)

♦ LEL

less than 10% (of the LEL)

◆ CARBON MONOXIDE (CO)

less than 35 ppm (concentration)

♦ HYDROGEN SULFIDE (H₂S)

less than 10 ppm (concentration)

Test space for additional toxic vapors, if necessary, and enter only if concentrations are below the OSHA and/or PESH Permissible Exposure Limit (PEL). For example, at facilities where mercury is known or suspected to be present, test for mercury (note DEP applies the ACGIH recommended TWA of 0.025mg/m³ for mercury). Specific air monitoring requirements are determined by the hazard evaluation and documented on *Attachment B* for each confined space.

Note: 29 CFR1910.134 (i) Breathing air quality and use. (ii) Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, which includes an Oxygen content (v/v) of 19.5-23.5%.

- MEASURE PRIOR to OPENING any access port, lid, door, or hatch to a confined space that will be entered, conduct sampling outside the space to determine the presence of a hazard that may warrant additional precautions. After this initial sampling, open the access lid, door, or hatch to the confined space only enough to insert probe (or use existing port). It is preferable to conduct the air sampling from a sampling port.
- MEASURE PRIOR to ENTRY at the opening of the space, halfway into the space and at the bottom of the space, at a minimum, and elsewhere, if appropriate. For example, a space more than 15 feet deep might be measured every 3 to 5 vertical feet from top to bottom of the space. Different gases may be present at different heights in the space (an example is chlorine gas which settles near the bottom).
- WAIT to take instrument readings 1-2 minutes after the instrument probe is in place.
- DOCUMENT readings in Section E, Air Monitoring Requirements, on Confined Space Entry Permit.
- MONITOR CONTINUOUSLY during entry (recording readings on the permit every 15 minutes).
- CARRY the instrument with you in the space to monitor the air immediately around you. When using remote flex line equipped instruments, the *Attendant* can monitor the readings with the air intake at the entrant's location, but the *Entrant* MUST be able to hear alarms.

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Any questions on the above should be directed to Bureau EHS staff.

Individual Bureaus may have unique confined space safety requirements applicable to a type of space or individual location (e.g., see Table 1). *Entrants* and *Attendants* should become familiar with any Bureau-specific procedures.

TABLE 1- ADDITIONAL BUREAU-SPECIFIC AIR MONITORING REQUIREMENTS

Bureau	Permit Required Confined Space (PRCS)	Alternate Procedure	Non-Permit Confined Space:
Customer Services	Prohibited from entering PRCSs.	Prohibited from entering alternate procedure spaces.	Monitoring is required prior to and during entry. Should any reading be outside the acceptable range, no entry will be made. If alarm sounds during entry, Entrant will immediately exit.
Water Supply	 If initial readings are unacceptable, testing may be repeated after venting space (e.g., for 10-15 minutes, up to 3 times, then reassess permit conditions). May need to monitor for chlorine (<0.5 ppm) and mercury (<0.025 mg/m³). 	 Ventilation and Monitoring are required prior to and during entry. Should any reading be outside the acceptable range, no entry will be made until all parameters of PRCS procedures have been followed. If alarm sounds during entry, Entrant will 	Monitoring is required prior to and during entry. Should any reading be outside the acceptable range, no entry will be made unless PRCS procedures are followed. If alarm sounds during entry, entrant will immediately exit.
Water and Sewer Operations	 If initial readings are unacceptable, testing can be repeated after venting space (e.g., for 10-15 minutes, up to 3 times, then reassess permit conditions). Monitor for chlorine in sodium hypochlorite tanks. 	immediately exit.	 (Maintenance Shafts) Monitoring is required prior to and during entry. Should any reading be outside the acceptable range, no entry will be made unless PRCS procedures are followed. If alarm sounds during entry, Entrant will immediately exit. Supervisor must periodically
Wastewater Treatment	If initial readings are unacceptable space may be vented (e.g., for 10-15 minutes, up to 3 times, then reassess permit conditions), and then retested after ventilation is turned off.	BWT does not use Alternate Procedure.	monitor mercury, oxygen and carbon monoxide. Monitoring is required prior to and during entry. Should any reading be outside the acceptable range, no entry will be made unless PRCS procedures are followed. If alarm sounds during entry, Entrant will immediately exit.

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6.1.1 Air Sampling Equipment and Calibrations

Atmospheric testing instruments used in confined spaces shall be those approved by *Bureau EHS* and shall be calibrated regularly, as per the manufacturer's recommendations. Only persons familiar with conducting calibration of equipment will calibrate gas detection devices. The *Local Program Administrator* or his designee will establish and implement a regular inspection, calibration and maintenance schedule for gas detection devices in accordance with manufacturer's recommendations. Records will be kept on calibration, inspections, and repairs. Calibration stickers indicating the date of calibration, due date for next calibration and initials of person conducting the calibration will be placed on all calibrated air sampling equipment.

When calibration is done in-house, the expiration dates of calibration gases are to be checked to ensure their usability.

6.2 Ventilation

In all DEP PRCSs you must:

- > Provide ventilation when atmospheric sampling results indicate it is necessary;
- Provide forced ventilation through one port and exhaust ventilation through another port, when necessary;
- Ensure make-up air or air being sent into the space is from a clean air source suitable for breathing;
- Provide continuous ventilation when indicated on the entry permit; and
- > Vent the space as noted below before entry is made.

Follow Bureau-specific procedures applicable to the space or location (see Table 2).

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TABLE 2 - BUREAU-SPECIFIC VENTILATION REQUIREMENTS

Bureau	PRES	Alternate Procedure	Non-Permit Conf. Space
Customer Services	Prohibited from entering PRCSs.	Prohibited from entering alternate procedure spaces.	None required.
Water Supply Water and Sewer Operations -	No ventilation is required if air monitoring results are acceptable and there are no unusual conditions.	Requires continuous ventilation during entry-the recommended ventilation set up for sewers includes a supply through one manhole and an exhaust hose from a downstream manhole.	None required.
	· .	 Should air monitoring be unacceptable or should there be unusual conditions, enter per PRCS procedures. 	
Wastewater Treatment	No ventilation is required if air monitoring results are acceptable and there are no unusual conditions.	BWT does not use Alternate Procedure.	None required.

6.3 Special Requirements for Hazard Control

The Confined Space Entry Permit includes a "Special Requirements" section (Section C) with checkboxes to identify appropriate control methods to be implemented prior to entry.

6.4 Specialized Equipment

The Confined Space Entry Permit includes an "Equipment Checklist" section (Section D) with checkboxes to identify equipment required for safe entry and work in the space. Communications and other equipment must be appropriate for the hazards encountered in the space (e.g., intrinsically safe).

6.5 Respirators

Respirator use is not required for alternate procedure or non-permit confined space entries. Some PRCS entries may require that entrants have a SCBA or an escape pack available for emergency escapes depending on the duration of the entry and the configuration of the space. Non-typical PRCS entries involving contaminant-producing procedures may require an air-purifying respirator or supplied air respirator, depending on the contaminant. Follow Bureau-specific procedures applicable to the space or location (see Table 3).

If respiratory protection is required you must:

Wear the proper respiratory protection indicated on the entry permit;

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Be in full compliance with the DEP Respiratory Protection procedure including being trained, approved medically for wearing a respirator and fittested for the respirator you will wear in the confined space; and

Never wear an Air Purifying Respirator in an oxygen-deficient atmosphere. Only Self Contained Breathing Apparatus (SCBA) or supplied air with an escape pack is acceptable in oxygen-deficient atmospheres.

Note: SCBA or escape pack should be used when traveling into sewer lines long distances from any point of exit. The purpose of the SCBA is for safe exit if a toxic atmosphere is encountered along the way.

TABLE 3 - BUREAU-SPECIFIC RESPIRATOR REQUIREMENTS

Bureau 👢	PRCS	Alternate Procedure	Non-Permit Cont. Space
Customer Services	Prohibited from entering PRCS spaces.	Prohibited from entering alternate procedure spaces.	Not Required.
Water Supply	Entrants working a far distance from the exit point may use an SCBA or escape pack to escape.	Not Required.	Not Required.
Water and Sewer Operations	 Escape packs may be used for other workers when they are a long distance from the ventilation and exit points. 	Not Required.	Not Required.
Wastewater Treatment	 Escape packs are required for all PRCS entrants. SCBAs may be required for hazardous atmospheres and travel times of more than 5 minutes from ventilation and exit points. 	BWT does not use Alternate Procedure.	Not Required.

6.6 PPE/Communications Equipment

Individual Bureaus may have unique requirements with regard to PPE and communications equipment that are necessary because of the space or the location. You should become familiar with the procedures covering your operation. In all DEP PRCSs:

- Entrants must wear hard hat where overhead drop hazards exist and safety harness (except where it is determined that a body harness might increase the overall risk of entry or would not contribute to an external rescue in this case see Section 8.1 on advance written notification of emergency service units);
- Wear additional PPE appropriate to the hazards of the space and of the activity that will be conducted within the space;

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- Entrant must have a means of communication with the Attendant outside the space. Means of communications may include but not be limited to voice, radio, cell phone or other communications equipment.
- The Attendant must have an appropriate means of summoning assistance in the event of an emergency.

7 Entry Procedures

These procedures apply to PRCSs, alternate entry procedure spaces and spaces temporarily reclassified as non-permit spaces. Prior to confined space entry, the *Entry Supervisor* will review the Confined Space Hazard Identification/Evaluation Form to determine if current conditions within the space are consistent with those identified. The *Entry Supervisor* shall evaluate aspects of the work to be performed that could create a new hazard or magnify an existing hazard. If conditions have changed or the work to be performed within the space creates new hazards, the *Entry Supervisor* must identify appropriate hazard control measures to address them and may contact *Bureau EHS* for additional guidance.

7.1 Permit-Required Confined Space Entry

This procedure applies to spaces that have been permanently classified as PRCSs, those which may be temporarily reclassified as non-permit confined spaces or which have been temporarily upgraded to a PRCS because of new hazards identified by the Entry Supervisor due to the planned work or conditions in the space.

PRIOR TO ENTRY:

The Entry Supervisor will:

- > Identify the need and purpose for entering the space.
- Identify the trained work crew to complete the job (Entry Supervisor, Attendant [if different] and Entrants).
- Conduct any necessary pre-notification of rescue services whether within the Bureau or an outside agency such as NYPD or FDNY (see Emergency Procedures Section 8). This step is not required for spaces that will use alternate entry procedure or be reclassified to non-permit.
- > Obtain and review MSDS for all hazardous materials brought into the permit space. MSDSs reviewed should be available during the work.
- > Review the work to be performed and the hazards of the space to identify potential issues.
- Review previous entry records (completed permits). Carefully assess any comments or difficulties noted and proceed accordingly.
- Complete the entry permit. Identify/evaluate the hazards inside and outside the space and complete Sections A through D. Blank spaces are not permitted. If a section is not applicable (N/A), so indicate. Pay particular attention to "Activities That May Create Hazardous

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Conditions" and "Special Requirements" including lockout/tagout procedures. Indicate on the permit all equipment required for the job.

- Prepare for and be equipped to follow the appropriate Emergency Procedure identified in Section 8 as conditions, locations, and staffing vary from place to place. In all cases, these procedures must be in place before anyone enters the permit space. If the emergency procedure for the entry cannot be properly implemented, both the permit and the job must be postponed until adequate rescue services are provided.
- Notify other workers in the area that an entry will take place or that a service interruption may occur.
- Gather needed safety, communication, and monitoring equipment; check radios and telephones before mobilizing and entering the space to ensure that they are in good working order and all necessary communications are established.
- > Review the "Pre-Entry Checklist".
- Conduct pre-job safety meeting with *Attendant* and all *Entrants*. Discuss hazards to be encountered, procedures to be followed, method of communication to be used, emergency procedures, and prohibited actions; answer all employee questions.
- ➤ If hazards are sufficiently controlled, sign the entry permit, thereby authorizing entry.
- Eliminate any condition that could make it unsafe to remove manholes, doors, hatches or covers prior to attempting to open. When the entrance covers are removed, ensure that the entrance is appropriately barricaded (traffic cones and/or barricades) to create safe working conditions and prevent unauthorized entry into the space or inadvertent fall hazards.
- > Cancel the entry permit when work is complete or unexpected condition develops, and note any problems encountered during the entry operation.

ENTRY PROCEDURE

The entry team will:

- 1. Post the signed entry permit near the entrance.
- 2. Open the space.
- 3. Station the *Attendant* outside of the space and ensure contact with the workers at all times during the work.
- 4. Perform air monitoring as identified in Section E of the entry permit. Initially test before entry, and after initiating mechanical ventilation in accordance with DEP air monitoring requirements (Section 6.1). If acceptable readings are not achieved, NO ENTRY WILL BE MADE. Crew leader will notify the permitissuing supervisor of conditions. Any unusual condition will be relayed to the supervisors.

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- 5. Establish mechanical ventilation as necessary to meet the entry permit requirements and Section 6.2 of this procedure.
- 6. After evaluating pre-entry readings, authorize entry by signing Section F (for alternate entry procedure and temporarily reclassified non-permit spaces) OR Section G (for spaces that remain PRCSs throughout entry).
- 7. Authorized *Entrant* will don the harness (for PRCSs) and carefully enter. If inplace metal rungs appear unstable or unsafe in any way, a separate ladder should be inserted into the opening and used for entry and exit.

Note: Straight ladders must extend 3 feet above the hole or surface upon which the ladder is leaning, be placed on a secure footing. The ladder shall be tied off to prevent it from sliding or falling and must be used within its design length and intended uses. Where entry does not conform to ladder use regulations (29 CFR 1910.25 and 26) or where powered platforms are used, appropriate fall protection measures must be identified on the permit and used for entry.

- 8. Continuous monitoring for oxygen, LEL, carbon monoxide and hydrogen sulfide will be done for the duration of the work in a permit space. At least one employee entering the permit space will carry the gas detection device set in continuous monitoring mode with alarms set at audio. Alternately, the *Attendant* may continuously monitor the space, provided the remote sampling probe is in the space and both the *Attendant* and the *Entrant* can hear the audible alarms.
- 9. If, at any time, the entrant detects an unusual odor or condition, or the gas detection device alarm sounds or the employee experiences any symptom such as fatigue or dizziness, the *Attendant* is to be notified and the space exited. Employee(s) may don an SCBA or escape pack to exit safely. No re-entry will be made unless readings are brought back into acceptable range.
- 10. Maintain the entry permit at the job site for the duration of the job. If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new entry permit must be completed.
- 11. After the permit space work is complete, the completed permit will be returned to the *Local Program Administrator*. Any comments about the job or difficulties encountered will be recorded on a separate sheet that will be stapled to the permit. These comments will be reviewed prior to the next job to be done in the same space.

SEQUENTIAL SEWER ENTRIES UNDER ONE PERMIT

Where entries are made at multiple points in a sewer system over the course of the day, entry may be made under a single permit, using the same precautions and procedures described above at each location. The multiple sewer entry documentation pages of the permit providing Section E, G and I data input fields for

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each entry (see $Attachment\ C$ or OEHSC approved equivalent) must be used to document the monitoring and entrant accounting at each location.

7.2 Non-Permit Confined Space Entry

This procedure applies to spaces that have been permanently classified as non-permit spaces because hazard elimination measures are PERMANENT measures and are not removed after the work. It is the DEP's policy that at least 2 employees shall be present when work is in progress inside a non-permit confined space, an Entrant and an Attendant. Each employee shall remain in contact with each other at all times.

Entries into non-permit confined spaces do not require a permit. Entry into non-permit confined spaces is allowed only after it has been determined that a toxic atmosphere does not exist. Safety harnesses may be necessary when a fall hazard exists.

ENTRY PROCEDURE

- 1. Perform air monitoring in accordance with DEP air monitoring requirements (Section 6.1).
- 2. Ensure the Confined Space Evaluation (Attachment B) with Certification is made available to all Entrants upon request.
- 3. Inform all *Entrants* of the pre-entry atmospheric test results.
- 4. For all non-permit confined space entries, there will be an *Attendant* present. The *Attendant* will be stationed outside of the space. Under no circumstances is the *Attendant* to enter the space. The *Attendant* must maintain communication with *Entrant(s)* at all times. If the *Attendant* must leave his post, he may do so only after he has instructed the *Entrant* to exit the space.
- 5. The Attendant must be trained to recognize conditions outside of the space that could affect the entrant. If the Attendant observes potential hazards, he/she must instruct the Entrant to exit the space.
- 6. Under all circumstances, the employees must have nearby, some form of communication for emergency purposes (i.e. a radio, cellular phone, or telephone).
- 7. In the event of an emergency, the *Attendant* must execute the emergency procedure (see Emergency Procedures Section 8 of this procedure). The *Attendant* will make contact with emergency services, and remain at the scene to direct emergency responders to the space and the injured *Entrant*.

Attachment E is a form that may be used to document air monitoring results. Use of Attachment E is not a regulation requirement but is required by some Bureaus to support the classification of the space and/or as a means of ensuring that readings are taken. It is available for voluntary use by other Bureaus.

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8 EMERGENCY PROCEDURES

This emergency procedure was developed with input from the Citywide Office of Occupational Safety and Health, the NYPD ESU, the NYC Fire Department, and all DEP Bureaus and Offices. If any changes/revisions are needed, contact:

DEP Office of Environmental, Health and Safety Compliance 59-17 Junction Blvd., 10th floor Flushing, N.Y. 11373-5108

PRIOR TO ALLOWING ANY WORK TO BE DONE IN A PERMIT REQUIRED CONFINED SPACE, THE ENTRY SUPERVISOR MUST BE PREPARED AND EQUIPPED TO FOLLOW THESE PROCEDURES. THE ENTRY SUPERVISOR MUST ALSO DEVELOP AND INFORM ALL ENTRANTS AND ATTENDANTS OF THE SPECIFIC EMERGENCY PROCEDURES APPLIABLE TO THE ENTRY.

Emergency procedures must be established prior to each job since conditions, locations, and staffing vary from place to place. But in all cases these procedures must be in place before anyone enters the permit space. In the event of an emergency, on site rescue will be performed by PRCS rescue-trained DEP personnel and/or available rescue services. Each member of a DEP rescue team shall be properly trained in the use of personal protective and rescue equipment, basic first aid and cardiopulmonary resuscitation (CPR). Method of contact and phone numbers for local ambulance and fire departments will be determined ahead of time and listed on the entry permit.

The radios and telephones shall be checked before the job to ensure that they are in good working order.

If the emergency procedure for the specific job cannot be properly implemented in the event activation was necessary the job shall be postponed and permit cancelled.

8.1 DEP Requirements

Individual Bureaus may have unique confined space rescue plans that are applicable to a particular space or location. For example, due to their remote location, the Bureau of Water Supply relies on in-house PRCS rescue teams, while facilities in the city rely upon the New York City Fire Department (FDNY) and the New York City Police Department (NYPD) Rescue Companies. All rescue resources utilized should be trained in PRCS and informed of the hazards of the space and practice types of rescues they may be called upon to perform in these spaces.

Non-Entry rescues are preferred. These are rescues performed by DEP employees (usually the Attendant or other trained employees), where entrants in the space can be rescued without entering the space. Non-entry rescues, are possible only under the following circumstances:

Entrant is equipped with a body harness attached to a lifeline and tripod and winch system.

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> Attendants and/or Entry Supervisors are present and immediately available to perform rescue.

In cases where a body harness might increase the overall risk of entry or would not contribute to an external rescue, emergency service units must be provided with advance written notification of the entry to be performed.

8.2 Within New York City

8.2.1 Phase I - Pre-Notification of Confined Space Entry

All Bureaus conducting PRCS entry in New York City will be covered under a standing agreement with Police and Fire Departments. BWSO and BWT are currently covered under such an agreement. These Bureaus will periodically communicate with Fire and Police rescue groups to offer coordination, familiarization, pre-planning and exercise opportunities.

If other Bureaus need to make PRCS entries, they must obtain a standing agreement or notify the Fire and Police Departments with the date, time and location at least two weeks in advance of the entry. Confined space communications are with the following Fire and Police Departments contacts:

Fire Department

Chief of Rescue Operations or Officer on **Duty Special Operations Command**

Tel. #: (212) 755 - 8684 or 212-755-8597

Fax #: (212) 755 – 8470

Police Department

Emergency Services

Unit

Tel. #: (718)-677-8300

Fax #: (718)-677-8330

8.2.2 Phase II - Emergency Numbers on Entry Permit

The Emergency Phone Number space on each Confined Space Entry Permit must include first 911 and then one of the following telephone numbers for the Fire Communications Center for the borough where entry is made:

Manhattan:

212-999-2222

Bronx:

718-999-3333

Brooklyn:

718-999-4444

Queens:

718-999-5555

Staten Island: 718-999-6666

8.2.3 Phase III - Emergency

The DEP Entry Supervisor and the Attendant will be required to do the following:

1. Call 911 and provide the operator with all pertinent information such as the exact location, the number of people involved, etc. The caller must state that this is a "CONFINED SPACE INCIDENT."

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The operator will generally connect the caller to the appropriate Fire Communications Center (or Police Department Emergency Rescue Unit if current Fire emergency commitments so require) to ensure proper communication of the situation and location. IF THE CALLER IS NOT CONNECTED TO THE FIRE COMMUNICATIONS CENTER BY 911, FDNY REQUESTS THE CALLER ALSO CALL THE FIRE COMMUNICATIONS CENTER DIRECTLY. Average time to respond is less than five minutes.

- 2. Notify DEP's 38th Street 24 Hour Dispatch at: 212 689-1520, or 212-689-1620
- 3. Notify DEP District Yard.

Fire

The Fire Department is the lead agency on rescue. It currently has 5 Rescue companies, 7 Squad companies, one Hazardous Materials company, and 25 Ladder companies strategically located throughout the city that are trained and equipped to perform confined space rescue. These units carry a full complement of air monitoring equipment and their personnel are trained Hazardous Materials technicians.

If the Fire Dispatcher receives an alarm for a confined space emergency, a full confined space response will be dispatched. This response includes three CFR-D trained Engine Companies, two ladder companies (at least one of which is a Special Operations support Ladder trained in confined space rescue), two confined space trained rescue companies and one confined space trained squad company (each of which have a full complement of confined space rescue gear including tripods, SCBA's and supplied air respirators, and patient packaging and retrieval systems), one Hazardous Materials Company, three Chief officers as supervisors/coordinators and safety officers, three Basic Life Support ambulances, one Advanced Life Support ambulance and three EMS supervisors.

Police

The NYPD Emergency Service Unit's (ESU) Operations Desk will notify the local Emergency Squads of the confined space rescue in their response area. Each of the ten ESU Squads throughout the City are trained and equipped to respond to and effect rescue of persons within confined spaces. All are equipped with tripods, lifelines, harnesses and retrieval systems, SCBA and SAR systems, Haz-Mat equipment, and are certified NYS Emergency Medical Technicians.

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8.3 Upstate

8.3.1 Permit Required Confined Spaces Procedure

An on-site rescue team will be assigned and standing-by prior to any entry being made in all PRCSs. Rescue services are verbally summoned by the *Attendant* or *Entrants* when needed. The procedure to summon emergency services for providing necessary medical services to rescued employees is to call either 911 or, if different, the emergency phone number entered in the appropriate space in the entry permit. Each rescue team member will be:

- > Trained to perform confined space entry, the assigned rescue duties and in the characteristics of the space;
- > Practiced in making a permit space rescue at least once every 12 months;
- > Trained in the proper use of PPE and rescue equipment; and
- ➤ Be familiar with the emergency services for providing necessary medical services if different from 911.

Note: At least one member of the rescue team shall hold a current certification in first aid and CPR.

All PPE and rescue equipment necessary for making the rescue will be assembled and brought to the site prior to allowing entry into the PRCS. This list of equipment may include:

- > Self-Contained Breathing Apparatus (SCBA);
- Harnesses;
- > Retrieval lines and winches as appropriate for a rescue for the particular space;
- > Appropriately stocked weather resistant first aid/CPR kit;
- Basket stretcher;
- > Explosion proof flash lights; and
- > Means of communication such as radio or cell phone.

8.3.2 Alternate Procedure Spaces

PRIOR TO ALLOWING ANY WORK TO BE DONE IN AN ALTERNATE PROCEDURE CONFINED SPACE (i.e., Enclosed or Alternate Procedure Space), THE ENTRY SUPERVISOR MUST DETERMINE HOW CONTACT WILL BE MADE WITH RESCUE SERVICES SHOULD THE NEED ARISE. The applicable phone numbers must be on the entry permit form as well as being posted at the telephone that might be used.

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TABLE 4 - DEP EXTERNAL AND INTERNAL RESCUE REQUIREMENTS

Bureau	Non-Entry Rescue	Entry Rescue
Customer Services (NOTE: Job and permit are automatically cancelled if emergency procedures are not established.)	No PRCS or Alternate Procedure entries made. Evacuations: Whenever the air monitor alarm sounds; if Attendant or Entrant detects an unusual condition; or if Entrant experiences symptoms.	Summoning rescue team: For medical assistance; Attendant calls 911 to summon NYPD/NYFD rescue services and then radios or calls home base from a telephone.
Water Supply (NOTE: Job and permit are automatically cancelled if emergency procedures are not established.)	 Evacuations for all spaces: Whenever the air monitor alarm sounds; if Attendant or entrant detects an unusual condition; or if entrant experiences symptoms. No reentry until source of problem is identified and condition is abated. PRCS Non-Entry Rescue: Tripod and retrieval device must be set up over opening to space. External rescues may be initiated if entrant is within 10 feet of the vertical opening. Should not be attempted if injury is caused by something other than a toxic atmosphere. 	Rescue team: On-site trained personnel or local rescue services. Summoning rescue teams: Attendant makes direct verbal request to rescue staff standing by on-site. For medical assistance; Attendant calls 911 or the emergency medical service number listed on the permit. If prearranged, the attendant may use a radio to contact home base which then calls 911.
Water and Sewer Operations	 Evacuations for all spaces: Whenever the air monitor alarm sounds; if Attendant or entrant detects an unusual condition; or if entrant experiences symptoms. No reentry until source of problem is identified and condition is abated. Non-Entry Rescue - all spaces: Tripod and retrieval device must be set up over opening to space External rescues may be initiated if entrant is within 10 feet of the vertical opening. Should not be attempted if injury is caused by something other than a toxic atmosphere. 	Summoning rescue teams: ■ DEP Team Leader and Attendant: Call 911 Notify DEP Help Center Notify District Yard
Wastewater Treatment	Same as Water and Sewer Operations	Same as Water and Sewer Operations

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9 TRAINING

All employees required to enter a confined space must be trained in DEP entry policies and procedures and the proper use of specified equipment prior to being assigned confined space entry duties. The training will be designed to ensure they acquire the skills, understanding and knowledge necessary for the safe performance of duties under this program and will be performed by qualified instructors. Training can be performed at three levels or these may be combined.

- 1. Confined Space *Entrant/Attendant* Training: Participants will learn how to properly enter confined spaces and act as confined space *Attendant* or monitor. Training will include air monitoring equipment, ventilation apparatus, and retrieval equipment, as well as entry into an actual confined space.
- 2. Confined Space *Supervisor*/Hazard Analysis Training: Participants will learn how to properly assess hazards, plan and supervise the entry into confined spaces. Training will emphasize understanding and application of regulations; hazard recognition and control; DEP policies and programs; and development and implementation of emergency procedures.
- 3. Confined Space Rescue Training: Participants will learn how to properly assess emergencies, develop rescue plans, use retrieval equipment and practice rescue operations in an actual confined space. Rescue team members will also receive first aid and cardiopulmonary resuscitation (CPR) training.

Additional or refresher training is required before a change in assigned duties (e.g., to supervisor), whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained, or whenever there is reason to believe that there are deviations from the accepted program or inadequacies in the employee's knowledge. Confined space rescue team members will receive initial training and practice making permit space rescues at least once every 12 months, by means of simulated rescue operations.

DEP encourages awareness level training and communications for all employees working in locations where they may come into contact with confined spaces but are not expected to enter them. Such employees must be able to recognize the existence of a confined space and be instructed to avoid this hazard. This can be integrated into other training (e.g., Right-to-Know).

Upon completion of training, employees must receive a certificate of training that includes the employee's name, signature or initials of trainer(s), and dates of training. Employees and their authorized representatives must make the certification available for inspection.

Training records will be kept and maintained by *Bureau EHS*. The *Local Program Administrator* will maintain a list of staff currently trained in confined space entry.

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10 CONTRACTORS

For contracts managed by the Bureau of Engineering Design and Construction (BEDC) Design, the *Contract Supervisor* is the Lead Project Engineer. For contracts managed by BEDC Construction, the *Contract Supervisor* is the DEP Resident Engineer, or the DEP employee directly responsible for overseeing the consultant Resident Engineer when a Construction Manager (CM) is responsible for resident engineering. For Contracts managed by various BWS divisions, the *Contract Supervisor* (or equivalent designee) is the Director of the Hiring Division or his/her designee (e.g., Project Manager). For Contracts managed by BWSO, the *Contract Supervisor* (or equivalent designee) is the BWSO Manager (Director, Chief, Deputy Chief, etc.) responsible for managing and overseeing the Contract or his/her designee (e.g., Project Manager).

The *Contract Supervisor* (or equivalent designee) must coordinate with *Responsible Managers* for any contractor activities involving Permit Required Confined Space entry at their facilities to ensure that DEP informs all contractors involved in work that involves PRCS entry of:

- Existence of permit spaces that must be entered in accordance with applicable regulations;
- > Hazards within the permit spaces based on DEP experience; and
- > Precautions and procedures in place that DEP uses to protect its employees when in or near permit spaces.

Contractors required to perform work in permit required confined spaces will generally be required by their contract to have their own confined space entry program, equipment and trained personnel, although this may vary for some contract work and specific requirements will be as governed by the contract. The *Contract Supervisor* or equivalent designee must coordinate each entry with *Responsible Managers* when both DEP and contractor employees are to work near or in a permit space to ensure both the contractor and DEP employees are safe.

DEP will also debrief contractors at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during the entry operations.

11 PROGRAM EVALUATION

This program must be reviewed annually and entry procedures revised as needed by the *Local Program Administrator* and *Bureau EHS*. The annual review will include a review of the following:

- Review all entry permits generated since the last annual evaluation;
- > Review permits for proper completion and certification of hazard elimination;
- Review permits for effectiveness in controlling and communicating hazards; and
- > Review permits for proper close-out, documentation and recordkeeping.

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The review must be documented using Attachment F, or equivalent. Regulations also allow a rolling evaluation within 1 year after each entry (although this may be more difficult to administer) and does not require a review if no entry was performed during a 12-month period. The review will identify entry procedures that did not protect employees participating in entry operations from permit space hazards. Such procedures must be modified for use in subsequent entries as necessary to protect employees. If the reviewers believe this DEP Confined Space Entry procedure should be revised to facilitate hazard control, they must so advise OEHSC.

12 RECORDKEEPING

The Local Program Administrator will retain all canceled entry permits for at least one year to facilitate the annual review of the program.

13 ATTACHMENTS

13.1 Attachment A	Confined Space Inventory
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13.6 Attachment F Annual Review Documentation

ATTACHMENT A

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CONFINED SPACE INVENTORY

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Confined Space Entry Attachment A

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		Confined Spa	ce Inven	itory			: -	
	eau:Div	ision:					-	
Loca	ation/Operation/Workgroup:					·•		
	Name / Location of Space*			Re-Classification Status				
				etion of Evaluation	(record date status attained)			
	-	PRCS	PRCS Atmos- pheric Only	Non- Permit Confined Space - Permanent	Not a Con- fined Space	Alternate Procedure - Date Re- identified (***)	PRCS w/ Procedure for Non- Permit Re- Classifica- tion (****)	
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* 1	int all appears that sould not set utility be			<u> </u>				
	ist all spaces that could potentially be con complete the Classification section only a	•		aa Cualuatia				
*** P	RCS with Atmospheric Only hazard may according the condition of the condit	be reclassified alterna			completing	g reclassificatio	n procedure/	
**** P st el	RCSs w/Procedure for Non-Permit Recla tandard procedure for eliminating all haz limination steps are removed, the space l	assification are those th ards (e.g. by LOTO) so becomes a PRCS agai	the space n. ENTER	e can be reclass DATE PROCEI	iffed as No DURE ES	on-PRCS After	nave a hazard	
Persor	n conducting initial inventory: (Print name	2)			· · · · · · · · · · · · · · · · · · ·			
ynat	ture of person conducting initial inventory	:				Date:		
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NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION	res Manual Environmental, Health & Safety	Confined Space Entry Attachment A Effective Date: 09/28/05	Confined Space Inventory	(Alternate Form)	Division: Location/Operation/Workgroup:	Classification Re-Classification Status	cting	Not a	Permit Con- Procedure - Procedure	Space identified	Permanent							1 is to Il more that control is to a considerate and another terms of the control is to the control in the control in the control is the control in the cont
	Policies and Procedures Manual	Volume III			Bureau : Division:	ID Name / Location of Space*	·0					A Section 1				 The second secon	 7000000	* 1 at all an accept the theory of the first

Complete the Classification section only after completing the Confined Space Evaluation

PRCS with Atmospheric Only hazard may be reclassified alternate entry procedure, after completing reclassification procedure/ recordkeeping requirements. Enter date of reclassification.

PRCSs w/Procedure for Non-Permit Reclassification are those that, under normal conditions are PRCSs but which have a standard procedure for eliminating all hazards (e.g. by LOTO) so the space can be reclassified as Non-PRCS. After hazard elimination steps are removed, the space becomes a PRCS again, ENTER DATE PROCEDURE ESTABLISHED.

ATTACHMENT B

CONFINED SPACE EVALUATION



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•	Е.	•	-	100

- PERMIT REQUIRED CONFINED SPACE
 PERMIT REQUIRED ATMOSPHERIC HAZARD ONLY (POTENTIAL ALT. ENTRY PROC.)
 NON-PERMIT REQUIRED CONFINED SPACE
 NOT A CONFINED SPACE

CONFINED SPACE EVALUATION SURVEY		
BUREAU:		
FACILITY / LOCATION:		
DESCRIPTION OF SPACE: SPACE IDENTIFICATION #: (IF APPLICABLE)		
SECTION 1 - CONFINED SPACE DETERMINATION		
1A Space is large enough and so configured that employee can bodily enter and perform assigned wo 1B The space has limited or restricted means for entry and exit. 1C The space is not designed for continuous employee occupancy. • IF ANSWER TO ALL THREE (3) QUESTIONS IS "YES"THEN SPACE IS A CONFINED SPACE. • IF ANSWER TO ANY OF THE QUESTIONS IS "NO", IT IS NOT A CONFINED SPACE; EXPLAIN & PROCEED		!
SECTION 2 - NON-PERMIT / PERMIT REQUIRED CONFINED SPACE DETERMINATION - POTENTIA	AL HAZARDS	
2A The space contains or has the potential to contain a hazardous atmosphere (check off below) □ Oxygen < 19.5% or > 23.5 % □ Flammable gas, vapor or mist > 10% of its lower explosive limit (LEL) □ Combustible dust > 10% LEL or if visibility is reduced to 5 feet or less □ Toxic atmosphere of any substance capable of causing death, incapacitation, impairment of at	<u>Yes</u> No □ □	!
to self-rescue, injury or acute illness (list): The confined space contains a material that has the potential for engulfing an entrant: The confined space has an internal configuration such that an entrant could be trapped or asphyxia by inwardly converging walls or by a floor that slopes downwards and tapers to a smaller cross sec		
2D The confined space contains any other recognized serious safety or health hazard (check off below		
 Other (describe): IF THE ANSWER TO ANY QUESTIONS IS "YES"THEN SPACE IS A PERMIT REQUIRED CONFINED SPACE IF THE ANSWER TO ALL OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE ANSWER TO ALL OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE ANSWER TO ALL OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO", THEN THE SPACE IS A NON-PERMIT REQUIRED OF THE QUESTIONS IS "NO". 		
SECTION 3 - THE SPACE IS: (and check appropriate box in upper right corner)		
□ Not a Confined Space □ Non-Permit Required Confined Space □ Permit Required □ Permit Required Confined Space – ATMOSPHERIC HAZARD ONLY (Potential to use Alter	ed Confined Space rnate Procedure)	
Survey Conducted By:		
Print Name Signature	Date	_

ATTACHMENT C

 $\begin{aligned} & (x,y,y) = \frac{\mathbf{e}_{x,y}}{2} (x,y) & = -\frac{1}{2} (\frac{1}{2} (x,y) - \frac{1}{2} (y,y)) \\ & = \frac{1}{2} (x,y) + \frac{1}{2} (x,y) + \frac{1}{2} (x,y) + \frac{1}{2} (x,y) + \frac{1}{2} (x,y) \end{aligned}$

CONFINED SPACE ENTRY PERMIT

Confined Space Entry

Responsibilities

(Post with Permit at Space)

Entry Supervisor

- ♦ Must know the:
 - Potential atmospheric and physical hazards of entry.
 - How a hazard enters the body.
 - Signs and/or symptoms resulting from exposure to the hazardous atmosphere.
 - Consequences of exposure to the hazardous atmosphere.
- Verifies that:
 - All tests specified by the permit have been conducted.
 - All procedures and equipment specified by the permit are in place.
 - The appropriate entries have been made on the permit.
- Completes the Confines Space Pre Entry Checklist.
- Signs the verified permit and allows entry.
- Terminates the entry and cancels the permit as required under the permit process.
- Verifies that rescue services are available and can be summoned when needed.
- Determines that entry operations remain consistent with what is written on the permit and maintains these acceptable entry conditions.

Authorized Entrant

- Must know the:
 - Atmospheric and physical hazards associated with entry.
 - How a hazard enters the body.
 - Signs and/or symptoms resulting from exposure to the hazardous atmosphere.
 - Proper use of equipment required under the Confined Space Entry Program.
- Communicates with the authorized attendant as necessary to:
 - Enable the attendant to monitor entrant status.
 - Alert entrants to evacuate the space.
- ♦ Alerts the authorized attendant when:
 - Warning signs and symptoms of exposure to a dangerous situation are recognized.
 - A prohibited condition is detected.
- Exits the permit space as quickly as possible whenever any of the following occur:
 - An order to evacuate is given by the attendant or authorizing person.
 - Warning signs or symptoms of exposure to a dangerous situation are recognized.
 - > A prohibited condition is detected.
 - An evacuation or air monitoring alarm is sounded.

Authorized Attendant

- Must know the:
 - Atmospheric and physical hazards associated with the entry.
 - How the hazard enters the body.
 - Signs and/or symptoms resulting from exposure to the hazardous atmosphere.
 - Consequences of exposure to the hazardous atmosphere.
- Is aware of possible behavioral effects of hazard exposure in authorized entrants.
- Continuously maintains an accurate count of authorized entrants in the space.
- Remains outside the permit space at all times while work is being performed inside until relieved by another authorized attendant.
- Maintains communication with authorized entrants.
- Monitors activities both inside and outside the space to determine whether it is safe for entrants to remain inside.
- Orders evacuation of the space if any of the following conditions occur:
 - A prohibited condition is detected.
 - Behavioral effects resulting from a hazard exposure is detected in any of the entrants.
 - A situation is detected outside the space that could endanger the entrants.
 - The authorized attendant is unable to effectively and/or safely perform all the required duties.
- Summons rescue and/or other emergency services if he/she determines that entrants may need assistance escaping from the space.
- Note: The attendant is not to attempt an entry rescue unless he/she is properly trained in confined space rescue and unless another authorized attendant is present.
- ♦ Does the following when unauthorized persons approach or attempt to enter a permit space while work is going on:
 - Warns the person to stay away from the permit space.
 - If the person has entered, advises him to exit the permit space immediately.
 - Informs authorized entrants and the authorizing person that an unauthorized person has entered the permit space.
- Performs or assists in non-entry rescues as specified by the Confined Space Program, but only if trained to do so.
- Does not perform any duties that might interfere with his/her primary duty of monitoring an protecting the entrants.

CONFINED SPACE ENTRY

PRE ENTRY CHECK LIST

The Pre Entry Check List should be reviewed by the entry supervisor prior to initial entry.

- 1. Are confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry?
- 2. Are all lines to a confined space, containing inert, toxic, flammable, or corrosive materials valved-off and blanked or disconnected and separated before entry?
- 3. Are all impellers, agitators, or other moving parts and equipment inside confined spaces locked-out if they present a hazard?
- 4. Is either natural or mechanical ventilation provided prior to confined space entry?
- 5. Are appropriate atmospheric tests performed to check for oxygen deficiency, toxic substances and explosive concentrations in the confined space before entry?
- 6. Is adequate illumination provided for the work to be performed in the confined space?
- 7. Is the atmosphere inside the confined space frequently tested or continuously monitored during conduct of work? Is there an assigned safety standby employee outside of the confined space, when required, whose sole responsibility is to watch the work in progress, sound an alarm if necessary, and render assistance?
- 8. Is the standby employee appropriately trained and equipped to handle an emergency?
- 9. Is the standby employee or other employees prohibited from entering the confined space without lifelines and respiratory equipment if there is any question as to the cause of an emergency?
- 10. Is approved respiratory equipment required if the atmosphere inside the confined space cannot be made acceptable
- 11. Is all portable electrical equipment used inside confined spaces either grounded and insulated, or equipped with ground fault protection?
- 12. Before gas welding or burning is started in a confined space, are hoses checked for leaks, compressed gas bottles forbidden inside of the confined space, torches lighted only outside of the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is to be taken into the confined space?
- 13. If employees will be using oxygen-consuming equipment-such as salamanders, torches, and furnaces, in a confined space-is sufficient air provided to assure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume?
- 14. Whenever combustion-type equipment is used in a confined space, are provisions made to ensure the exhaust gases are vented outside of the enclosure?
- 15. Is each confined space checked for decaying vegetation or animal matter which may produce methane?
- 16. Is the confined space checked for possible industrial waste which could contain toxic properties?
- 17. If the confined space is below the ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?

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Yes/No

Yes/NR

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V	olume III		Confined Space En Attachment C	try		Revision: 1 Effective Date: 09/28/05
		. C o	onfined Space Entry	Permit	Permit	# ***
A.) Ins	tructions: Follow all pr					
	n:			-	-	
	otion:				Commod Sp	
	ate/Time: / / :				me· / /	· AM/PM
	of work (i.e., inspection					
	upervisor:				14	THE PARTY OF THE P
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	zea rittendant(s).		Aumorr	zea Entran	ıts:	
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	Sections B	, C, D, E, F	& G to be filled out by a	qualified I	Entry Supervis	or
B.) Acti	ivities that may produ	ce hazaro	dous conditions – Ar	iswer Yes,	No or NR (1	Not Required)
Circle		Circle		Circle	4 4 5	
Yes/No	Welding	Yes/No	Solvent Use	Yes/No	Painting or C	oating
Yes/No	Open Flame	Yes/No	Electrical Tool	Yes/No	Disassembly	Process
Yes/No	Brazing	Yes/No	Electrical Work	Yes/No	Equipment or	Piping
Yes/NR	Other					
	cial Requirements – A	inswer Ye	s, No or NR (Not Re	quired)	1 1 1	
Circle		Circle	Yes	Circle		•
Yes/No	Secure Area	Yes/No	Purge, Flush & Vent	Yes/No	Lines Capped	or Blanked
Yes/No	Lock out/De-Energize			Yes/NR	Other:	
D.) Equ	iipment Checklist – Ai	nswer Yes	s, No or NR (not requ	ired)		
Circle		Circle		Circle		
Yes/No	Tripod and winch	Yes/No	Hard Hats	Yes/No	Explosion Pro	oof Lighting
Yes/No	Harness	Yes/No	First Aid Kit	Yes/No	Ventilation fa	ns & flex hoses
Yes/No	Ladder	Yes/No	Fire Extinguisher	Yes/No	Barriers	
Yes/No	Scott Pak	Yes/No	Escape Pak	Yes/No	Traffic Cones	
Yes/No	"People Working" signs	Yes/No	Air Monitor	Air Moni	tor Calibration 1	Date:
Yes/NR	Other Personal Protective	Equipment:			•	

Emergency Rescue Service and Phone # (if not 911):

Radio or other means of outside communication:

Emergency response procedure to be followed:

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		DEP	ARTMENT O	F ENVIRONM	IENTAL PROT	TECTION		
Policies a	and Procedures M	lanual					Environmental, Healt	h & Safety
Volum	ie III			ned Space I tachment			Revision: Effective Date:	1
						Po	ermit #	
				•			Date:	
	ed Air Monito					. 1,	and the file	:
Locatio	n dependent 1	required ai	r monitor	ing (circle	applicable	e) Cl _{2,} Hg	, Other	
Acceptable	Air Levels		4.	4.5			et e e	
Oxyg Hg <	gen 19.5% to 23.5 0.025 mg/m3, Oth	%, LEL <10% her:	6, Hydrogen	Sulfide < 10	ppm, Carbon	n Monoxide	<35 ppm, Cl ₂ < 0.5 p	ρm,
Initial Air m	nonitoring mus	st be perforn	ned prior t	o every en	try. Monito	or all item	s listed in order li	sted &
Time	or readings. Us	se other c	column for	an additio	nal parame	ter.		
i unc	Location opening	Oxygen	LEL	H2S	CO		Other	Initials
	halfway			·	·			
	bottom			 .			· · ·	
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NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

	DEPARTMENT OF ENVIRONMENTAL PROTEC	TION
Policies and Procedures Ma	anual	Environmental, Health & Safety
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		Permit #
		Date:
F.) Reclassified Space De	termination/Certification (ONLY FOR – c	heck one):
this space have bee	Procedure Space: I certify that all non-atmost en eliminated and, as our monitoring and inspecton alone will control any atmospheric hazard	ection data demonstrate,
procedures (referen space have been eli	ce – Temporary Reclassification: I certify the ced above or attached) have been followed an iminated. This space is now temporarily reclared safe for work (until hazard elimination managed).	nd all hazards within this assified as a non-permit
Certify below only if the sp	pace has been reclassified	
Entry Supervisor Name	Signature	Date
any atmospheric testing result is	ously with gas detection device set at audio alarm for the s outside Permissible Exposure Limits (PEL) and cannot ernate Entry. If the air monitor alarm sounds while in t	ot be reduced/controlled by ventilation.
G.) PRCS Entry Authoriz	zation and Close-out (Note: If space reclass	sified above, skip Section G.)
Entry Authorization:		
Entry Supervisor Name	Signature	Date
The above signature is required are completed and all persons in	after initial air monitoring test and certifies that all pro- the work crew are trained, equipped, and physically ca	visions for safe entry into a confined space apable of performing the assigned work.
Entrant(s) will monitor continuo	ously with gas detection device set at audio alarm for th	ne duration of confined spaced work.
Entry Close-out:		
If work is completed or the becomes apparent, this per	re is a change in atmospheric conditions that mit is no longer valid and immediately exit th	is unacceptable or a new hazard e space.
Entry Cancelled By:	Time:	Date:
Reason:		
Note all problems encounte	ered during entry operations.	

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	d Space Entry achment C	Revision: 1 Effective Date: 09/28/05
		Permit # Date:
H.) Entry / Exit Log (POST AT ENTRY) RE-ENTER Name for EACH ENTRY/EXIT)		
Name of Entrant	Time of Entry	Time of Exit
<u>-</u>		
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						Date:	
	LY for sequentia e been complete					where a complete permit (Se	ections A
E.) Air Mon	nitoring Requ	irements (c	ircle all applica	ble) O ₂	LEL H ₂ S	CO Cl ₂ Othe	er
Acceptable .	Air Levels						•
Oxygen 19.5%	to 23.52%, LEI	_<10%, Hydi	rogen Sulfide	< 10 ppm,	Carbon Mono	xide $<$ 35 ppm, $Cl_2 < 0.5$ ppr	n, Other:
						all items listed in order nonitor for an additional	
Time	Location opening	Oxygen	LEL	H2S	co	Other	Initials
	halfway						
	bottom						
					 		
	:						

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	ARMENIA						
				<u> </u>			·
G.) PRCS E	ntry Authori	zation (Ret	urn to ma	in permit	for Close-o	ut documentation)	
Entry Autho	orization:						
Entry Supervise			Signature			 Date	
are completed a	and all persons in	the work cre	w are trained,	equipped, a	nd physically	ovisions for safe entry into a capable of performing the as- the duration of confined space	signed work.

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ADDITIONAL WORKSHEETS FOR SEQUENTIAL SEWER ENTRIES
--

Note: Use ONLY for sequential sewer entries by the SAME crew on the SAME day where a complete permit (Sections A through H) have been completed for sewer entry with SAME hazards/precautions.					
H.) Entry / Exit Log (POST AT ENTR	RY)				
(RE-ENTER Name for EACH ENTRY/EXIT)					
Name of Entrant	Time of Entry	Time of Exit			
٤					

ATTACHMENT D

CONFINED SPACE RECLASSIFICATION CERTIFICATION

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Revision:	_1
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Space Name:			Date:
Space Location:			Space ID No. (if applicable):
The following actions for eliminated. These action	rm the basis for determining that all hazard s must be verified complete prior to reclass	s identified o	n Confined Space Evaluation Survey have bee his confined space to Non-Permit Required.
Potential Hazard	Description		nination Method (List or Attach)
Example: Inundation	Potential for water to fill the from main water supply pipes to fill the clarifier with water.	chem 2 Close 3 Pump	and lockout chemical feed pump and ical feed shutoff valve. and lockout inlet Valves 1 and 2 out clarifier to Sludge Tank and lockout Sludge Outlet valve.
۷			
space can be edemonstrate, for the latest procedures (all within this space).	Entry Procedure Space: I certify the eliminated and, as data from at least forced air ventilation alone can context Space — Permanent Reclassificate pove or attached) have been implemented have been permanently eliminate a non-permit space unless new hazar	1 PRCS entrol atmosphine: I certifiented, are parted. This	ntry permit (attach permit) heric hazards in this space. If that hazard elimination permanent and all hazards space is now permanently
□ Non-Permi (or attached) h temporary bas be temporarily	t Space – Temporary Reclassificate ave been found to reliably eliminate is, until the work is complete and the reclassified as a non-permit space of or are introduced.	tion: I certice all hazard	ify that the procedures above Is within this space on a are removed. This space can

Signature of Certifying Individual

ATTACHMENT E

NON-PERMIT REQUIRED CONFINED SPACE WORK FORM (USE IS VOLUNTARY OR BY BUREAU INSTRUCTION)

The following the street of the first transfer of the Alberta

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NON-PERMIT Required Confined S	Space Entry Air	r Monitoring Log
--------------------------------	-----------------	------------------

Start Date/	n: Fime <u>: / /</u>	: AN	 И/РМ			ne <u>: / / ; AM/</u>]	DN #
Nature of w	vork (i.e., inspe	ction, repai	r. mainten:	ance):	<i>Date</i> / 1111	C. / / . Alvi/1	<u>PIVI</u>
Attendant:_			,	· · · · · · · · · · · · · · · · · · ·		, , , , , , , , , , , , , , , , , , , ,	****
Entrant(s):_							
Required A	Air Monitoring	g - O ₂ LEL	, CO, H ₂ S				
Location d	ependent requ	ired air m	onitoring (circle ann	licable) (Cl _{2,} Hg, Other	
Acceptable	Air Levels			(on ove ubb	neuble) C	, 11g, Other	
Охуд	gen 19.5% to 23.59	%, LEL <10%	6, Hydrogen	Sulfide < 10	ppm. Carbo	n Monoxide <35 ppm, Cl ₂ < 0	5 nnm
Hg <	0.025 mg/m3, Oth	ner:					
Initial Air n	nonitoring must	t be perforn	ned prior to	every ent	ry. Monit	or all items listed in order	listed &
record thine	or readings. Us	se "otner" c	olumn for	an addition	ıal parame	eter.	
Time	Location	Oxygen	LEL	H2S	CO	Other	Initials
	opening , halfway						
	bottom		,				
							
				·			
							
							
					·····		<u></u>
							
							
<u>-</u>							
			 .				
							
Vote problen	ns or issues enc	ountered di	uring entry	operation	o.		
Note problen	ns or issues enc	ountered d	uring entry	operation	·		

ATTACHMENT F

ANNUAL REVIEW

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CONFINED SPACE ENTRY PROGRAM

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Confined Space Entry Attachment F

Revision: 1
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1						
			Annua	l Review of	Confined Space Entry Program	
Facili	ty/Oper	ating Div	ision Covered:			
Addre						
Yes	No	N/A				
			ally (or on an ongoi	ng basis):		
			Reviewed all entry	permits genera	ted in the last 12 months since the last annual evaluation y were generated over the last 12 months).	ı (OR evaluated
					oletion and certification of hazard elimination.	
					s of the procedures and equipment used in controlling a	nd communicating
			Reviewed permits	for proper close	-out, documentation and recordkeeping.	
					trants/supervisors with current training/certifications.	
Resul	ts of an	nual rev			strator and Bureau EHS:	
			Identified entry pro hazards after an en	cedures that did try and procedur	I not protect employees participating in entry operations res were revised in response (before the annual review).	from permit space
			Identified entry pro hazards during the	cedures that dic annual review.	d not protect employees participating in entry operations	from permit space
			Procedures must be and verify complet	e modified for u	se in subsequent entries as necessary to protect employe	es (identify actions
أت				endations for rev	vision of DEP Confined Space Entry procedure to facilit	ate hazard control,
By sig	of Evalu		tify that I participated		on required in 29 CFR 1910.146(d)(14) and documente	d above.
Evalu Local		m Admir	nistrator (Print)		(Sign)	
Burea	u EHS	Represei	itative (Print)		(Sign)	
			iring Revised Proce		Follow-up To Verify Action Item Comp	letion
Space	/Locatio	n	Assigned to:	Target Date	How Completed/Disseminated to Entry Supervisors	Date Completed
	:					
		<u>·</u>				-
l have lan	followed ations o	l-up with f f alternati	those assigned to cor ve approaches have	nplete the recor been completed	lete After All Action Items Closed Out): mmended action items and have verified that they are all (attach explanations, if necessary). Date:	complete or

APPENDIX S

FALL PROTECTION PLAN

1. Fall Protection

1.1 Purpose

The purpose of this program is to develop, implement, enforce and maintain a system that creates 100% fall protection for our employees that work in an environment <u>six feet</u> or higher off of the ground or when hazards below <u>six feet</u> dictate enforcement at lesser height. By providing our employees with a fall protection system that guarantees 100% protection, we believe that our employees work efforts can be maximized and used as efficiently as possible.

1.2 Applicable Regulations

OSHA 29 CFR 1926,500-503

1.3 Responsibilities

1.3.1 Project Management shall:

- Provide the most feasible form of fall protection when a fall hazard 6 feet or greater exists;
- Exposure engineering controls to eliminate fall hazards completely before instituting the use of fall protection systems;
- Write a fall protection plan (according to details outlined in this program) when conventional fall
 protection systems are infeasible or crease a more serious hazard to workers;
- Purchase fall protection equipment or ensure the construction of fall protection systems meet the requirements of this program;
- Ensure personal fall arrest systems are used properly; and
- Train employees in topics identified in this program.

1.3.2 Employees shall:

- Use all fall protection systems according to the direction of their immediate supervisor;
- Inspect their personal fall arrest systems for damage or wear before every use; and
- Remove any damaged, defective or worn personal fall arrest equipment from service.

1.4 Procedures

1.4.1 Guardrail Systems

- Standard rail will consist of:
 - Top rail 42 inches plus or minus 3 inches. When wire rope is selected it shall be at least ¼ inch and shall be flagged at 6' intervals with high visibility material such as caution ribbon;
 - Mid-rails must be installed half way between top edge of guardrail and the walking/working surface; and
 - Toeboard must be minimum 1 x 4" lumber or equivalent.
- When wood railings are used, the posts shall be at least 2-inch by 4-inch lumber spaced not more than 8 feet apart on centers; the top rail shall be at least 2-inch by 4-inch lumber; the intermediate rail shall be at least 1-inch by 6-inch lumber;

- When pipe railings are used, posts, top rails, and intermediate railings shall be at least 1-1/2 inches nominal diameter (schedule 40 pipe) with posts spaced not more than 8 feet apart on centers;
- When structural steel railings are utilized, posts, top rails and intermediate rails shall be at least 2-inch by 2-inch by 3/8-inch angles, with posts spaced not more than 8 feet apart on centers;
- Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within 2 inches of the top edge, in any outward or downward direction, at any point along the top edge;
- A maximum allowable deflection in the system will not exceed 3-inches;
- Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing;
- Duplex nails are not allowed in the construction of handrails and
- When guardrail systems are used at access ways and hoisting areas, a chain, gate or removable guardrail section shall be installed.

1.4.2 Safety Nets

- Safety nets shall never be relied upon as a sole form of fall protection;
- Nets are designed to provide fall arrest under or around an elevated surface such as a bridge or steel structure, and are typically used on projects that are long-term nature unless other means of protection is impractical;
- The following criteria must be met when using nets:
 - Place nets as close to the work as possible, and not more than 30 feet below the work surface;
 - Install nets so the weight does not come into contact with any lower surface when dropped;
 - Extend the net outward from the outermost projection of the work surface as follows:

Distance Below Work Surface	Projection Distance
Up to 5 feet	8 feet
5 to 10 feet	10 feet
Over 10 feet	13 feet

- Mesh openings shall not exceed six (6) inches by six (6) inches;
- All scrap material that may have fallen into the net shall be removed as soon as possible to help ensure a fallen employee's protection;
- Nets shall be drop tested, using a 400 lb bag of sand dropped from 42 inches above the highest working surface that employees would be exposed to a fall, on the following occasions:
- Immediately after installation;
- Prior to beginning work in the area;
- After relocation;
- Following any repairs; or
- At six month intervals if left in one place.
 - A copy of the test results shall be maintained at the jobsite;
 - If it is unreasonable to perform a test drop, a designated competent person may certify its compliance with the standards;

- The compliance certificate must include the identification of the net and its installation, date
 it achieved compliance and the signature of the competent person. This certification must be
 located at the jobsite;
- Due to the potential liabilities involved with the certification process, all safety nets installed shall be certified by an independent engineer or drop tested;
- All defective nets shall be immediately removed from service;
- A border rope for webbing capable of withstanding a minimum breaking strength of 5,000 pounds must be used;
- Connections shall be as strong as the integral net components and not spaced greater than six
 (6) inches apart; and
- All nets will be inspected on a <u>weekly basis</u> and documented, for wear, damage or other deterioration, and after any occurrence that could affect the integrity of the net.

1.4.3 Warning Line System – <u>Low slope roofs only!</u>

- Warning line systems can be an effective restraint method for working on elevated slabs or roof;
- Warning lines should be set up around the work are and be a minimum of six (6) feet back from any unprotected or leading edge;
- Lines should be 36" high and flagged every six feet to ensure visibility. They should withstand a minimal side load to avoid tipping over; and
- Access shall be a path formed by two warning lines leading to the work area.

1.4.4 Safety Monitoring System – <u>Low slope roofing only!</u>

- On roofs 50 feet or less in width OSHA allows a designated employee to serve as a monitor where fall protection is not feasible.
- A safety monitoring system will NOT be used without Safety Director approval; and
- If approved, a detailed, written, site specific, Fall Protection Plan will be developed.

1.4.5 Covers

- Covers will be placed and labeled "open hole" on any holes in walking/working or road surfaces that present fall hazards;
- Covers will be capable of supporting, without failure, at least twice the maximum weight of
 employees, materials and equipment; and
- Holes in roadways will be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.

1.5 Personal Fall Arrest Systems

1.5.1 General

- All personal fall arrest equipment shall be inspected <u>prior to use</u>;
- Any damaged, defective or worn equipment must be removed from service;
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service; and

• The project must provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

1.5.2 Full Body Harness/Lanyards

- Approved full body harnesses are to be used when a personal fall arrest system must be used. Note: the only exception is for lineman performing power transmission work. Refer to OSHA 1926.959 for specific requirements;
- All lanyards shall be shock absorbing with a locking type snap hook. The anchorage point must be able to withstand a load of 5,000 pounds; and
- The attachment point of the body harness shall be located in the center of the wearer's middle of the back near the shoulder level, or above the wearer's head.

1.5.3 Self-Retracting Lifelines (Yo-Yo's)

- Self-retracting lifelines when used will be inspected prior to use by the supervisor or designated competent person responsible for the fall protection system;
- The supervisor will ensure the anchorage and use will not injure the worker due to a "pendulum" effect. The anchorage point must be able to withstand a load of 5,000 pounds; and
- The manufacturer must inspect self-retracting lifelines annually and they must provide certification of testing. Self-retracting lifelines shall be inspected prior to use for damage and for proof of annual inspection.

1.5.4 Horizontal/Vertical Lifelines

- Lifelines shall be designed, installed, and used, under the supervision of a designated qualified person and maintain a safety factor of at least two;
- Lifeline systems will be engineered by a qualified engineer prior to use and should consider at a minimum:
 - The number of personnel tied to the lifeline;
 - The size of wire rope to be used. It shall be a minimum 7 x 19-3/8" galvanized aircraft cable. This should provide adequate protection for 2 people using deceleration devices;
 - Distance between anchorage points (slack);
 - Obstructions, permanent material, etc. which may cause injury should a person fall;
 - Emergency rescue in case of a fall; and
 - Synthetic rope may only be used for vertical applications prior to selection: exposures to UV rays, extreme weather, abrasion activities and type of work to be performed (i.e. hot work) can all degrade the rope to an unsafe condition and must be considered.

1.5.5 Ladder Climbing Safety Devices and Rope Grabs

- These devices are attached to a vertical line and allow protection during climbing operations;
- They can either be synthetic or wire rope. Models that require hand manipulation are unacceptable; and
- Where a lanyard is incorporated in the system, the device must always be overhead to limit fall distance.

1.6 Fall Protection Plan

1.6.1 General

- A fall protection plan will be instituted for leading edge work \ that make conventional fall protection systems infeasible or create a greater hazard;
- The plan will be site specific and developed and maintained, up-to-date, by a qualified person;
- Any changes to the plan will be approved by a qualified person;
- A copy of the plan will be maintained on the jobsite;
- A designated competent person will implement the plan;
- In the event an employee falls or a near miss occurs during the use of a safety monitoring system, an inspection will take place to identify the cause of the accident; and
- Modifications will be made to the plan to prevent similar occurrences.
- It is possible to fall over 12 feet, when using a 6 foot lanyard, if improperly positioned and the harness is loosely worn.

1.6.2 Components

- The plan will detail the measures taken to protect employees from fall hazards;
- The plan will detail why conventional fall protection systems are infeasible or create a greater hazard to workers;
- The plan will detail why a safety monitoring system or a controlled access zone is the only feasible means of fall protection; and
- The plan will identify safety monitors or employees designated to work in controlled access zones.

1.7 Training

Each employee must be trained in:

- The recognition of fall hazards;
- Proper procedures for erecting, maintaining, disassembling and inspecting of fall protection systems they will use;
- The role of employees in the fall protection plan (including safety monitoring systems if used); and
- OSHA requirements regarding fall protection.

Retraining will be provided when:

- · Conditions change;
- New types of fall protection equipment are used; and
- There is a reason to believe that a trained employee does not have the understanding or skill to meet these requirements, (<u>fails to comply</u>).

1.7.1.1.1 Fall Protection Work Plan Sample # 2 - Instructions

Why do I need a fall protection work plan?

- Falls from elevation are a major cause of injuries in the construction industry.
- OSHA Regulations require you to evaluate your worksite to identify fall hazards.
- You must then eliminate or control the fall hazards you identify.
- If fall hazards of 6 feet or more exist, you must provide a written plan which identifies:
 - All fall hazards in the work area
 - o The methods you and your employees will use to eliminate and control them
 - Correct procedures for assembly, maintenance, inspection, and disassembly of fall protection systems used
 - o Correct procedures for handling, storage, and securing of tools and materials
 - The method of providing overhead protection
 - o The method for prompt, safe removal of injured workers
 - o Training methods for the employees working on the jobsite
- The fall protection work plan must be specific to the work site
- The fall protection work plan must be available on the work site for review
- The documentation of training must be available on the work site for review

How do I write the plan?

- Use the attached template to assist you
- Have a "competent employee" complete the template to make it work site specific
- Customize the template as needed by adding missing information and/or deleting unnecessary information
- NOTE: The plan form and individual site plans <u>must</u> accurately describe the conditions at your worksite and the methods you will use. A compliance officer will, in addition to ensuring that your plan contains all the required elements, determine if it describes what you actually do. If it does not, you may be subject to citation and monetary penalty!

1.7.1.2 Fall Protection Work Plan

1.7.1.3 Fall Hazard Identification and Protection Selection Worksheet

On the table below, identify each fall hazard of 6 feet or more that exists or will exist during this construction project and then select the protection method from the options identified below the table.

√	1.7.2 Hazard Type	General Location(s)	Fall Protection Method	Overhead Protection Method
	Roof > 4/12 Pitch			
	Roof < 4/12 Pitch			
	Skylight Openings			
	Roof Openings			
	Floor Openings			
	Window Openings			
	Open-sided Floors			
	Decks			
	Balconies			
	Leading Edge Work			
	Mobile Lift Work			
	Excavation Edges			
	Grade Drop-Offs			
	Other			

Fall Protection Methods:	Select a fall protection method from the list below	for each home did	
implementation instructions	for the method(s) used are located elsewhere in thi	is document	Assembly and
Standard Guardrails	Fall Arrest Harness	E-11 D	75. 1.

Warning Line System

Fall Arrest Harness

Fall Restraint Harness/Belt

Safety Net

Cover or Hatch

Warning Line & Safety Monitor

Positioning Belt – Rebar work

Other:

Overhead Hazard Protection Methods: For each overhead hazard identified, specify the method(s) of protection for workers below. Refer to the "Overhead Protection" Section of this plan for any special installation instructions.

Hard Hats Required
Overhead Hazard Signs
Debris Nets
Toe Boards on Guardrails

d	Screens on Guardrails	*
Signs	Barricade to Control Access to Area	
	Other:	
ardrails	Other:	
4. 2.		

Fall Protection System Assembly and Maintenance

Fall protection systems will be assembled and maintained according to manufacturer's instructions when using a manufactured system. A copy of those instructions is available <u>on-site</u> for reference. Any fall protection system used will meet OSHA regulations. Assembly and maintenance instructions unique to this worksite such as components, placement of systems, anchor points, areas where systems are particularly subject to damage, etc., are specified below.

Standard Guardrails must:

- Be 39" to 45" above the work surface at top rail with midrail and toe board.
- Be able to withstand 200 pounds of pressure on the top rail in any direction.
- Not have significant deflection.

Be inspected regularly for damaged or missing components.

Note: A guardrail does not protect a person standing on a ladder, box, or other surface above the work surface.

Post Material:	Rail Material:		·
Post Spacing (8' max):	Anchor Method:		
Other Instructions:			
 Fall Arrest Harness: Must have anchor points capable of withstandin limits fall to 2 feet, in which case a 3000 pound Free fall may not exceed 6 Feet'. A lower level may not be contacted during a fall Lifelines must be placed or protected to prevent Snap hooks may not be connected to each other Inspect components for deformation, wear, and 	ng a 5000 pound shock unless anchor point may be used. l. abrasion damage. or to loops in webbing		on device in use
System Component List:			
Anchor Point at this worksite:			
Can Can Can Can Can Can Can Can Can Can			
Other Instructions:			
 Positioning Belt: Employees must not be able to fall more than 2 f The anchorage must be able to sustain 4 times th Snap hooks must not be connected to each other, 	eet.	en November	
System Component List:			
Anchor Point at this worksite: Other Instructions:			

Fall Restraint Harness/Belt:

Anchor points:

- Must withstand 4 times the intended load.
- Must always prevent a free fall from the work surface. (Several alternate anchor points may be necessary to achieve this requirement.)
- Inspect components for deformation, wear and mildew.

		•	
System Component List:			9 9 9 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Anchor Point at this worksite:			•
Configuration and placement sketch attached?	Yes	No	
Other Instructions:			
Safety Nets must: Be installed within 30 feet vertically of the Extend out from the outermost projection Must be tested or certified to withstand a 4 Mesh at any point must not exceed 36 squ Inspect weekly for mildew, wear or damage A person falling into the net cannot contact any of	e work surface. of the work surface 400 pound object drare inches with the lage and remove any o	as specified below. opped from the highest work largest opening being 6 inche	es side to side.
System Component List:			
Anchor Point at this worksite:	•		
Maximum Fall Distance from Work Surface to Ne	t:	Feet	
Distance from Outer Edge of Net to Outermost Ed Up to 5' Fall = 8 Feet 5' to 10'	ge of Work Surface Fall = 10 Feet	: > 10' Fall = 13 Feet	
Configuration and placement sketch attached?	Yes	No	
Other Instructions:			
 Covers or Hatches must: Be able to support twice the weight of emptwice the maximum axle load of the larges Be secured to prevent accidental displacen Be marked with the word "Cover" or "Holl 	ployees and equipment of vehicle that would ment.	ent that would be on it at the	same time <u>or</u>
Material to use:			
Other Instructions:			

Warning Line Systems must:

- Block access to all fall hazards in the work area.
- Be placed 6 feet back from the edge.
- Be made of rope wire or chain between 39" and 45" above the surface height.
- Be flagged at 6 foot intervals
- Be attached to stanchions such that pulling on one section of chain will not take up slack in the other sections.
- Have stanchions that are able to withstand a 16-pound force applied horizontally at 30" high.

System Component List:			
Configuration and placement sketch attached?	Yes	No	
Other Instructions:		· · · · · · · · · · · · · · · · · · ·	
 Controlled Access Zones must: Meet the "Warning Line System" requirements following when employees work between the following when employees work between the two that was a competent person designated as "Mode of the work of the	e fall hazard are conitor" who "Monitor". oyees in the co	ontrol zone directing employees regarding fall hazane control zone (all of whom also wear him)	·de
This system is not to be used in adverse weather con		-	
Monitor(s):			
Control Zone Employees:			
		·	
Other Fall Protection System: Provide a descriptio operated, inspected, and maintained, including specif	n of how the sications for ma	system is to be assembled, disassembled, aterials to be used in its construction:	

Emergencies and Injuries:			
First Aid Trained Employee(s) On Site:	:		
Name:	Title:	:	A Company of the Comp
Name:		<u> </u>	
First Aid Kit Location(s):			
Nearest Medical Facility:			
Emergency Services Phone Numbers:	•		•
Medical: Fire	e:	Police:	NA CONTRACTOR OF THE STATE OF T
Location of Nearest Telephone:			Markette de la Contraction de
site to facilitate lowering the injured worke			
- ·	ovisions of this plan and ha	ave been trained in the	proper use of the fall they understand the
Employee Training: All employees must be instructed on the proprotection equipment involved. By signing	ovisions of this plan and ha	ave been trained in the	proper use of the fall they understand the
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FALL PROTECTION

FALL PROTECTION TRAINING GUIDE FOR EMPLOYEES

APPENDIX T

WELDING AND CUTTING SAFETY RULES

Welding and Cutting Safety Rules

- 1. Always follow the manufacturer's recommendations for setting up and operating equipment, selection of tip size, and gas cylinder-operating pressures.
- 2. Always use a regulator to reduce gas cylinder pressure to the operating pressures recommended by the equipment manufacturer. All piping and equipment must meet the standards of the Compressed Gas Association.
- 3. Always ensure that all connections are leak tight. Each time connections are loosened and retightened each connection should be checked with a soap and water-solution (oil free soap). Do not check with a flame.
- 4. Before "lighting up" clear out each line by letting a small amount of gas flow (separately) to remove any mixed gases that might be in the lines.
- 5. Never use defective, worn or leaky equipment. Repair it or take it out of service.
- 6. Never use acetylene in excess of 15-psi pressure. Higher pressures with acetylene are dangerous. If the cylinder is not fitted with a hand wheel valve control, any special wrench required must be placed on the cylinder while the cylinder is in service. On manifolds, one wrench for each manifold will suffice.
- 7. Always have an appropriate fire extinguisher in good operating condition readily available when operating welding or cutting equipment.
- 8. Never perform welding, cutting, brazing, or heating operations in a poorly ventilated area. Avoid breathing fumes from these operations at all times, particularly when zinc, cadmium, or lead coated metals are involved.
- 9. Never perform welding or cutting operations near combustible materials (gasoline cans, paints, paper, rags, etc.).
- 10. Always protect yourself, others present, welding hoses, gas cylinders, and flammable materials in the area from hot slag and sparks from the welding and cutting operations.
- 11. The welder and spectators must always wear goggles to protect the eyes from injurious light rays, sparks and hot molten metal during welding, cutting, and heating operations. Eye protection must comply with the established ANSI Standards. Welding screens should be used wherever possible.
- 12. Always wear clean, oil free clothing during welding and cutting operations.

 Protect the hands with leather welding gloves to avoid burns from radiation and

- hot molten slag. Low cut shoes and trousers with cuffs or open pockets should not be worn.
- 13. Never use a match or cigarette lighter to light a cutting or welding torch. Always use a spark igniter. Fingers are easily burned by the igniting gas when a match or cigarette lighter is used.
- 14. Ensure that the material being welded or cut is secure and will not move or fall on anyone.
- 15. Never use a welding, cutting, or heating torch on a container that has held a flammable liquid. Explosive vapors can accumulate and linger in closed containers for extended periods of time.
- 16. Never use a regulator for gasses other than those for which it was designed for by the manufacturer since the diaphragm and seat materials may not be compatible with other gasses.
- 17. Never attempt to adapt and use a fuel gas or inert gas regulator on an oxygen cylinder. A special protective device is incorporated on the oxygen regulator to harmlessly dissipate the heat caused by the recompression when the cylinder valve is quickly opened. Such a protective device is not furnished on fuel gas and inert gas regulators.
- 18. Never tamper with the safety devices on cylinders, fuse plugs, safety discs, etc. and do not permit torch flames or sparks to strike the cylinder.
- 19. Always refer to the various gasses by their proper names. (Do not refer to oxygen as "air" or acetylene as "gas".)
- 20. All cylinders, particularly acetylene and Oxygen, should be restrained securely in an upright position to prevent accidents. A non-vertical position for an acetylene cylinder in use would allow the discharge of acetone through the regulator and into the cutting torch, clogging the mixer passages and creating a fire hazard. It would reduce the efficiency of the flame and contaminate the weld area. It also can cause voids in the porous material inside the cylinder, which can lead to acetylene explosions.
- 21. Store all gas cylinders not in use away from excessive heat sources, such as stoves, furnaces, radiators, the direct rays of the sun, and the presence of open flames. Cylinders in storage should always be **secured** in an upright position.
- 22. Keep all burning or flammable substances away from the oxygen or fuel gas storage area (at least 20 feet) and post "No Smoking" signs.

- 23. Upon completion of a welding, heating, or cutting operation immediately inspect the surrounding areas for smoldering embers. Allow at least one half hour to elapse before leaving the area and conduct another thorough inspection just before leaving. Also alert other personnel of fire possibilities.
- 24. Always have the properly fitted wrench to fasten a regulator to a cylinder. Never tighten the regulator by hand.
- 25. Always leave the fuel gas cylinder valve wrench in place when the cylinder valve is open so that it can be closed quickly in an emergency. Do not open acetylene valves more than one-quarter (1/4) turn.
- 26. Before connecting a regulator to a gas cylinder, open the cylinder valve for a moment. Called cracking the cylinder valve, this will blow out any foreign material that may have lodged in the valve during transit. Do not stand in front of the valve when "cracking".
- 27. After attaching a regulator to a gas cylinder, be sure the regulator adjusting screw is fully released (backed off in a counter clockwise direction so that it swivels freely) before the cylinder valve is opened. Never stand in front of a regulator when you are opening a cylinder valve.
- 28. Always open the cylinder valve slowly so that gas pressure will build up slowly in the regulator (particularly in the oxygen cylinder). Quick opening of the cylinder valve causes a build up of heat due to recompression of the gas. When combined with combustible materials, ignition and explosion may result.
- 29. If a leak develops in a fuel gas cylinder that cannot be stopped by closing the valve, immediately place the cylinder outside of the building away from possible fire or ignition sources in a location that is free from wind currents that might carry the gas to an ignition source.
- 30. Never attempt to mix gasses in a cylinder or fill an empty one from another (particularly oxygen cylinders). Mixture of incompatible gasses and/or heat caused by recompression of the gas or gasses may result in ignition and fire. Only the owner of a cylinder may mix gasses in it.
- 31. When a gas cylinder is ready for return to the supplier, be certain the cylinder valve is closed to prevent internal contamination and the shipping cap is in place to protect the cylinder valve. Identify empty cylinders properly.
- 32. Never use oxygen or other gasses as a substitute for compressed air in operation of air-operated tools, blowing off parts, or for ventilation purposes. The only exception to this rule is where oxygen is used to blow out port passages and talcum powder or dust from welding hoses when setting up new or old "dusty" equipment.

- 33. Do not attempt to do your own repair on welding equipment. Equipment that is improperly repaired can cause leaks and other hazardous conditions. Qualified repair personnel must perform repairs.
- 34. Never repair welding hose with tape. Use of tape and many hose splices can reduce the pressure to the torch and can cause hazardous conditions. Welding hose must meet the specifications of the Compressed Gas Association.
- 35. Use the shortest length of hose possible. Longer hoses require higher gas pressures and can be hard to handle.
- 36. Never use oil or grease on any part of welding or cutting equipment and never let it come into contact with oil or grease. This includes gas cylinders, workbench, regulators, torches, tips, threads on bottles, and clothes that are worn, such as jackets, gloves, and aprons. Oxygen and oil or grease can cause explosions and fire.
- 37. Never use a hammer on the valve cover caps to loosen them. Use a piece of wood to soften the impact and prevent sparks and damage to the cap.
- 38. When moving gas cylinders always roll them on their bottom edges or in a cart designed for their movement. Sliding or dragging them or rolling causes excessive wear and may weaken their walls by metal erosion. Slings and electromagnets are not authorized when transporting cylinders.
- 39. Never use cylinders as rollers to move material. Do not let them bump into each other or let them fall.
- 40. Fuel gas and liquefied fuels must be stored and shipped valve end up.
- 41. Do not hammer on any cylinder. Do not tamper with the relief valves. If you have trouble, contact the supplier for assistance.
- 42. Suitable eye protection must be worn for all welding and cutting operations.
- 43. Cylinders must be secured. Valves must be closed when unattended and caps must be on the cylinders when the regulators are not on the cylinders.
- 44. Cylinders must be upright when they are transported in powered vehicles.
- 45. All cylinders with a water weight of over 30 lbs. must have caps or other protection.
- 46. All fuel gases must be used through a regulator on cylinder or manifold.

- 47. Compressed gas cylinders must be upright except for short periods for transportation.
- 48. Repair work on gauges and regulators must be done by qualified personnel.
- 49. Only 4 inches of hose per foot may be covered with tape. Defective hoses must be removed from service.
- 50. Oxygen must not be used for ventilation.
- 51. Oxygen regulators must be marked "Use No Oil". Regulators and fittings must meet the specifications of the Compressed Gas Association.
- 52. Union nuts on regulators must be checked for damage.
- 53. Before removing a regulator, shut off cylinder valve and release gas from regulator. Equipment must be used only as approved by the manufacturer.
- 54. Caps must be on cylinders unless they are transported on a special carrier.
- 55. Hot warnings on materials are required.
- 56. Fire is the biggest hazard in welding. The area should be cleared for a radius of 35 feet. Fire shields should be used. The area should be monitored for 30 minutes or more after end of work to ensure there is no delayed ignition.
- 57. Proper personal protective equipment must be worn by all welders and assisting personnel.
- 58. All welding personnel should be advised of the hazards from heating zinc, lead, cadmium, and any other substances that could cause health problems from the welding activity.

(The following apply to arc welding)

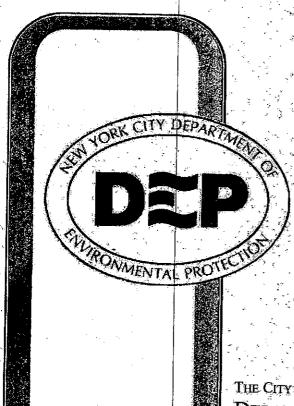
- 59. Chains, wire ropes, hoists, and elevators must not be used to carry welding current.
- 60. Leather capes should be used for overhead welding.
- 61. The neck and ears must be protected from the arc.
- 62. Conduits with electrical conductors in them must not be used to complete a welding circuit.
- 63. Welding shields must be used to protect other workers from injurious light rays.

- 64. Welding leads must be inspected regularly for damage to insulation. Only proper splicing will be authorized. There should be no splices in stinger lead within 10 feet of the stinger and the leads should never be wrapped around the body.
- 65. A designated, competent person must inspect welding equipment and gas cylinders.

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66. Output lugs on welders require the protective boots to be in place.



THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL, HEALTH & SAFETY POLICIES AND PROCEDURES

Vol. III Hot Work

Health and Safety Coordination Committee Approval

The New York City Department of Environmental Protection's Health and Safety Coordination Committee has reviewed this document and by the Chair's signing below agree that it adequately defines the program necessary to address regulatory requirements for their Bureau/Office operations and commit to the policies and/or procedures contained within (or substantially equivalent procedures, if Bureau/Office specific amendment is required and it is approved by the Health and Safety Coordination Committee).

Revision / Action		Signature of Co	mmittee Chair		.	
Revision 0, Authoriz	ation C	(_ Date:	11/26/03	
Revision L. Authori	zation	Turky	Phay	_ _ Date:	12/24/04	
Revision2, Authori	zation	AL Wille	CIH CIH	_ Date:	8/10/06	
REvision3, Authorf	zation	Mewale	, cth	_ Date:	1/22/07	
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DEP Office of Environmental, Health and Safety Compliance Authorization

I, a duly authorized representative of the DEP Office of Environmental, Health and Safety Compliance, have reviewed this document, have found it to be acceptable and authorize its use for all DEP operations.

Revision / Action	9	<u>Signature</u>			
Revision 0, Authoriz	ation June	Q. Mely	Date:	11/26/03 Ca	
Revision1, Authoria	ration Axent	200	Date:	12/28/04 00	
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Revision3, Authoriz	ation Crus	Den	Date:	1/22/07 Can	
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Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Hot Work

Revision: 3 Effective Date: 1/31/07

1 Purpose

Processes that generate sparks or a significant heat source are considered "Hot Work." The purpose of this procedure is to minimize the potential for a damaging fire, explosion or exposure to hazardous materials above permissible limits during or after Hot Work activities by providing appropriate safeguards and a written Hot Work Permit (HWP) procedure and meeting the requirement of OSHA welding, cutting and brazing regulations (29 CFR 1910 Subpart Q and 1926 Subpart J) and NFPA 51B (which is incorporated by reference into the OSHA regulations).

2 Scope

All DEP employees and Contractor personnel performing work within a DEP facility that involves welding, grinding, metal cutting, flame cutting, flame-thawing pipe, or similar activities that generate sparks or a significant heat source must obtain a HWP as required by OSHA regulations (29 CFR 1910.252(a)(2)(iv)) and NFPA 51B Section 5.3.1. They must take all necessary precautions to prevent unintentional ignition of combustible materials within the work area.

Contractors may use their own Hot Work Permit only if they are working in an area with no active DEP operations which has been cleared by the DEP facility *Responsible Individual* and released to the Contractor. The Contractor is fully responsible for regulatory compliance in these areas in accordance with the DEP Contractor Safety procedure and all applicable contractual and legal requirements. In all other cases, DEP employees and Contractor personnel performing Hot Work within a DEP facility shall obtain a DEP HWP in accordance with this procedure. This procedure also defines responsibilities for meeting the other requirements of 1910 Subpart Q - Welding, Cutting, & Brazing (29 CFR 1910. 252 to 255) pertaining to welding equipment design and operation and 1926 Subpart J - Welding and Cutting (e.g., 29 CFR 1926, 350 to 354).

3 Definitions

Approved - listed or approved by a nationally recognized testing laboratory. Refer to 1910.155(c)(3) for definitions of listed and approved, and 1910.7 for nationally recognized testing laboratory.

Designated Area - Permanent location designed or approved for Hot Work operations to be performed regularly.

Hot Work - Any work involving burning, welding, grinding, or similar operations that are capable of initiating fires or explosions.

NFPA - National Fire Protection Association.

Operating Bureau Designee (OBD) – Individual designated by an Operating Bureau to coordinate with the PAI in the case where the PAI is not employed by that bureau.

Permit (Hot Work Permit) - A document issued by the authority having jurisdiction for the purpose of authorizing performance of a specified activity.

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Permit Authorizing Individual (PAI) - The individual designated by management to authorize hot work.

Welder and Welding Operator - Any operator of electric or gas welding and cutting equipment.

Welding and Allied Processes - Processes such as arc welding, oxy-fuel gas welding, open-flame soldering, brazing, thermal spraying, oxygen cutting, and arc cutting.

4 Responsibilities

4.1 Bureau EHS

Bureau EHS personnel have the following responsibilities:

- Provide support to the *Responsible Individuals* of facilities and field operations involving Hot Work to ensure that all such activities are performed safely and in accordance with this DEP procedure.
- > Provide technical support for those performing Hot Work.
- Evaluate and designate areas designed and approved for hot work, when appropriate.

4.2 Responsible Individual

The highest ranking manager or supervisor within each DEP Bureau at each facility (or whose employees perform field operations outside of fixed facilities) is the *Responsible Individual* for that Bureau's operation. [Note: Procedures issued before November 2006 refer to this individual as the Responsible Manager]. If a Bureau is working in a facility "owned" by another Bureau, all other Bureau *Responsible Individuals* must coordinate with the owning Bureau's *Responsible Individual* and provide him or her with information regarding the Hot Work Permit procedure. The *Responsible Individual* has the following responsibilities:

- With Bureau EHS support, ensure that Hot Work is performed in accordance with OSHA regulations and that Hot Work permits are used in accordance with this procedure when appropriate.
- Communicate the location-specific hazards of Hot Work (e.g., flammables and combustibles present in vessels, piping, etc.) and DEP's requirements to employees and contractors to ensure that employees and contractors are aware of this program's requirements and the hazards.
- Ensure that all DEP facility cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the Hot Work process. Ensure that welders have the appropriate Certificate of Fitness from FDNY, when required. [Also see note below for structural welding requiring certification.]

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- Ensure that when Fire Watch personnel are required and provided, they are fire extinguisher trained, and familiar with how to sound an alarm in the event of a fire and other emergencies.
- Ensure that Fire Watch personnel have an appropriate Certificate of Fitness from FDNY, when required.
- Designate a "Permit Authorizing Individual" (PAI) who has received DEP Hot Work training to properly identify the hazards inherent in Hot Work, to confirm that required hazard mitigation measures are in place before the start of work and to authorize Hot Work operations by completing the HWP.
- Designate a DEP "Operating Bureau Designee" (OBD) who is familiar with facility operations and hazards in the work area to coordinate with the PAI, in the case where the PAI is not employed by that bureau.

The Responsible Individual may delegate some or all of the above tasks to qualified DEP staff (e.g., to the EHS Liaison or other staff), as appropriate.

NOTE: Rules of the City of New York (RCNY) Title 2, §25-01(2) No person shall perform welding work on any structural member of a structure without having obtained a certificate of qualification from the Board of Examiners for Welders.

4.3 Supervisors Overseeing Hot Work

When work activities performed by DEP employees involve Hot Work, the Supervisor responsible for overseeing this work is also responsible for obtaining a HWP in accordance with this procedure. The DEP Supervisors overseeing Hot Work operations are also responsible for:

- > Providing cutting or welding equipment (in accordance with 29 CFR 1910.252 to 255) in safe condition.
- > Being familiar with the safe operation of equipment and the Hot Work procedure.
- Recognizing when a particular job or work practice may result in **Hot Work** activities and initiating the **HWP** procedure as required.
- > Determining that the cutter or welder has secured approval that conditions are safe before going ahead.
- > Requiring that fire protection and extinguishing equipment be available at work sites, as needed for Hot Work.
- > Requiring that fire watches be available, as required per Section 5.4 of this procedure (29 CFR 1910.252(a)(2)(iii)(A)).

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4.4 Permit Authorizing Individual

The Permit Authorizing Individual (PAI) is designated by management to authorize the hot work activities and must not be the person conducting the Hot Work. Responsibilities of the PAI include:

- > Conducting site inspections to verify that safeguards are in place and authorizing Hot Work operations by issuing a HWP, when required.
- Identifying site-specific flammable materials, hazardous processes, or other potential fire hazards that are present or likely to be present in the work location.
- Requiring that affected process equipment and piping have been evacuated, cleaned, purged, disconnected and/or blanked (when applicable) in accordance with Lockout/Tagout procedures prior to initiation of Hot Work.
- Requiring the protection of combustibles from ignition by the following means:
 - 1. Moving the work to a location that is free from combustible materials.
 - 2. If the work cannot be moved, moving the combustibles to a safe distance or properly shielding the combustibles against ignition.
 - Scheduling Hot Work so that operations that could expose combustibles
 to ignition are not begun during Hot Work operations.

If the criteria (1) (2) and (3) above cannot be met, hot work shall not be performed.

- > Requiring that fire protection and extinguishing equipment are available and properly located at the site.
- > Requiring that a fire watch is at the site, if needed.
- > If the PAI is not employed by the Operating Bureau, ensuring that the *OBD* completes the "Acknowledgement of Coordination by the OBD" section of the HWP, or the hot work may not be performed.
- > Completing the Hot Work Permit, including the Required Precautions Checklist.
- Disallowing any Hot Work that cannot be supported by the Permit or Precautions Checklist.
- Where a HWP is issued but a fire watch is not required, making a final check 30 minutes after the completion of Hot Work operations to detect and extinguish smoldering fires.
- Dobtaining all HWPs at the completion of the Hot Work and maintaining them for a minimum of 30 days.
- Documenting deficiencies when HWP daily revalidation is not acceptable and stopping the hot work until the deficiencies are corrected.

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If the *Responsible Individual* authorizes a PAI who is not a DEP employee, that PAI must meet the PAI requirements in Section 6 and must understand the DEP Hot Work procedure. Any PAI not employed by the DEP operating Bureau where work is conducted, must consult the *OBD* identified by the *Responsible Individual* before issuing a HWP.

4.5 Person Performing Hot Work

The hot work operator shall handle equipment safely and use it as follows so as not to endanger lives and property:

- Dobtain a HWP from the PAI before starting Hot Work operations.
- > Use all required PPE, welding screen/shields, and ventilation necessary.
- Examine all equipment to ensure it is in a safe operating condition. If it is found to be unsafe, the equipment must be repaired by qualified personnel prior to its use or withdrawn from service.
- > Cease all Hot Work operations if an unsafe condition develops and immediately notify the Responsible Individual or the area supervisor and notify the PAI for reassessment of the work area.
- > Post the approved HWP at the work location for the duration of the Hot Work activities.

4.6 Fire Watch

The Fire Watch is responsible for:

- Attending required fire extinguisher training, having a current Certificate of Fitness from FDNY (when required), and being knowledgeable about the Hot Work procedure requirements and the use of fire suppression equipment.
- > Being familiar with all potential fire hazards that may be present in the Hot Work area.
- > Reviewing the specific requirements outlined in the permit and verifying that the HWP is approved and the daily revalidation is current.
- Requiring that suitable fire extinguishing equipment is maintained in a state of readiness for instant use at the worksite. The equipment may include pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.
- > Extinguishing, or attempting to extinguish, all incipient-level fires.
- > STOPPING Hot Work if unsafe conditions develop.
- Maintaining constant observation of the Hot Work activities and the adjacent areas to detect the presence of fire or to detect the possibility of ignition

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sources coming into contact with fuel sources. The Fire Watch shall not be involved in the work process or in assisting the craftsperson.

- Being knowledgeable about the facility's policies and procedures regarding the use of fire fighting equipment (i.e., extinguishers, fire hoses) and reporting and responding to emergencies.
- Remaining in the affected areas at all times while Hot Work is in progress and for the period required following completion of the work to detect and extinguish any smoldering fires.

4.7 Operating Bureau Designee (OBD)

The Operating Bureau Designee (OBD) is the individual from the DEP operating Bureau designated by the Responsible Individual to coordinate with the PAI in cases where the PAI is not employed by that bureau (e.g., where the PAI is a consultant, contractor or employee of another bureau) and is working in an area not completely turned over to the contractor for construction. The OBD is briefed by the PAI on the nature and extent of the hot work to be performed and is responsible for:

- > Checking all applicable listed functioning systems and or equipment that contractors are not in control of in the "Acknowledgement of Coordination" section of the permit.
- Advising the PAI of any process-related hazards of which the OBD is aware that are not apparent to someone from outside the operation by visual inspection of the area.
- Completing the Acknowledgement of Coordination section of the HWP, if appropriate.

4.8 Contract Supervisor

The Contract Supervisor is the person responsible for managing and overseeing the Contract. The Contract Supervisor is assigned by the Bureau management based on the type, scale and phase of the project (e.g., Project Manager, Construction Manager, Resident Engineer, Chief, Deputy Chief, etc.). The Contract Supervisor shall:

- Ensure that all contractors performing hot work or PAI services are provided with a copy of this procedure and submit a completed Contractor Certification (Attachment G).
- > Obtain the Responsible Individual's authorization for any PAI needed for the construction who is not employed by the DEP operation.
- Enforce the DEP Hot Work requirements, including the outside PAI consultation with the OBD.

5 Procedure

All Hot Work must be conducted in accordance with the Hot Work procedure and relevant regulatory requirements. Hot Work at DEP facilities must be performed in either

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designated areas or permit-required areas. Hot Work is allowed only in areas that are or have been made fire safe.

5.1 Permanent Designated Hot Work Areas

Bureau EHS will conduct an evaluation to designate a permanent specific area that is designed or approved for Hot Work in accordance with 1910.252(a)(2)(xiii)(A) and NFPA 51B, such as a maintenance shop or a detached outside location that is of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. No HWP is required in an area designated as a permanent Hot Work area and maintained as such. (Note: while this is not explicit in the regulations, it is implicit in 1910.252(a)(2)(xiii)(B) which states "Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes").

Bureau EHS or a designee will evaluate and document all areas to be designated as "Permanent Hot Work Areas" (see Attachment D). Bureau EHS or a designee must be knowledgeable about the applicable regulations and the hazards of Hot Work and be able to determine appropriate administrative and engineering controls (e.g., ventilation, shielding, and screens) required for each specific location. Local exhaust or general ventilation must be provided and arranged in the proposed Permanent Hot Work Area to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in 29 CFR 1910.1000 prior to approval (see Section 5.7 for additional information regarding the use of ventilation). A copy of the completed approval form must be maintained by Bureau EHS and the Responsible Individual for record keeping as long as the area is in use.

The walls of welding booths must have a non-combustible finish that offers low reflectivity in order to prevent exposure to glare and ultraviolet light emitted from welding arcs. Welding screens must be used as appropriate. The Hot Work area must be suitably segregated from other work areas (e.g., a separate room or an area identified with appropriate signs).

Fire-extinguishing equipment must be immediately available and accessible within the designated area.

Individuals performing hot work in a designated area must check to confirm that it is free of combustible and flammable materials before beginning their hot work.

An annual inspection of the Permanent Hot Work Area must be conducted to ensure the space continues to meet all requirements of this Hot Work procedure and any special requirements noted on the completed Designated Hot Work Area Evaluation (Attachment D). The inspection is to be conducted by a supervisor or PAI knowledgeable in this procedure and the hazards of hot work. To ensure all controls previously identified remain in place, the person performing the annual inspection must review the completed Designated Hot Work Area Evaluation form prior to performing the inspection. The inspection must be documented using Attachment E (Designated Hot Work Area Annual Inspection) or equivalent.

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5.2 Temporary Designated Hot Work Areas

Temporary designated hot work areas may be established at any one location during projects requiring Hot Work activities expected to last longer than (7) days (i.e. a construction site) under the following conditions:

- A temporary designated hot work area must be established by means of the same evaluation as described in Section 5.1 for a Permanent Hot Work Area with the exception that it will be identified as temporary and the expiration date will be identified on the Designated Hot Work Area Evaluation form (Attachment D).
- The boundaries of the temporary designated hot work area must be clearly identified and delineated.
- If combustibles are introduced into any such temporary designated hot work area, they must be immediately removed in order for the designation to remain valid or a Hot Work Permit must be obtained.
- > If the Hot Work activities last for longer than 1 year, then the area will be subject to annual inspections as described in Section 5.1.

Note: If hot work must commence immediately and Bureau EHS is unable to accommodate a request to designate an area as a Temporary Hot Work Area within an acceptable time frame, the PAI may complete Hot Work Permits (Attachment A) as described in Section 5.3 below for up to seven (7) days at a time until Bureau EHS is able to evaluate and designate the area as a Temporary Hot Work Area.

5.3 Hot Work Permits in Non-Designated Areas

All welding, grinding, flame cutting, flame-thawing pipe, or similar activities that generate sparks or a significant heat source in DEP facility areas not specifically designed and designated for Hot Work shall require a Hot Work Permit (Attachment A) to be completed prior to commencing the work. The decision tree in Attachment B can be used to determine if a HWP is necessary. Outside of designated areas, a separate permit must be issued by a PAI for each area where Hot Work is to be performed in a DEP facility in accordance with the following procedure.

- 1. Prior to any Hot Work activities, a PAI must coordinate with the worker performing the hot work (or the supervisor if more than one worker) to review the job, identify any special hazards and precautions required, inspect the work area preparation, verify conditions are safe to initiate work and complete the HWP. The work area inspection/preparation must include, but not be limited to:
 - Where practicable, relocating all combustibles at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles must be protected with flameproofed covers or otherwise shielded with metal or fire resistant guards or curtains. (1910.252(a)(2)(vii));

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- Protecting or shutting down ducts, conveyor systems, and augers that might carry sparks to distant combustibles;
- Cleaning or removing combustible waste, debris, spills, dust, etc.;
- > Protecting cables, pipes, ducts or equipment in the work area;
- Purging and venting pipes, vessels or other equipment that will be worked on that may have flammable, combustible or potentially reactive residues:
- > Covering, shielding, or otherwise protecting combustible materials and open wall or floor penetrations;
- > Providing supplemental ventilation in areas of potential accumulation of compustible or flammable liquid vapors or gases;
- Evaluating combustible or flammable liquid and gas use, storage, or dispensing activities during Hot Work; and
- Conducting atmospheric testing for the presence of flammable gases (if applicable).
- 2. After all requirements are met to the PAI's satisfaction, the worker performing the hot work (or the crew supervisor) shall review the permit and sign the acknowledgement section of the HWP. The PAI approves the HWP by signing and dating it, authorizing the Hot Work to commence.
- 3. Post the approved HWP at the work location where it must remain for the duration of the Hot Work.
- 4. If performing revalidation of the HWP, a PAI must review the HWP, inspect the work site to verify that the work-site still meets all requirements, and coordinate with the OBD to confirm that conditions reflected in the Acknowledgement of Coordination have not changed. If requirements are met, the PAI must complete one re-validation line in the HWP.

Note: Hot Work Permits are issued for a period of time not to exceed seven (7) days. The permit may be valid for work for a period of twenty-four (24) hours at a time. After each twenty-four (24)-hour period, the permitted area must be inspected by a *PAI* to confirm that the existing controls, safety precautions, and conditions of the HWP are acceptable for continued Hot Work. The permit is then re-validated by a *PAI* for another twenty-four (24) hours.

Permit validation may be necessary at a more frequent interval in areas requiring enhanced fire safety oversight or deemed by a *Supervisor* to be dynamic. These areas must be identified and all requirements documented on the **HWP** at the time the permit is issued.

5. If the HWP daily revalidation is not acceptable, the PAI must document deficiencies in the "Comments" column and stop work until deficiencies are

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corrected and he re-inspects the area, verifies that the work-site meets all HWP requirements and signs the re-validation line.

5.4 Fire Watch Requirements

At times, the welding, cutting, and/or heating operation(s) can be such that normal fire prevention precautions are not sufficient. A fire watch with extinguishing equipment suitable to the combustible hazard is required whenever Hot Work is being performed in locations where other than a minor fire might develop. The decision tree in Attachment C can be used to determine if a Fire Watch is necessary. A Fire Watch is required whenever any of the following conditions exist:

- > Torch work being performed in New York City.
- > Combustible materials are closer than 35 feet to the point of the Hot Work;
- Appreciable combustibles are more than 35 feet away but are easily ignited by sparks (this includes combustibles at ANY distance if located below the work area);
- > Openings in walls or floors expose combustible material in adjacent areas; or
- Whenever combustible materials are adjacent to partitions and can be easily ignited due to the transfer of heat or other ignition sources.

A fire watch is not required for grinding in a designated hot work area or where sparks cannot reach combustible materials.

When required, fire watches must watch for fires in all exposed areas and be positioned where all areas can be observed, including those above, below, and adjacent to potential ignition sources. This may require the use of more than a single fire watch. Other duties cannot be assigned to the fire watch while he is performing fire watch duties.

If welding is to be done on a metal wall, partition, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. Where combustibles cannot be relocated on the opposite side of the work, an additional fire watch person must be provided.

In the event of a fire, fire-watch personnel must report the fire in accordance with the Facility Emergency Response procedures and attempt to extinguish an incipient fire with the available fire-extinguishing equipment. Following the conclusion of the work, fire watches must be maintained in all areas affected by Hot Work for a period of 30 minutes. After this time, fire watch personnel must inspect the area and, if there are no signs of smoldering or fire, sign and date the HWP. In New York City, a second inspection is required after an additional 30 minutes (RCNY Title 3, 25-01(j)(2)(vi) and 38.1-01(i)). If the work is completed, fire watch personnel will remove the HWP from the work site and return it to the PAI who issued the permit.

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5.5 Welding Equipment and Operating Requirements

The Supervisor overseeing oxygen fuel gas, are or resistance welding and cutting work must ensure that all welding/cutting equipment used meets the relevant OSHA regulations (29 CFR 1910.253 to 255 and 1926.351 to 354) including requirements for storage, marking, operation, maintenance, training, safety, etc.

5.6 Personal Protective Equipment

Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected by personal protective equipment in accordance with the requirements of OSHA 1910 Subpart I. For PPE selection and hazard assessments, refer to the DEP Personal Protection Equipment procedure.

5.7 Ventilation for General Welding and Cutting

Determining ventilation requirements is the responsibility of Bureau EHS for permanently designated areas and the responsibility of the PAI for temporary designated areas and for work requiring a HWP. Natural ventilation may be adequate in open areas and mechanical ventilation may be necessary in others. OSHA regulations (29 CFR 1910.252(c), 1926.353, ANSI Z49.1 - 1967 Safety in Welding and Cutting published by the American Welding Society standard, etc.) define several ways for providing minimum ventilation required; however, employers must also recognize when working conditions require additional measures to maintain worker airborne contaminant exposures below the allowable levels specified in 29 CFR 1910.1000.

5.8 Special Considerations

Hot Work not only creates potential fire hazards but often results in other potential health and safety hazards. Therefore, workers dealing with confined spaces, surface coatings, storage vessels and or containers during Hot Work must be aware of any additional hazards that may result from their work.

5.8.1 Confined Spaces

The following precautions shall be implemented in confined spaces:

- The DEP's Confined Space Procedure must be used to determine other conditions/permits required for work in the space.
- Adequate ventilation must be established and maintained for both welding fume control and other atmospheric hazards associated with the confined space.
- Sas cylinders must remain on the outside of the space and must be secured to prevent unexpected movement.
- A personal retrieval system must be used in accordance with the Confined Space Entry procedure.

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Torches and hoses must be removed from the space when not in use.

5.8.2 Combustible Atmospheres

Air testing is required only when there is a possibility of combustible atmospheres within a 35-foot radius of Hot Work activities or when Hot Work will take place in a Confined Space. If air testing reveals the presence of combustible gases greater than 10% of the Lower Explosive Limit (LEL), no Hot Work will be allowed until the area has been ventilated and subsequent air testing demonstrates that the hazard has been abated. Continuous air monitoring is required if the potential for a combustible atmosphere remains. Air testing must take into account that some gases are lighter than air and will rise (i.e., ammonia, hydrogen, and natural gas), and that others are heavier than air and will sink (i.e., propane, hydrogen sulfide). Such factors must be considered and incorporated into testing procedures to provide for more accurate measurements.

5.8.3 Motor Vehicle Repair

Motor vehicle repairs involving Hot Work may be performed in a designated Hot Work Area to eliminate the need for a HWP; however, all hot work must be performed following procedures contained in the Vehicle Repair Safe Work Practices in Attachment F.

5.8.4 Prohibited Activities

Hot Work activities shall not be performed:

- > In unauthorized areas;
- > In buildings requiring sprinklers, whenever sprinkler systems are inoperable or impaired;
- ➤ In the presence of combustible atmospheres or whenever there is a potential for a combustible atmosphere to occur except as provided in Section 5.8.2;
- ➤ In proximity to large quantities of exposed, readily ignitable materials such as baled paper, chemical products, or cloth (rag) storage;
- On used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors; or
- On hollow spaces, cavities or containers until they have been vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

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5.8.5 Hot Work Outside DEP Facilities

Construction work conducted outside of active DEP operating facilities is subject to the OSHA construction standard (29 CFR 1926 Subpart J for Hot Work) or, for additional details not covered in that standard, applicable technical portions of American National Standards Institute, Z49.1-1967, Safety in Welding and Cutting (applicable by reference). The construction standard has similar requirements for welding equipment operation but it differs in not specifically requiring "authorization" for Hot Work. The Fire Prevention regulations (29 CFR 1926.352) do call for similar types of protections as the general industry standards, although in less detail.

DEP will apply reasonable prudence in conducting field construction hot work. Cold cutting operations (e.g., using a hack saw) will not require a HWP or special precautions unless conducted in a confined space or in areas with odors or other signs of natural gas or flammable vapors.

Individuals performing hot work with a flame or non-flame welding equipment must be qualified, follow applicable regulations (29 CFR 1926 Subpart J) and apply the concepts of the HWP to safeguard the work. A HWP is not required for field construction welding outside DEP facilities unless conducted in a confined space or in areas with odors or other signs of natural gas or flammable vapors.

If the work is conducted in a confined space, with little natural or mechanical ventilation, or if there is the potential for the presence of flammable vapors or other significant fire/explosion hazards, DEP's Confined Space Entry procedure must be followed and a HWP is recommended to ensure that these hazards are comprehensively evaluated and controlled.

5.8.6 Contractors and Hot Work Authorized by PAI Not Employed by the Operating Bureau

All contractors performing hot work or PAI services shall be provided with a copy of this procedure and shall submit to the DEP Contract Supervisor a completed Contractor Certification (Attachment G) that indicates they have received and understood the DEP Hot Work program and will communicate the requirements to all of their employees performing or authorizing hot work.

As described above, construction hot work in areas fully turned over to contractors for construction can be completed under the contractors hot work program and HWP. Otherwise, DEP's hot work program and HWP shall be used.

A Responsible Individual may authorize a PAI who is not employed by the DEP operation if he receives documentation that the PAI meets the requirements in Section 6. In this case, the Responsible Individual must also designate a DEP "Operating Bureau Designee" (OBD) who is familiar with plant operations and hazards in the work area to coordinate with the PAI.

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Any PAI from outside the DEP operation must consult and coordinate with the OBD identified by the Responsible Individual before issuing a HWP. The OBD must check all applicable listed functioning systems and or equipment that contractors are not in control of in the "Acknowledgement of Coordination" section of the permit and should advise the PAI of any process related hazards of which he is aware that are not apparent to someone from outside of the operation by visual inspection of the area. If the PAI is not employed by the Operating Bureau, a HWP shall not be issued without OBD acknowledgement.

6 Training

Employees whose work requires them to conduct Hot Work activities, perform fire watch duties, or supervise such work must receive training that will provide them with the understanding, knowledge, and skills necessary for performing their work safely. Within New York City, Welders (specifically flame welding) and Fire Watches are required to have a current Certificate of Fitness. Refer to the Certificate of Fitness procedure for additional information regarding Certificates of Fitness.

A PAI must have either:

- A Certificate of Fitness for Torch Use or Fire Watch and have thoroughly reviewed the DEP Hot Work procedure and be knowledgeable about its requirements; or
- Successfully completed DEP's course on Hot Work.

Note: Plasma cutters and are welders are not required to have a FDNY Certificate of Fitness.

7 Recordkeeping

The PAI will maintain all HWPs for a minimum of 30 days after the completion of the Hot Work. A copy of the completed evaluations of Permanent Hot Work Areas must be retained by Bureau EHS and the Responsible Individual as long as the area is in use for hot work.

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Hot Work Permit

Attachment A

Hot Work

	•	DEPART	MENT OF E	NVIRONMENTA	L PROTECTION	,
Polic	ies and Procedures M	anual			Ei	nvironmental, Health & Safety
Vo	lume III	7		ork Permit hment A		Revision: 3 Effective Date: 1/31/07
L. dy i	1	Hot	Vork Perm	it Job Informa	tion	
	ame:	· · · · · · · · · · · · · · · · · · ·	- :	Loca	ation of Hot Work:	
Permit Au	thorizing Individual:	i			Pl	none:
Permit Issu	ued (Date) pires (Date)		_ (Ti	me)	AM/PM	· · · · · · · · · · · · · · · · · · ·
Femilie Exp	ones (Date)		_ , (11	me)	AM/PM	
Type of ho	t work to be used (So	arce of ignition):	☐ Grinding☐ Welding		☐ Cutting ☐ Heating	☐ Brazing or Soldering ☐ Other
PPE to be I	Used by Person Perfor	ming Hot Work:	<u></u>			
Describe th	e Hot Work Job and I	Materials to be W	orked on: _	5		
Any specia	I hazards and/or speci	al precautions to	he taken			
					, , , , , , , , , , , , , , , , , , ,	
			· · · · · · · · · · · · · · · · · · ·			
Fire Wat	ch Required?	Yes	No .	Nu	mber of Fire Watch	es Required:
1	Acknowledge	ement of Permit	Review by	Person Perfor	ming Work or Crev	y Supervisor
understand valid only s any change	the work to be perfor so long as work condi- in work area condition	med and my resp tions existing at t ons which adverse	onsibilities, he time of is ely affects sa	The person(s) property of the person of the	performing the hot we change. They will sto erson(s) performing t	this Hot Work Permit and I fully ork understand that this permit is op the work and notify the PAI of he work are adequately trained in the ed, have a Certificate of Fitness.
Worker/Su	pervisor:	* * * * * * * * * * * * * * * * * * *		Signature:		
COMPANY	ин сац.	1 .	` `		Date:	3
71	हारू पूर्व हुए। 	Permit Author				-
hazardous c	onditions which may	not be obvious.	and verified	that the person	performing (or direc	bout flammable materials or itly supervising the crew work is not permitted)
Signature:		· (Date:	me above: (11110, not	work is not permitted)
_		ork Permit area			are complete Unau (Completion return permit to the PAL
Acknow	ledgement of Coord	ination Operation	ig Bureau I	<i>leu operuuons:</i> Designee (□ N <i>A</i>	V - PALis employed	by the Operating Bureau)
I understand this hot wor	i the nature and locati k permit: □ Sprinkler.	on of the hot wor fire suppression	k to be perf systems in t	ormed on this p he area are ope	permit and, as applica rational (if applicable	ble to the work performed under c); □ DEP operations personnel in or shut down (if applicable), □ All
appropriate Signature:	process equipment/pi	ping has been pu	rged, discon	nected and blan	nked in accordance w	ith Lockout/Tagout procedures.
oignature.	Final	Inspection (Fire	Watch: or	Date: PALIFNa Fire	Watch Was Requi	rod).:
I completed	final inspection at the	required times a	ifter comple	tion of Hot Wo	rk and observed no s	igns of smoldering or combustion.
Signature:	• .		· ·	Date:	r	ime:
	eriore Programme	Hot V	Vork Exce	eding 1 day	- Verification of	Acceptable Conditions
Day	PAI Signature	Date/Time	Acceptab Yes N	ole Final In	isp./	Comments
2			1			, <u>, , , , , , , , , , , , , , , , , , </u>
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Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Hot Work Permit Attachment A

Revision: 3 Effective Date: 1/31/07

	Required Brewnflorts Gheddist
Ir	spect work area and confirm that applicable precautions have been taken in accordance with NFPA 51B
(by	PAI After Coordination With & Setup By Person Performing Hot Work; initially and when revalidating):
	All sprinkler and/or other fire suppression systems in the Hot Work Permit area operational.
	Cutting/welding equipment in good repair, free of damage or defects.
	Persons conducting hot work have certificates of fitness from fire department, when required.
· 🔲	All facility employees or other parties that may be potentially affected by the hot work have been notified.
	REQUIREMENTS WITHIN 35 FEET OF WORK (HORIZONTAL & VERTICAL)
	Flammable liquids and combustible dust/lint/oil deposits/trash removed or shielded with fire-retardant material.
	Flammable vapor sources removed or flammable vapor properly tested and found to be well below the LEL. List readings:
	Combustible flooring properly wetted, wet sanded or shielded.
	Combustible walls, ceilings, partitions or roofing properly shielded.
	Covers under work to keep sparks from lower levels and shielding/partitions to protect passer-by.
	WORK ON WALLS OR CEILINGS
	Combustibles have been moved away from opposite side. (If no, hot work is not permitted)
	No combustible covering, interior (for sandwich-type panel) or other combustible content.
	Danger from conduction of heat to adjacent rooms eliminated.
	WORK ON ENCLOSED EQUIPMENT (Tanks, Containers, Ducts, Dust Collectors, etc.)
	All duct and conveyor systems properly protected or shut down.
	Equipment is cleaned of all combustibles, flammable vapors, liquids, or dusts. (If a flammable vapor source, conduct vapor monitoring)
	FIRE WATCH
	Required for the following: (1) NYC torch work (2) Combustibles within 35' (3) Combustibles >35', but easily
·	ignited, (4) Wall/floor openings expose adjacent/concealed combustibles, (5) Conduction through metal can ignite other side (6) Potential for more than a minor fire.
	Charged, inspected, operational fire extinguishers of an appropriate type are present.
	Fire Watch trained in extinguisher and emergency alarms (fire alarm, telephone, or radio).
	OTHER PRECAUTIONS
	Work in a confined space requires Confined Space Entry Permit prior to hot work permit approval.
	Is continuous atmospheric monitoring, smoke detection or heat detection warranted?
	Ample ventilation exists or provisions made for continuous ventilation to remove smoke/vapor from work area
	Process equipment/piping purged, disconnected and blanked in accordance with Lockout/Tagout procedures.
	Do conditions require Re-Validation more than every 24 hr? (circle one) 12 hr 8 hr Other:

HOL WORK

Attachment B

Hot Work Permit Decision Tree

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION Policies and Procedures Manual Environmental, Health & Safety Hot Work Permit Decision Tree Volume III Revision: Attachment B Effective Date: 1/31/07 **Hot Work Permit Decision Tree** (Source NFPA 51B 2003, Fig. A.5.3) Is there an acceptable Complete job without hot alternative to hot work? work. No hot work permit is needed. No. Can hot work be performed Examine designated area in a designated area? then complete hot work Yes there. No hot work permit is needed. No Is the proposed work to be Hot work and permit are not performed in a authorized. nonpermissible area? Yes

Hot Work

Attachment C

Fire Watch Decision Tree

Policies and Procedures Manual

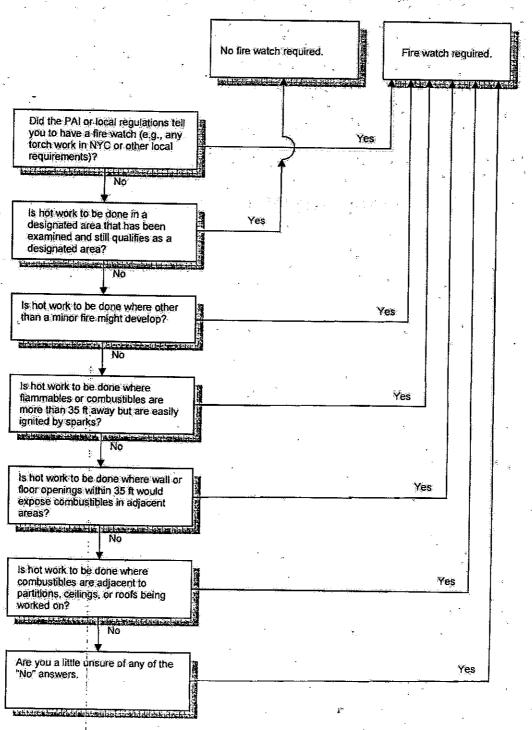
Environmental, Health & Safety

Volume III

Fire Watch Decision Tree Attachment C

Revision: 3 Effective Date: 1/31/07

Fire Watch Decision Tree (Adapted from NFPA 51B 2003, Fig. A.5.4.1)



Hot Work

Attachment D

DESIGNATED HOT WORK AREA EVALUATION

Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Designated Hot Work Area Evaluation Attachment D

 Revision:
 3

 Effective Date:
 1/31/07

Designated Hot Work Area Evaluation

Bureau EHS or their designee must complete this form for each facility designating an area as a "Temporary" or "Permanent" Hot Work Area where a Hot Work Permit is not required for burning, welding, or other hot work capable of initiating fires or explosions. The designated area shall be a specific area designed or approved for such work, such as a maintenance shop or a detached outside location that is of noncombustible or fire-resistant construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas (NFPA 51B 3-1.1).

		100		
Section A=Talbe completed by fact Requested Status (check one):	amiy			
Permanent Hot Work Area			•	·
· · · · · · · · · · · · · · · · · · ·				
Temporary Hot Work Area	If Temporary, Expiration Date:		<u>.</u>	
Facility	-97	· . *		*
Location and boundaries of designate	ed Hot Work Area:			
* 8				٠.۵
	. "			-
* :	3	:		
Will any welding or cutting work in the fluxes, coatings, etc.), zine, lead, bery	this area involve metals that may cyllium, cadmium, or mercury?	ontain toxic YES / NO	fluorine c	ompounds (i
Responsible Individual's Signature _	* 1	Date		
		Date	,	
SectionB=TobecompletedbyBux	eaulEHS)representative	Date.	,	•
Section)B=TolbelcompletedbyBurc	eaulEHS)representative			
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Hot Work

Attachment E

DESIGNATED HOT WORK AREA ANNUAL INSPECTION

Policies	and Procedures	Manual

Environmental, Health & Safety

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Comments:

Designated Hot Work Area Annual Inspection Aftachment E

Revision: 3 Effective Date: 1/31/07

Designated Hot Work Area Annual Inspection

For each area designated as a Permanent Hot Work Area, complete the following checklist at least annually:

Yes	No	
		Are flammable and ignitable materials and debris kept at least 35 feet away from the hot work area or covered and protected with fire resistant material?
		Are cracks or holes in floors, walls, and ceilings (including ductwork) covered or plugged?
		Are there fire extinguishers located nearby?
,		Does the area have adequate ventilation?
		Do employees have proper Personal Protection Equipment available?
	,	Is there an adequate quantity and type of shielding materials readily available for use?
		Is the fire sprinkler system operable (if installed)?
		Are all controls identified on the completed Designated Hot Work Area Approval Form in place?

	4
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	<u>.,</u>
Signature: Date:	**,:

Hot Mork

Attachment F

Vehicle Repair Safe Work Practices

Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Vehicle Repair Safe Work Practices
Attachment F

Revision: 3

Effective Date: 1/31/07

Vehicle Repair Safe Work Practices

Motor vehicles and similar equipment frequently require repairs that involve hot work and the combustible materials inherent to the vehicle/equipment construction cannot be easily removed or relocated to greater than 35 feet. In these cases, a vehicle work area may be identified as a Designated Hot Work Area in accordance with the DEP Hot Work procedure contingent on implementing the following Safe Work Practices to minimize the hazards, as applicable to the work conducted.

Whenever hot work is performed on a Vehicle in a Designated Hot Work Area, FIRST:

- Check authorized Hot Work Area to ensure all combustible materials are removed or properly shielded.
- Inspect contents of vehicle. Remove readily flammable and ignitable materials from inside of vehicle (i.e. portable gas can, trash, paper).
- ☐ If readily accomplished, remove combustible components from the vehicle prior to welding.
- To the extent possible, use shielding or fire resistive blanks to minimize the heat and sparks reaching flammable or combustible materials that cannot be readily removed from the vehicle (e.g., fuel/brake lines, gas tank, oil/hydraulic fluid reservoirs).
- Remove any combustible materials (i.e., carpet and/or floor mats) that are in contact with a metal surface that is the point of the hot work operation (e.g., when hot work is on fire wall or floor board).
- If proximity to gas tank or lines does not allow for sufficient shielding to prevent heat buildup on the tank and lines, remove the susceptible item, ventilate residual combustible vapors and ensure that the area is free of combustible vapors before proceeding.
- Assign a qualified person to perform all responsibilities of a Fire Watch for all torch operations and, for other hot work, in locations where other than a minor fire might develop.

NEVER:

□ Weld directly on tanks, lines, or hoses (i.e., fuel tank, brake line).

Hot Work

Attachment G

CONTRACTOR CERTIFICATION ON DEP HOT WORK PROGRAM

Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Contractor Certification - DEP Hot Work Program - Attachment G

 Revision:
 3

 Effective Date:
 1/31/07

Contractor Certification DEP Hot Work Program

Bureau:	 	,	•	~
Durcau	 -	 		

Attached is a copy of the DEP Hot Work program. Please read and become familiar with its requirements and procedures. Then sign the certification below:

I have read and I understand the DEP Hot Work procedures. I am willing to comply with the requirements of the DEP program and will communicate the requirements to all employees who perform and oversee hot work for my company under this DEP contract.

Name:	Signature:	 Date:	
Title (Person with project	authority):	:	
Contractor Company Nam	te:		
Home Office Address:			
Home Office Phone:	· · · · · · · · · · · · · · · · · · ·		
Home Office Fax:			
Facility Name and Locatio	n:		



Plant Name and Location:

Bureau:			
Contractor Certific	cation re: DEP Hot W	ork Program	ers in a
Attached is a copy of the DEP requirements and procedures.	Then sign the certification	e read and become familiar w below:	
I have read and I unders comply with the requirer		•	villing to
Name	Signature	Date	
Title:			
Contractor Company Name: _			· · · · · · · · · · · · · · · · · · ·
Home Office Address:		· · · · · · · · · · · · · · · · · · ·	<u>.</u>
Home Office Phone/Fax:			

Hot Work

Attachment A

Hot Work Permit

New York City Department of Environmental Protection

Policies and Procedures Manual

Environmental, Health & Safety

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Hot Work Permit Attachment A

Revision: 3
Effective Date: 1/31/07

	Volume III		Atta	chme	ent A		Effective Date: 1/31/07			
		That W	ork Pen	mit Jo	olinformation == :	and the second of the second o				
Facilit	y Name:				Location of I	lot Work:				
Permit	Authorizing Indiv	vidual:				Phor	ne:			
Permit	Issued (Date)		(Time)	A	M/PM				
Permit	Expires (Date)		(Time)	A	M/PM	1.5			
Type of hot work to be used (Source of ignition): Grinding Welding/Burning Heating Description Other										
PPE to be Used by Person Performing Hot Work:										
Descri	Describe the Hot Work Job and Materials to be Worked on:									
Any sp	ecial hazards and/	or special precautions to b	e taken:							
Fire	Watch Required?	Yes 🗌	No		Number of	Fire Watches	Required:			
		owledgement of Permit.	NAME OF THE OWNER OF THE OWNER OF THE OWNER.	DESCRIPTION DESCRIPTION OF A						
unders valid o any ch	Acknowledgment: I participated in the work site preparation, coordinated with the PAI, reviewed this Hot Work Permit and I fully understand the work to be performed and my responsibilities. The person(s) performing the hot work understand that this permit is valid only so long as work conditions existing at the time of issuance do not change. They will stop the work and notify the PAI of any change in work area conditions which adversely affects safety. I or the person(s) performing the work are adequately trained in the safe handling and use of their equipment and applicable regulatory requirements and, when required, have a Certificate of Fitness.									
Work	er/Supervisor:	·		Sig	nature:		<u> </u>			
Comp	any/Bureau:									
T	1 . 1.1				l (PAI) Authoriza					
		ection, notified the person ich may not be obvious, a					out flammable materials or			
		reviewed the permit and								
**			_		=	*	-			
_	<u></u>						mpletion return permit to the PAI.			
							the Operating Bureau)			
- Contract C			on a short the process were	territorios de estados de	Parado Carbonal Carbonal Anno Carbonal	and the company of the contract of the contrac	e to the work performed under			
							☐ DEP operations personnel in			
							shut down (if applicable), □ All			
approp	riate process equip	oment/piping has been pur	ged, disc	connec	ted and blanked in	accordance wit	h Lockout/Tagout procedures.			
Signat	ure:				Date:	NAME OF TAXABLE PARTY.				
T		Final Inspection (Fire	100.000.000.000.000.000.000.000	480.31031200000000000000	EULISSOCIE LOUPEI COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA COLUMNIA CO		CONTROL OF THE PROPERTY OF THE			
1 comp	ietea mai inspecti	on at the required times a	ner com	pletion	of Hot Work and	observed no sig	ns of smoldering or combustion.			
Signat	ure:				Date:	Tir				
	Mari karang	. de e e e e e e e e e e e e e e e e e e		and the second second second		ification of .	Acceptable Conditions			
- Day	PAI Signatur	re Date/Time	Accep Yes	ntable No	Final Insp./ Initials		Comments			
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Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Hot Work Permit Attachment A

Revision: 3
Effective Date: 1/31/07

Required Precautions Checklist

6.0	
Ir (by	nspect work area and confirm that applicable precautions have been taken in accordance with NFPA 51B PAI After Coordination With & Setup By Person Performing Hot Work; initially and when revalidating):
	All sprinkler and/or other fire suppression systems in the Hot Work Permit area operational. Cutting/welding equipment in good repair, free of damage or defects. Persons conducting hot work have certificates of fitness from fire department, when required. All facility employees or other parties that may be potentially affected by the hot work have been notified.
	REQUIREMENTS WITHIN 35 FEET OF WORK (HORIZONTAL & VERTICAL) Flammable liquids and combustible dust/lint/oil deposits/trash removed or shielded with fire-retardant material. Flammable vapor sources removed or flammable vapor properly tested and found to be well below the LEL. List readings: Combustible flooring properly wetted, wet sanded or shielded. Combustible walls, ceilings, partitions or roofing properly shielded. Covers under work to keep sparks from lower levels and shielding/partitions to protect passer-by.
	WORK ON WALLS OR CEILINGS Combustibles have been moved away from opposite side. (If no, hot work is not permitted) No combustible covering, interior (for sandwich-type panel) or other combustible content. Danger from conduction of heat to adjacent rooms eliminated.
	WORK ON ENCLOSED EQUIPMENT (Tanks, Containers, Ducts, Dust Collectors, etc.) All duct and conveyor systems properly protected or shut down. Equipment is cleaned of all combustibles, flammable vapors, liquids, or dusts. (If a flammable vapor source, conduct vapor monitoring)
	FIRE WATCH Required for the following: (1) NYC torch work (2) Combustibles within 35' (3) Combustibles >35', but easily ignited, (4) Wall/floor openings expose adjacent/concealed combustibles, (5) Conduction through metal can ignite other side (6) Potential for more than a minor fire. Charged, inspected, operational fire extinguishers of an appropriate type are present. Fire Watch trained in extinguisher and emergency alarms (fire alarm, telephone, or radio).
	OTHER PRECAUTIONS Work in a confined space requires Confined Space Entry Permit prior to hot work permit approval. Is continuous atmospheric monitoring, smoke detection or heat detection warranted? Ample ventilation exists or provisions made for continuous ventilation to remove smoke/vapor from work area Process equipment/piping purged, disconnected and blanked in accordance with Lockout/Tagout procedures. Do conditions require Re-Validation more than every 24 hr? (circle one) 12 hr 8 hr Other:

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Hot Work Permit Decision Tree

Policies and Procedures Manual

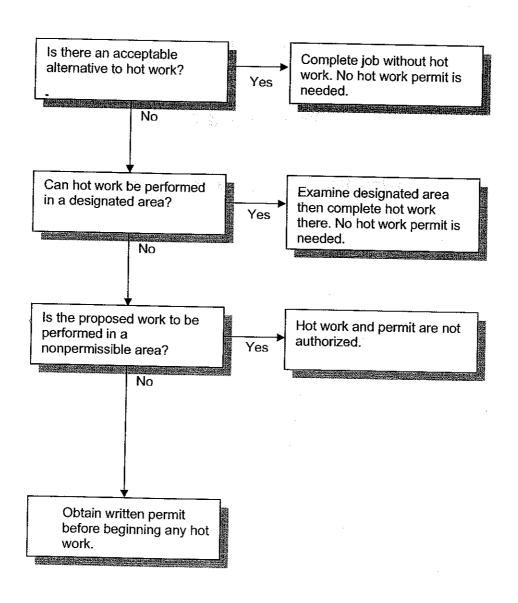
Volume III

Hot Work Permit Decision Tree Attachment B Environmental, Health & Safety

Revision: 3

Effective Date: 1/31/07

Hot Work Permit Decision Tree (Source NFPA 51B 2003, Fig. A.5.3)



Hot Work

Attachment C

Fire Watch Decision Tree

Policies and Procedures Manual

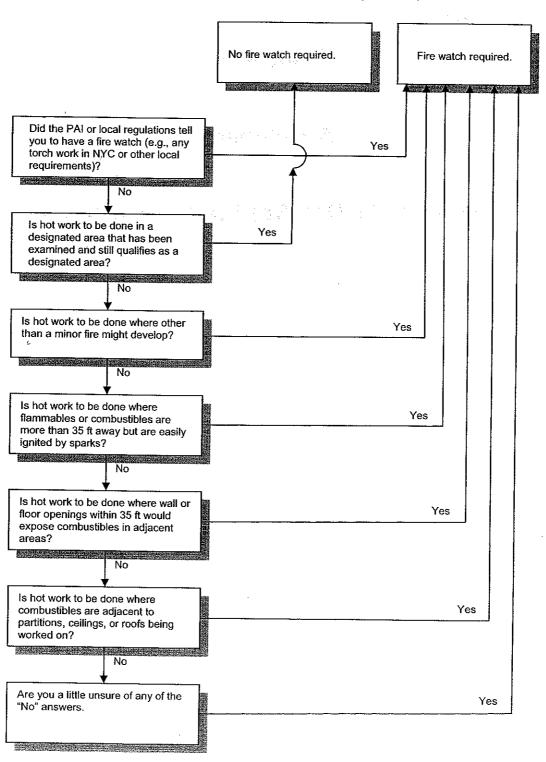
Environmental, Health & Safety

Volume III

Fire Watch Decision Tree Attachment C

Revision: 3
Effective Date: 1/31/07

Fire Watch Decision Tree (Adapted from NFPA 51B 2003, Fig. A.5.4.1)



Hot Work

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Attachment D

DESIGNATED HOT WORK AREA EVALUATION

Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Designated Hot Work Area Evaluation Attachment D

Revision: 3

Effective Date: 1/31/07

Designated Hot Work Area Evaluation

Bureau EHS or their designee must complete this form for each facility designating an area as a "Temporary" or "Permanent" Hot Work Area where a Hot Work Permit is not required for burning, welding, or other hot work capable of initiating fires or explosions. The designated area shall be a specific area designed or approved for such work, such as a maintenance shop or a detached outside location that is of noncombustible or fire-resistant construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas (NFPA 51B 3-1.1).

Section A.—To be completed to		
Requested Status (check one):		
Permanent Hot Work Area	•	
Temporary Hot Work Area	-	
Tomporary Hote Hote Aica	If Temporary, Expiration Da	ate:
Facility		<u> </u>
Location and boundaries of des	signated Hot Work Area:	
YY 7144 4 4K		
Will any welding or cutting wor	ork in this area involve metals that m	ay contain toxic fluorine compounds (in
nuxes, coamigs, etc.), zinc, leac	d, beryllium, cadmium, or mercury?	YES/NO
Responsible Individual's Ciana		
responsible marvidual 8 Signar	ture	Date:
Section B - To be completed by	o Rurogu FRC rancopatolica	
	200 Cur DIO representative	
Required Hot Work Area engine	eering controls: (e.g., ventilation, sh	2.1.3:
1	cering controls. (e.g., ventilation, sin	ielding, screens):
	•	
-		
01 2		
Comments or Other Requiremen	ats:	
Bureau EHS Approval Signature	2	Date:

Hot Work

Attachment E

DESIGNATED HOT WORK AREA ANNUAL INSPECTION

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Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Designated Hot Work Area Annual Inspection Attachment E

Revision: 3
Effective Date: 1/31/07

Designated Hot Work Area Annual Inspection

For each area designated as a Permanent Hot Work Area, complete the following checklist at least annually:

Yes	No	
	•	Are flammable and ignitable materials and debris kept at least 35 feet away from the hot work area or covered and protected with fire resistant material?
		Are cracks or holes in floors, walls, and ceilings (including ductwork) covered or plugged?
		Are there fire extinguishers located nearby?
	¥.*	Does the area have adequate ventilation?
		Do employees have proper Personal Protection Equipment available?
		Is there an adequate quantity and type of shielding materials readily available for use?
		Is the fire sprinkler system operable (if installed)?
	4	Are all controls identified on the completed Designated Hot Work Area Approval Form in place?

Comments:	
Signature:	Date:

Hot Work

Attachment F

Vehicle Repair Safe Work Practices

Policies and Procedures Manual

Environmental, Health & Safety

Volume III

Vehicle Repair Safe Work Practices Attachment F

 Revision:
 3

 Effective Date:
 1/31/07

Vehicle Repair Safe Work Practices

Motor vehicles and similar equipment frequently require repairs that involve hot work and the combustible materials inherent to the vehicle/equipment construction cannot be easily removed or relocated to greater than 35 feet. In these cases, a vehicle work area may be identified as a Designated Hot Work Area in accordance with the DEP Hot Work procedure contingent on implementing the following Safe Work Practices to minimize the hazards, as applicable to the work conducted.

Whenever hot work is performed on a Vehicle in a Designated Hot Work Area, FIRST:

- □ Check authorized Hot Work Area to ensure all combustible materials are removed or properly shielded.
- ☐ Inspect contents of vehicle. Remove readily flammable and ignitable materials from inside of vehicle (i.e. portable gas can, trash, paper).
- ☐ If readily accomplished, remove combustible components from the vehicle prior to welding.
- To the extent possible, use shielding or fire resistive blanks to minimize the heat and sparks reaching flammable or combustible materials that cannot be readily removed from the vehicle (e.g., fuel/brake lines, gas tank, oil/hydraulic fluid reservoirs).
- Remove any combustible materials (i.e., carpet and/or floor mats) that are in contact with a metal surface that is the point of the hot work operation (e.g., when hot work is on fire wall or floor board).
- If proximity to gas tank or lines does not allow for sufficient shielding to prevent heat buildup on the tank and lines, remove the susceptible item, ventilate residual combustible vapors and ensure that the area is free of combustible vapors before proceeding.
- Assign a qualified person to perform all responsibilities of a Fire Watch for all torch operations and, for other hot work, in locations where other than a minor fire might develop.

NEVER:

□ Weld directly on tanks, lines, or hoses (i.e., fuel tank, brake line).

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CONTRACTOR CERTIFICATION ON DEP HOT WORK PROGRAM

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Contractor Certification - DEP Hot Work Program – Attachment G

Revision:	3	
Effective Date:_	1/31/07	_

	Contractor	Certif	icatio	n				
	DEP Hot W	ork Pi	rogra	m				
	Bureau	•						_
Attached is a copy of the I requirements and procedure	DEP <i>Hot Work</i> proges. Then sign the center	ram. F tificatio	Please : on belo	read and ow:	l becom	e fam	iliar with i	ts
I have read and I unders with the requirements of								
all employees who perfo								
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$\frac{\mathbf{H}}{\mathbf{H}} = \frac{1}{2} \mathbf{H} + \frac{1}{2} \mathbf{H}$		••	÷	t jär	A si	٠.	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
Name:	Signature:				Date	e:		

Name:	Signature:	Date:
Title (Person with project	authority):	
Contractor Company Nan	ne:	
Home Office Address:		
Home Office Fax:		
Facility Name and Location	·	

APPENDIX U

Daily Weekly and Monthly Safety Checklist Forms

DAILY CONSTRUCTION SAFETY AUDIT Fill Out All Appropriate Sections and Include all Backup and Closeout Documentation

PROJECT NAME: Barretto I	<u>Point Er</u>	ivironmei	ntal Remediaition		
DATE OF INSPECTION:					
COMPANY: Posillico Envir	onment	al		1.	1.4
SAFETY PROFESSIONAL:	OIMITORE	<u>a1</u>			
				1.5	,
CONTRACT NUMBER: HP	<u>-EK-1</u>		·		
PROJECT LOCATION: Hun	<u>ts Point</u>	New Yo	<u>ork</u>		
START TIME:					
FINISH TIME:					1.14.1
WEATHER CONDITIONS:					
INSPECTION PERFORMED B	VADDI	TTONIAT	DEDCONNEY		
	1 11010,	TIONAL	TERSONNEL:	-	·····
Scope and description o	f work	at the tir	ne of the inspection with identi	fication	ı of all
contractor and sul	<u>ocontra</u>	ctors per	forming work and number of	worker	<u>s</u>
					
	CONSTI	RUCTION	NSAFETY CHECKLIST		
6		A			1 1 1
	ок	Action			Action
FIRST AID AND EMERGENCY	OK	Needed	I ABDEBC AND COLUMN PROC	OK	Needed
			LADDERS AND SCAFFOLDING		
First aid supplies/eye wash			Proper Construction/Condition	_	
Certified First Aiders/CPR	ā	ä	Proper placement & Secured		. 🗆
Emergency Numbers Posted		ā	Guardrails/ Toeboards/Screening	0	
Access to site Clear		ī	Working areas free of Debris		
	_	J	Working areas free of Debits		
HOUSEKEEPING AND SANITAT	ION		HOISTS, CRANES, AND DERRIC	KS	
Work Areas/Passageways Clear		О	Adamata CI	_	
Toilets adequate and Clean			Adequate Clearances	9	
Drinking Water Available			Load Capacity & Proper Usage		
Waste Containers Provided & Used			Clearances to Energized Equipment		
waste containers 110vided & Osed			Hand/Voice Communications		
FIRE PREVENTION & PROTECT	PYON:		Swing Radius Protected		
THE THE VENTION & PROTECT	ION		Annual Inspection Current		
Fire Hazards Analyzed			EXCAVATION & SHORING		.*
Fire Extinguishers Maintained	ō	- 0	EXCAVATION & SHURING		
Adequate Fire Extinguishers	Ö		Competent Domain design at 1		_
Fire Extinguishers Inspected	ō		Competent Person designated		
Proper Flammable Storage/ Use			Shoring for Soil & Depth		
No Open Flames	<u> </u>		Spoil Bank & Equip. Distances		ā
Gas Cylinders- Use & Storage			Access Provided		_
Regulators not damaged			Water Controlled	₫	
Caps on while in storage			Equipment Ramps Adequate		
Cylinders secured			Utility Markout Completed Utility Markout Maintained		0

	e de la company		
PERSONAL PROTECTIVE EQUIPMEN	T HAND	LING AND STORAGE OF MATE	RIALS
Hard Hats Worn at All Times Eye Protection Worn at All Times Hearing Protection as Required Respirators as Required Medical Clearance and Fit Tested Fall Protection ~ per the Site Plan High Visibility Vests worn Medical Clearance and Fit Tested Fall Protection equip. checked daily	Stacks S No Exc Stored A Rigging Proper I Rigging Rigging	Material Handling Secure/Neat/Protected essive Heights Away From Openings g inspected by competent person Rigging selected/used acked/racked or cribbed g done by qualified person g stored properly	00000000
ELECTRICAL INSTALLATIONS	мото	R VEHICLES / HEAVY EQUIPM	ENT
Electrical Dangers Posted Temporary Lighting Adequate Heavy Duty Adequate Wiring		Lights/ Warning Devices Controllers as Required Heavy Equipment Wheels Chocked	0 d 0
Safe/ Sufficient # of Outlets GFCI's used properly Cords and tools inspected daily Circuit Breakers labeled	☐ Daily ir ☐ Spotter	Its Used spection of all mobile equip. for backing vehicles ean of trash & debris	0 0 0
•	Action		Action
OK TOOLS, HAND & POWER	Needed	O MISCELLANEOUS	K Needed
Proper Tool For Each Job Daily Inspection and Maintenance Proper Instruction In Use All Required Guards In Place GFCI's used on all power cords BARRICADES AND RAILINGS Floor Openings Protected/marked Midrails & Toeboards in place Open Sided Floors Protected Trenches/ Excavations Protected Guardrails withstand 200lb force Scaffolds checked daily-Competent Per .		Safe Entrances/ Exits Provided DSHA Act & Warning Signs Posted Fask Safety Training Provided Public & Property Protected Proper Welding & Cutting Proper & Safe Demolition Spill Containment kits on-site Safety Nets/ Catch Platforms Stairway Railings/ Stairs Fille Lock Out/ Tag Out as Required Air Monitoring Conducted Properly Impalement Hazards Protected Required Rebar caps in place Lir Monitoring Equipment Inspected	
TRAFFIC MAINTENANCE Cones/Barrels/Barricades in proper position Cones/Barrels/Barricades in good condition Signs mounted properly Signs visible and in good condition Lane markings visible and in proper position Night lighting adequate for safe operations Arrow boards working properly and secured Work zones secure to unauthorized entry	Needed L	owder-activated tools aws and ordinances complied with perators qualified – vendor trained controlled storage competent instructions & supervision aspection & maintenance rotection of other workers afety goggles or face shield icensed for each type of tool used	OK Action Needed O O O O O O O O O O O O O O O O O O O

CONFINED SPACE PROCEDURE	ок	Action Needed	e North	PILE D	RIVIN	G ·	o	K Actio	
Confined Space entry training conducter Signs posted to identify confined spaces Personal protective equipment specified Standby person Emergency equipment for standby person Permit required precautions taken All required signatures for entry/testing Permits posted prior to start of work Permits retained a minimum of two years			Mater Equip Piledr Ladde Coffe Adequ Tag li Safety Prope Barrie	er storage rial hand oment ins riving rig ers on fra rdams m uate wate ines used y harness er signali- caded as rotection	ling con pected is prope mes and aintained or pump es and l ng require	and main rly supp d stirrup ed and in ing avai	ntained orted s used spected lable used		
ADDITIONAL TEMS CORRECTIVE	ACTIO	ONS:							
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								· · · · · · · · · · · · · · · · · · ·	_
Č .									_
Was Subcontractor's work also inspected	i ?	□ YES	5	□NO					ż
Did subcontractor participate in inspection	on?	□ YES	3	□NO					
Are any items found to be "Imminent Da	nger"?	□ YES	5	□ №					
							s. De		٠,
Inspector's Signature						· · · · · ·			•

General Contractor: Posillico Civil 9/3/2008

WEEKLY CONSTRUCTION SAFETY AUDIT Fill Out All Appropriate Sections and Include all Backup and Closeout Documentation

PROJECT NAME: Barretto P	oint Env	rironment	al Remediaition		1.00	
DATE OF INSPECTION:		*		La the Year		V.
COMPANY: Posillico Enviro	nmenta	 :	**************************************	\$ *		
SAFETY PROFESSIONAL:		- · · · .				
CONTRACT NUMBER: HP-		2.444.4				
PROJECT LOCATION: Hunt		New Yor				
START TIME:		11077 101	<u>v</u>			
FINISH TIME:						
WEATHER CONDITIONS:	•					
				•		
INSPECTION PERFORMED	DY AD		AL PERSUNNEL:			
WAS SUBCONTRACTOR W	OKK A	T20 IN2	PECTED:			
Scope and description o contractor and sub			e of the inspection with orming work and numb			<u>all</u>
			,			
		·				
£						
Review of daily safety reports	, toolbox	k talks and	i AHAs:		· ·	
Upcoming work activities:						
	<u>CONST</u>	RUCTIO	N SAFETY CHECKLIST	-		
		Action				Action
FIRST AID AND EMERGENCY	OK	Needed	LADDERS AND SCAFFO	OI LDING	K	Needed
First aid supplies/eye wash	О		Proper Construction/Condition	on 🗆	J .	
Certified First Aiders/CPR			Proper placement & Secured	. 🗆	ļ	
Emergency Numbers Posted			Guardrails/ Toeboards/Scree			
Access to site Clear	П	П	Working areas free of Debris	: [i	П

HOUSEKEEPING AND SANITAT	TON		HOISTS, CRANES, AND DERRICK	KS .		
Work Areas/Passageways Clear	.		Adequate Clearances	0	a	
Toilets adequate and Clean			Load Capacity & Proper Usage			
Drinking Water Available			Clearances to Energized Equipment			
Waste Containers Provided & Used			Hand/Voice Communications			
***************************************			Swing Radius Protected			
FIRE PREVENTION & PROTECT	TION		Annual Inspection Current		ā	
Fire Hazards Analyzed	□		EXCAVATION & SHORING			
Fire Extinguishers Maintained						
Adequate Fire Extinguishers			Competent Person designated			
Fire Extinguishers Inspected			Shoring for Soil & Depth	5		
Proper Flammable Storage/ Use			Spoil Bank & Equip. Distances	Ö		
No Open Flames	a		Access Provided			
Gas Cylinders- Use & Storage			Water Controlled	<u></u>	0	
Regulators not damaged	<u> </u>		Equipment Ramps Adequate		<u>.</u>	
Caps on while in storage		ō	Utility Markout Completed			
Cylinders secured			Utility Markout Maintained	0		
PERSONAL PROTECTIVE EQUIPMENT			HANDLING AND STORAGE OF MATERIALS			
Hard Hats Worn at All Times		· a	Proper Material Handling	<u>-</u>	1	
Eye Protection Worn at All Times	· 🗖		Stacks Secure/Neat/Protected		□.	
Hearing Protection as Required	0		No Excessive Heights			
Respirators as Required		Ö	Stored Away From Openings		_	
Medical Clearance and Fit Tested			Rigging inspected by competent person			
Fall Protection ~ per the Site Plan	· 🗖 · ·	<u> </u>	Proper Rigging selected/used		0	
High Visibility Vests worn	· 🗖		Items stacked/racked or cribbed	0		
Medical Clearance and Fit Tested	ō	Ö	Rigging done by qualified person			
Fall Protection equip. checked daily	ä	0	Rigging stored properly			
ELECTRICAL INSTALLATIONS			MOTOR VEHICLES / HEAVY EQU	IPMEN		
Electrical Dangers Posted	_	_		AR 1711511	•	
Temporary Lighting Adequate			Brakes/ Lights/ Warning Devices			
Heavy Duty Adequate Wiring			Traffic Controllers as Required	□		
Duty Adequate witing			☐ Heavy Equipment Wheels Cho	ocked		
Safe/ Sufficient # of Outlets			Seat Belts Used			
GFCI's used properly						
Cords and tools inspected daily					<u> </u>	
Circuit Breakers labeled			~ • • • • • • • • • • • • • • • • • • •			
		Action			Action	
5007.0 TT.L	OK	Needed		ок	Needed	
FOOLS, HAND & POWER			MISCELLANEO		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Proper Tool For Each Job		0	Safe Entrances/ Exits Provided	-	_	
Daily Inspection and Maintenance			OSHA Act & Warning Signs Post	ted 🗍		
Proper Instruction In Use		ā	Task Safety Training Provided			
All Required Guards In Place		Ö	Public & Property Protected			
GFCI's used on all power cords	Ō		Proper Welding & Cutting			
•			Proper & Safe Demolition			
BARRICADES AND RAILINGS			Spill Containment kits on-site			
			Safety Nets/ Catch Platforms		0	
loor Openings Protected/marked			Stairway Railings/ Stairs Fille			
Midrails & Toeboards in place		Ö	Lock Out/ Tag Out as Required			
pen Sided Floors Protected		ā	Air Monitoring Conducted Proper		0	
renches/ Excavations Protected	ā		Impalement Hazards Protected	-		
Sec. 4 24 23 3 4 6 6 6 6 6			Required Rebar caps in place		ם	
caffolds checked daily-Competent Per			Air Monitoirug Equipment Inspect	-d (T		

TRAFFIC MAINTENANCE	ок	Action Needed	POWDER-ACTIVATED TOOLS	OK Action Needed
Cones/Barrels/Barricades in proper position Cones/Barrels/Barricades in good condition Signs mounted properly Signs visible and in good condition Lane markings visible and in proper position Night lighting adequate for safe operations Arrow boards working properly and secured Work zones secure to unauthorized entry	00000000		Laws and ordinances complied with Operators qualified – vendor trained Controlled storage Competent instructions & supervision Inspection & maintenance Protection of other workers Safety goggles or face shield Licensed for each type of tool used	
CONFINED SPACE PROCEDURE			PILE DRIVING	e Arrivation
Confined Space entry training conducted Signs posted to identify confined spaces Personal protective equipment specified Standby person Emergency equipment for standby person Permit required precautions taken All required signatures for entry/testing Permits posted prior to start of work Permits retained a minimum of two years			Proper storage of piles Material handling controlled Equipment inspected and maintained Piledriving rigs properly supported Ladders on frames and stirrups used Cofferdams maintained and inspected Adequate water pumping available Tag lines used Safety harnesses and lifelines used Proper signaling Barricaded as required Ear protection area posted	
ADDITIONAL ITEMS and CORREC	TIVE	ACTION	S:	
				·
			The state of the s	1 - 1 - 1
				ting the second
Inspector's Signature				

MONTHLY CONSTRUCTION SAFETY AUDIT Fill Out All Appropriate Sections and Include all Backup and Closeout Documentation

PROJECT NAME: <u>Barretto Point Environmental Remediaition</u> DATE OF SUBMITTAL:	
COMPANY: Posilico Environmental	
SAFETY PROFESSIONAL: Lee Kaplan	
CONTRACT NUMBER: HP-ER-1	
PROJECT LOCATION: Hunts Point, New York	
Safety Training Held for Month:	
Conditions of Work Areas for Month:	
	<u> </u>
Accidents, Injuries and Illnesses (Please Note if OSHA Recordable) 1. 2.	:
3. 4.	
5.	
Evaluation of SSHASP and Changes:	
Attach Equipment Inspection Logs and any Additional Safety Docur	mentation.
Safety Professional Signature	
Safety Fiotessional Signature	
Project Manager Signature	

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APPENDIX V

Incident Reporting

INCIDENT REPORT

1.0 Accident and Incident Reporting

It is important that all accidents and incidents that result in injury, illness, or medical treatment be reported immediately. Supervisors are required to complete the Supervisor's Report of Accident included in this section. It is Posillico's responsibility to investigate each incident, file appropriate paperwork and conduct a follow-up analysis of each incident.

2.0 Reporting Phone Numbers

Safety and Health Director:

Thomas Conrad 516-315-3467

Human Resources Director:

Frank Franzini 516-790-3565

3.0 First Aid and Medical Treatment

Posillico Environmental, Inc. provides a First Aid Kit on each site and in each Company vehicle. It is there for use in the treatment of minor scratches, burns, headaches, nausea, etc. Each employee should verify the location of the nearest first aid kit and should make use of it whenever needed. Each kit is fully stocked and restocked monthly by an outside vendor. The kit includes bandages, over the counter medications, disinfecting supplies and topical ointments. The user of each kit is responsible for contacting the vendor to replace items used or submitting the kit to Posillico for replacement. Kits are to be inventoried by the Project Manager before being sent in the field. Only completely stocked kits are to be brought into the field. The kits are maintained in a weatherproof container and in accordance with ANSI Standard Z308.1-1998. The first aid supplies in each kit are included in Attachment A.

Any work related injury or illnesses that requires professional medical assistance should be reported immediately. Failure to promptly notify of a work related injury could make the claim questionable and subject to stricter review. The nearest medical center or hospital will be identified for each project. The phone number and location for this center will be determined before commencing field activities and be included in the Health and Safety Plan. The phone numbers will be posted by Health and Safety Director or the Project Manager and available to all employees in order to provide prompt response to all injuries. The Project Manager will contact the nearest medical facility to determine the facility's capabilities and verify that the facility is willing to provide emergency medical services.

4.0 First Aid

Each Posillico project will have at least one certified CPR/first aid trained person on site at all times. All Project Managers and anyone acting as the on-site Health and Safety Officer must be current in First Aid/CPR. First aid training sponsored by the American Red Cross is acceptable and must be renewed every three years. CPR training must be renewed annually. Other first aid training will be reviewed to see if it is comparable to the Red Cross training.

1. Minor First Aid Treatment

First aid kits are stored in each company vehicle. If an injury is sustained or results in minor first aid treatment:

a. Inform your supervisor.

b. Administer first aid treatment to the injury or wound.

- c. If a first aid kit is used, indicate usage on the accident investigation report.
- d. Access to a first aid kit is not intended to be a substitute for medical attention.
- e. Provide details for the completion of the accident investigation report.

2. Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, management must first authorize treatment. If you sustain an injury requiring treatment other than first aid:

- a. Inform your supervisor.
- b. Proceed to the posted medical facility. Your supervisor will assist with transportation, if necessary.
- c. Provide details for the completion of the accident investigation report.

3. Emergency Medical Treatment

If you sustain a severe injury requiring emergency treatment:

- a. Call for help and seek assistance from a co-worker.
- b. Use the emergency telephone numbers and instructions posted next to the telephone in your work area to request assistance and transportation to the local hospital emergency room.
- c. Provide details for the completion of the accident investigation report.
- d. The Project Manager will identify an ER provider for each long-term project for emergency medical services. The phone number will be posted at each job site.

4. First Aid Training

Each employee will receive training and instructions from his or her supervisor on our first aid procedures.

5. Wounds

- a. Minor Cuts, lacerations, abrasions, or punctures
 - Wash the wound using soap and water; rinse it well.
 - Cover the wound using clean dressing.
- b. Major Large, deep and bleeding
 - Stop the bleeding by pressing directly on the wound, using a bandage or cloth.
 - Keep pressure on the wound until medical help arrives.

6. Broken Bones

- a. Do not move the victim unless it is absolutely necessary.
- b. If the victim must be moved, "splint" the injured area. Use a board, cardboard, or rolled newspaper as a splint.

7. Burns

- a. Thermal (Heat)
 - Rinse the burned area, without scrubbing it, and immerse it in cold water; do not use ice water.
 - Blot dry the area and cover it using sterile gauze or a clean cloth.

b. Chemical

• Flush the exposed area with cool water immediately for 15 to 20 minutes. Posillico will ensure that suitable facilities will be provided within the work area.

8. Eye Injury

- a. Small particles
 - Do not rub your eyes.
 - Use the corner of a soft clean cloth to draw particles out, or hold the eyelids open and flush the eyes continuously with water.
- b. Large or stuck particles
 - If a particle is stuck in the eye, do not attempt to remove it.
 - Cover both eyes with bandage.

c. Chemical

• Immediately irrigate the eyes and under the eyelids, with water, for 30 minutes. Posillico will ensure that suitable facilities will be provided within the work area.

9. Neck And Spine Injury

If the victim appears to have injured his or her neck or spine, or is unable to move his or her arm or leg, do not attempt to move the victim unless it is absolutely necessary.

- 10. Heat Exhaustion
- a. Loosen the victim's tight clothing.
- b. Give the victim "sips" of cool water.
- c. Make the victim lie down in a cooler place with the feet raised.

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Employee's Report of Injury Form

<u>Instructions:</u> Your employees may use this form to report <u>all</u> work related injuries, illnesses, or "near miss" events (which could have caused an injury or illness) — no matter how minor. This helps you to identify and correct hazards before they cause serious injuries. This form should be completed by employees as soon as possible and given to a supervisor for further action.

	☐ Illness ☐ Near miss
Your Name:	
Job title:	
Supervisor:	
Have you told your supervisor about this i	njury/near miss? 🔲 Yes 🗀 No
Date of injury/near miss:	Time of injury/near miss:
Names of witnesses (if any):	
And the second s	
Where, exactly, did it happen?	
What were you doing at the time?	
(vivat were you actif at the fille).	
Describe stap by stop what led	
Describe step by step what led up to the in tecessary):	ljury/near miss. (continue on the back if
What could have been done to prevent this	injun/hear miss?
What parts of your body ways tolly and us	
rend; parts or your body were injured? If a	near miss, how could you have been hurt?
Did you see a doctor about this injury/illnes	\$? DYES DNO
Did you see a doctor about this injury/illnes If yes, whom did you see?	s? Dector's phone number:
Did you see a doctor about this injury/illnes If yes, whom did you see? Date:	s? Deter's phone number: Time:
Did you see a doctor about this injury/illnes If yes, whom did you see? Date: Has this part of your body been injured before	s? Dector's phone number: Time: Dector Dec
Did you see a doctor about this injury/illnes If yes, whom did you see? Date: Has this part of your body been injured befole if yes, when?	s? BYes DNo Doctor's phone number: Time: pre? DYes DNo Employer:
Did you see a doctor about this injury/illnes If yes, whom did you see? Date: Has this part of your body been injured before	s? UYes ONo Doctor's phone number: Time: Dre? OYes ONo

Incident Investigation Report Form

<u>Instructions</u>: Complete this form as soon as possible after an incident that results in serious injury or illness. (Optional: Use to investigate a minor injury or near miss that could have resulted in a serious injury or illness.)

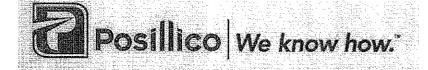
Step 1: Injured employee (complete Same: Praft or Trade:	Sex: Male Female	Date of Birth:
Part of body affected: (shade all that apply)	Nature of injury: (most serious one) Abrasion, scrapes Amputation Broken bone Bruise Burn (heat) Concussion (to the head) Crushing Injury Cut, laceration, puncture Hernia Ullness Sprain, strain Damage to a body system:	This employee works: Regular full time Regular part time Regular part time Reasonal Temporary Months with this employer Months doing this job: (e.g.: nervous, respiratory, coirculatory systems)
Step 2: Describe the incident exact location of the incident:		Exact time:
What part of employee's workday? ☐ Entering During meal period ☐ During break: Names of witnesses (if any):	ng or leaving work Doi DWorking overtime DOt	ig normal work activities her

umber of Written witness statements: Photographs:		Maps / drawings:			
What personal protective equipment was being used (if any)?					
Describe, step-by-step the events that led up to the tools, materials and other important details.	injury. Include names	of any machines, parts, objects,			
	Descripti	on continued on attached sheets: 🗆			
Step 3: Why did the incident happen? Unsafe workplace conditions: (Check all that apply) Inadequate guard Unguarded hazard Safety device is defective Tool or equipment defective Workstation layout is hazardous Unsafe lighting Unsafe ventilation Lack of needed personal protective equipment Lack of appropriate equipment / tools Unsafe clothing No training or insufficient training	☐ Operating wi☐ Operating at☐ Operating at☐ Servicing eq☐ Making a sat☐ Using defect☐ Using equipn☐ Unsafe lifting☐ Taking an un☐ Distraction; te☐ Failure to we	uipment that has power to it ety device inoperative ve equipment nent in an unapproved way			
Why did the unsafe conditions exist? Why did the unsafe acis occur?					
Is there a reward (such as "the job can be done more that may have encouraged the unsafe conditions of a If yes, describe;	quickly", or "the prod cts?	uct is less likely to be damaged") □ Yes □ No			
Were the unsafe acts or conditions reported prior to the	ne Incident?	□ Yes □ No			
Tave there been similar incidents or near misses prior to this one?					

Step 4: How can f What changes do yo	uture incidents be pro pusuggestato preventti	evented? nis injury/near miss from happening again?
☐ Stop this activity	☐ Guard the hazard	Train the employee(s) Train the supervisor(s)
☐: Redesign task steps	: 🗓 Redesign work station	☐ Write a new policy/rule ☐ Enforce existing policy
☐ Routinely inspect for	the hazard	otective Equipment
What should be (or has		suggestion(s) checked above?
Step 5: Who comple Written by:	ted and reviewed this for	orm? (Please Print)
Department		Date:
Names of investigatio	nteam members;	
Reviewed by:		Tille:

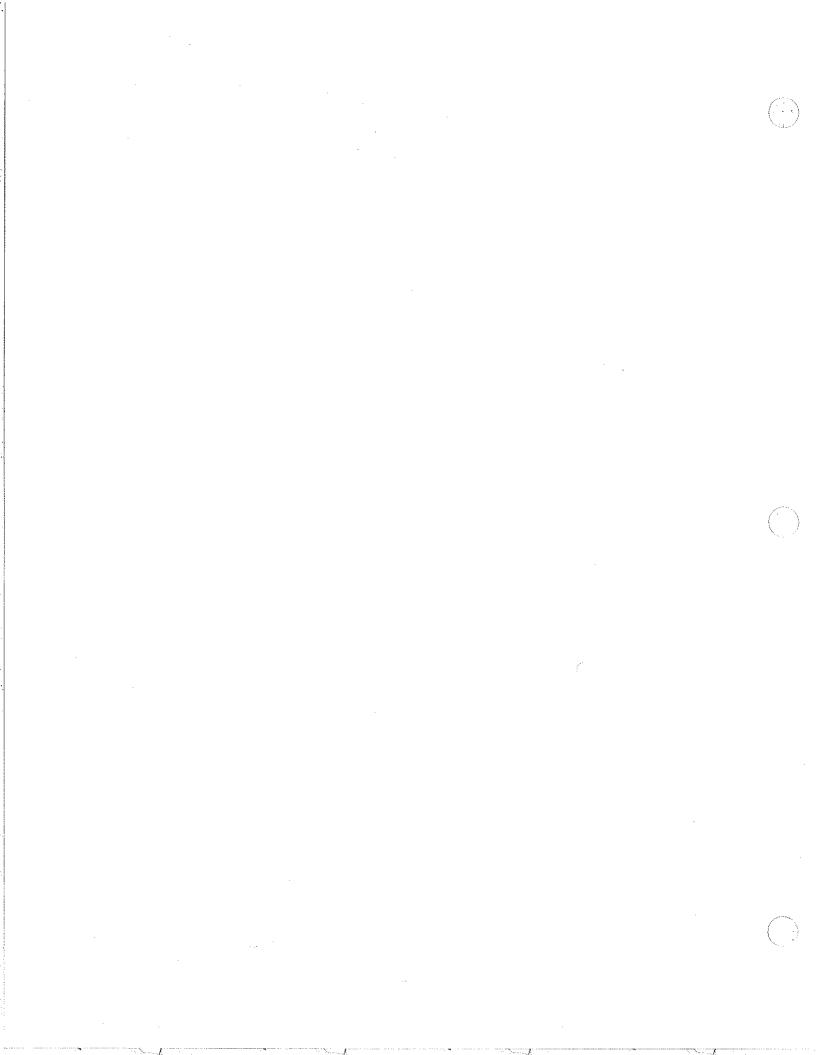
APPENDIX W

Employee Orientation Form



POSILLICO Company: Employee: Trainer: Selso Salazar Hire Date: Date: Position: This checklist is a guideline for conducting employee safety orientations for employees new to Posillico. Once completed and signed by both Supervisor and Employee, it serves as documentation that orientation has taken place. Date **Initials** 1. Explain The Company Safety Program "No Hard Hat, No Vest, No Safety Glasses" "NO WORK!" To Be Filled Out By Personal Safety Responsibility - STOP Button Safety Representative Tool Box Talks & Safety Huddles Accident Reporting - Personal & Property (Location of First Aid & MSDS) Employee Behavior (Sexual Harassment Policy-Copy To Employee, Discrimination, Horseplay, Altercations, Substance Abuse) 2. Use And Care of Personal Protective Equipment (Hard Hat, Fall Protection, Eye Protection, Etc.) - Mandatory PPE TO BE COMPLETED BY JOB SITE MANAGEMENT REPRESENTATIVE: 3. Line of Communication and Responsibility For Immediately Reporting Injuries A. When to report an injury. B. How to report an injury. C. Who to report an injury to. D. Filling out "Employees Report of Injury" form. 4. General Overview of Operation, Procedures, Methods and Hazards As They Relate to The Specific Job Site. 5. Pertinent Safety Rules of the Company and OSHA 6. First Aid Supplies, Equipment and Training A. Obtaining treatment. B. Location of facilities. C. Location and names of first-aid trained personnel. 7. **Emergency Plan** A. Exit location and evacuation routes. B. Use of fire fighting equipment (extinguishers, hose). C. Specific procedures (medical, chemical, etc.). 8. Vehicle/Equipment Safety 9. Personal Work Habits D. Smoking policy. E. Good housekeeping practices. F. Proper lifting techniques. NOTE TO EMPLOYEES: Do not sign unless ALL items are covered and ALL questions are satisfactorily answered. The signatures below document that the appropriate elements have been discussed to the satisfaction of both parties, and that both the supervisor and the employee accept responsibility for maintaining a safe and healthful work environment. Date: _____ Supervisor's Signature: Date: _____ Safety Representative Signature:

Employee's Signature:



APPENDIX C – SAMPLE CAMP

COMMUNITY AIR MONITORING PLAN

BARRETTO POINT SITE
(SOUTHEAST SIDE OF VIELE AVE
BETWEEN MANIDA ST AND BARRETTO ST)
BRONX, NEW YORK.

DATE: APRIL 21, 2006 REVISION #3

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I. INTRODUCTION

This Community Air Monitoring Plan (CAMP) requires real-time monitoring for levels of volatile organic compounds (VOCs) and particulates (i.e., dusts and aerosols) at the downwind perimeter of each designated work area when certain activities are in progress at the site. It also requires air samples to be collected and analyzed for polyaromatic hydrocarbons (PAHs) and Target Compound List (TCL) Metals.

A. SCOPE AND APPLICABILITY

The purpose of this CAMP is to provide protection for the downwind community from potential airborne contaminant releases as a direct result of remedial and construction work activities. The downwind community includes, but is not limited to, the following:

- · off-site receptors including residences and businesses; and,
- on-site workers not directly involved with the subject work activities.

Exceedance of the action levels specified herein will require, as appropriate, increased monitoring, corrective actions to reduce emissions, and/or cessation of work activities. In addition, implementation of the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

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II. AIR MONITORING

This section explains the general concepts of a community air monitoring program and specifies the monitoring and sampling activities that will be performed.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the exposure to the downwind community from potential airborne contaminant releases as a direct result of remedial and construction work activities. Initial screening for identification is often qualitative (i.e., the contaminant, or the class to which it belongs, is demonstrated to be present, but quantification requires subsequent testing). Two principal approaches will be used for identifying and/or quantifying airborne contaminants:

A. <u>DIRECT-READING MONITORING INSTRUMENTS</u>

Monitoring for VOCs will be conducted using a photoionization detector (PID). The PID will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate the exceedance of an action level.

Monitoring for particulates will be conducted using a real-time particulate monitor that measures the concentration of airborne respirable particulates less than 10 micrometers in size (i.e., PM₁₀). The particulate monitor will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate exceedance of an action level.

B. <u>LABORATORY ANALYSIS OF AIR SAMPLES</u>

Air samples for laboratory analysis for PAHs will be collected using a GMW GPS-1 Sampler and the PUF Sampling System or equivalent. Sampling will be in accordance with USEPA Method TO-13A (i.e., Determination of Polycyclic Aromatic Hydrocarbons (PAHs) in Ambient Air Using GC/MS).

Air samples of PM_{10} for laboratory analysis for TAL Metals will be collected using a GMW PM_{10} High Volume Air Sampler or equivalent. Measurement of the inhalation exposure pathway (respirable concentration) for TAL Metals will be calculated from PM_{10} filter by extraction of TAL Metals from PM_{10} collected. Sampling and laboratory analysis will be in accordance with USEPA Method 40 CFR, Part 50, Appendix M – Reference Method for Determination of Particulate Matter as PM_{10} in the Atmosphere.

Results of laboratory testing for both PAHs and TAL Metals in collected air samples must be submitted to the Engineer for review within one week of the termination of the sample collection period.

(i) A PARTITION OF A CONTROL

III. AIR MONITORING STRATEGY

The following section describes measures and procedures for air monitoring.

A. CONTINUOUS MONITORING

Continuous monitoring will be required for all ground-intrusive activities and during the demolition/reconstruction of contaminated or potentially contaminated site/structures. Ground-intrusive activities include, but are not limited to, earthmoving operations, and excavation and handling of soil/waste.

B. <u>PERIODIC MONITORING</u>

Periodic monitoring will be required for non-ground-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of monitoring while opening a well cap or overturning soil, or monitoring during well purging.

IV. RESPONSE LEVELS AND REQUIRED ACTIONS

A. VOLATILE ORGANIC COMPOUNDS

VOCs concentrations must be monitored at the upwind and downwind perimeters of the immediate work area (i.e., the Exclusion Zone) on a continuous basis during all ground-intrusive work activities and periodically during non-ground-intrusive work activities. Upwind concentrations will be measured at the start of each work shift and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate.

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

If the ambient air concentration of total VOCs at the downwind perimeter of the work area or Exclusion Zone persists at 5 ppm above background but less than 25 ppm, work activities must be halted, the source of contaminant identified, corrective actions taken to reduce emissions, and monitoring continued. After these steps, work activities can resume provided that the VOC concentration 200 feet (ft) downwind of the Exclusion Zone or half the distance to the nearest potential receptor or residential/commercial structure (whichever is less – but in no case less than 20 ft) is below 5 ppm above background for the 15-minute average.

If the ambient air concentration of total VOCs at the downwind perimeter of the work area or Exclusion Zone exceeds 25 ppm, work activities must cease and the Engineer notified immediately.

B. PARTICULATES

Particulate concentrations must be monitored at the upwind and downwind perimeters of the immediate work area (i.e., the Exclusion Zone) on a continuous basis during all ground-intrusive

work activities and periodically during non-ground-intrusive work activities. In addition, fugitive dust migration should be visually assessed during all work activities.

If the downwind PM-10 particulate level is more than 100 micrograms per cubic meter (ug/m 3) greater than background (i.e., upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, dust suppression techniques must be employed. Work may continue with appropriate dust suppression techniques being employed provided that downwind PM₁₀ levels do not exceed 150 ug/m 3 above the upwind PM₁₀ level and provided that no visible dusts are observed migrating from the work area.

If, after implementation of appropriate dust suppression techniques, downwind PM_{10} levels are greater than 150 ug/m³ above the upwind PM_{10} level, work activities must be ceased and a re-evaluation of work activities initiated. Work activities can resume provided that particulate suppression measures and other controls are successful in reducing the downwind PM_{10} particulate concentration to within 150 ug/m³ of the upwind level and in preventing visible dust migration.

C. METALS

Air samples for laboratory analysis for TAL Metals must be collected at the upwind and downwind perimeters of the immediate work area (i.e., the Exclusion Zone) on a continuous basis during all ground-intrusive activities. If the results of laboratory analysis for any "downwind" TAL Metal exceeds its USEPA ambient air standard or is above the "upwind" TAL Metal level, work activities potentially causing these emissions must cease and the Engineer notified immediately. The source of these contaminants must be identified, corrective actions taken to reduce emissions, and air sampling continued. After these steps, work activities can resume.

D. POLYAROMATIC HYDROCARBONS

Air samples for laboratory analysis for PAHs must be collected at the upwind and downwind perimeters of the immediate work area (i.e., the Exclusion Zone) on a continuous basis during all ground-intrusive activities. If the results of laboratory analysis for any "downwind" PAH exceeds its USEPA ambient air standard or is above the "upwind" PAH level, work activities potentially causing these emissions must cease and the Engineer notified immediately. The source of these contaminants must be identified, corrective

actions taken to reduce emissions, and air sampling continued. After these steps, work activities can resume.

NO TEXT ON THIS PAGE

APPENDIX D – ANAYLTICAL TEST RESULTS CLEAN FILL



May 1, 2009

Mr. Jeff Manganello Thalle Construction Company, Inc 51 Route 100 Briarcliff Manor, NY 10510

Re:

Elmsford Soil Quality Data & Evaluation – Conti-7

Dear Mr. Manganello:

lives the scripping for the first file.

This letter report presents the soil data analytical results of the one soil sample (Conti-7) collected from Elmsford Recycling facility on April 23, 2009. Copies of the analytical soil summary tables and laboratory data are presented in the Attachment. Based upon the review of soil analytical data, the reported results are below the Unrestricted Residential, Commercial and Industrial Use regulatory cleanup objective requirements of the New York State Department of Environmental Conservation (6NYCRR Part 375-3.8(a)) and as such is suitable for all fill application(s) within the New York State.

One soil sample was collected from the Thalle Elmsford Recycling facility, identified as samples Conti-7, for use as fill material. The soil samples were analyzed for the following NYSDEC Analytical Service Protocol (ASP) parameters:

- Target Analyte List (TAL) inorganics (23 metals plus cyanide) using Contract Laboratory Protocol (CLP) Analytical Methods For Inorganics, Exhibit D, Part V (10/95);
- Total Compound List (TCL) Volatile Organic Compounds using CLP Methodology 95-1;
- TCL Base/Neutral Semivolatile Organic Compounds using CLP Methodology 95-2;
- TCL Acid Extractable Semivolatile Organic Compounds using CLP Methodology 95-2; and
- Pesticide, Herbicide and Polychlorinated Biphenyls Compounds (Pest/PCB) using NYSDEC ASP CLP Method 95-3.

To evaluate the nature and extent of potential contaminants the soil analytical results were compared to applicable New York State standards, criteria and guidance values. Specifically, the soil data results were compared to Unrestricted Use guidance of DEC 6NYCRR Part 375-3.8(a). Where no cleanup objectives were published for specific analytes and compounds then previous state guidance values of NYSDEC Technical Assistance Guidance Memorandum (TAGM) No. HWR-94-4046 (1994) was used. In addition, regional published background ranges for soil quality were used to establish a baseline concentration and for comparative purposes. The standards, cleanup objectives,

and background concentrations are provided in the summary tables. In addition to the contaminant-specific numerical RSCO's, NYSDEC also applies a maximum value for the following classes of compounds:

Total Volatile Organic Compounds (TVOC's) (10 mg/kg);

- Individual Semivolatile Organic Compound less than or equal to (50 mg/kg);
- Total Semivolatile Organic Compounds (sVOC's) (500 mg/kg); and
- Total Pesticides (10 mg/kg).

Metals detected in soil samples were also compared to natural background levels found in regional soils, published by Skacklette & Boerngensen (1984) and McGovern (1998). Both references are recognized by the NYSDEC.

Results:

Volatile Organic Compounds (TCL)

No volatile organic compounds were reported over the analytical Method Detection Limit for TCL volatile organic compounds in the soil sample. Data results were below the NYSDEC RSCO's for all individual thirty-five (35) volatile compounds and the Total Volatile Organic Compound objective of 10 mg/kg (TVOC = 10 mg/kg).

Semivolatile Organic Compounds (TCL)

No semivolatile organic compounds were reported above NYSDEC Unrestricted Use Soil Cleanup Objectives. Nine (9) TCL Semivolatile Organic Compounds were detected above the Method Detection Limits but below regulatory cleanup objectives. In soil sample Conti-5 the following compounds were detected less the quantification limit: Phenanthrene, Fluoranthene, Chrysene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(a,h) anthracene and Benzo(g,h,l)perylene. All semivolatile organic compounds were detected below individual NYSDEC RSCO's and Total Semivolatile Organic Compound objectives of 500 mg/kg (sVOC = 500 mg/kg).

Pesticide/ Herbicide and PCB Analyses (TCL)

No Pesticide, Herbicide and PCB organic compounds were reported above NYSDEC Unrestricted Use Soil Cleanup Objectives. No Pesticide, PCB or Herbicide compounds were reported above the Method Detection Limit. All soil analytical data results were below NYSDEC RSCO's for individual pesticide/PCB compounds and the Total Pesticide objective of 10 mg/kg.

Metals Analyses (TCL)

No metal analytes were reported above NYSDEC Unrestricted Use Soil Cleanup Objectives. Eighteen (18) metal analytes were detected above the Method Detection Limits for the specific analysis. Aluminum, arsenic, barium, calcium, chromium, copper, iron, lead, manganese, magnesium, mercury, nickel, potassium, selenium, sodium, thallium, vanadium and zinc were detected within background range established for metal elements reported in soils of New York State (Shacklette, McGovern).

Conclusion & Recommendations

Based upon a review of the soil sample data, the soil quality was below the DEC Unrestricted Use Soil Cleanup Objectives (6 NYCRR Part 375-3.8(a) allowing its use at residential, commercial and industrial sites. The soil material is representative of "clean fill" (6NYCRR Part 375.6.7(d) and is suitable for all fill application(s) within the New York State.

Should you or your staff have any questions regarding this report, please feel free to contact me at your convenience.

Sincerely,

Nicholas Mann Principal

Nicholas Hann

Attachment(s)

Table 1. Summary of Metals and Cyanide in Soil Sample Elmsford Soil Material - April 23, 2009

	Unrestricted Use	Eastern US	New York State	Conti - 7
	Soil Cleanup	Element Conc.	Background Conc.	0904320-01
Metal Analytes	Objectives	in Soils (Shacklette)	in Soils (McGovern)	4/23/2009
(Concentration in mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	SB	7,000 -100,000	33,000	10600
Antinomy	S8	<1 - 8.8	NA.	0.498 U
Arsenic	16"	<0.1 - 73	3.0 - 12	0.671
Barium	350*	10 - 1,500	15 - 600	177
Beryllium	14"	<1 - 7	0 - 1.75	0.399 U
Cadmium	2.5*	NA	0.1 - 1	0.399 U
Calcium	S8	100 - 280,000	130 - 35,000	4150
Chromium	19*	1 - 1,000	1.5 - 40	32.6
Cobalt	30 or SB	<0.3 - 70	2.5 ~ 60	0.399 U
Copper	270*	<1 - 700	<1 - 50	31.7
lron	2,000 or SB	100 - 100,000	2,000 - 550,000	21400
Lead -	400*	<10 - 300	200 - 500	8.3
Magnesium	SB	50 - 50,000	100 - 5,000	6600
Manganese	2000*	<2 - 7,000	50 - 5,000	227
Mercury	1.2*	0.01 - 3.4	0.001 - 0.2	0.0122
Vickel	130*	<5 - 700	0.5 - 25	21.5
Potassium	SB	50 - 37,000	8,500 - 43,000	5790
Selenium	1*	<0.1 - 3.9	<0.1 - 3.9	0.498 U
Silver	8.3	NA NA	NA	0.399 U
Sodium	SB	<500 - 50,000	6,000 ~ 8,000	277
hallium	\$B	2.2 - 23	NA	0.498 U
/anadium	150-SB	<7 - 300	1 - 300	46.8
Sinc	2200"	<5 - 2,900	9.0 - 50	60.5
yanide	27*	NA.	NA	0.115 U
6 Moisture	-	_	_	13.2

Qualifiers:

mg/kg - Milligram per kilogram mg/l - Miligrams per liter U - Not detected; detection limit shown

B - Analyte Found in associated blank as well as sample

B - Analyte Found in associated plank as well as sample
SB - Site Background
*Unrestricted Use Soil Cleanup Objectives (6NYCRR Part 375-3.8(a) Protection of Human Health
Scacklette, HT and JG Boerngen, 1984. "Element Concentration in Soils and other Surficial Materials of the Conterminus United States, L
E. Carol McGovern, NYSDEC Wildlife Resource Center. "Background Concentrations of 20 elements in Soils with Special Regard for New

Table 2. Summary of Volatile Organic Compounds in Soil Samples Elmsford Soil Material - April 23, 2009

	Unrestricted Use	Conti - 7
	Soil Cleanup	0904320-01
Metal Analytes	Objectives	4/23/2009
(Concentration in ug/kg)	(ug/kg)	(ug/kg)
Vînyl Chloride	20*	5.7 U
Chloroethane	1900**	5.7 U
Methylene Chloride	50*	1
Acetone	50*	9.3 B
		5.7 U
Carbon disulfide	2700**	5.7 U
1,1-Dichloroethene	330*	5.7 U
1,1-Dichloroethane	270*	5.7 U
t-1,2-Dichloroethene	190*	5.7 U
c-1,2-Dichloroethene	250*	5.7 U
Chloroform	370*	5.7 U
1,2-Dichloroethane	10*	5.7 U
1.2-Dichlorobenzene	1100*	5.7 U
1,3-Dichlorobenzene	2,400*	5.7 U
1,4-Dichlorobenzene	1800*	5.7 U
1,4-Dioxane	150*	5.7 U
Butylbenzene	1200*	5.7 U
Hexachlorobenzene	330*	5.7 U
Methyl Ethyl Ketone	120*	5.7 U
Methyl tert-butyl ether	930*	5.7 U
Propylbenzene-n	3900*	5.7 U
sec-Butylbenzene	11000*	5.7 U
tert-Butylbenzene	5900*	5.7 U
1,2,4-Trimethylbenzene	3,600	
1,3,5-Trimethylbenzene	8400*	5.7 U
1,1,1-Trichloroethane		5.7 U
	680*	5.7 U
Carbon Tetrachloride	760	5.7 U
Bromodichloromethane	-	5.7 U
1,2-Dichloropropane	-	5.7 U
cis-1,3-Dichloropropene	300**	5.7 U
Trichloroethene	470*	5.7 U
Dibromochloromethane	100*	5.7 U
1,1,2-Trichloroethane	6000**	5.7 U
Benzene	60*	5.7 U
rans-1,3-Dichloropropene	300	5.7 U
Bromoform	<u>-</u> .	5.7 U
1-Methyl-2-pentanone	1000**	5.7 U
2-Hexanone	- 1	5.7 U
Tetrachloroethene	470*	5.7 U
Toluene	700*	5.7 U
1,1,2,2-Tetrachloroethane	600**	5.7 ป
Chlorobenzene	1100*	5.7 U
Ethylbenzene	1000*	5.7 U
Styrene	-	5.7 U
n,p-xylene	1600*	5.7 U
-xylene	1600*	5.7 U
VOC's	10,000	9.3
Qualifiers:	10,000	უ.ა

ug/kg - Microgram per kilogram of part per billion (ppb) equivalent

ug/l - Microgram per liter (Aq) of part per billion (ppb) equivalent

U - Not detected; detection limit shown

B - Analyte Found in associated blank as well as sample

*Unrestricted Use Soil Cleanup Objectives (6NYCRR Part 375-3.8(a) Protection of Human Health

** Specific Numerical values of TAGM 4046 used, since no Part375 objectives published

Table 3. Summary of Semivolatile Organic Compounds in Soil Samples Elmsford Soil Material - April 23, 2009

	NYSDEC Unrestricted Use	ATSDR Background Soil	Conti - 7 0904320-01
Semivolatile Compounds	Soil Cleanup	Concentrations PAHs	4/23/2009
(Concentration in ug/kg)	Objectives	in Urban Soils	(ug/kg)
. 50,	(ug/kg)	(ug/kg)	(-ga)
Phenol	330*	-	140 L
2-Chlorophenol	800**		140 L
2-Methylphenol	330*	-	140 L
3,4-Methylphenol	330**	-	140 L
Nitrobenzene	200**	<u>-</u>	140 L
Isophorone ~	4400**	-	140 L
2-Nitrophenol	330**	-	140 U
2,4-Dichlorophenol.	400**	_	140 U
Naphthalene	12000*	-	140 U
4-Chloroaniline	220**	- 1	140 U
4-Chloro-3-methylphenol	240**	-	140 U
2-Methylnaphthalene	36400**	-	140 U
2,4,5-Trichlorophenol	100		140 U
2-Nitroaniline	430**	<u>-</u>	140 U
Dimethylphthalate	2000**	.	140 U
Acenaphthylene	100000*	-	140 U
2,6-Dinitrotoluene	1000**	-	140 U
3-Nitroaniline	500**	- 1	140 U
Acenaphthene	98000*	-	140 U
2,4-Dinitrophenol	200**	-	140 U
4-Nitrophenol	100**	-	140 U
Dibenzofuran	14,000***	- 1	140 U
Diethylphthalate ,	7100**	-	140 U
Fluorene	100,000*	-	140 U
Hexachlorobenzene	410**	-	140 U
Pentachlorophenol	1700* .	-	140 U
Phenanthrene	100,000*		60 J
Anthracene	100,000*		140 U
Di-n-butylphthalate	8100**	.	140 U
Fluoranthene	100,000*	200 - 166,000	84 J
Pyrene	100,000*	145 - 147,000	71 J
Butylbenzylphthalate	50,000**	_	140 U
3,3'-Dichlorobenzidine		<u>-</u>	140 U
Benzo(a)anthracene	1,000*	169 - 59,000	38 J
Chrysene	590*	251 - 640	33 J
is(2-Ethylhexyl)phthalate	50,000**	-	140 U
Di-n-octylphthalate	50,000**	- 1	140 U
Benzo(b)fluoranthene	1,000*	15,000 - 62,000	46 J
Benzo(k)fluoranthene	1,700*	300 - 26,000	140 U
Benzo(a)pyrene	1,000*	165 - 220	34 J
ndeno(1,2,3-cd)pyrene	500*	8,000 - 61,000	27 J
Dibenz(a,h)anthracene	330*	_	140 U
Benzo(g,h,i)perylene	100,000*	900 - 47,000	26 J
otal SVOC's	500,000		419

ug/kg - Microgram per kilogram

- U Not detected; detection limit shown
- J Estimated value. The result is less than the qualification limit
- D Compound identified at a secondary dilution
- B Analyte Found in associated blank as well as sample
- *Unrestricted Use Soil Cleanup Objectives (6NYCRR Part 375-3.8(a) Protection of Human Health
- ** Specific Numerical values of TAGM 4046 used, since no Part375 objectives published

Table 4. Summary of Pesticide, Herbicide & PCB Compounds in Soil Samples Elmsford Soil Material - April 23, 2009

	Unrestricted Use	Conti - 7
TCL Pesticide	Soil Cleanup	0904320-01
Compounds	Objectives	4/23/2009
(Concentration in ug/kg)	(ug/kg)	(ug/kg)
alpha-BHC	20*	5.6 U
beta-BHC	70*	5.6 U
delta-BHC	250*	5.6 U
gamma -BHC(Lindane)	100	5.6 U
Heptachlor	380*	5.6 U
Aldrin	2.600*	5.6 U
Heptachlor epoxide	20**	5.6 U
Endosulfan I	4,800*	5.6 U
Dieldrin	40*	5.6 U
4,4'-DDE	1,800*	5.6 U
Endrin	60*	5.6 U
Endosulfan II	4,800*	5.6 U
4-4'-DDD	2,600*	5.6 U
Endosulfan sulfate	4,800*	5.6 U
4,4'-DDT	1,700*	5.6 U
Methoxychlor	· -	5.6 U
Endrin ketone	-	5.6 U
alpha-Chlordane	91*	5.6 U
Total Pesticides	10,000	0.00
TCL Herbicide		
Compounds		
(Concentration in ug/kg)		
2,4,5-T	1,900**	110 U
2,4,5-TP (Silvex)	3,800*	110 U
2,4-D	500**	110 U
		0
Polychlorinated Biphenyls(PCBs)	· · · · · · · · · · · · · · · · · · ·	1
(Concentration in ug/kg)		
Aroclor-1016	1,000*	92 U
Aroclor-1221	1,000*	92 U
Aroclor-1232	1,000*	92 Ų
Aroclor-1242	1,000*	92 U
Arocior-1248	1,000*	92 U
Aroclor-1254	1,000*	92 U
Aroclor-1260	1,000*	92 U
Total PCB	25,000	0

Qualifiers:

ug/kg - Microgram per kilogram

- U Not detected; detection limit shown
- J Estimated value. The result is less than the qualification limit
- D Compound identified at a secondary dilution
- C Pesticide Compound where the identification has been successfully confirmed
- P Pesticide/Aroclor target analyte when there is a >25% difference detected Conc. between GC columns
- Y Several pesticide peaks "detected" in samples SS-1, 2, 4, 5, 6, 8, and 9 are most likely due to Arochlor conditions
- *Unrestricted Use Soil Cleanup Objectives (6NYCRR Part 375-3.8(a) Protection of Human Health
- ** Specific Numerical values of TAGM 4046 used, since no Part375 objectives published

Date: 01-May-09

CLIENT:

Quay Consulting, LLC.

Project:

Conti - 6

Lab Order:

0904320

Work Order Sample Summary

Lab Sample ID

0904320-01A

0904320-01B

Client Sample ID

Conti - 6

Conti - 6

Date Collected

4/23/2009 10:00:00 AM

4/23/2009

Date Received

4/23/2009 10:00:00 AM

4/23/2009

7735 56 TOLEDO STREET • FARMINGDALE, NEW YO. (631) 454-6100 • FAX (631) 454-8027

TAG # / COC

元H-0205 NY050 68-573

NYSDOH CTDOH NJDEP PADEP

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RELINGUISHED BY (SIGNATURE)	ATURE)	PATE 3 PRINTED NAME	NAME	RECEIVED BY ON (SIGNATURE)	DATE//24/65 PRIN	MTED NAME	
		WHITE-OFFICE / CANA	RY-LAB / PINK-SAMPI	WHITE-OFFICE / CANARY-LAB / PINK-SAMPI E CLISTONIAN / GOLDENBOD-CLIENT	8/30 ENT	7/14/1/ \b.	
		27 8 87742		コーク・コーク ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・			

Client Name QUAY		-	Date and	d Time Receive	4/23/2009	
Work Order Numbe 0904320	RcptNo: 1		Receive	dby NM		
COC_ID: Cooler Checklist completed by	11/24/	69	Poviovo	el bu	-5-r	Lave Date
Signature	Date	- 1	Reviewe	Initials		Date
Matrix:	Carrier name	Courier		•		
:		<u> </u>	1 o			
Shipping container/cooler in good condition?		Yes 🗸	Noll	Not Presen		
Custody seals intact on shippping container/co	poler?	Yes	No	Not Presen	V	
Custody seals intact on sample bottles?		Yes	No	Not Presen	V	
Chain of custody present?		Yes 🛂	No			
Chain of custody signed when relinquished an	d received?	Yes 🔽	No 🛄			
Chain of custody agrees with sample labels?		Yes 🔽	No !			
Samples in proper container/bottle?		Yes 🗹	No			
Sample containers intact?		Yes 🔽	No!			
Sufficient sample volume for indicated test?		Yes 🗹	No 🛄		•	
All samples received within holding time?	•	Yes 🗹	No 🔣		٠	
Container/Temp Blank temperature in complian	nce?	Yes 🗹	No 🛄	· · · · · · · · · · · · · · · · · · ·		
Water - VOA vials have zero headspace?	No VOA vials subm	itted 🗸	Yes	No _		+ 1
Water - pH acceptable upon receipt?	·	Yes 🗌	No 🗀	N/A	٠	
	Adjusted?		Checked b	······································	_	*
Any No and/or NA (not applicable) response mo	ust be detailed in the co	mments sect	ion be			
Client contacted	Date contacted:		Pe	rson contacted		
Contacted by:	Regarding:		t ***			
Conments: Cooler: Yes; fce: Yes; T = 4 Corrective Action	1.7 C.					
				. :		

Sample Receipt Checklist

Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

Lab Order:

0904320

Project:

Conti - 6

Lab ID:

0904320-01A

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOIL

Certificate of Results

Analyses	Sample Result	LOD	LOQ	Qua	Units	DF	Date/Time Analyzed
VOLATILE SW-846 METHOD 8	260	ž s	SW	3260B			Analyst: LA
1,1,1,2-Tetrachloroethane	÷ U	0.34	5.7		µg/Kg-d ry	1	4/25/2009 6:23:00 AM
1,1,1-Trichloroethane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1,2,2-Tetrachloroethane	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1,2-Trichloro-1,2,2-trifluoroethan	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1,2-Trichloroethane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1-Dichloroethane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1-Dichloroethene	ប	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,1-Dichloropropene	u	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2,3-Trichlorobenzene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2,3-Trichloropropane	U	0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2,4,5-Tetramethylbenzene	U	0.34	5.7		µg/Kg-dıy	1	4/25/2009 6:23:00 AM
1,2,4-Trichlorobenzene	U	0.34	5.7	С	µg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2,4-Trimethylbenzene	Ū	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2-Dibromo-3-chloropropane	U	0.45	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2-Dibromoethane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2-Dichlorobenzene	ប	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2-Dichloroethane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,2-Dichloropropane	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
1,3,5-Trimethylbenzene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,3-Dichlorobenzene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,3-dichloropropane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,4-Dichlorobenzene	Ü	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
1,4-Dioxane	U	0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23;00 AM
2,2-Dichloropropane	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
2-Butanone	U	0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
2-Chloroethyl vinyl ether	Ü	0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
2-Chlorotoluene	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
2-Hexanone	· U	0.34	5.7	С	μg/Kg-dry	1	4/25/2009 6:23:00 AM
2-Propanol	ប	0.45	57		µg/Kg-dry	1	4/25/2009 6:23:00 AM
4-Chiorotoluene	U	0,34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
4-Isopropyltoluene	u	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
4-Methyl-2-pentanone	U	0.34	5.7	С	μg/Kg-dry	1	4/25/2009 6:23:00 AM
Acetone	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM

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Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

0904320

Lab Order: Project:

Conti - 6

Lab ID:

0904320-01A

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOIL

Certificate of Results

Analyses	Sample Result	LOD	LOQ	Qual	Units	DF	Date/Time Analyzed
VOLATILE SW-846 METHO	OD 9250		200	8260B			A
Acrolein	U	0.34	28	02008	μg/Kg-dry	1	Analyst: LA 4/25/2009 6:23:00 AM
Acrylonitrile	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Benzene	U	0.34	5.7		μg/Kg-dry	, 1	4/25/2009 6:23:00 AM
Bromobenzene	บ	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
Bromochloromethane	Ŭ	0.45	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Bromodichloromethane	U.	D.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
Bromoform	Ü	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Bromomethane	Ü	0.34	5.7		рд/Kg-dry µg/Kg-dry	1	4/25/2009 6:23:00 AM
Carbon disulfide	Ŋ	0.34	5.7		µg/Kg-dry µg/Kg-dry	1	4/25/2009 6:23:00 AM
Carbon tetrachloride	Ü	0.34	5.7		µg/Kg-dry µg/Kg-dry	1	
Chlorobenzene	- U	0.34	5.7		μg/Kg-dry		4/25/2009 6:23:00 AM 4/25/2009 6:23:00 AM
Chlorodifluoromethane	U	0.34	5.7 5.7			1 1	4/25/2009 6:23:00 AM
Chloroethane	Ü	0.34	5.7		μg/Kg-dry μg/Kg-dry	1	
Chloroform	Ü	0.34	5.7		μg/Kg-dry		4/25/2009 6:23:00 AM 4/25/2009 6:23:00 AM
Chloromethane *	Ŋ	0.34	5.7 5.7		pg/Kg-dry	1 1	4/25/2009 6:23:00 AM
cis-1,2-Dichloroethene	Ü	0.34	5.7			-	140
cis-1,3-Dichloropropene	U	0.34	5.7		μg/Kg-dry μg/Kg-dry	1 1	4/25/2009 6:23:00 AM 4/25/2009 6:23:00 AM
Dibromochloromethane	Ü	0.34	5.7		-	1	
Dibromomethane	U	0.34	5.7		µg/Kg-dry µg/Kg-dry	i	4/25/2009 6:23:00 AM
Dichlorodifluoromethane	U	0.34	5.7 5.7			-	4/25/2009 6:23:00 AM
Diisopropyl ether	U	0.34	5.7 5.7		pg/Kg-dry	1	4/25/2009 6:23:00 AM
Ethanoi	U	0.34	3.7 28		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Ethyl acetate	υ	0.45	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Ethylbenzene	U	0.34			µg/Kg-dry	1	4/25/2009 6:23:00 AM
Freon-114	U	0.45	5.7 5.7		µg/Kg-diy	1	4/25/2009 6:23:00 AM
Hexachlorobutadiene	U	0.45			µg/Kg-dry	1	4/25/2009 6:23:00 AM
Isopropyl acetate	. U		5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
isopropylbenzene		0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
m.p-Xylene	U _.	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
		0.34	11		µg/Kg-dry	1	4/25/2009 6:23:00 AM
Methyl tert-butyl ether Methylene chloride	U CO	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
•		0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
n-Amyl acetate		0.45	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
Naphthalene	1.6	0.34	5.7	JC j	µg/Kg-dry	1	4/25/2009 6:23:00 AM

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Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

Lab Order:

0904320

Project:

Conti - 6

Lab ID:

0904320-01A

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOIL

Certificate of Results

Analyses	Sample Result	LOD	LOQ	Qual	Units	 DF	Date/Time Analyzed
VOLATILE SW-846 METHOD 82	60	144.	SW8	260B			Analyst: LA
n-Butyl acetate	ាប	0.34	5.7	С	μg/Kg-dry	1	4/25/2009 6:23:00 AM
n-Butylbenzene	U	0.34	5.7		μg/Kg-dry	1 .	4/25/2009 6:23:00 AM
n-Propyl acetate	U	0.45	5.7		μ g/ Kg-dry	1	4/25/2009 6:23:00 AM
n-Propylbenzene	Ü	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
o-Xylene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
p-Diethylbenzene	u '	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
p-Ethyltoluene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
sec-Butylbenzene	U	0.34	5.7		μg/Kg-dry	 1	4/25/2009 6:23:00 AM
Styrene	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
t-Butyl alcohol	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
lert-Butylbenzene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Tetrachloroethene	. U	0.45	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Toluene	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
trans-1,2-Dichlorgethene	U	0.45	5.7		μg/Kg-dry	1	4/25/2009 6;23;00 AM
trans-1,3-Dichloropropene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Trichloroethene	U	0.34	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Trichlorofluoromethane	U	0.34	5.7		μg/Kg-đry	1	4/25/2009 6:23:00 AM
Vinyl acetate	. U	0.45	5.7		μg/Kg-dry	1	4/25/2009 6:23:00 AM
Vinyl chloride	U	0.34	5.7		µg/Kg-dry	1	4/25/2009 6:23:00 AM
Surr: 4-Bromofluorobenzene	93.9	0 6	34-132		%REC	1	4/25/2009 6:23:00 AM
Surr: Dibromoffuoromethane	91.7	0 6	6-131		%REC	1	4/25/2009 6:23:00 AM
Surr: Toluene-d8	101	0 8	4-132		%REC	1	4/25/2009 6:23:00 AM

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Date: 01-May-09

ELAP ID: 11418

CLIENT: Lab Order: Quay Consulting, LLC.

0904320

Collection Date: 4/23/2009 10:00:00 AM

Client Sample ID: Conti - 6

Project:

Conti - 6

3.6

Lab ID:

0904320-01B

Matrix: SOIL

Certificate of Results

Analyses	Sample Resul	t LOD	LOQ Qua	l Units	DF	Date/Time Analyzed
MERCURY -			SW7471B	SW7471B		Analyst: AH
Мегсигу	0.0122	0.005	0.00976	mg/Kg-dry	1	4/24/2009 12:40:37 PM
HERBICIDES SW-846 8151			SW8151A	SW8151		Analyst: PT
2,4,5-T	U	7.67	110	ug/Kg-dry	1	4/28/2009 12:46:00 PM
2,4,5-TP (Silvex)	. U	7.67	110	µg/Kg-dry	1	4/28/2009 12:46:00 PM
2.4-D	U	7.67	110	µg/Kg-dry	1	4/28/2009 12:46:00 PM
Surr. 2,4-DCAA	95.9	0	15-135	%REC	1	4/28/2009 12:46:00 PM
PCB'S AS AROCLORS SW-	346 METHOD 808	2	SW8082A	SW3550		Analyst: AR
Aroclor 1016	· · · · · · · · · · · · · · · · · · ·	7.70	92	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Aroclor 1221	U	7.70	92	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Aroclor 1232	U	7.70	92	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Aroclor 1242	บ	7.70	92	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Aroclor 1248	U	7.70	92	µg/Kg-đry	1	4/29/2009 8:17:00 PM
Aroclor 1254	U	7.70	92	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Aroclor 1260	U	7.70	92	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Surr: TCX	36.8	0	16-148	%REC	1	4/29/2009 8:17:00 PM
Surr: DCB	100	0	15-174	%REC	1	4/29/2009 8:17:00 PM
PESTICIDES SW-846 METHO	DD 8081		SW8081B	SW3550		Analyst: AR
4,4 -DDD	U	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
4,4'-DDE	ប	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
4,4'-DDT	u ·	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Aldrin	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
alpha-BHC	U	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
beta-BHC	U	0.76	5.6	µg/Kg-dry	†	4/29/2009 B:17:00 PM
Chlordane	ប	7.55	68	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Chlorobenzilate	U	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
DBCP	ប	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
delta-BHC	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Dieldrin	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Endosulfan I	υ	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Endosulfen II	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Endosulfan sulfate	Ü	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM

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Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

Lab Order: Project: 0904320

0704320

Lab ID:

Conti - 6

0904320-01B

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOIL

Certificate of Results

Analyses	Sample Result	LOD	LOQ Q	ual Units	DF	Date/Time Analyzed
PESTICIDES SW-846 METH	OD 8081		SW808	IB SW355	0	Analyst: AR
Endrin	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Endrin aldehyde	U	0.76	5.6	μg/Kg-dry	1 -	4/29/2009 8:17:00 PM
Endrin ketone	£	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
gamma-BHC	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Heplachlor	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Heptachlor epoxide	Ū	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Hexachlorobenzene	U	0.76	5.6	μg/Kg-dry	1	4/29/2009 8:17:00 PM
Hexachlorocyclopentadiene	ប	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Methoxychlor	U	0.76	5.6	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Toxaphene	U	7.55	54	µg/Kg-dry	1	4/29/2009 8:17:00 PM
Surr: DCB	111	0	28-147	%REC	1	4/29/2009 8:17:00 PM
Surr: TCX	38.5	. 0	20-138	%REC	1	4/29/2009 8:17:00 PM
PERCENT MOISTURE			D2216			Analyst: NM
Percent Moisture	13.2	0	0	wt%	1	4/24/2009
TAGM METALS			SW6010	B SW3056	DΑ	Analyst: JP
Aluminum	10600	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Antimony	U ·	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Arsenic	0.671	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Barium	177	0.2	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Beryllium	U	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Cadmium	U	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Calcium	4150	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Chromium	32.6	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Cobalt	U	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Соррег	31.7	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
tron	21400	1.99	3.99	mg/Kg-dry	10	4/24/2009 2:28:50 PM
Lead	8.30	0.2	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Magnesium	6600	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Manganese	227	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Nickel	21.5	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Potassium	5790	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Selenium	U	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM

American Analytical Laboratories, LLC., 56 Toledo Street, Farmingdale, NY, Zip - 11735

Tel - 6314546100 Fax - 6314548027 www.American-Analytical.com



- Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- LOQ Limit of Quantitation
 - S Spike Recovery outside accepted recovery limits
- C Calibration %RSD/%D exceeded for non-CCC analytes
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- LOD Limit of Detection
- ND Not Detected at the Reporting Limit
- U Indicates the compound was analyzed but not detected.

Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

Lab Order:

0904320

Project:

Conti - 6

Lab ID:

0904320-01B

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOlL

Certificate of Results

SW6010B SW3050A Analyst: JP	Analyses -	Sample Result	LOD	LOQ Qual	Units	DF	Date/Time Analyzed
Silver	TAGM METALS			SW6010B	SW3050A		Analyst: JP
Thallium U 0.3 0.498 mg/Kg-dry 1 4/24/2009 1:38:27 PM Vanadium 46.8 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM Zinc 60.5 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM Zinc 60.5 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM Zinc 60.5 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM Mg/Kg-dry 1 4/24/2009 1:38:27 PM SEMIVOLATILE SW-846 METHOD 8270 SW8270D SW3550A Analyst: LDS 1.2,4-Trichlorobenzene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 1,2-Dichlorobenzene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 1,3-Dichlorobenzene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-S-Trichlorophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-G-Trichlorophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dichlorophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimitrylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimitrylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimitrobluene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimitrobluene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,5-Dimitrobluene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2,5-Dimitrobluene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3-Dichlorobenzidine U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3-Dichlorobenzidine U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenol Henrylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 μg/Kg-dry 1 4/28/2009	Silver	U	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Vanadium 46.8 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM Zinc 60.5 0.1 0.399 mg/Kg-dry 1 4/24/2009 1:38:27 PM SEMIVOLATILE SW-846 METHOD 8270 SW8270D SW3550A Analyst: LDS 1.2,4-frichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,2-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,3-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,3-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,5-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,5-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylpaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3-Dichlorobenzidine U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM 4/28/2009 6:22:00 PM	Sodium	277	0.2	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
Zinc 60.5 0.1 0.399 mg/Kg-dry 1 4/22/2009 1:38:27 PM SEMIVOLATILE SW-846 METHOD 8270 SW8270D SW3550A Analyst: LDS 1,2,4-Trichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,2-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-S-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,-Chlorophenol U 16.9	Thallium	U	0.3	0.498	mg/Kg-dry	1	4/24/2009 1:38:27 PM
SW8270D SW3550A Analyst: LDS	Vanadium	46.8	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
1,2,4-Trichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,2-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,3-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28	Zinc	60.5	0.1	0.399	mg/Kg-dry	1	4/24/2009 1:38:27 PM
1,2-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,3-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimethylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylpheno	SEMIVOLATILE SW-846 ME	THOD 8270		SW8270D	SW3550A		Analyst: LDS
1,3-Dichlorobenzene	1,2,4-Trichlorobenzene	U	16.9	140	μg/Kg-dry	1	4/28/2009 6:22:00 PM
1,4-Dichlorobenzene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,6-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Mitrophinol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00	1,2-Dichlorobenzene	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
2,4,5-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4,6-Trichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dirhitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,6-Dirhitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylnaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	1,3-Dichlorobenzene	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
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2,4-Dichlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dimethylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Mitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Y-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM <td>2,4,5-Trichlorophenal</td> <td>U</td> <td>16.9</td> <td>140</td> <td>μg/Kg-dry</td> <td>1</td> <td>4/28/2009 6:22:00 PM</td>	2,4,5-Trichlorophenal	U	16.9	140	μg/Kg-dry	1	4/28/2009 6:22:00 PM
2.4-Dimethylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2.4-Dinitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2.4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2.6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2,4,6-Trichlorophenol	Ú	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
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2,4-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2,6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylnaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2,4-Dimethylphenói	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
2,6-Dinitrotoluene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chloronaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-a-methylophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2,4-Dinitrophenol	υ	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
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2-Chlorophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylnaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3°-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2,6-Dinitrotoluene	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
2-Methylaphthalene U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Methylaphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylaphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylaphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylaphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylaphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylaphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-aniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Chloronaphthalene	υ	16.9	140	µg/Kg-đry	1	4/28/2009 6:22:00 PM
2-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Chlorophenol	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-aniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Methylnaphthalene	U ,	16.9	140	μg/Kg-dry	1	4/28/2009 6;22:00 PM
2-Nitrophenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3,3'-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-aniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Methylphenol	U	16.9	140	μg/Kg-đry	1	4/28/2009 6:22:00 PM
3,3°-Dichlorobenzidine U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3+4-Methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Nitroaniline	ນ	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
3+4-Methylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 3-Nitroaniline U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM	2-Nitrophenol	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
3-Nitroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	3,3°-Dichlorobenzidine	U	27.9	140	μg/Kg-dry	1	4/28/2009 5:22:00 PM
4,6-Dinitro-2-methylphenol U 55.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Bromophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	3+4-Methylphenol	ប	16.9	140	μg/Kg-dry	1	4/28/2009 6:22:00 PM
4-Bromophenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	3-Nitroaniline	ប	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
4-Chloro-3-methylphenol U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chloroaniline U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	4,6-Dinitro-2-methylphenal	Ü	55.9	140	μg/Kg-dry	1	4/28/2009 6:22:00 PM
4-Chloroaniline U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM 4-Chlorophenyl phenyl ether U 16.9 140 μg/Kg-dry 1 4/28/2009 6:22:00 PM	4-Bromophenyl phenyl ether	ប	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
4-Chlorophenyl phenyl ether U 16.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	4-Chloro-3-methylphenol	и	16.9	140	µg/Kg-dry	1	4/28/2009 6;22:00 PM
, , , , , , , , , , , , , , , , , , , ,	4-Chloroaniline	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
4-Nitroaniline U 27.9 140 µg/Kg-dry 1 4/28/2009 6:22:00 PM	4-Chlorophenyl phenyl ether	U	16.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM
	4-Nitroaniline	υ	27.9	140	µg/Kg-dry	1	4/28/2009 6:22:00 PM

American Analytical Laboratories, LLC., 56 Toledo Street, Farmingdale, NY, Zíp - 11735

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- Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- LOQ Limit of Quantitation
- S Spike Recovery outside accepted recovery limits
- C Calibration %RSD/%D exceeded for non-CCC analytes
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- LOD Limit of Detection
- ND Not Detected at the Reporting Limit
 - U Indicates the compound was analyzed but not detected.

Date: 01-May-09

ELAP ID: 11418

CLIENT:

Quay Consulting, LLC.

Lab Order:

0904320

Project:

Conti - 6

Lab ID:

0904320-01B

Client Sample ID: Conti - 6

Collection Date: 4/23/2009 10:00:00 AM

Matrix: SOIL

Certificate of Results

Analyses	Sample Result	LOD	LOQ	Qual	Units	DF	Date/Time Analyzed
SEMIVOLATILE SW-846 ME	THOD 8270		SW8	270D	SW3550	A	Analyst: LDS
4-Nitrophenol	U	16.9	170		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Acenaphthene	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Acenaphthylene	U	16.9	140		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Aniline	υ	16.9	140	-	µg/Kg-dry	1	4/28/2009 6:22:00 PM
Anthracene	U	16.9	140		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Azobenzene	บ	16.9	140		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzidine	U	27.9	140		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzo(a)anthracene	38	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzo(a)pyrene	34	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzo(b)fluoranthene	46	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzo(g,h,i)perylene	26	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzo(k)fluoranthene	ប	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzoic acid	19	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Benzyl alcohol	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Bis(2-chloroethoxy)methane	บ	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Bis(2-chloroethyl)ether	υ	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Bis(2-chloroisopropyl)ether	U	16.9	140		µg/Kg-dry	1	4/28/2009 6:22:00 PM
Bis(2-ethylhexyl)phthalate	Ü	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Butyl benzyl phthalate	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Carbazole	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Chrysene	33	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Diberizo(a,h)anthracene	U	16. 9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Dibenzofuran	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Diethyl phthalate	บ	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Dimethyl phthalate	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Di-n-butyl phthalate	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22;00 PM
Di-n-octyl phthalate	· U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Fluoranthene	84	16.9	140	J	μg/Kg-dry	1	4/28/2009 6:22:00 PM
Fluorene	U	16.9	140		μg/Kg-dry	1	4/28/2009 6:22;00 PM
Hexachiorobenzene	Ũ	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Hexachlorobutadiene	Ü	16.9	140		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Hexachlorocyclopentadiene	Ü	55.9	170		μg/Kg-dry	1	4/28/2009 6:22:00 PM
Hexachioroethane	U	16.9	14D		μg/Kg-dry	1	4/28/2009 6:22:00 PM

American Analytical Laboratories, LLC., 56 Toledo Street, Farmingdale, NY, Zip - 11735

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- Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- LOQ Limit of Quantitation
 - S Spike Recovery outside accepted recovery limits
- C Calibration %RSD/%D exceeded for non-CCC analytes
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- LOD Limit of Detection
- ND Not Detected at the Reporting Limit
 - J Indicates the compound was analyzed but not detected.

Laboratories, LLC.	
American Analytical Laboratories, LLC.	ti dende in de de la company d

CLIENT: Work Order:	Quay Consulting, LLC 0904320	liting, LLC.	· · · · · · · · · · · · · · · · · · ·		The state of the s	A	NALYT	ANALYTICAL QC SUMMARY REPORT	JMMARY I	REPORT
Project:	Conti - 6					:		TestCode:	TestCode: Dry8081_Soil	
Sample ID: MB-25550 Client ID: PBS	5550	SampType: MBLK Batch ID: 25550	TestCo	rstCode; Dry8081_S TestNo: SW8081B	Soil Units: µg/Kg 3 SW3550	Ana	Prep Date: 4 Analysis Date: 4	4/27/2009 4/29/2009	RunNo: 43486 SeoNo: 592413	
Analyte		Result	<u> </u>	SPK value	ω Υ	%REC Lo		HighLimil RPD Ref Val	RPD R	RPDLimit Qual
4,4'-DDD		<u> </u>	4.9				1	ı	-	
4,4'-DDE	-	<u>י</u>	4.9							
4,4'-DDT)	4.9							
Aldrin alpha,RHC		=	0. 4					4		
beta-BHC		כנ	. 4. . 0.							
Chlordane			59			:	*.			
Chlorobenzilate			4.9		n					•
DBCP		つ :	4.9							
delta-BHC Dieldric	*)	6.4.9		•				1	
Dietoriii Fodosiiifoo I		.						٠		
Endosuifan II)	4. 4. 9. 0.					•		
Endosulfan sulfate	ar.	ח	4.9							
Endrin		D	4,9							•
Endrin aldehyde		3	4.9				•			
Endrin kelone		э :	4,9							
gamma-BMC		.	9.4				-	,		
Reptachlor Reptachlor epoxide		:	2. 4.							
Hexachlorobenzene	. P	,	6,4							
Hexachlorocyclopentadiene	entadiene	J	4.9					· :		
Methoxychior Toxaphene		⊐ 5	1 4,9							
Sur: DCB		45	. 15	49.49		90.6	28	147		-
Surr: TCX		38		49.49		77.6	20	138		
	** .						٠			
										15 1
		1000 mm 1000								
Qualifiers: E	Ì	Value above quantitation range	The second state of the second	Holdin	Holding times for preparation or unalysis exceeded	1 or analysis ex	ceeded	J Analyte detected	Analyte detected below quantitation li	
	Δ	ction		~	Limit of Quantitation			ND Not Detected at	Not Detected at the Reporting Limit	
(R RPD outside	RPD outside necepted recovery limits	s	S Spike	Spike Recovery outside accepted recovery limits	pled recavery !	imits	U Indicates the cor	indicates the compound was analyzed	`
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CLIENT:

Quay Consulting, LLC. 0904320

Work Order: Project:

Conti - 6

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8081_Soil

Sample ID: LCS-25550	SampType: LCS	TestCo	TestCode: Dry8081_Soil	ioil Units: ua/Ka		Pren Date.	000617618			
Client ID: LCSS	Batch ID: 25550	Test	estino: Swanate		o				Kunno: 43486	
		-		ADD SAD	÷	Analysis Date;	4/29/2009		SeqNo: 592414	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit R	RPD Ref Val	, caa %	į
4,4'-DDD	18	4.8	19.21	0	0.29				- {	Kual
4,4'-DDE	,	4	10.01) (5 6	0 !	20			
4.4 -DDT	÷ 4		- T	o , (9. P	25	45			
Aldrin	9 4	0 (12.8	0	92.9	56	143			
C 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	8	4. 8.	19.21	0	92.9	25	137			
	20	4.8	19.21	0	103	. 29	154			
bela-BHC	18	8,8	19.21	0	95.4	28	i i			
delta-BHC	20	8,4	19.21	C	103	66	1 B			
Dieldrin	18	4.8	19.21	, ,	2 40	1 2	8			
Endosulfan I	27	4	10.21	.	1 80.1	17	5			
Endosulfan II	, 4 , 1	, ,	12,01	∍	(8.6	12	153			
	~ :	δ. Σ	19,21	0	87.2	15	143			
Endosuitan suitate	17	4.8	19.21	0	90.0	9	155			
Endrin	16	4.8	19,21	0	84.9	22	ı T			
Endrin aldehyde	16	8,4	19.25	· c	0	1 5	2 1			
OHB-BHO				٠, د	0.00	2	149			
		4 2	19.21	0	96.3	23	150		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Heptacilia)		4.8	19.21	0	99.3	50	152			
neptacilior epoxide	9	4.8	19.21	0	1 0	9	157			
Surr: DCB	46		48.06		95,8	28	147			
Surr: TCX	48		48.06		400	, c	. 0			
			2002		202	707	38			
Sample ID; 0904320-01B-MS	SampType: MS	TestCo	Code: Dry8081_Soil	oli Units: µg/Kg-dry	I-dry	Prep Date:	4/27/2009		RunNo. 41486	
Cilent ID: Conti - 6	Batch ID; 25550	Test	TestNo: SW8081B	SW3550		Anatysis Date:	0006/06/7			
						one contract	******		SeqUO: 592417	
Analyte	Resull	Pa	SPK value	SPK Ref Val	%REC	LowLimit Hi	HighLimit Ri	RPD Ref Val	%RPD RPDLimit	Qual
4,4'-DDD	22	5.6	22.56	0	99.1	28	167			
4,4'-DDE	20	5.6	22.56	0	87.2	2 2	2 4			
4,4'-DDT	23	5.6	22.56	0	102	92	2 2		N.	
Aldrin	. 20	5,6	22.56	. 0	89.7	3, 5,	7 5		-	
alpha-BHC	21	5.6	22.56	· c	93.8	2 00	ž ř.			
beta-BHC	56	5,6	22.56	0	113	28	157			,
detta-BHC		5.6	22.56	0	95.3	22	, 15 R. R.			
Dieldrin	53	5.6	22.56	0	92.9	2.7	4.0			-
	Value above quantitation range			Holding times for preparation or analysis exceeded	on or analysis) exceeded	J Ann	yte detected be	Analyte detected below quantitation li	•
^	ection		LOQ Limit of	Limit of Quantitation			ND. Not	Detected at the	Not Detected at the Reporting 1 imit	
RPD outside	RPD outside accepted recovery limits		S Spike R	Spike Recovery outside accepted recovery limits	entert recover	ar limite				
	,			an animan fixing	יייייייייייייייייייייייייייייייייייייי	tune s		ates the compo	indicates the compound was analyzed	

Quay Consulting, LLC. 0904320 CLIENT:

Work Order:

Conti - 6 Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8081_Soil

Commis 10: 0004200 040 350	Camp Tours	Carack	i d	H			li -				
	Sallipiype, 1810	- Casi Co	estoode; Dryaval_2011	on chits; pg/kg-ary	dr.	Prep Date:	4/27/2009		RunNo: 43486	36	
Client ID: Conti - 6	Batch (D: 25550	Testh	TestNo: SW8081B	SW3550		Analysis Date:	4/29/2009		SeqNo: 592417	417	•
Analyte	Result	Pol	SPK value	SPK Ref Val	%REC	LowLimit	HighLimil RF	r RPD Ref Val	%RPD	RPDLimit	Qual
Endosulfan l	61	5.6	22.56	0	82,6	12	153				-
Endosulfan II	11	5.6	22,56	0	75.4	5	143				
Endosulfan sulfate	20	5.6	22.56	0	87.0	60	155				
Endrin	19	5,6	22.56	0	85.3	22	155				
Endrin aldehyde	11	5.6	22,56	0	74.3	σ	149				
датта-ВНС	6	5.6	22.56	0	82.3	23	150		% .		
Heptachlor	18	5.6	22.56	0	80.7	20	152				
Heptachlor epoxide	23	5.6	22.56	0	100	19	157				
Surr: DCB	55		56,43		97.4	28	147				
Surr; TCX	13		56,43		31.7	20	138				
Sample ID: 0904320-01B-MSD	SampType: MSD	TestCoc	TestCode: Dry8081_S	Soil Units: µg/Kg-dry	-dry	Prep Date:	4/27/2009		RunNo; 43486	86	
Client ID; Conti - 6	Batch ID; 25550	Tesil	TesiNo: SW8081B	SW3550		Analysis Date:	4/29/2009		SeqNo: 592418	418	
Analyte	Result	Pa	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit Ri	RPD Ref Val	%RPD	RPDLimit	Quai
4,4'-DDD	22	5.6	22,56	0	97.2	28	162	22,36	1.93	0	
4,4'-DDE	. 22	5.6	22.56	0	97.4	25	145	19,67	1.4	20	
4,4'-DDT	26	5.6	22,56	0	114	26	143	22.99	11.4	20	
Aldrin	24	5,6	22.56	0	108	25	137	20.23	18.9	20	
alpha-BHC	25	5.6	22.56	0	-	53	154	21.15	17.0	20	
beta-BHC	28	5,6	22.56	0	124	88	152	25,54	8.76	20	
della-BHC	23	5.6	22,56	0	104	22	158	21.49	8.90	20	
Dieldrin	23	5.6	22.56	0	103	21	148	20,96	9.98	20	
Endosulfan I	21	5,6	22.56	0	93.1	12	153	18.64	11.9	20	
Endosulfan II	19	5,6	22.56	ò	85.9	15	143	17.01	13,0	20	
Endosulfan sulfate	23	5,6	22.56	0	10	18	155	19,63	14,5	20	
Endrín	22	5.6	22.56	0	95.5	22	155	19.24	11.3	202	
Endrin aldehyde	19	5.6	22.56	0	85.7	19	149	16.76	14.2	8	
gamma-BHC	22	5.6	22.56	0	96,3	23	150	18.56	15.8	20	
Heptachlor	21	5.6	22.56	0	94.7	50	152	18.21	.15,9	20	
Heptachlor epoxide		ກ ທ	22.56	0	117	9	157	22.66	14.9	20	
Qualifiers: E Value above	Value nbove quantitation range		H Holdin	Holding times for preparation or analysis exceeded	ion or analysi	s exceeded	J An	alyte detected b	Analyte detected below quantitation li	on li	and the second second
LOD Limit of Detection	ection		~	Limit of Quantitation			ND No	Detected at th	Not Detected at the Reporting Limit	- E	
R RPD outside	RPD outside accepted recovery limits		S Spike I	Spike Recovery outside accepted recovery limits	cpied recove	ny limits	U mai	icates the comp	indicates the compound was analyzed	paz	
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CLIENT: Work Order:

Quay Consulting, LLC. 0904320 Conti - 6

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TestCode: Dry8081_Soil

sample IU:	Sample ID: 0904320-01B-MSD	SampType: MSD	TestCode: Dry8081_Soil	Soil Units: µg/Kg-dry	Prep Date:	a: 4/27/2009	RunNo; 43486	
Cilent ID:	Conti - 6	Batch ID: 25550	TestNo: SW8081B	3 SW3550	Analysis Date:	a: 4/29/2009	SegNo: 592418	
Analyte		Result	PQL SPK value	SPK Ref Val		LowLimit HighLimit RPD Ref Val	%RPD RPDLIMI	Quai
Surr: DCB Surr: TCX		61	56,43		108 28 33.6 20	147	0	1.
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.3		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)						:
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					75 6 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	The state of the s		
Qualifiers:	E Value above quanti LOD Limit of Detection R RPD outside accept	Value above quantitation range Limit of Detection RPD outside accepted recovery limits	H Holdin LOQ Limit o S Spike	Holding times for preparation or analysis exceeded Limit of Quantitation Spike Recovery outside accepted recovery limits	Ilysis exceeded	J Analyte defected below quantitation ND. Not Detected at the Reporting Limit U Indicates the compound was analyze	Analyte detected below quantitation li Not Detected at the Reporting Limit Indicates the compound was analyzed	

Quay Consulting, LLC. 0904320 CLIENT;

Work Order:

Conti - 6

Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8082_Soil

Cilent ID: PBS Batch ID: 25549 TestNo: SW8082A SW Analyte	Soli Units: µg/Kg SW3550		RunNo: 43496
Patch ID: 25549 TestNo: SW8082A			
PQL SPK value SPF		Analysis Date: 4/29/2009	SeqNo; 592547
U 80 U 80 U 80 U 80 U 80 U 80 U 80 U 80	SPK Ref Val	LowLimit HighLimit RPD Ref Val	: : :
24-MSD SampType: MSD TestCode: Dry8082_Soil 24-MSD SampType: MSD TestCode: Dry8082_Soil 24-MSD SampType: MSD TestCode: Dry8082_Soil 250 98 615.1 260 98 615.1 260 98 615.1 210 SPK value SPK value SPK value SPK SPK SPK SPK SPK SPK SPK SPK SPK SPK			WARD KYDLIMII Quei
2A-MS SampType: MSD TestCode: Dry8082_Soil 2A-MSD SampType: MSD TestNo: SW8082A 2A-MSD SampType: LCS TestNo: SW8082_Soil 2A-MSD SampType: LCS TestNo: SW8082A SampType: LCS TestNo: LCS TestN			
2A-MS SampType: MSD TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A 2A-MSD SampType: MSD TestNo: SW8082A Result PQL SPK value SPK 57 61.51 Batch ID: 25549 TestNo: SW8082A 260 98 615.1 51 61.51 51 61.51 SampType: LCS TestNo: SW8082 Soil 61.51 SampType: LCS TestNo: SW8082 Soil 61.51 SampType: LCS TestNo: SW8082A S			
24-MSD SampType: MSD TestCode: Dry8082_Soil 24-MSD SampType: MSD TestCode: Dry8082_Soil 24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A Sell 260 98 615.1 260 98 615.1 260 98 615.1 51 61.51 51 61.51 51 EstNo: SW8082_Soil 61.51 51 EstNo: SW8082_Soil 61.51 51 EstNo: SW8082_Soil 61.51			
24-MS SampType: MSD TestCode: Dry8082_Soil 81.51 24-MSD SampType: MSD TestCode: Dry8082_Soil 81.51 24-MSD SampType: MSD TestCode: Dry8082_Soil 81.51 24-MSD SampType: MSD TestCode: Dry8082_Soil 81.51 250 98 615.1 Batch ID: 25549 TestNo; SW8082A Service SPK value			
24-MS SampType: MS TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A 24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25649 TestNo: SW8082A 260 98 615.1 260 98 615.1 270 98 615.1 271 61.51 571 61.51 571 61.51 571 61.51 571 61.51 571 61.51 571 61.51 572 TestNo: SW8082_Soil Batch ID: 25549 TestNo: SW8082_Soil Batch ID: 25549 TestNo: SW8082_Soil			
24-MS SampType: MS TestCode: Dry8082_Soli			
2A-MS SampType: MS TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A 2A-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A 260 98 615.1 260 98 615.1 260 98 615.1 261 51 61.51 51 61.51 51 61.51 51 51	1		
ZA-MS SampType: MS TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A Result PQL SPK value SPK 20 98 61.51 61.51 57 61.51 81.51 A-MSD SampType: MSD TestCode: Dry8082_Soil SPK Patch ID: 25649 TestNo: SW8082A \$1.51 260 98 61.51 61.51 21 61.51 61.51 61.51 51 51 61.51 61.51 51 51 61.51 51 Batch ID: 25549 TestNo: SW8082_Soil 51	72.6	16 148 15 174	
## SampType: MS TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082_Soil ### Result POL SPK value SPK ### SAMSD SampType: MSD TestCode: Dry8082_Soil ### Result POL SPK value SPK ### Result POL SPK value SPK ### SECODE: Dry8082_Soil ### SampType: LCS TestCode: Dry8082_Soil ### SampType: LCS TestCode: Dry8082_Soil ### SampType: LCS TestNo: SW8082_Soil ### SampType: LCS TestNo: SW8082_Soil			
### PGL SPK value SPF 20	30II Units: µg/Kg-dry	Prep Date: 4/27/2009	RunNo: 43496
Sesult POL SPK value SPF	SW3550	Analysis Date: 4/30/2009	SeqNo: 592549
300 98 615.1 20 61.51 57 81.51 24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25649 TestNo: SW8082A Result PQL SPK value SPK 21 61.51 51 61.51 51 61.51 Batch ID: 25549 TestNo: SW8082_Soil	SPK Ref Val %REC	LowLimit HighLimit RPD Ref Val	
20 96 615.1 20 81.51 57 81.51 24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A 260 98 61.51 51 61.51 51 61.51 Batch ID: 25549 TestNo: SW8082_Soil		,	
24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A Result PQL SPK value SPK 260 98 61.51 51 61.51 51 61.51 Batch ID: 25549 TestNo: SW8082_Soil	0 49.1	30 120	
24-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25649 TestNo: SW8082A Result PQL SPK value SPK 260 98 61.51 21 61.51 51 61.51 51 61.51 Batch ID: 25549 TestNo: SW8082_Soil	31.8	16 148	
2A-MSD SampType: MSD TestCode: Dry8082_Soil Batch ID: 25649 TestNo: SW8082A Result PQL SPK value SPK 260 98 61.51 61.51 51 61.51 61.51 61.51 SampType: LCS TestCode: Dry8082_Soil Batch ID: 25549 TestNo: SW8082A	92.6	15 174	
Batch ID: 25649 TestNo: SW8082A Result PQL SPK value SPK 260 98 61.51 61.51 51 61.51 61.51 51 TestCode: Dry8082 Soll Batch ID: 25549 TestNo: SW8082A	ioil Units: ua/Ka-dry	Pren Date: Airtingon	
Result PQL SPK value SPR value S			Runivo: 43496 SegNo: 592550
260 98 615.1 21 61.51 51 61.51 SampType: LCS TestCode: Dry8082_Soll Batch ID: 25549 TestNo: SW8082A	SPK Ref Val %REC	LowLimit HighLimit RPD Ref Val	Fire Hail Man Cany
21 61.51 51 61.51 SampType: LCS TestCode: Dry8082_Soll Batch ID: 25549 TestNo: SW8082A			S CERTIFIC
51 61.51 SampType: LCS TestCode: Dry8082_Soll Batch ID: 25549 TestNo: SW8082A	0 27.4		14.3 20
SampType: LCS TestCode: Dry8082_Soll Batch ID: 25549 TestNo: SW8082A	34.2	16 148 15. 174 :	0
LCSS Batch ID: 25549 TestNo: SW8082A	Unite: 1101Km	- 11	0 0
Coo TestNo: SW8082A		Fieb Date: 4/2//2009	RunNa; 43496
	SW3550	Analysis Date: 4/29/2009	SeqNo: 592554
Analyte Result PQL SPK value SPK Ref	SPK Ref Val %REC	WREC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual

Value above quantitation range	LOD Limit of Detection	RPD outside accepted recovery limits	
四	COD	~	
Qualifiers:	-		(

H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation

S Spike Recovery outside accepted recovery limits

Analyte detected below quantitation li
 ND Not Detected at the Reporting Limit
 U Indicates the compound was analyzed Indicates the compound was analyzed

CLIENT: Work Order:

Quay Consulting, LLC. 0904320

Conti - 6

Project;

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8082_Soil

Sample ID: LCS-25549 Client ID: LCSS	SampType: LCS Batch ID: 25549	TestCode: Dry8082_Soil Units: µg/Kg TestNo: SW8082A SW3550	Prep Date: 4/27/2009 Analysis Date: 4/29/2009	RunNo: 43496 SeqNo: 592554
Analyte	Result	POL SPK value SPK Ref Val	"REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Aroclor 1221 Surr: TCX Surr: DCB	260 42 40	80 499.5 0 49.95 49.95	52.6 30 140 83.9 16 148 79.9 15 174	
Sample ID; MB-25549 Cllent ID; PBS	SampType; MBLK Batch ID: 25549	TestCode: Dry8082_Soil Units: µg/Kg TestNo: SW8082A SW3550	Prep Date: 4/27/2009 Analysis Date: 4/29/2009	RunNo: 43498 SeqNo: 592582
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Aroclor 1016 Aroclor 1221 Aroclor 1232		80 80 80		
Aroclor 1248 Aroclor 1254 Aroclor 1260 Surr TCX	קברם	80 80 80 80 80	1 (m. a. \$	
Surr: DCB	40	49.95 49.95	72.6 16 148 80.8 15 174	
Sample ID: LCS-25549 Client ID: LCSS Anaiyte	SampType: LCS Batch ID: 25549 Result	TestCode: Dry8082_Soil Units: µg/Kg TestNo: SW8082A SW3550 PQL SPK value SPK Ref Val	Prep Date: 4/27/2009 Analysis Date: 4/29/2009 WREC 1 owl imit Picht imit DED Def Vot	
Aroclor 1221 Sur: TCX Sur: DCB	260 42 40	498.5 49.95 49.95	30 15	ארדט הדטבוחוו סנומו

The state of the profession is a section of the sec	J Analyte detected below quantitation !i	ND Not Detected at the Reporting Limit	U Indicates the compound was analyzed
	H Holding times for preparation or analysis exceeded	LOQ Limit of Quantitation	S Spike Recovery outside accepted recovery limits
	E Value above quantitution range	LOD Limit of Detection	R RPD outside accepted recovery limits

Qualifiers:

CLIENT: Quay Consulting, LLC.
Work Order: 0904320
Project: Conti - 6

ANALYTICAL QC SUMMARY REPORT

Soil	
Dry8151	
TestCode;	

Comple 10: MR offers	N ICENTIFICATION	- C C	7 7 7 6 7 7	1			!!		
Carriple ID. MD-K0000	Sampiye, Mach	COISE	restcode: Dryk151_Soil	oil Units: µg/Kg		Prep Date;	: 4/27/2009	RunNp: 43451	
Client ID: PBS	Batch ID: 25553	Test	estivo: SW8151A	SW8151		Analysis Date:	: 4/28/2009	SeqNo: 591903	
Analyte	Result	A I	SPK value	SPK Ref Val	%REC	LowLimit	, HighLimit RPD Ref Val	%RPD RPDLimit	Qual
2,4,5-T	ב	100					The second second second second second second second second second second second second second second second se		
2,4,5-TP (Silvex)	>	100							
2,4-D	J	100							
Dicamba	3	100							
Surr. 2,4-DCAA	17	:	16,65	:	6.66	15	135		
Sample ID: LCS-25553	SampType: LCS	TestCo	TestCode: Dry8151_Soil	oil Units: µg/Kg		Prep Date:	4/27/2009	RunNo: 43451	
Client ID: LCSS	Baich ID: 25553	Test	estNo: SW8151A	SW8151		Analysis Date:	: 4/28/2009	SeqNo: 591904	
Analyte	Result	집	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimil	Oual
2,4,5-T	120	100	166.5	0	74.1	15	151		
2,4,5-TP (Silvex)	110	100	166.5		68.4	5	134		
2,4-D	120	100	166.5	0	73.6	<u>7</u>	135		
Surr: 2,4-DCAA	14		16,65		81.4	5	135		
Sample ID: 0904327-06A-MS	SampType: MS	TestCo	TestCode: Dry8151_Soil	oil Units: µg/Kg-dry	lry	Prep Date:	4/27/2009	RunNo; 43451	
Client ID: ZZZZZZ	Batch ID: 25553	Test	esiNo: SW8151A	SW8151		Analysis Date;	: 4/28/2009	SeqNo: 591909	
Analyte	Result	Pat	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
2,4,5-T	180	140	233.1	0	75.7	15	151		
2,4,5-TP (Silvex)	150	140	233.1	a	54.7	€	134		
2,4-D	140	140	233,1		59.5	5	135	-	7
Surr: 2,4-DCAA	23		23,31	,	100	15	135		•
Sample ID: 0904327-06A-MSD	SampType: MSD	TestCo	TestCode: Dry8151_Sail	all Units: µg/Kg-dry	lī,	Prep Date:	4/27/2009	RunNa: 43451	
Client ID: ZZZZZZ	Batch (D: 25553	Test	estNo; SW8151A	SW8151		Analysis Date:	: 4/28/2009	SeqNo: 591910	
Analyte	Result	PQL	SPK value	SPK Ref Vai	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
2,4,5-T	210	140	233.4	0 ,	91.2	15	151 176.4	18.7 20	
2,4,5-TP (Silvex)	180	140	233.4	0	7.77	18	134 150.8	18.4	
Qualiffers: E Value above	Value above quantitation range		H Holdin	Holding times for preparation or analysts exceeded	or analys	is exceeded	J Analyte detector	Analyte detected below quantitation li	
LOD Limit of Detection	ຕະເກ່ວກ		LOQ Limit o	Limit of Quantitation		٠.	ND Not Detected at	Not Detected at the Reporting Limit	
R RPD outside	RPD outside accepted recovery limits			Spike Recovery outside accepted recovery limits	vocan bala	ory limits	U Indicates the co.	Indicates the compound was analyzed	(
				**					

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Quay Consulting, LLC. 0904320 Conti - 6

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ANALYTICAL QC SUMMARY REPORT

Sample ID: 0904327-06A-MSD	SampType: MSD	TestCo	te: Dry8151_Sc	TestCode: Dry8151_Soil Units: µg/Kg-dry	-dry	Prep Date	Prep Date: 4/27/2009	_	RunNo: 43451	151	
Client ID: ZZZZZZ	Batch ID: 25553	Test	TestNo: SW8151A	SW8151	*	Analysis Daf	Analysis Date: 4/28/2009		SeqNo; 591910	1910	
Analyte	Result	PQL	PQL SPK value SPK Ref Val	SPK Ref Val	%REC	LowLimit	"REC LowLimit HighLimit RPD Ref Val	PD Ref Val	%RPD	%RPD RPDLimit Qual	Qual
2,4-D	180	140	233.4	0	76.4	15	135	138.8	25.0	20	CC.
Surr: 2,4-DCAA	25		23.34		106	<u>გ</u>	135		0	20	

COLUMN TO THE PROPERTY OF THE	ding times for preparation or analysis exceeded J Analyte detected below quantitation li	tion ND Not Detected at the Reporting Limit	nuiside accepted recovery limits U Indicates the compound was analyzed
marija liikusherii taasi Vide palaajala dan balkai dikumiin tapa majai jidalii kubusa mari va a sali ya ajaba jidali ku immana mamiya ja jidalii kubusa marija ja	E Value above quantitation range	LOD Limit of Detection	R RPD outside necepted recovery limits Spike Recovery outside accepts

Qualifiers:

Quay Consulting, LLC. CLIENT:

0904320 Work Order:

Conti - 6

Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8270_Soil

Sample ID; MB-25551	SampType: MBLK	TestCo	TestCode: Dry8270_Soft Units: µg/Kg	il Units: µg/Kg	Prep Date: 4/27/2009	RunNo: 43449
Ollent ID: PBS	Batch ID: 25551	Test	TesiNo: SW8270D	SW3550A	Analysis Date: 4/28/2009	SeqNo: 591878
Analyle	Resul	PaL	SPK value	SPK Ref Val	, %REC LowLimit HighLimit RPD Ref Val	I %RPD RPDLIMIt Qual
1,2,4-Trichlorobenzene	n	120				
1,2-Dichlorabenzene		120				
1,3-Dichlorobenzene	¬	120				
1,4-Dichlorobenzene	-	120				
2,4,5-Trichlorophenol	>	120				
2,4,6-Trichlorophenol)	120				
2,4-Dichlarophenal	J	120				
2,4-Dimethylphenol	J	120				
2,4-DinItrophenol	5	120				
2,4-Dinitrotoluene	>	120				
2,6-Dinitrotoluene	-	120				
2-Chloronaphthatene	D	120				
2-Chlorophenal	¬	120				
2-Methylnaphthalene	ס	120				
2-Methysphenol	Ð	120				
2-Nitroanliine	ח	120				
2-Nitrophenol	⊃	120				
3,3'-Dichlorobenzidine	⊃	120				
3+4-Methylphenol	כ	120				
3-Nitroaniline	ס	120				
4,6-Dinitro-2-methylphanol)	120				
4-Bromophenyl phenyl elher	⊃	120				
4-Chloro-3-methylphenol	>	120				
4-Chloroaniline	J	120				
4-Chlorophenyl phenyl ether	>	120				
4-Nitroaniline	5	120				.***
4-Nitrophenol	Þ.	150				
Acenaphthene	J	120				
Acenaphthylene	D	120	*			
Aniline	n 33 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	120				
Anthracene	>	120				

RPD outside accepted recovery limits

Value above quantitation range

Qualifiers;

E Value and LOD Limit of Detection

Analyte detected below quantitation li

Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation

S Spike Recovery outside accepted recovery limits

Indicates the compound was analyzed

CLIENT:

Quay Consulting, LLC. 0904320 Conti - 6 Work Order: Project:

ANALYTICAL QC SUMMARY REPORT TestCode: Dry8270_Soil

Barch ID: 25651 TestNo: SW8270D	Sample ID: MB-25551	SampType: MBLK	TestCor	16. Dr.8270 S	oll Holls:		Ш				
Pack Pack				Je. 101 your 0_3	on Units: pg/Ng	l.		7/2009	RunNo: 434	49	
Result PQL SPK value SPK Red Val %REC LowLinff HighLinff RPD Red Val %RPD RPDLinff U		Batch ID: 25551	Testi	No: SW8270D	SW3550A	Anaî		8/2009	SeqNo: 591	878	
ane	Analyte	Result	POL	SPK value	SPK Ref Val				%RPD	RPDLímit	, o
U 120	Azobenzene		120								
U 120	Benzidine	,	120								
ane	Benzo(a)anthracene	ָר ר	120	i.							
ane U 120 U 12	Benzo(a)pyrene	5	120								
ane U 120 U 12	Benzo(b)fluoranthene		120								
ane	Benzo(g,h,i)perylene	D	120			٠					
U 120	Benzo(k)fluoranthene	כ	120				1				
ane U 120 e U 120 e U 120 U	Benzoic scid)	120								
ane U 120 be 120 c U 120 U	Benzyl alcohol		120			:					
ref U 120 te U 120 U	Bis(2-chloroethoxy)methane	n	120			Fig. (
ref 120 1 120	Bis(2-chloroethyl)ether	n	120								
e U 120 U 12	Bis(2-chloroisopropyl)elher	n	120					er.			
U 120 U	Bis(2-ethylhexyl)phthalate	n	120			·			٠		
U 120 U U U U U U U U U	Butyl benzyl phthalate	D	120	•		. 4.					
U 120 U U 120 U U U U U U U U U	Carbazole	: ⊃ :	120			\$;				
U 120 U U U U U U U U U		J	120								
U 120 U 120	Dibenzo(a,h)anthracene	ָם	120								
U 120 Doutside accepted recovery limits Solike Recovery outside accepted recovery limits U 2 Doutside accepted recovery limits Solike Recovery outside accepted recovery limits	Dibenzofuran	ח	120								
U 120 120 U U U U U U U U U	Diethyl phthalate	ם	120								
U 120 120 U U U U U U U U U	Dimethyl phthalate	ก	120								
U 120 120 U U U U U U U U U	Di-n-butyl phthalate	n	120								
U 120 120 U 120 D outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits U S Spike Recovery outside accepted accep	Di-n-octyl phthalate	n n	120								
U 120 120 U 120 D outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits S Spike Recovery outside accepted recovery limits U U U U U U U U U	Fluoranthene	n	120								
u 120 U 120 U 120 U 150 U 150 U 120 U 120 U 120 U 120 U 120 U 120 LOQ Limit of Quantitation or analysis exceeded J LOQ Limit of Quantitation ND Doutside accepted recovery limits S Spike Recovery outside accepted recovery limits	Fluorene)	120								
u 120 U 150 U 120 LOQ Limit of Detection LOQ Limit of Quantitation ND Doutside accepted recovery limits S Spike Recovery outside accepted recovery limits	Hexachlorobenzene	⊃	120								
ane U 120 U 120 U 120 U 120 U 120 U 120 LOO Limit of Quantitation or analysis exceeded J LOO Limit of Quantitation ND D outside accepted recovery limits S Spike Recovery outside accepted recovery limits (1)	Hexachforobutadiene	>	120		:		1				
U 120 U 120 U 120 U 120 U 120 U 120 U 120 LOO Limit of Quantitation or analysis exceeded J LOO Limit of Quantitation ND Doutside accepted recovery limits S Spike Recovery outside accepted recovery limits	Hexachiorocyclopentadiene	n	150					· · · · · · · · · · · · · · · · · · ·			
U 120 U 120 U 120 U 120 U 120 U 120 U 120 U 120 LOQ Limit of Operantion or analysis exceeded J ND Solicection LOQ Limit of Quantitation ND Outside accepted recovery limits S Spike Recovery outside accepted recovery limits	Hexachloroethane	J	120								
LOD Limit of Detection R RPD outside accepted recovery limits U 120 H Holding times for preparation or analysis exceeded J LOQ Limit of Quantitation ND S Spike Recovery outside accepted recovery limits U 120	Indeno(1,2,3-c,d)pyrene	n	120								
E Value above quantitation range LOD Limit of Detection R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits UND S Spike Recovery outside accepted recovery limits	Isophorone	3	120								
E Value above quantitution range H Holding times for preparation or analysis exceeded J LOD Limit of Detection LOQ Limit of Quantitation ND R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits 1	Naphthalene	n	120								:
E Value above quantitation range H Holding times for preparation or analysis exceeded J LOD Limit of Detection LOQ Limit of Quantitation ND R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits (1)		***************************************	POLICE OF THE PROPERTY OF THE	t en Marier I naan een je bejelendig tyk mych hank den keep skryf by de							
LOQ Limit of Quantitation RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits Spike Recovery outside accepted recovery limits	凹	s quantitation range			times for preparation	1 or analysis exec		Analyte delected by	clow quantitatio		The second secon
RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits t		tection			f Quantitation		Ż		Reporting Lim		
		e accepted recovery limits			ecovery outside accer	ofed recovery lim		-	Sulping and Dailo	-	

Quay Consulting, LLC. 0904320 CLIENT: Work Order:

Conti - 6

Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8270_Soil

								l	
Sample ID: MB-25551	SampType: MBLK	TestCod	TestCode: Dry8270_Soll	oll Units; µg/Kg		Prep Date:	e: 4/27/2009	PunNo. 45440	
Client ID: PBS	Batch ID: 25551	TestN	TestNo: SW8270D			Analyse Do		ביינונות היינוני הפיניים	
						Citalysis Date	c. 4/20/2009	SeqNo: 591878	
Analyte	Result	Pal	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit O.	Oual
Nitrobenzene	_	120							
N-Nitrosodimethylamine	П	120							
N-Nitrosodi-n-propyiamine	¬	120							
N-Nitrosodiphenylamine	3	120							
Pentachlorophenol	5	150							
Phenanthrene	¬	120							
Phenol	· ⊃	120							
Ругеле	· n	120							
Pyridine	· ¬	120							
Surr: 2,4,6-Tribromophenol	1800	:	3956		4	č	1		
Surr: 2-Fluorobiphenyl	1000		1978		- C	- E	<i>/</i>		
Surr: 2-Fluorophenol	1700		3956		0,70	77 7	2112		
Surr: 4-Terphenyl-d14	920		1978		1 4 C . U	2 2	113		
Surr: Nitrobenzene-d5	068		1978		0, 4	7 6	124		
Surr: Phenol-d6	1800		3956		י ע איי	3 5	 		
Sample ID: LCS-25551	SampType; LCS	TestCod	TestCode: Drv8270 Soll	il Units: nafKa		Dran Date:	1		
000 - 51 400		1	l l			180 A51		Kuning; 43449	
	5atch IU: 25561	Test/N	TestNo; SW8270D	SW3550A		Analysis Date:	3: 4/28/2009	SeqNo: 591879	
Analyte	Result	Pal	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual	
1,2,4-Trichlorobenzene	3100	120	3963	0	78.2	23	122		
1,4-Dichlorobenzene	2900	120	3963	0	73.6	22	124		
2,4-Dinitrotoluene	2500	120	3963	0	64.3	21	119		
2-Chlorophenol	2600	120	3963	0	66,3	23	125		
4-Chloro-3-methylphenol	2800	120	3963	0	71.8	27	121		
4-Nitrophenol	2900	150	3963	0	72.8	ភូ	115		
Acenaphthene	3000	120	3963	0	74.7	24	124		
N-Nitrosodi-n-propylamine	3400	120	3963	0	84.6	52	127		
Pentachlorophenoi	2000	150	3963	0	49.3	4	118		
Phenol	2800	120	3963	0	70.3	_6	123		
Pyrene	2500	120	3963	0	64.0	22	126		
Qualifiers: E Value above	Value above quantifation ringe		1	The second secon			İ	er er er er er er er er er er er er er e	
001	dection		in invaring	review of mines for proparation of analysis exceeded	or analysis	encecaea		Analyle defected below quantitation li	
	RPD outside perented recessory limits			Cuminitiani			_	Not Detected at the Reporting Limit	
	estititi finannas paudanas a			Spike Kecevery outside accepted recovery limits	ted recover	y limits	U Indicates the comp	Indicates the compound was analyzed	(
)- No.					,- <,

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Quay Consulting, LLC. 0904320 Conti - 6

ANALYTICAL QC SUMMARY REPORT

TestCode: Dry8270_Soil

Sample ID: 1 OR SEEE4	00.1	F		11			П			
	calliplype, too	0) 20	estogge: Dryszyu_som			Prep Date:	4/27/2009	RunNo: 43449	49	
Client ID: LCSS	Batch ID: 25551	Test	Testivo: SW8270D	SW3550A		Analysis Date:	4/28/2009	SeqNo: 591879	879	
Analyte	Result	Pal	SPK value	SPK Ref Va	%REC	LowLimit	, HighLimit RPD Ref Val	%RPD	RPOLimit (Qual
Surr, 2,4,6-Tribromophenol	1800		3960		45.2	21	117			
Surr: 2-Fluorobiphenyl	1600		1980		78.7	22	112			
Surr: 2-Fluorophenol	2300		3960		59.0	£.	113			
Surr. 4-Terphenyl-d14	1400		1980		68.4	24	124			
Surr: Nitrobenzene-d5	1400		1980		7.1.7	20	115			
Surr. Phenol-d6	2700		3950		67.5	4	118			
Sample ID: 0904327-18A-MS	SampType: MS	TestCo	TestCode: Dry8270_Soil	oil Units: µg/Kg-dry	dry	Prep Date:	4/27/2009	RunNo: 43449	49	
Cilent ID: ZZZZZZ	Batch ID: 25551	Test	TestNo: SW8270D	SW3550A		Analysis Date:	4/29/2009	SeqNo: 591898	898	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD	RPDLimit (Qual
1,2,4-Trichlorobenzene	3300	180	6148	0	53.9	23	122			
1,4-Dichlorobenzene	3500	180	6148	0	56.2	22	124			
2,4-Dinitrotoluene	2600	180	6148	0	42.1	53	119			
2-Chlorophenol	3600	180	6148	0	58.0	23	125			
4-Chloro-3-methylphenol	3300	180	6148	O	54.4	27	121			
4-Nitrophenol	2900	230	6148	0	47.2	15	115			
Acenaphthene	3300	180	6148	0	53,3	24	124			
N-Nitrosodi-n-propylamine	3900	180	6148	0	63.3	25	127			
Pentachlorophenot	2100	230	6148	0	34,6	14	118		•	
Phenol	3500	180	6148	o	57.1	19	123			~
Pyrene	3000	180	6148	168.2	46.7	. 22	126			
Surr: 2,4,6-Tribromophenol	3700		6143		59.8	21	117			
Surr: 2-Fluorobiphenyl	1600		3072		53.5	22	112			
Surr: 2-Fluorophenol	3300		6143		53.9	15	113			
Surr: 4-Terphenyl-d14	1500		3072		48.0	24	124			
Surr; Nitrobenzene-d5	1500		3072		48,9	20	115			
Surr: Phenol-d6	3400		6143		65.0	14	118			
						-			:	:
	Value above quantitation range		H Floidin	Holding times for preparation or analysis exceeded	n or analysi	e exceeded	J Apalyte detected	Analyte detected below quantitation It	11	***
LOD Limit of Detection	ection		\sim	Limit of Quantitation				Not Detected at the Reporting Limit		
	ICPD outside accepted recovery limits		S Spike	Spike Recovery autside accepted recovery limits	pted recove	ry limits	U Indicates the cor	Indicates the compound was analyzed	pa	

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Quay Consulting, LLC,

0904320 Work Order; Conti - 6

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TestCode: Dry8270_Soil

ANALYTICAL QC SUMIMARY REPORT

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		2)	de. Diyoziu	rescond to have a soil onlist hg/Kg-dry	٩٦٧	Prep Date:	s: 4/27/2009		RunNo: 43449	449	
Ollent ID: ZZZZZZ	Batch ID: 25551	Test	estNo: SW8270D	SW3550A		Analysis Date:	3: 4/29/2009	_	SeqNo: 591899	1899	
Analyte	Result	På	SPK value	SPK Ref Vai	%REC	LowLimit	HighLimit Ri	RPD Ref Val	%RPD	RPDLímit	Oua
1,2,4-Trichlorobenzene	3100	180	6148	0	51.2	23	122	4315	7.7.11	6	
1,4-Dichlorabenzene	3100	180	6148	Ċ	5.05	3.	1 7	20.00	3.17	20	
2,4-Dinitrotoluene	3000	180	6148	• 0	48.3	7 7	17. 140	4040 CORC	2,0r	8 8	
2-Chlorophenol	3500	180	6148	0	56.1	i K	124	3568	0.5	02.0	
4-Chloro-3-methylphenol	3700	180	6148	O	59.4	27	121	3344	, G	2 2	
4-Nitrophenel	3500	230	6148	0	55.6	5	115	2902	2.2	2 5	
Acenaphthene	3400	180	6148	O	55.8	24	124	3274	- 5 0 2	2 5	
N-Nitrosadi-n-propylamine	3800	92	6148	0	61.3	25	127	3895	, e	0 6	
Pentachlorophenol	2500	230	6148		4	15	118	9120	 	3 8	
Phenol	3600	180	6148	C	Α. 7.	. ģ	7 -	2 12 3	- /. 0 0	₹ ;	
Pyrene	3500	180	6148	168.2	ָ טַ נְּ	2 5	027	8000	87. T	20	
Surr: 2,4,6-Tribromophenol	4100		6143		, u	7 6	7 17	3038	14.7	20	
Surr: 2-Fluorobiphenyl	1700		3072		א ה ה	; ;			O (0 (
Surr; 2-Fluorophenol	3200		6143		2 6	1 11 11 11 11	7 F)	0	
Surr: 4-Terphenyl-d14	1700		3072		א איי	2 5	2 5		0 (0	**
Surr: Nitrobenzene-d5	1500		3072		1 6	3 6	17 +		0 (5 (
Surr: Phenol-d6	3500		6143		7. 67.	24 +	- τ - α)	⇒ •	

H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation

S Spike Recovery outside accepted recovery limits

Analyte detected below quantitation li ND Not Detected at the Reporting Limit
Undicates the compound was unalyzed

RPD outside accepted recovery limits

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Value above quantitution range

Qualifiers:

E Value above quantiti
LOD Limit of Detection

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Quay Consulting, LLC. 0904320 Conti - 6

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Sample ID: V624i CS-0424ff9aV S	SamuTyne: C.	Taction	TeetOode: Dottiviteden	•					
		-		Bush isun				Kunno: 43540	
	Batch ID: K43540	est	estivo: SW8260B	٤	٠.	Analysis Date:	:: 4/25/2009	SeqNo; 593365	
Analyte	Result	Pal	SPK value SF	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual	
1,1,1,2-Tetrachloroethane	38	5.0	50.00	o	76.6	25	125		7
1,1,1-Trichloroethane	4	5,0	50.00	0	82.0	26	120		
1,1,2,2-Tetrachloroethane	38	5.0	50,00	0	78.0	30	130		
1,1,2-Trichloro-1,2,2-(rifluoroethane	22	5.0	60,00	0	43.4	30	130		
1,1,2-Trichtoroethane	37	5.0	50.00	0	74.8	56	126		
1,1-Dichloroethane	43	5.0	50.00	0	96.9	20	129	,	
1,1-Dichloroethene	40	5.0	50.00	0	79.4	25	130		
1,1-Dichloropropene	41	5,0	50.00	0	82.9	8	130		
1,2,3-Trichlorobenzene	32	5.0	50.00	0	63,4	33	130		
1,2,3-Trichloropropane	36	5.0	50.00	0	71.8	30	130		
1,2,4-Trichlorobenzene	32	5.0	50.00	Ö	64.1	30	130	C	
1,2,4-Trimethylbenzene	42	5.0	50.00	O	84.3	30	130	•	
1,2-Dibromo-3-chloropropane	36.	5.0	50.00	o	71.8	8	130		
1,2-Dibromoethane	35	5.0	50.00	0	70.0	33	130		
1,2-Dichlorobenzene	35	5.0	50.00	0	9'69	24	120		
1,2-Dichloroethane	37	5.0	20.00	0	73.1	20	120		
1,2-Dichloropropane	38	5.0	20.00	0	76.0	22	126		
1,3,5-Trimethylbenzene	44	5.0	50.00	0	88.8	8	130		
1,3-Dichlorobenzene	34	5.0	50.00	0	68.1	23	120		
1,3-dichloropropane	36	5.0	50.00	Ó	72.6	8	130		
1,4-Dichlorobenzene	37	5.0	50.00	0	73.2	56	123		
1,4-Dioxane	43	5.0	50,00	0	85.1	30	130		
2,2-Dichloropropane	40	5,0	50.00	0	79.5	93	130		
2-Chlorotoluene	44	5.0	50.00	0	87.5	30	130		
4-Chforotoluene	37	5.0	50.00	0	73.9	99	130	٠.	
4-isopropylioluene	43	5.0	90'09	0	86.1	. 25	125		
Acrylonitrile	4.	5.0	20.00	0	81.0	. 25	125	结	
Benzene	ee E	5.0	50.00	Ö	76.2	33	130		
Bromobenzene	141	5,0	20.00	0	82.9	8	130		•
Bromochloromethane	34	5.0	90,03	0	68.9	20	120		
Bromodichloromethane	44	5.0	20,00	0	82.4	30	130		
	der maj in this part abundus or easy case 7741 things in memberses	,	Ī				manusch - 14 betrieb demonstration - 14 betrieb	The second secon	:
	antitation range			Holding times for preparation or analysis exceeded	ı or analysi	exceeded	J Analyte detected b	Analyte detected below quantitation li	
Δ	uo		\sim	Limit of Quantitation			ND Not Detected at the Reporting Limit	e Reporting Limit	
R RPD outside acc	RPD outside accepted recovery limits		S Spike Rec	Spike Recovery outside accepted recovery limits	oted recove	y limits	U Indicates the comp	Indicates the compound was analyzed	

CLIENT:

Quay Consulting, LLC. 0904320

Work Order;

Conti - 6

Project:

ANALYTICAL QC SUMMARY REPORT

Sample ID; V624LCS-042409aY	SampType: LCS	TestCo	de: Ordinase	TestCode: OpyEnil8960 Thite:					
				P CHIS. HB/NB		Prep Date:		RunNo: 43540	
Olient ID: LCSS	Batch ID: R43540	Test	TestNo: SW8260B	د		Analysis Date:	4/25/2009	SeqNo: 593365	
Analyte	Resuft	Pal	SPK value	SPK Ref Val	%REC	LowLimit Hig	HighLimit RPD Ref Val	%RPD RPDLímit	nit Qual
Bromoform	36	5.0	50.00	0	71.4	20	123		
Carbon disulfide	37	5.0	50.00	O	74.9	30	130		
Carbon tetrachloride	44	Ω Ω	50.00	0	87.1	25	125		
Chlorobenzene	45	5.0	50.00	0	89,3	21	133		
Chloroform	4	5.0	50.00	0	81.4	52	124		
cis-1,2-Dichloroethene	34	5.0	50,00	0	69.0	e e	130		
cis-1,3-Dichloropropene	೮೫	5,0	50.00	0	66.7	22	122		
Dibromochloromethane	38	5.0	50.00	0	0 //	22	124		
Ethylbenzene	46	5.0	50.00	0	92,2	ل ئ	130		
Hexachlorobutadiene	4	5.0	50.00	٥	82,8	, K	125		
Isopropylbenzene	46	ις. Ο	50.00	0	91.1	30	130		
m,p-Xylene	85	10	100.0	. 0	85.4	30	130		
Methylene chloride	40	9.0	50.00	0	80.5	26	142		α
Naphthalene	0e :	5.0	50.00	O	59.8	30	130		ı C
n-Butylbenzene	35	5.0	50.00	0	69.4	93	130		3
n-Propylbenzene	42	5,0	50,00	0	83.9	30	130		
o-Xylene	42	5,0	50.00	0	83.8	30	130		
sec-Butylbenzene	45	5,0	50.00	0	90.4	30	130		
Styrene	41	5.0	50.00	0	81.4	30	130		
tert-Butylbenzene	44	5.0	50.00	0	87.8	30	130		
Tetrachloroethene	44	5.0	50.00	0	7.78	20	120		
Toluene	43	5.0	50.00	0	86.2	20	119		
frans-1,2-Dichloroethene	99	5.0	50,00	0	77.3	20	120		
trans-1,3-Dichloropropene	36	5.0	50,00	0	71.8	4	115		
Trichtoroethene	38	5.0	50.00	0	75.0	23	121		
Surr: 4-Bromofluorobenzene	47		50.00		94.9	64	132		
Surr: Dibromofluoromethane	90		50,00		101	99	13:1		
Surr: Toluene-d8	49		50.00		98.7	10 4	132		
	100	:							

) palifiers:	E Value above quantitation range	if Holding times for preparation or analysis exceeded	Analyte detected heless essentiation 1
	LOD Limit of Detection	LOO Limit of Quantitation	NO Deferred a the Reporting Limit
	R RPD outside accepted recovery limits	S Spike Recovery outside accented recovery limits	11 Indicates the compound are a section of

Quay Consulting, LLC. CLIENT:

0904320 Work Order:

Project:

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ANALYTICAL QC SUMMARY REPORT

Batch Dr. R45640 TistNo: SW8266B Analysis Date: 4/125/2009	Sample ID: VBLK-042409aY	SamoTvne: MBLK	TestCode: r	PostCode: DryE.III8980 11085				
Patch D. R45540 Tath No. SW6260B Analysis Date: 4726/2009 SeqVos. 593536 SeqVos					Lieb Date:		RunNo; 43540	
Result PQL SPK value SPK Ref Val WRRC LowLinni HighLinni RPD Ref Ve WSRPD RPDLinni RPD Ref Ve WSRPD REf Ve RPD Ref Ref RPD Ref Ve RPD	Olient ID: PBS	Batch ID: R43540	TestNo: S	W8260B		25/2009	SeqNo: .593366	
1 50 50 50 50 50 50 50	Analyte	Result			LowLimit			Qua
1	1,1,1,2-Tetrachloroethane	n	5.0					
1 5.0	1,1,1-Trichloroethane	5	5,0					
111 111	1,1,2,2-Tetrachtoroethane	⊃	5.0					
## 1 5.0 1 5.0 1 5.0 1 5.0 1 5.0 1 5.0 1 5.0 2 5.0 3 5.0 4 5.0 5 5	1,1,2-Trichloro-1,2,2-trifluoroethar		5.0					
1 5.0 5.0	1,1,2-Trichforoethane	ɔ	5.0					
U 5.0 5.0	1,1-Dichloroethane	J	5.0					
U 5.0	1,1-Dichloroethene	Ð	5.0					
ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 10 5.0 ne 5.0 10 ne 5.0 ne 5.0	1,1-Dichloropropene	ס	5.0					
1	1,2,3-Trichlorobenzene	ח	5,0					
Position 5.0 Position	1,2,3-Trichloropropane	5	5.0					
nee U 5.0 porcpane U 5.0 porcpane U 5.0 u 5.0 Analyse accepted ut the Reporting Limit of Quantitation Analyse detected balow quantitation If Limit of Pocaciton nee U 5.0 Analyse detected balow quantitation If Limit of Quantitation or analysis exceeded J Analyse detected balow quantitation If Limit of Quantitation Nall of Decention L.OQ Limit of Quantitation J Analyse detected balow quantitation If Indicates the compound was analysis exceeded J Analyse detected balow quantitation If Indicates the compound was analysed	1,2,4,5-Tetramethylbenzene)	5.0					
Single U 5.0 Spropane U 5.0 U 5.0 Analyse Above quantilation range U 5.0 Analyse detected below quantilation D 5.0 Analyse detected below qua	1,2,4-Trichlorobenzene	J	5.0					c
Optiopane U \$.0 I \$.0 \$.0 I <t< td=""><td>1,2,4-Trimethylbenzene</td><td>ב</td><td>5.0</td><td></td><td></td><td></td><td></td><td>)</td></t<>	1,2,4-Trimethylbenzene	ב	5.0)
U 5.0 E E E E E E E E E	1,2-Dibromo-3-chloropropane	J	5.0					
1 5.0	1,2-Dibromoethane	ח	5.0					
10 5.0 5.0 5.0	1,2-Dichlorobenzene	ח	5.0					
one U 5.0 u 5.0 Analyse detected below quantitation ther U 5.0 Analyse detected below quantitation ther U 5.0 Analyse detected below quantitation Value above quantitation range H Holding times for preparation or analysis exceeded J Analyse detected below quantitation Value above quantitation D 5.0 Analyse detected below quantitation Value above quantitation ND Not Detected air the Reporting Limit Value above quantitation ND Not Detected air the Reporting Limit Value above quantitation ND Not Detected air the Reporting Limit Value above quantitation ND Not Detected air the Reporting Limit	1,2-Dichloroe(hane)	5.0					
sne U 5.0 U 5.0 Recovery limits A milyte detected below quantiturion by size exceeded by a milyzed second point of succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and succession by a size of specific and specific	1,2-Dichloropropane	J	5.0					
U	1,3,5-Trimethylbenzene	⊃	5.0					
U 5.0	1,3-Dichlorobenzene	U	5.0					
U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 Limit of Detection J Limit of Detection ND Not Detected at the Reporting Limit Limit of Detection ND Not Detected at the Reporting Limit RPD outside accepted recovery limits S pike Recovery outside accepted recovery limits U indicates the compound was annityzed	1,3-dichloropropane	ח	5.0					
U 5.0 E E E E E E E E E	1,4-Dichlorobenzene	n	5.0					
U 5.0 5.0	1,4-Dioxane)	5,0					
U 5.0 E	2,2-Dichloropropane	J	5,0					
wyl ether U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 D 5.0 E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation li B Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation li CD Limit of Detection LOQ Limit of Quantitution ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U Indicates the compound was analyzed	2-Butanone	₽	5.0					
D 5.0 U 5.0 U 5.0 U 5.0 U 5.0 U 5.0 D 5.0 H Holding times for preparation or analysis exceeded J Analyte detected below quantitation li Analyte detected li Analyt	2-Chloroethyl vinyl ether		5,0					
bene U 5.0 U 60 Storm	2-Chlorotoluene	ָם	5.0					
Lob Limit of Detection R RPD outside accepted recovery limits S spike Recovery outside accepted recovery limits S spike Recovery limits S spike Recovery limits U 5.0 Holding times for preparation or analysis exceeded J Analyte detected below quantitation limes for preparation or analysis exceeded J Analyte detected below quantitation limits S spike Recovery limits S spike Recovery limits S spike Recovery limits U indicates the compound was analyzed	2-Hexanone	¬	5.0	-				C
U 5.0 U 5.0 Value above quantitation range LOQ Limit of Detection RPD outside accopted recovery limits S Spike Recovery outside accopted recovery limits U 5.0 H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation ND ND	2-Propanol)	50			-)
Value above quantitation range Value above quantitation range Helding limes for preparation or analysis exceeded LOQ Limit of Quantitution ND RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits U	4-Chlorotoluene	n	5.0					
E Value above quantitation range H Holding times for preparation or analysis exceeded J LOD Limit of Detection LOQ Limit of Quantitation ND R RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits U	4-isopropylioluene	.5	5.0					
E Value above quantitation range LOD Limit of Detection R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits US Spike Recovery outside accepted recovery limits US Spike Recovery outside accepted recovery limits US Spike Recovery outside accepted recovery limits US Spike Recovery outside accepted recovery limits	4,11	The state of the s		7011vvvvvvv	(*************************************			
LOQ Limit of Quantitution RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U	ш (quantitation range	* !			_	slow quantitution li	
NED DISSIDE RECOVERY IMMIS Spike Recovery outside accepted recovery limits U		iction	ם י			-	Reporting Limit	
		accepted recovery timits	25				ound was analyzed	٠

Quay Consulting, LLC. CLIENT:

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Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: DryFull8260_Soil

Analysis Date: 4/25/2009 9/8 REC LowLimit HighLimit RPD Ref Vai on or analysis exceeded J Analyte detected belt ND Not Detected in the I ND Not Detected in the I ND Not Detected in the I ND Not Detected in the I	Sample ID: VBLK-042409aY	SampType: MBLK	TestCode: DryFull8260_ Units:	Units: µg/Kg Prep Date:		RunNo: 43540	
Political Political Political Political Political SPK Ref Val SPR Val SPR Ref Val SPR Ref Val SPR Ref Val SPR Ref Val SPR Ref Val SPR Ref Val SPR Ref Val SPR Per Val		Batch ID: R43540				SeqNo: 593366	
### ### ### ### #### #### ############	Analyte	Result	SPK value	%REC		%RPD RPDLIMI	Qual
10 5.0 10 5.0 11 5.0 12 5.0 13 5.0 14 5.0 15 5.0 16 5.0 17 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 18 5.0 19 5.0	4-Methyl-2-pentanone	ח	5.0				
1	Acetone	ם	5,0				s
1	Acrolein	D	25				
1	Acrylonitrile	.	5,0				
10 5.0	Велгепе	⊃	5.0				
December December	Bromobenzene	J	5.0				
m 5.0 m 5.0 ethane U 5.0 straction of each of the straction or analysis exceeded by the straction or analysis exceeded by the straction or analysis exceeded by the straction or analysis or cooperation range by the straction or analysis exceeded by the	Bromochloromethane	כ	5.0				
Marie	Bromodichloromethane	ח	5.0				
1	Bromoform	D	5,0				
Signature Colorada	Bromomethane	ח	5.0				
1	Carbon disulfide	٦,	5,0			,	
Managementarian	Carbon tetrachioride	ם	5,0				
fluoromethane U 5.0 hane U 5.0 thane U 5.0 ethane U 5.0 ethane U 5.0 pxlotropropene U 5.0 ethioromethane U 5.0 pxlotropropene U 5.0 ethioromethane U 5.0 pxl ether U 5.0 pxl ether U 5.0 state U 5.0 are acted U 5.0 are accoptated U 5.0 are acted U 5.0 are accoptated U 5.0 are acted U </td <td>Chlorobenzene</td> <td>></td> <td>5.0</td> <td></td> <td></td> <td></td> <td></td>	Chlorobenzene	>	5.0				
hane U 5.0 m U 5.0 ethane U 5.0 bichloroperopene U 5.0 chloromethane U 5.0 pyl ether U 5.0 probuladiene U 5.0 procedie U 5.0 phenzene U 5.0 phenzene U 5.0 procedie U 5.0	Chlorodifluoromethane	D,	5.0				
S	Chloroethane	D	5.0				
Signature	Chloroform	⊐	5.0				
Nichloroefhene U 5.0 Nichloroefhene U 5.0 chloromethane U 5.0 diffuoromethane U 5.0 pyl ether U 5.0 zene U 5.0 zene U 5.0 orobutadlene U 5.0 i acetate U 5.0 ibenzene U 5.0 rife U 5.0 rife U 5.0 rife Value above quantitation range H Holding times for preparation or analysis expected rife E Value above quantitation range H Holding times for preparation or analysis expected rife E Value above quantitation range H Holding times for preparation or analysis expected J rife E Value above quantitation range H Holding times for preparation or analysis expected J	Chloromethane	ח	5.0				
Signature Color	cis-1,2-Dichloraethene)	5.0			•	
chloromethane U 5.0 methane U 5.0 diffuoromethane U 5.0 pyl ether U 5.0 state U 5.0 identale U 5.0 thenzene U 5.0 stactate U 5.0 thenzene U 5.0 sine U 5.0 rane U	cis-1,3-Dichloropropene	J	5,0	•			
methane U 5.0 diffuoromethane U 5.0 pyl ether U 5.0 state U 5.0 izene U 5.0 id 0 5.0 id cobultadiene U 5.0 id coctate U 5.0 inhenzene U 5.0 inhenzene U 5.0 inne U 5.0 inne LOD Log innit of Detection LOQ Limit of Optantitation R RPD outside accopied recovery limits S Spike Recovery outside accopred recovery limits U	Dibromochloromethane	⊃	5.0				
diffuoromethane U 5.0 pyl ether U 2.5 state U 2.0 zene U 5.0 idencente U 5.0 idencente U 5.0 idencente U 5.0 ine U 5.0 ine U 5.0 ine U 10 ine U 10 ine Initiof Detection Initiof Detection Initiof Detection Initiof Detection Initiof Detection R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits	Dibromomethane		5.0				
pyl ether U 5.0 state U 2.5 zene U 5.0 szene U 5.0 orobutadlene U 5.0 d acefate U 5.0 thenzene U 5.0 sne U 5.0 rat E Value above quantitation range H Holding times for preparation or analysis exceeded J LOD Limit of Detection LOQ Limit of Detection LOQ Limit of Quantitation ND R RPD outside accepted recovery limits S pike Recovery outside accepted recovery limits U	Dichlorodifluoromethane	⊃	5.0				
U Signature	Dilsopropyl ether	ɔ :	5,0				
U 5.0	Ethanol) :	. 25 				
U 5.0	E(ny) acetate Ethythanzene) =	o c			- - - - - -	
sefate U 5.0 nzene U 5.0 nzene U 5.0 10 5.0 LOD Limit of Detection R RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits U 5.0 LOQ Limit of Quantitation R RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits U 5.0 LOQ Limit of Outside accepted recovery limits Spike Recovery outside accepted recovery limits U 5.0	Freon-114	· • = = = = = = = = = = = = = = = = = = =	, C				
nzene U 5.0 D 10 10 10 10 10 10 10 10 10 10 10 10 10	Hexachlorobutadiene	· >	ž, O				
D 5.0 U 10 U 10 U 10 I 10 E Value above quantitation range LOQ Limit of Detection R RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits U 10 LOQ Limit of Quantitation R RPD outside accepted recovery limits U 10	Isopropy) acefate		0 5				
U 10 E Value above quantitation range LOD Limit of Detection R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U	Isopropylbenzene	⊃½½½	5.0				
E Value above quantitation range LOD Limit of Detection R RPD outside accepted recovery limits Spike Recovery outside accepted recovery limits UDD Limit of Detection UDD Limit of Dete		n	10				
E Value above quantitation range LOD Limit of Detection R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U	- Landerstoner (1)		Ì			er () fewellek en lan an mannel in gegagt () 4. a.e.g. Heker et man acte tot in ingesprendikte kolonis	
LOQ Limit of Quantitation LOQ Limit of Quantitation RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U	ഥ	e quantitation range		eparation or analysis exceeded		elow quantitation li	
RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits U		tection			-	e Reporting Limit	
		e accepted recovery limits		side accepted recovery limits		sound was analyzed	(

Quay Consulting, LLC. 0904320 Conti - 6 CLIENT:

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ANALYTICAL QC SUMMARY REPORT

Sample ID: VBLK-042409aY	SamoTvoe: MBLK	TestOn	TestCode: DruFullage	in linite: unite		o con					
			zej yr miogo			riep Date:			RunNo: 43540	43540	
Cilent ID: PBS	Batch ID: R43540	Test	TestNo: SW8260B	ç		Analysis Date:	4/25/2009	5 3	SeqNo: 593366	593366	
Analyte	Result	g	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	rPD Ref Val	%RPD	D RPDLimil	Qua
Methyt ten-butyl ether	n	5,0				-					
Methylene chloride	9.0	5.0									
n-Amyl acetate	\supset	5.0									
Naphthalene	ח	5.0									ť
n-Butyl acetate	ח	5.0									<i>)</i> (
n-Butylbenzene	D	5,0)
n-Propyl acetate	5	5.0	*								į
n-Propylbenzene)	5,0	i.								
o-Xylene	ח	5.0									
p-Diethylbenzene	n	5.0				,					
p-Ethyltoluene	¬	5.0									
sec-Butylbenzene	ɔ	5.0									
Styrene	<u> </u>	5.0								:	
I-Butyl alcohol)	5,0			•.						
tert-Butylbenzene)	5,0			:						
Tetrachloroethene)	5,0				14 2			74,4	¥.	
Toluene	.	5.0									
trans-1,2-Dichloroethene	כ	5.0							:	.1	
trans-1,3-Dichloropropene)	5.0									
Trichloroethene	>	5,0									:
Trichlorofluoromethane	D	5.0							-		
Vinyl acetate	D	5.0									
Vinyl chloride	n	5.0	· · · · · · · · · · · · · · · · · · ·						τ.	***	
Surr: 4-Bromofluorobenzene	43		50.00		86.6	64	132	· .			
Surr, Dibromofluoromethane	56		50,00		112	99	131				
Surr: Toluene-d8	52		50.00		104	7. 4.0	132				
								***		:	

CLIENT: Quay Consulting, LLC.

Work Order: 0904320

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ANALYTICAL QC SUMMARY REPORT

TestCode: DRYHG_S

Sample ID: LCSS-042409A	SampType: LCS	TestCode	TestCode: DRYHG_S	Units: mg/Kg		Prep Date:	Prep Date: 4/24/2009	RunNo. Ass7	2974	
Client ID: LCSS	Batch ID: 25544	TestNo	estNo: SW7471B	SW7471B		Analysis Date: 4/24/2009	4/24/2009	SeqNo: 590668	90668	4
Analyte	Result	Pal.	SPK value	SPK Ref Val	%REC	LowLimit H	, %REC LowLimit MighLimit RPD Ref Val	/al %RPD	RPDLimit	O
Mercury	0.220	0,0100	0.2000	0	110	63	128			
Sample ID: PBS-042409A Client ID: PBS	SampType: MBLK Batch ID: 25544	TestCode TestNo	Code: DRYHG_S estNo: SW7471B	Units: mg/Kg SW7471B		Prep Date: 4/24/2009 Analysis Date: 4/24/2009	4/24/2009	RunNo: 43374 SedNo: 590668	3374 30669	
Analyte	Result	Pal	SPK value	SPK Ref Val	%REC	LowLimit HighLimit	ighLimit RPD Ref Val		RPDLimit	Oua
Mercury	n	0.0100								
Sample ID: 0904320-01B-MS Client ID: Contl - 6	SampType: MS Batch ID: 25544	TestCode	TestCode: DRYHG_S TestNo: SW7471B	Unils: mg/Kg-dry SW7471B		Prep Date: Analysis Date:	Prep Date: 4/24/2009 ilysis Date: 4/24/2009	RunNo: 43374 SeqNo: 590689	1374	
Analyte	Result	Par	SPK value	SPK Ref Val	%REC	LowLimit Hi	LowLimit HighLimit RPD Ref Val		RPDLimit	Ou a
Mercury	0.211	0.00968	0,1936	0.01220	103	63	128			
Sample ID: 0904320-01B-MSD Client ID: Conti - 6	SampType: MSD Batch ID: 25544	TestCode	TestCode; DRYHG_S TestNo; SW7471B	Units: mg/Kg-dry SW7471B		Prep Date: Analysis Date:	Prep Date: 4/24/2009 lysis Date: 4/24/2009	RunNo: 43374 SeqNo: 590690	1374	
Analyte	Result	Pal	SPK value	SPK Ref Val	%REC	LowLimit Hi	LowLimit HighLimit RPD Ref Val	ai %RPD	RPDLimit	Oua
Mercury	0.213	0.00976	0.1952	0.01220	103	63	128 0.2110	1.07	20	

 Analyte detected below quantitation li
 Not Detected at the Reporting Limit
 U Indicates the compound was analyzed. H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation

S Spike Recovery outside accepted recovery fimits RPD outside accepted recovery limits Value above quantitation range E Value above quantitat
LOD Limit of Detection
R RPD outside accepted

Qualifiers:

CLIENT:

Quay Consulting, LLC. 0904320

Work Order:

Conti - 6

Project:

TestCode: TAGM_MET_DRY

ANALYTICAL QC SUMMARY REPORT

Cample IO: PEG-042408A	SampType: MBLK	TestCo	TestCode: TAGM MET Units: ma/Kg	Units: ma/Ka		Prep Date	Prep Date: 4/24/2009	800	Dunhle: 42270	10	
Ollent ID: PBS	Batch ID: 25543	Test	TestNo: SW6010B	SW3D50A	*	Analysis Date: 4/24/2009	e: 4/24/2	600	SeqNo: 590957	957	
Analyte	Result	Pal	SPK value SP	SPK Ref Val	%REC	LowLimit	HighLimit	%REC LowLimit HighLimit RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	.U	0.400									
Antimony	⊃	0.500									
Arsenic	ם	0.500									
Barium	-	0.400									
Beryllium	⊃	0.400									
Cadmium	5	0.400				-					
Calcium	כ	0.500									
Chromium	⊃	0.400									
Cobalt	ח	0.400					-				
Copper	⊃	0.400			÷						
Iran	⊃	0.400									
Lead	⊃	0.400				-		-			
Magnesium	Ξ.	0.400									
Manganese	⁻	0.400									
Nickel	ם	0.400									
Potassium	D	0.500						٠			
Selenium	⊃	0.500				•					
Silver	⊃	0.400		. *							
Sodium	n	0.500									
Thailium	n	0.500									
Vanadium	⊃	0.400	. •			-					
Zinc	D	0.400									

Sample ID: 1	Sample ID: LCSS-042409A	SampType: LCS	TestCoc	le: TAGM_MET	estCode: TAGM_MET_ Units: mg/Kg		Prep Date	Prep Date: 4/24/2009	Ru	RunNo: 43378	78	
Client ID: LCSS	SSOT	Batch ID; 25543	Testh	TestNo: SW6010B	SW3050A		Analysis Date:	: 4/24/2009	8 8 8	SeqNo: 590958	958	
Analyte		Result	Pal	SPK value SPK Ref Val	PK Ref Val	%REC	LowLimit	%REC LowLimit HighLimit RPD Ref Val	∂ef Val	%RPD	%RPD RPDLimit Qual	Qual
Aluminum		41.6	0.400	40.00	0	104	88	124				
Antimony		40,2	0.500	40,00	0	100	9	126				
Arsenic		40.8	0.500	40.00	0	102	63	120	-		÷	
Barlum	* * * * * * * * * * * * * * * * * * *	39.5	0.400	40.00	0	98.9	65	125				
Qualifiers:	Qunififiers: E Value above quantitative LOD Limit of Detection R RPD outside accepted to	Value above quantitation range Limit of Detection RPD outside accepted recovery limits		H Holding times for pre LOQ Limit of Quantitation S Spike Recovery outsit	Holding times for preparation or analysis exceeded Limit of Quantitation Spike Recovery outside accepted recovery limits	or analysis	exceeded y limits	J Analyte ND Not Dete U Indicates	J Analyte detected below quantitation li ND Not Detected at the Reporting Limit U Indicates the compound was analyzed	quantitation orting Limi was analyz	1] i cd	

CLIENT:

Quay Consulting, LLC. 0904320 Work Order:

Conti - 6 Project:

ANALYTICAL QC SUMMARY REPORT

TestCode: TAGM_MET_DRY

Sample ID: LCSS-042409A	SampType: LCS	TestCoc	estCode: TAGM_MET_	_ Units: mg/Kg		Prep Date:	4/24/2009	RunNo: 43378	
Client ID: LCSS	Batch ID: 25543	Test	TestNo: SW6010B	SW3050A	Ā	Analysis Date:	4/24/2009	SeqNo: 590958	
Analyte	Result	Pal	SPK value	SPK Ref Val	%REC	LowLimit H	, HighLimit RPD Ref Val	%RPD RPDLimit	r Qua
Beryllium	40,7	0,400	40,00	0	102	64	124		
Cadmium	40.5	0.400	40.00	0	101	99	124		
Calclum	39.9	00910	40.00	0	99.9	64	124	÷	:
Chromlum	40.2	0.400	40.00	0	100	99	128		
Cobalt	40,3	0.400	40.00	٥	101	65	123		
Copper	40.0	0.400	40.00	0	8	29	130		
Iron	43.2	0.400	40.00	0	108	29	123		
Lead	40.2	0.400	40.00	O	101	64	124		
Magnesium	40.2	0.400	40.00	0	5	56	132		
Manganese	39,5	0,400	40.00	0	98.8	65	125		
Nickel	40.2	0.400	40.00	0	101	63	125		
Potassium	408	0.500	400.0	0	102	62	121		
Selenium	41,4	0.500	40.00	0	104	99	124		
Silver	39,9	0.400	40,00	0	8,66	29	123		
Sodium	42.3	0.500	40.00	0	106	62	128		
Thallium	40.2	0.500	40.00	0	101	54	125		
Vanadium	39.8	0.400	40.00	0	93.6	ස	126		
Zinc	40,8	0.400	40.00	Q	102	62	130		

J Analyte detected below quantitation li
ND Not Detected at the Reporting Limit
U Indicates the compound was analyzed Indicates the compound was analyzed H Holding times for preparation or analysis exceeded LOQ Limit of Quantitation

S Spike Recovery outside accepted recovery limits RPD outside accepted recovery limits Value above quantitation range E Value nouve, LOD Limit of Detection
R RPD outside accepter

Qualifiers;

Individual Gradation Report

Quarry ID:	Thalle Elmsford		Gradation Date: 5/12/2009
Material:	Surge Fines		Print Date: 5/12/2009
Sampled From:			
Barge Number:			4
Sample Number:	1		
Customer:			•
Technician:	AlunceTosting	1.	
Shift:		<u> </u>	
Specification:	Vone		

SI	eve				
(in)	(mm)	Wt. Retained	% Retained	% Passing	Specification
3	75.0	0	0.0%	100.0%	
2	50.0	0	0.0%	100.0%)
1.5	37.5	0	0.0%	100.0%	· ·
1	25.0	0	0.0%	100.0%	
0.75	19.0	0	0.0%	100.0%	
0.5	12.5	19.7	0.6%	99.4%	
0.375	9.5	14			
0.25	6.4	649.1	19.8%	79.6%	
°#4	4.75	237	7.2%	72.4%	
#8	2.36	95.6	18.0%	59.3%	
#20	0.850	102.1	19.2%	45.4%	
#30	0.600	31.1	5.9%	41.2%	
#40	0.425	41.7	7.8%	35.5%	
#80	0.180	103.4	19.5%	21.4%	
#200	0.075	78.8	14.8%	10.7%	

Comments: This was collected and labeled as SELECT FILLER





February 16, 2009

NYCDEP Contract HP-ER-1

Eric Bodnar, P.E. **URS** Corporation 650 From Road, Suite 475 Paramus, NJ 07652-3909

Re:

Backfill Source Submittal

Technical Specification Section: 02200 1.5, D.1.a, D.3.a and D.5.b

Barretto Point Remediation Site

Hunts Point, New York

Mr. Bodnar,

The intent of this submittal is to obtain approval for a source of backfill material for use at the Barretto Point Remediation site. The material is described as "Mole Rock" and is coming from the Long Island Railroad's East Side Access Tunnel project. A copy of the contract plan showing the location of the tunnel has been attached to this submittal. Since the material is coming from a tunnel-boring project it should be considered a virgin source.

Posillico Environmental, Inc. (Posillico) has received approval from the New York State-Department of Environmental Conservation (NYSDEC) to use the "mole rock" as backfill material on a project that was recently completed by Posillico in Long Island City, Queens. The approval letter from the NYSDEC to Vernon Realty Holding LLC (project owner) is provided in this submittal package. The DEC approval letter is submitted as a substitute to the certification required under section 02200-1.5-D.3.a.

Based on the specification for the project, the "mole rock" is within the range of gradation requirements for backfill material. The gradation analysis, performed by Accutest Laboratories is attached to this submittal.

As allowed by specification section 02200-1.5-D.5.b, Posillico performed analytical testing in lieu of specification requirement 02200-1.5-D.3.c. The analytical report contains five metals that exceed NYSDED Recommended Soil Cleanup Objectives (RSCOs) including Nickel, Chromium, Beryllium, Iron and Zinc. With the exception of Zinc (at a concentration of 50.9 ppm and an Eastern USA Background concentration 50.0 ppm), all of the metals are well within their respective Eastern USA Background concentrations. Additionally, the NYSDEC allows for each of these metals to be compared to their site background concentrations. Given that the material is a virgin source, it can be inferred that the concentrations given in the analytical report are near their respective Site Background concentrations.

Thank you in advance for your prompt response to this submittal. Please feel free to contact myself at 516-779-1990 with any additional questions or comments.

Very Truly Yours,

Lee B. Kaplan, M.P.H.

Senior Environmental Engineer

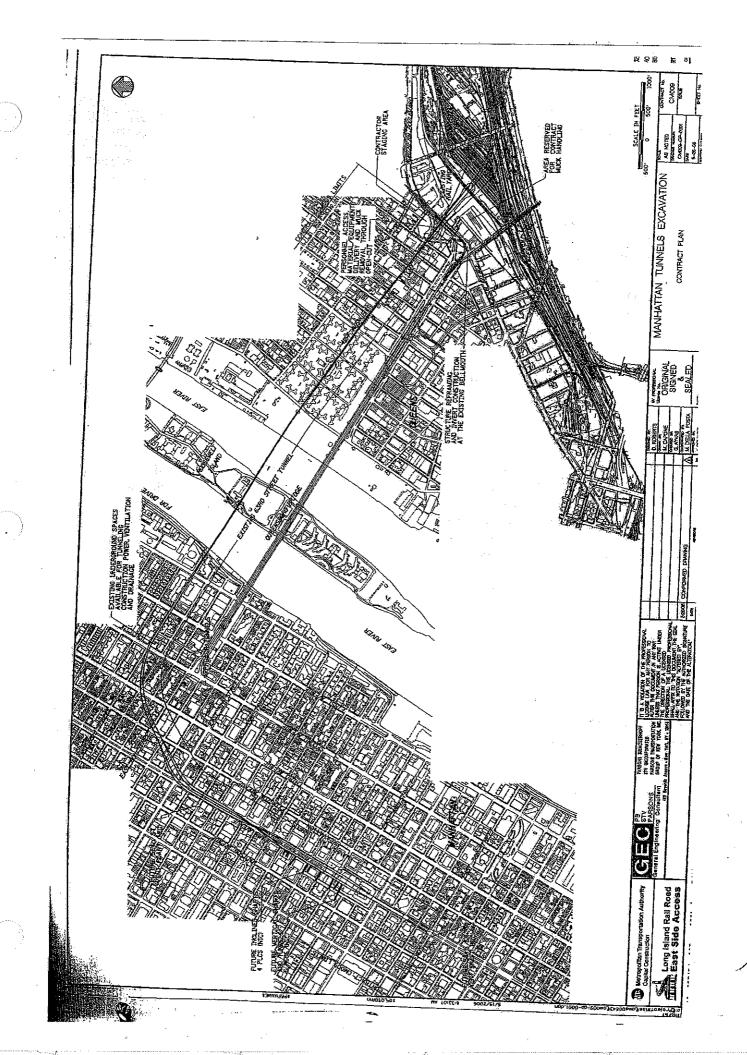
Posillico Environmental Inc.

CC:

W. Fahmy, P.E., HAKS

A. Patel, P.E., NYCDEP

File 0522



New York State Department of Environmental Conservation

Division of Environmental Remediation, Region 2 47-40 21ST Street, Long Island City, NY 11101-5407

47-40 21° Street, Long Island City, NY 11101-5407. Phone: (718) 482-6412 • FAX: (718) 482-6390

Website: www.dec.state.ny.us



May 13, 2008

Vernon Realty Holdings, LLC 112 Clifton Avenue, Suite 15 Lakewood, NJ 08701-3333

RE: "Mole Rock" Backfill Material

44-02 Vernon Blvd, Long Island City, NY NYSDEC Spill Number 030

NYSDEC Spill Number 0308234

Dear Sir or Madam:

The New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remedation (DER) has received and reviewed the sample analytical results for the "Mole Rock" material, dated November 12, 2007, submitted on your behalf by Posillico. Posillico requested the Department consider this material for use as backfill at the 44-02 Vernon Boulevard remediation site. Based on review of the sample analytical results provided, the Department approves the use of this material as backfill at the above referenced site.

Please feel free to call my office at the above number if you have any questions concerning this matter.

Sincerely,

Andre Obligado

Engineering Geologist

Region 2

cc: J. Sun (NYSDEC), J. Mahon (Poscillico), S. Panter (Fleming Lee Shue), C. Mesbah (CM Associates)

Sample Summary

Posillico Environmental

National Grid, Rockaway, NY

Job No:

JA11115

Sample Number	Collected Date	Time By	Received	Matrix Code Type	Client Sample ID
JA11115-1	01/29/09	13:30 LK	02/02/09	SO Soil	GRADATION A

Report of Analysis

Page 1 of 1

Client Sample ID: GRADATION A

Lab Sample ID: Matrix:

JA11115-1

SO - Soil

Date Sampled: 01/29/09 Date Received: 02/02/09

Percent Solids: n/a

Project:

National Grid, Rockaway, NY

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	Ву	Method					
Particle Size Analysis (Sieve and Hydrometer Testing)												
3 Inch Sievē	100		%	1	02/04/09	RI	ASTM D422-63					
1.5 Inch Sieve	100	4	%	1	02/04/09	RI	ASTM D422-63					
0.75 Inch Sieve	87.5		%	1	02/04/09	RI	ASTM D422-63					
0.375 Inch Sieve	74.8	4254 1313	%	1	02/04/09	RI	ASTM D422-63					
No.4 Sieve (4.75 mm)	67.2		%	1	02/04/09	RI	ASTM D422-63					
No.8 Sieve (2.36 mm)	62.3		%	1	02/04/09	RI	ASTM D422-63					
No.10 Sieve (2.00 mm)	61.5	N. Z.	%	1	02/04/09	RI	ASTM D422-63					
No.16 Sieve (1.18 mm)	55.6	Artis Nga	%	1	02/04/09	RI	ASTM D422-63					
No.30 Sieve (0.60 mm)	47.2	d.	%	1	02/04/09	RI	ASTM D422-63					
No.50 Sieve (0.30 mm)	34.6		%	1	02/04/09	RI	ASTM D422-63					
No.100 Sieve (0.15 mm)	21.4		%	1	02/04/09	RI	ASTM D422-63					
No.200 Sieve (0.075 mm)	14.5	. 1	%	1	02/04/09	RI	ASTM D422-63					
0.030 mm (Hydrometer)	10	5.3	%	1	02/04/09	RI	ASTM D422-63					
0.005 mm (Hydrometer)	3.5	SA 1	%	. 1	02/04/09	RI	ASTM D422-63					
0.0015 mm (Hydrometer)	2.6		%	1	02/04/09	RI	ASTM D422-63					
% Gravel	33		%	1	02/04/09	RI	ASTM D422-63					
% Sand	53	#1.	%	1	02/04/09	RI	ASTM D422-63					
% Silt, Clay, Colloids	15		%	1	02/04/09	RI	ASTM D422-63					
рН	9.33	e i	su	1	02/05/09	LMM	SW846 9045C					

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JA11115: Chain of Custody Page 1 of 2



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JA111			Immediate Client Services	
Date / Time Received: 2/2/20 Project:	109	Delivery Method: No. Coolers:	Client Service Action 1 Airbill #s:	Required at Login: No
1. Custody Seals Present:	<u>or N</u>	YorN sent: ☑ □	Sample Integrity - Documentation 1. Sample labels present on bottles:	<u>Y or N</u> ☑ □
2. Custody Seals Intact:	4. Smpl Dates/	Time OK 😡 📋	Container labeling complete: Sample container label / COC agree:	
Temp criteria achieved: Cooler temp verification: Cooler media:	Infared gun		Sample Integrity - Condition 1. Sample recvd within HT: 2. All containers accounted for:	<u>Y or N</u>
Quality Control Preservatio 1. Trip Blank present / cooler: 2. Trip Blank fisted on COC: 3. Samples preserved properly:	Y of N		3. Condition of sample: Sample Integrity - Instructions 1. Analysis requested is clear. 2. Bottles received for unspecified tests	Y or N
4. VOCs headspace free:		:·	Sufficient volume recvd for analysis: Compositing instructions clear: Filtering instructions clear:	
Comments				
Accutest Laboratories		2235 US	Highway 130	Dayton, New Jerse

JA11115: Chain of Custody Page 2 of 2









05/07/08



Technical Report for

Posillico Group

QWD-Backfill, 5th Street, Long Island City, NY

Accutest Job Number: J85517

Sampling Date: 03/12/08

Report to:

Posillico Group

lkaplan@posillicogroup.com

ATTN: Lee Kaplan

Total number of pages in report: 28



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Vincent J. Pugliese President

Client Service contact: Nadine Yakes 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, PA, RI, SC, TN, VA, WV

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.



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-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Sample Results	
3.1: J85517-1: 1 BACKFILL-1 (QWD)	
3.2: J85517-1A: 1 BACKFILL-1 (QWD)	21
Section 4: Misc. Forms	
4.1: Chain of Custody	











Sample Summary

Posillico Group

QWD-Backfill, 5th Street, Long Island City, NY

Job No:

J85517

Sample Number	Collected Date	l Time By	Received	Matr Code		Client Sample ID
J85517-1 -	03/12/08	09:45 LK	03/12/08	so	Soil	1 BACKFILL-1 (QWD)
J85517-1A	03/12/08	09:45 LK	03/12/08	so	Soil	1 BACKFILL-1 (QWD)





CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Posillico Group

Job No

J85517

Site:

QWD-Backfill, 5th Street, Long Island City, NY

Report Date

4/4/2008 11:14:43 AM

On 03/12/2008, 1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 4.2 C. Samples were intact and properly preserved, unless noted below. An Accutest Job Number of J85517 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix LEACHATE

Batch ID: GP43196

Sample(s) J85499-2LS were used as the QC samples indicated,

Matrix LEACHATE

Batch ID: VL5236

J85743-1AMSD for 2-Butanone (MEK): Outside control limits due to matrix interference.

Matrix SO

Batch ID: VG 5258

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85557-1MS, J85557-1MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for 1,1,2-Trichloroethane, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, 1,2-Dichloroethane, trans-1,3-Dichloropropene are outside control limits. High percent recoveries and no associated positive found in the QC batch.
- Matrix Śpike Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Bromochloromethane, Bromodichloromethane, Bromoform, Chlorobenzene, Chloroform, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Cyclohexane, Dibromochloromethane, Ethylbenzene, Isopropylbenzene, m,p-Xylene, Methyl Acetate, Methylcyclohexane, o-Xylene, Styrene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethene, Xylene (total) are outside control limits. Outside control limits due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2,3-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Bromochloromethane, Bromodichloromethane, Bromoform, Chlorobenzene, Chloroform, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Cyclohexane, Dibromochloromethane, Ethylbenzene, Isopropylbenzene, m,p-Xylene, Methyl Acetate, o-Xylene, Styrene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, Xylene (total), 1,2,4-Trichlorobenzene are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for MSD for 1,2,4-Trichlorobenzene are outside control limits for sample J85557-1MSD. Probable cause due to sample homogeneity.



Extractables by GCMS By Method SW846 8270C

Matrix LEACHATE

Batch ID: OP31869

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- = All method blanks for this batch meet method specific criteria.
- Sample(s) J85520-ILS, J85792-ILS, J86330-ILS were used as the QC samples indicated.

Matrix SO

Batch ID: OP31688

- DG1511 1D. 01 31000
- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.

 Sample(s) J85573-19MS, J85573-19MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for Benzaldehyde are outside control limits.
- Matrix Spike Recovery(s) for 4-Chloroaniline, 4-Nitrophenol, Caprolactam, Dibenzofuran, Fluorene, N-Nitroso-di-n-propylamine, N-Nitrosodiphenylamine are outside control limits. Outside control limits due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for 3-Nitroaniline, 4-Chloroaniline, Caprolactam, Fluorene, N-Nitrosodiphenylamine, Naphthalene, Nitrobenzene, Phenanthrene, 2,4-Dimethylphenol, N-Nitroso-di-n-propylamine are outside control limits. Outside control limits due to matrix interference.
- Matrix Spike Recovery(s) for 2-Methylnaphthalene, Phenanthrene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for MSD for 2-Methylnaphthalene, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dimitrotoluene, 2-Nitrophenol, 4-Nitrophenol, Benzaldehyde, N-Nitroso-di-n-propylamine are outside control limits for sample OP31688-MSD. Outside control limits due to matrix interference.
- OP31688-MS for Phenanthrene: Outside control limits due to matrix interference.
- OP31688-MSD for 2-Methylnaphthalene: Outside control limits due to high level in sample relative to spike amount.
- OP31688-BS1 for Benzaldehyde: Outside of in house control limits.

2

Extractables by GC By Method SW846 8081A

Matrix LEACHATE

Batch ID: OP31873

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- * Sample(s) J85520-1LS, J85784-1LS, J85792-1LS, J85978-1LS, J85520-1LS were used as the QC samples indicated.
- Sample(s) OP31724-MS, OP31724-MSD have surrogates outside control limits. No Surrogate spiked.
- OP31873-LS3: No spike added.

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Batch ID: OP31724

- * All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- E Sample(s) J85229-1MS, J85229-1MSD, OP31724-MSMSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike Recovery(s) for 4,4'-DDE, Aldrin, alpha-BHC, alpha-Chlordane, delta-BHC, Dieldrin, Endosulfan-II, Endosulfan-II, Endrin, Endrin ketone, gamma-BHC (Lindane), gamma-Chlordane, Heptachlor are outside control limits. Probable cause due to matrix interference.
- RPD(s) for MSD for alpha-BHC, delta-BHC, gamma-BHC (Lindane), gamma-Chlordane are outside control limits for sample OP31724-MSD. High RPD due to possible MS concentrated.
- * Sample(s) OP31724-MS, OP31724-MSD have surrogates outside control limits. No Surrogate spiked.
- OP31724-MS for Endosulfan-II: Outside control limits due to possible extract concentrated.
- © OP31724-MS for Aldrin: Outside control limits due to possible extract concentrated.
- OP31724-MS for alpha-BHC: Outside control limits due to possible extract concentrated.
- OP31724-MS for alpha-Chlordane: Outside control limits due to possible extract concentrated.
- © OP31724-MS for Heptachlor: Outside control limits due to possible extract concentrated.
- OP31724-MSD for Tetrachloro-m-xylene: No Surrogate spiked.
- □ OP31724-MSD for Decachlorobiphenyl: No Surrogate spiked.
- ₩ OP31724-MS for 4,4'-DDE: Outside control limits due to possible extract concentrated.
- OP31724-MS for Endosulfan-I: Outside control limits due to possible extract concentrated.
- OP31724-MS for Endrin: Outside control limits due to possible extract concentrated.
- OP31724-MS for Endrin ketone: Outside control limits due to possible extract concentrated.
- © OP31724-MS for gamma-BHC (Lindane): Outside control limits due to possible extract concentrated.
- © OP31724-MS for gamma-Chlordane: Outside control limits due to possible extract concentrated.
- P31724-MS for Dieldrin: Outside control limits due to possible extract concentrated.
- P31724-BS1 for Endosulfan sulfate: Reported from 2nd signal. %D of check calibration on 1st signal exceed method criteria (15%) so using for confirmation only.
- © OP31724-MS for delta-BHC: Outside control limits due to possible extract concentrated.
- OP31724-MS for Tetrachloro-m-xylene: No Surrogate spiked.
- OP31724-MS for Decachlorobiphenyl: No Surrogate spiked.





Extractables by GC By Method SW846 8082

Matrix SO

Batch ID: OP31725

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J84931-45MS, OP31725-MSMSD, J84931-45MSD were used as the QC samples indicated.
- RPD(s) for MSD for Aroclor 1016, Aroclor 1260 are outside control limits for sample OP31725-MSD. High RPD due to high MSD recovery.
- Sample(s) OP31725-MS, OP31725-MSD have surrogates outside control limits. No surrogate spiked.
- OP31725-MS for Decachlorobiphenyl: No surrogate spiked.
- OP31725-MSD for Decachlorobiphenyl: No surrogate spiked.
- OP31725-MSD for Tetrachloro-m-xylene: No surrogate spiked.
- OP31725-MS for Tetrachloro-m-xylene: No surrogate spiked.

Extractables by GC By Method SW846 8151

Matrix LEACHATE

Batch ID: OP31859

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85520-1LS, J85784-1LS, J85792-1LS, J85978-1LS were used as the QC samples indicated.

Matrix SO

Batch ID: OP31857

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85517-1MS, J85517-1MSD were used as the QC samples indicated.



Metals By Method SW846 6010B

Matrix	LEACHA	TE
Matrix	LEACHA	1 1:

Batch ID: MP42996

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85792-1MS, J85792-1MSD, J85792-1SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Cadmium, Copper, Lead, Nickel are outside control limits for sample MP42996-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Matrix SO

Batch ID: MP42960

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85791-21MS, J85791-21MSD, J85791-21SDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Antimony, Arsenic, Cadmium, Copper, Iron, Lead, Manganese are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike Duplicate Recovery(s) for Antimony, Arsenic, Copper, Iron, Lead are outside control limits. Probable cause due to matrix interference.
- RPD(s) for Serial Dilution for Cadmium, Selenium, Sodium are outside control limits for sample MP42960-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP42960-SD1 for Aluminum: Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Copper: Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Iron; Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Potassium: Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Magnesium: Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Calcium: Serial dilution indicates possible matrix interference.
- MP42960-SD1 for Barium: Serial dilution indicates possible matrix interference.

Metals By Method SW846 7470A

Matrix LEACHATE

Batch ID: MP43014

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85792-1MS, J85792-1MSD were used as the QC samples for metals.

Metals By Method SW846 7471A

Matrix SO

Batch ID: MP42961

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria
- Sample(s) J85950-6MS, J85950-6MSD were used as the QC samples for metals.

Wet Chemistry By Method ASTM 4643-00

Matrix SO

Batch ID: GN13218

The data for ASTM 4643-00 meets quality control requirements.





Wet Chemistry By Method SW846 9012 M/LACHAT

Matrix SO

Batch ID: GP43222

- = All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85761-1DUP, J85761-1MS were used as the QC samples for Cyanide.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover









Section 3



Sample Results

Report of Analysis



Client Sample ID: 1 BACKFILL-1 (QWD)

DF

1

Lab Sample ID: Matrix:

J85517-1

SO - Soil

Ву

SJM

Date Sampled:

03/12/08

Method:

SW846 8260B

Prep Date

n/a

Date Received: 03/12/08

Project:

Percent Solids:

91.9

QWD-Backfill, 5th Street, Long Island City, NY

Analyzed

03/15/08

Prep Batch n/a

Analytical Batch VG5258

Run #1 Run #2

Initial Weight

File ID

G108453.D

Run #1 5.2 g

Run #2

VOA TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	4.4	ug/kg	
107-13-1	Acrylonitrile	ND	52	9.8	ug/kg	٠.
71-43-2	Benzene	ND	1.0	0.78	ug/kg	
74-97-5	Bromochloromethane	ND	5.2	0.31	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	0.27	ug/kg	
75-25-2	Bromoform	ND	5.2	0.88	ug/kg	
74-83-9	Bromomethane	ND	5.2	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	3.0	ug/kg	
75-15-0 °	Carbon disulfide	ND	5.2	0.31	ug/kg	$\hat{x}_1(k) = 1$
56-23-5	Carbon tetrachloride	ND	5.2	0.27	ug/kg	
108-90-7	Chlorobenzene	ND	5.2	0.60	ug/kg	
75-00-3	Chloroethane	ND .	5.2	0.56	ug/kg	. :
67-66-3	Chloroform	ND	5.2	0.42	ug/kg	
74-87-3	Chloromethane	ND .	5.2	0.56	ug/kg	
110-82-7	Cyclohexane	ND	5.2	0.42	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	1.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	0.22	ug/kg	
106-93-4	1,2-Dibromoethane	ND	1.0	0.31	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	5.2	0.30	ug/kg	4.
541-73-1	1,3-Dichlorobenzene	ND :	5.2	0.39	ug/kg	4.1
106-46-7	1,4-Dichlorobenzene	ND	5.2	0.32	ug/kg	
75-71-8	Dichlorodifluoromethane	ND .	5.2	0.44	ug/kg	11
75-34-3	1,1-Dichloroethane	ND	5.2	0.74	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.25	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.2	0.50	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.2	0.21	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.2	0.59	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	0.44	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	0.54	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	0.86	ug/kg	
123-91-1	1,4-Dioxane	ND	130	41	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.52	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 2 of 2

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix: J85517-1 SO - Soil SW846 8260B Date Sampled: 03/12/08

Date Received: 03/12/08 Percent Solids: 91.9

Method: Project:

QWD-Backfill, 5th Street, Long Island City, NY

VOA TCL List (SOM0 1.1)

			114.44			
CAS No.	Compound	Result	RL	MDL	Units Q	
76-13-1	Freon 113	ND	5.2	0.40	ug/kg	
591~78-6	2-Hexanone	ND	5.2	1.9	ug/kg	
98-82-8	Isopropylbenzene	ND	5.2	0.32	ug/kg	
79-20-9	J	12.4	5.2	3.3	ug/kg	
108-87-2	Methylcyclohexane	ND	5.2	0.54	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.67	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.2	2.1	ug/kg	
75-09-2	Methylene chloride	ND	5.2	0.50	ug/kg	
100-42-5	Styrene	ND	5.2	0.24	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.2	0.41	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	0.31	ug/kg	٠,
127-18-4	Tetrachloroethene	ND	5.2	0.36	ug/kg	
108-88-3	Toluene	ND	1.0	0.45	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.2	0.48	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.2	0.38	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.2	0.40	ug/kg	
79-00-5 °	1,1,2-Trichloroethane	ND	5.2	0.31	ug/kg	
79-01-6	Trichloroethene	ND	5.2	0.35	ug/kg	
75-69-4	Trichlorofluoromethane	ND	5.2	0.50	ug/kg	
75-01-4	Vinyl chloride	ND	5.2	0.60	ug/kg	
	m,p-Xylene	ND	2.1	0.52	ug/kg	
95-47-6	o-Xylene	ND	1.0	0.28	ug/kg	
1330-20-7	Xylene (total)	ND	2.1	0.28	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts	
1868-53-7	Dibromofluoromethane	87%		68-12	23%	
17060-07-0	1,2-Dichloroethane-D4	91%		59-13	36%	
2037-26-5	Toluene-D8	91%		75-12	3%	
460-00-4	4-Bromofluorobenzene	88%		65-14	10%	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound





By

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Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1 SO - Soil

SW846 8270C SW846 3550B

Analyzed

03/17/08

Date Sampled: 03/12/08 Date Received: 03/12/08

Percent Solids: 91.9

Prep Date

03/14/08

Method: Project:

QWD-Backfill, 5th Street, Long Island City, NY

Prep Batch Analytical Batch EP1459

OP31688

Run #1 Run #2

> Initial Weight ~ 30.2 g

File ID

P35609.D

Final Volume

Run #1 Run #2 1.0 ml

DF

1

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	180	23	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	49	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	44	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	720	40	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	720	66	ug/kg	
95-48-7	2-Methylphenol	ND	72	35	ug/kg	
	3&4-Methylphenol	ND	. 72	45	ug/kg	
88-75-5 °	2-Nitrophenol	ND	180	42	ug/kg	1: 11
100-02-7	4-Nitrophenol	ND	720	63	ug/kg	st .
87-86-5	Pentachlorophenol	ND	360	38	ug/kg	÷
108-95-2	Phenol	ND	·· 72	34	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	180	53	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	68	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	73	ug/kg	
83-32-9	Acenaphthene	ND	72	11	ug/kg	
208-96-8	Acenaphthylene	ND	72	7.3	ug/kg	
98-86-2	Acetophenone	ND	180	11	ug/kg	
120-12-7	Anthracene	ND	72	33	ug/kg	
1912-24-9	Atrazine	ND	180	21	ug/kg	* .
56-55-3	Benzo(a)anthracene	ND	72	7.5	ug/kg	
50-32-8	Benzo(a)pyrene	ND	72	18	ug/kg	56
205-99-2	Benzo(b)fluoranthene	ND	72	12	ug/kg	200
191-24-2	Benzo(g,h,i)perylene	ND	72	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	72	16	ug/kg	***
101-55-3	4-Bromophenyl phenyl ether	ND	72	16	ug/kg	* * .
85-68-7	Butyl benzyl phthalate	ND	72	13	ug/kg	
100-51-6	Benzyl Alcohol	ND	72	12	ug/kg	
92-52-4	1,1'-Biphenyl	ND	72	9.8	ug/kg	
100-52-7	Benzaldehyde	ND	180	6.8	ug/kg	
91-58-7	2-Chloronaphthalene	ŇD	72	11	ug/kg	
106-47-8	4-Chloroaniline	ND	180	13	ug/kg	

ND = Not detected

MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Page 2 of 3

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1

Date Sampled: 03/12/08 Date Received: 03/12/08

SO - Soil SW846 8270C SW846 3550B

Percent Solids: 91.9

Method: Project:

QWD-Backfill, 5th Street, Long Island City, NY

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
86-74-8	Carbazole	ND	72	12	ug/kg	
105-60-2	Caprolactam	ND	72	19	ug/kg	
218-01-9	Chrysene	ND	72	15	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	72	14	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	72	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	72	21	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	72	10	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	72	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	72	14	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	180	26	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	72	9.3	ug/kg	
132-64-9	Dibenzofuran	ND	72	7.1	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	72	10	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	72	15	ug/kg	
84-66-2	Diethyl phthalate	ND	72	13	ug/kg	
131-11-3	Dimethyl phthalate	ND	72	9.8	ug/kg	
117-81-7	bis (2-Ethylhexyl) phthalate	ND	72	22	ug/kg	
206-44-0	Fluoranthene	ND	72	6.7	ug/kg	
86-73-7	Fluorene	ND	72	7.3	ug/kg	
118-74-1	Hexachlorobenzene	ND	72	17	ug/kg	
87-68-3	Hexachlorobutadiene	ND	72	17	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	720	17	ug/kg	
67-72-1	Hexachloroethane	ND.	180	15	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	72	34	ug/kg	
78-59-1	Isophorone	ND	72	12	ug/kg	
91-57-6	2-Methylnaphthalene	ND	72	32	ug/kg	
88-74-4	2-Nitroaniline	ND	180	23	ug/kg	
99-09-2	3-Nitroaniline	ND	180	24	ug/kg	
100-01-6	4-Nitroaniline	ND	180	21	ug/kg	
91-20-3	Naphthalene	ND	72	8.1	ug/kg	
98-95-3	Nitrobenzene	ND	72	12	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	72	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	7.9	ug/kg	
85-01-8	Phenanthrene	ND	72	9.0	ug/kg	
129-00-0	Pyrene	ND	72	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	180	21	ug/kg	
		er er er er er er er er er er er er er e			~oo	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts	

ND = Not detected

367-12-4

MDL - Method Detection Limit

67%

J = Indicates an estimated value

26-105%

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

2-Fluorophenol





Page 3 of 3

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID:

J85517-1

Date Sampled: 03/12/08

Matrix: Method: SO - Soil

Date Received: 03/12/08

SW846 8270C SW846 3550B

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2 Limits
4165-62-2	Phenol-d5	76%	34-106%
118-79-6	2,4,6-Tribromophenol	87%	30-126%
4165-60-0	Nitrobenzene-d5	68%	36-115%
321-60-8	2-Fluorobiphenyl	65%	44-112%
1718-51-0	Terphenyl-d14	63%	42-133%



MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Ву

OPM

Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

DF

1

Lab Sample ID:

J85517-1

Date Sampled: 03/12/08

Prep Date

03/25/08

Matrix:

SO - Soil

Date Received: 03/12/08

Method:

SW846 8151 SW846 3550B

Percent Solids: 91.9

OP31857

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Analyzed

03/27/08

Prep Batch

Analytical Batch GWW2389

Run #1 Run #2

Initial Weight

File ID

WW71989.D

Final Volume

Run #1 ~ 30.1 g 10.0 ml

Run #2

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	- 18	7.7	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	3.6	0.85	ug/kg	
93-76-5	2,4,5-T	ND	3.6	0.74	ug/kg	
75-99-0	Dalapon	ND	3.6	1.3	ug/kg	
1918-00-9	Dicamba	ND	3.6	3.6	ug/kg	
120-36-5	Dichloroprop	ND	18	2.5	ug/kg	
88-85-7	Dinoseb	ND	18	25	ug/kg	
94-74-6	MCPA	ND	1800	450	ug/kg	
93-65-2	MCPP	ND	1800	300	ug/kg	
87-86-5	Pentachlorophenol	ND	1.8	0.31	ug/kg	
94-82-6	2,4-DB	ND	18	6.9	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
19719-28-9	2,4-DCAA	73%		10-1	47%	
19719-28-9	2,4-DCAA	78%			47%	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID:

J85517-1

Date Sampled: 03/12/08

Matrix:

SO - Soil

Date Received: 03/12/08

Method:

SW846 8081A SW846 3545

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Percent Solids: 91.9

Run #1

DF 1

Analyzed 03/27/08

Prep Date Ву JSE 03/17/08

Prep Batch OP31724

Analytical Batch G2G1087

Run #2

Initial Weight 15.1 g

File ID

2G27592.D

Final Volume

Run #1

10.0 ml

Run #2

Pesticide TCL List

CAS No.	Compound	Result	RL ·	MDL	Units	Q
309-00-2	Aldrin	ND	1.4	0.29	ug/kg	
319-84-6	alpha-BHC	ND	1.4	0.27	ug/kg	
319-85-7	beta-BHC	ND	1.4	0.48	ug/kg	£ .
319-86-8	delta-BHC	ND	1.4	0.26	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.4	0.35	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.4	0.44	ug/kg	. :
5103-74-2	gamma-Chlordane	ND	1.4	0.32	ug/kg	
60-57-1	Dieldrin	ND	1.4	0.28	ug/kg	• 1. •
72-54-8 °	4,4'-DDD	ND	1.4	0.23	ug/kg	
72-55-9	4,4'-DDE	ND	1.4	0.36	ug/kg	
50-29-3	4,4'-DDT	ND	1.4	0.33	ug/kg	
72-20-8	Endrin	ND	1.4	0.31	ug/kg	
1031-07-8	Endosulfan sulfate	ND	1.4	0.31	ug/kg	
7421-93-4	Endrin aldehyde	ND	1.4	0.34	ug/kg	
959-98-8	Endosulfan-I	ND	1.4	0.29	ug/kg	
33213-65-9	Endosulfan-II	ND	1.4	0.48	ug/kg	
76-44-8	Heptachlor	ND	1.4	0.38	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.4	0.29	ug/kg	
72-43-5	Methoxychlor	ND	1.4	0.39	ug/kg	
53494-70-5	Endrin ketone	ND	1.4	0.29	ug/kg	
8001-35-2	Toxaphene	ND	18	14	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
877-09-8	Tetrachloro-m-xylene	103%		38-1	30%	
877-09-8	Tetrachloro-m-xylene	105%		38-1	30%	
2051-24-3	Decachlorobiphenyl	102%		32-1	42%	
2051-24-3	Decachlorobiphenyl	112%		32-1	42%	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



JSE

Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID:

J85517-1

Date Sampled:

03/12/08 03/12/08

Matrix:

SO - Soil

Date Received:

Method:

SW846 8082 SW846 3545

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

.

91.9

File ID DF Analyzed
Run #1 AB72701.D 1 03/27/08

Prep Date 03/17/08

Prep Batch OP31725 Analytical Batch GAB4073

Run #2

Initial Weight
- 15.1 g

Final Volume

Run #1 Run #2 10.0 ml

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	36	6.9	ug/kg	
	1 1001					
11104-28-2	Aroclor 1221		36	22	ug/kg	
11141-16-5	Aroclor 1232	ND	36	20	ug/kg	
53469-21-9	Aroclor 1242	ND	- 36	11	ug/kg	
12672-29-6	Aroclor 1248	ND	36	12	ug/kg	
11097-69-1	Aroclor 1254	ND	36	17	ug/kg	
11096-82-5	Aroclor 1260	ND	36	7.3	ug/kg	
11100-14-4	Aroclor 1268	ND	36		ug/kg	
37324-23-5	Aroclor 1262	ND	36		ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
877-09-8	Tetrachloro-m-xylene	42%	4	37-1	40%	
877-09-8	Tetrachloro-m-xylene	43%		37-1	40%	
2051-24-3	Decachlorobiphenyl	54%		40-151%		
2051-24-3	Decachlorobiphenyl	47%			51%	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1 SO - Soil

Date Sampled: 03/12/08

Percent Solids: 91.9

Date Received: 03/12/08

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	10600	22	mg/kg	1	03/21/08	03/25/08 дм	SW846 6010B ³	SW846 3050B ⁴
Antimony ~	< 2.2	2.2	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Arsenic	< 2.2	2.2	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Barium	142	22	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B ⁴
Beryllium	0.61	0.55	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Cadmium	< 0.55	0.55	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Calcium	1990	550	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Chromium	20.8	1.1	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B ⁴
Cobalt	10.4	5.5	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Copper	21.0	2.8	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B 4
Iron	21600	11	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B 4
Lead	3.9	2.2	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B 4
Magnesium	6140	550	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B 3	SW846 3050B 4
Manganese	280	1.7	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Mercury	< 0.034	0.034	mg/kg	1	03/21/08	03/21/08 JW	SW846 7471A ¹	SW846 7471A ⁵
Nickel	18.3	4.4	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B 4
Potassium	7700	1100	mg/kg	1	03/21/08	03/25/08 дм	SW846 6010B 3	SW846 3050B 4
Selenium	< 2.2	2.2	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B ⁴
Silver	< 1.1	1.1	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B ⁴
Sodium	< 1100	1100	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B 4
Thallium	<1.1	1.1	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B 4
Vanadium	31.2	5.5	mg/kg	1	03/21/08	03/25/08 DM	SW846 6010B ³	SW846 3050B 4
Zinc	50.9	2.2	mg/kg	1	03/21/08	03/22/08 DM	SW846 6010B ²	SW846 3050B 4
			_ ~					

(1) Instrument QC Batch: MA20642

(2) Instrument QC Batch: MA20643

(3) Instrument QC Batch: MA20649

(4) Prep QC Batch: MP42960

(5) Prep QC Batch: MP42961



Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1

Date Sampled:

03/12/08

SO - Soil

Date Received:

03/12/08

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

General Chemistry

Analyte	Result RL	Units	DF	Analyzed	Ву	Method
Cyanide	<0.22 0.22	mg/kg	1	03/19/08 16:03	JA	SW846 9012 M/LACHAT
Solids, Percent	91.9	%		03/26/08	BR	ASTM 4643-00

By

MAH

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1A SO - Soil

Date Sampled: 03/12/08 Date Received:

Method:

SW846 8260B SW846 1311

DF

5

Percent Solids: 91.9

Prep Date

03/20/08

03/12/08

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Analyzed

03/21/08

Analytical Batch Prep Batch GP43196 VL5236

Run #1 Run #2

Purge Volume

File ID

L226048.D

Run #1 - 5.0 ml

Run #2

VOA TCLP Leachate

TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units Q	
71-43-2	Benzene	ND	D018	0.50	0.0050	0.0011	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.013	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0015	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0011	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0011	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0012	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0015	mg/l	
75-35-4	1,1-Dichloroethene	ND.	D029	0.70	0.0050	0.0016	mg/l	
127-18-4°	Tetrachloroethene	ND	D039	0.70	0.0050	0.0014	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.0050	0.0014	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.025	0.0014	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run#	2 I	imits		•	
1868-53-7	Dibromofluoromethane	94%	*	7	7-121%	4,175		
17060-07-0	1,2-Dichloroethane-D4	96%			5-133%	**	-	
2037-26-5	Toluene-D8	95%		_	0-117%			
460-00-4	4-Bromofluorobenzene	111%			9-124%			

ND = Not detected

MDL - Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





By

NAP

Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID:

J85517-1A

Date Sampled: Date Received:

03/12/08 03/12/08

Matrix:

SO - Soil

Prep Date

03/26/08

Method:

SW846 8270C SW846 3510C

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Analyzed

03/27/08

Analytical Batch Prep Batch OP31869 EM1948

Run #1 Run #2

> Initial Volume Final Volume

Run #1 ⁻ 100 ml

ABN TCLP Leachate

File ID

M55845.D

1.0 ml

DF

1

Run #2

TCLP Leachate method SW846 1311

CAS No.	Compound	1	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol		ND	D023	200	0.050	0.014	mg/l	
	3&4-Methylphenol		ND	D024	200	0.050	0.013	mg/l	
87-86-5	Pentachlorophenol		ND	D037	100	0.20	0.019	mg/l	
95-95-4	2,4,5-Trichlorophenol		ND	D041	400	0.050	0.019	mg/l	
88-06-2	2,4,6-Trichlorophenol		ND	D042	2.0	0.050	0.013	mg/l	
106-46-7	1,4-Dichlorobenzene		ND	D027	7.5	0.020	0.0018	mg/l	
121-14-2	2,4-Dinitrotoluene		ND	D030	0.13	0.020	0.0086	mg/l	
118-74-1	Hexachlorobenzene		ND	D032	0.13	0.020	0.0054	mg/l	
87-68-3 °	Hexachlorobutadiene		ND	D033	0.50	0.020	0.0018	mg/l	
67-72-1	Hexachloroethane		ND	D034	3.0	0.050	0.0028	mg/l	
98-95-3	Nitrobenzene		ND.	D036	2.0	0.020	0.0042	mg/l	
110-86-1	Pyridine		ND	D038	5.0	0.020	0.0064	mg/l	
CAS No.	Surrogate Recoveries		Run# 1	Run#	2	Limits		·	
367-12-4	2-Fluorophenol		41%			10-69%			
4165-62-2	Phenol-d5		28%			10-52%			
118-79-6	2,4,6-Tribromophenol		87%			33-125%			
4165-60-0	Nitrobenzene-d5		73%			27-120%			
321-60-8	2-Fluorobiphenyl		78%			31-111%			
1718-51-0	Terphenyl-d14		96%			31-124%			

ND = Not detected

MDL - Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1A SO - Soil

Date Sampled:

03/12/08 Date Received: 03/12/08

Method:

SW846 8151 SW846 3510C

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Run #1

File ID WW71986.D Analyzed 03/27/08

By **OPM**

Prep Date 03/25/08

54-141%

Prep Batch OP31859

Analytical Batch GWW2389

Run #2

Initial Volume Final Volume

Run #1 100 ml 10.0 ml

DF

1

Run #2

Herbicide TCLP Leachate

19719-28-9 2,4-DCAA

TCLP Leachate method SW846 1311

Units Q

CAS No. Compound Result HW# MCL RL MDL 94-75-7 2,4-D ND D016 10 0.0050 $0.0033 \, \text{mg/l}$ 93-72-1 2,4,5-TP (Silvex) ND D017 1.0 0.0015 0.00034 mg/l CAS No. Surrogate Recoveries Run# 1 Run#2 Limits 19719-28-9 2,4-DCAA 106% 54-141%

99%

ND = Not detected

MDL - Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1A SO - Soil

Date Sampled: 03/12/08 Date Received: 03/12/08

Method:

SW846 8081A SW846 3510C

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1G35783.D	1	03/27/08	OPM	03/26/08	OP31873	G1G1293
Run #2							

Initial Volume Final Volume

100 ml Run #1

Pesticide TCLP Leachate

10.0 ml

Run #2

TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND -	D013	0.40	0.00020	0.00001	7mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.00067	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00020	0.00003	0mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00020	0.00002	6mg/I	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00020	0.00001	5mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00006	8mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0025	0.00094	_	
CAS No.	Surrogate Recoveries	Run# 1	Run#	2 L	imits			
877-09-8	Tetrachloro-m-xylene	82%		3	0-128%			
877-09-8	Tetrachloro-m-xylene	88%		3	0-128%			
2051-24-3	Decachlorobiphenyl	84%		1	0-138%			
2051-24-3	Decachlorobiphenyl	88%		1	0-138%			

ND = Not detectedMDL - Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





Client Sample ID: 1 BACKFILL-1 (QWD)

Lab Sample ID: Matrix:

J85517-1A SO - Soil

Date Sampled: 03/12/08

Date Received: 03/12/08

Percent Solids: 91.9

Project:

QWD-Backfill, 5th Street, Long Island City, NY

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 0.50	D004	5.0	0.50	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Barium ~	< 1.0	D005	100	1.0	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Cadmium	< 0.0050	D006	1.0	0.0050	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Chromium	< 0.010	D007	5.0	0.010	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Copper	< 0.025			0.025	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Lead	< 0.50	D008	5.0	0.50	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Mercury	< 0.00020	D009	0.20	0.00020	mg/l	1	03/26/08	03/26/08 JF	SW846 7470A ¹	SW846 7470A 4
Nickel	< 0.040	:		0.040	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³
Selenium	< 0.50	D010	1.0	0.50	mg/I	1	03/26/08	03/26/08 ND		SW846 3010A ³
Silver	< 0.010	D011	5.0	0.010	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A 3
Zinc	< 0.10	:		0.10	mg/l	1	03/26/08	03/26/08 ND	SW846 6010B ²	SW846 3010A ³

(1) Instrument QC Batch: MA20654 (2) Instrument QC Batch: MA20658

(3) Prep QC Batch: MP42996 (4) Prep QC Batch: MP43014

RL = Reporting Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)







Section 4

4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody



	CCUTEST.
_,	Laboratories

CHAIN OF CUSTODY

	ACCUTEST:					т	22	35 Ro	ute I	30, Da	yton .	NJ 08	810		FED-EX Tracking #					Boltle Order Control #							
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	☐ 5 Day RU						NJ Reduc					VYASP (VYASP (\vdash	-C I			GL	N)	<u> 2024 </u>	٠		
	□ 3 Day EM						NJ Full					State For															
	□ 2 Day EM						Other				ΠE	OD For	mal					87	h	ı h	mi.	110	c .57	lat	10/5	70	5 3/R/G
	□ 1 Cay EMO □ Other	ERGENCY					_											Ť			. , ,	, 2	<i>7</i> - <i>p</i>	7 342	· E /-		2-2/5/3
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J85517: Chain of Custody Page 1 of 2



ACCUTEST.	Sample Log	-In Sumn	nary	J855	17 CW	_	
Lab Name:	Accore	55T		_Page{ of _	14 () 15 () <u>F</u>		•
Received by (Print Nam- Received by (Signature)	/			Log-in Date:	3/14/08		
			CORRES	PONDING	·		
Case Number: SDG Number: SAS Number:	N/A N/A	NYSDEC SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC		
REMARKS: 1. Custody Seal(s) 2. Custody Seal	Present/Absent/ Intact/Broken	N/A N/A N/A N/A		J85517-	Sim wax 1, Fre		i in the second
Numbers; 3. Chain-of-Custody Records	Present/Absent*	N/A N/A N/A					
4. Contract Lab Sample Inform. Sheet (CLSIS) 5. Airbill	Present/Absent* NA Airbill/Sticker /A	N/A N/A N/A N/A					
6. Airbill No.: 7. Sample Tags	Present/Absent*	N/A N/A N/A N/A					
Sample Tag Nos. 8. Sample Condition	Listed/Not Listed on Chain-of-Custody // Intact/Broken*/	N/A N/A N/A				- - -	
Does Information on custody rec., CLSIS, & sample	Leaking COC + LABERS WAST ASSET VOL. RECAUNLASERED	N/A N/A N/A N/A					
tags agree 10. Date received at Lab: 11. Time Received:	YestNo [*]	N/A N/A N/A					
12. Do aqueous VOC vials have headspace?	Yes(No)						
13. Are preserved voc soil samples fully im- mersed in preservative?	Yes/No* (N/A)	N/A					
Fraction:	Sample Transfer Real Implemental						
Area #: By: On:	See Internal				J84	517: Cha	in of Custody
· · · · · · · · · · · · · · · · · · ·	Chain of Custody						Page 2 of 2

* Contract BTSR and attach record of resolution Reviewed By: Date:

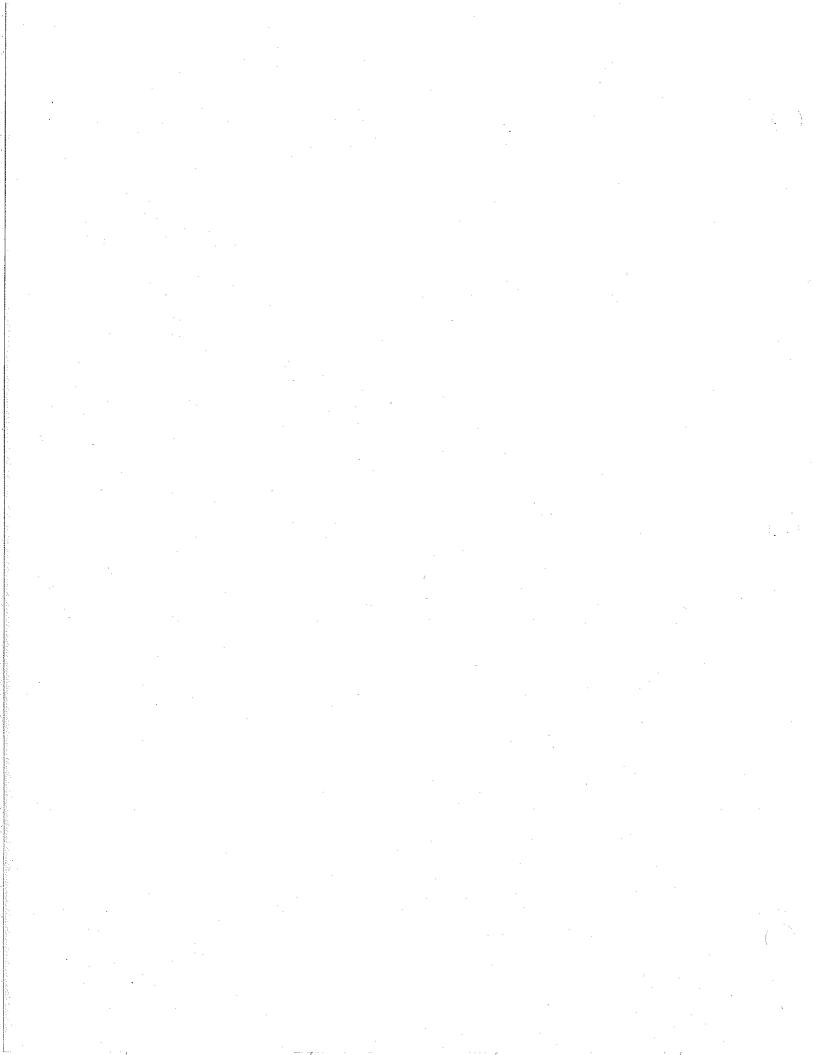
Logbook No.: Logbook Page No.:

N/A N/A

Form: SM10-02 Rev. Date: 8/21/03



APPENDÍX E – ANAYLTICAL TEST RESULTS Underground Storage Tanks











88/31/09

Technical Report for

Posillico Environmental

Barretto Point Remediation, Hunts Point, NY

PC 5522

Accutest Job Number: JA23828

Sampling Date: 07/23/09

Report to:

Posillico Environmental

dsposito@positlicogroup.com

ATTN: David Sposito

SLUDGELPPE

Total number of pages in report: 35



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

David N. Speis
VP Ops, Laboratory Director

Client Service contact: Marie Meidbof 732-329-0200

Certifications: NJ(12128), NY(10983), CA, CT, DE, PL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, PA, RI, SC, TN, VA, WV

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New Jersey * · ZZ35 Route 130 * Dayton, NJ 08910 * (el: 732-329-0200 * fax: 732-329-3499 * http://www.actitlest.com

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2.3: JA23828-3: TANK-2 (T-2)	7.4
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Sample Summary

Posillico Environmental

JA23828-3.

Barretto Point Remediation, Hunts Point, NY Project No: PC 5522

07/23/09 10:38 JMB

Job No:

TANK-3 (T-3)

TANK-Z (T-2)

JA23828

Sample Number	Collected Date	•		Mat.	rix e Type	Client Sample ID	 			
JA23828-1	07/23/09	09:53 JMB	07/23/09	SO	Soil	TANK-1 (T-1)	-	:	_	
JA23828-2	07/23/09	10:15 JMB	07/23/09	SO	Soil	TANK-2 (T-2)				

Soif

Soil samples reported on a dry weight basis unless otherwise indicated on result page.











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Sample Results

Report of Analysis

Page 1 of 1

Client Sample ID: TANK-1 (T-1)

Lab Sample 1D:

JA23828-1

Matrix:

SO - Soil

Method: Project:

SW846 8260B SW846 1311

Date Sampled: Date Received:

07/23/09 07/23/09

Percent Solids: 47.4

Barretto Point Remediation, Hunts Point, NY

File ID Run #1 L232908,D Run #2

DF 5

Analyzed By 07/31/09 MAII Prop Date 07/29/09

Prep Batch GP50027

Analytical Butch

VL5579

Purge Volume

Run #1 5.0 ml

Run #2

VOA TCLP Leachate

TCLP Leachate method SW846 1311

CAS No.	Compound	Rosult	HW#	MCL	RL	MDL	Units Q
71-43-2 78-93-3 56-23-5 108-90-7 67-66-3 108-46-7 107-06-2 75-35-4 127-18-4 79-01-6	Benzene Z-Butanone (MEK) Carbon tetrachloride Chlorobenzene Chloroform 1.4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethane Tetrachloroethene Trichloroethene Vinyl chloride	ND ND ND ND ND ND ND ND ND	D035 D019 D021 D022	0.50 200 0.50 100 6.0 7.5 0.50 0.70 0.70 0.50	0.0050 0.10 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.0012 0.0081 0.0013 0.0019 0.0012 0.0014 0.0017 0.0020 0.0013 0.0012	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l
	· ·	•				1, 14 B. T.	******

CAS No.	Surrogate Recoveries	Run#1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%		76-120%
17060-07-0	1,2-Dichloroethane-D4	95%		64-135%
2037-26-5	Tolucne-D8	93%		76-117%
460-00-4	4-Bromofluorobenzene	80%		72-122%

ND = Not detected MDL - Method Detection Limit MCL = Maximum Contamination Level (49 CFR 261 6/96) E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 2

Client Sample ID: TANK-1 (T-1)

Lab Sample ID: Matrix:

JA23828-1

SO - Soft

Date Sampled: 07/23/09

Method:

SW846 8260B

Date Received: 07/23/09 Percent Solids: 47.4

Project:

Barretto Point Remediation, Hunts Point, NY

Prep Date Prop Batch Analytical Batch

File ID DF By YXC Analyzed Run #1 Y90417_D 1 08/05/09 Run #2 Y90444.D 1 08/06/09 YXC

n/a n/a n/a n/a VY3788 VY3790

Initial Weight

Run #1 4.8 g

Run #2 -1.2 g

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1410 -	88	20	ug/kg	£
71-43-2	Benzone	1.9	2.2	0.75	ug/kg	J
75-27-4	Bromodichloromethane	,ND ···	. 11	0.56	ug/kg	
75-25-2	Bromoform	ND :		0.33	ug/kg	100
74-83-9	Bromomethane	ND	. [1	0.89	ug/kg	
78-93-3	2-Butanone (MEK)	ND	22	4.3	ug/kg	
75-15-0	Carbon disulfide	9.4	: 11	0.67	ug/kg	1
56-23-5	Carbon tetrachloride	ND	11	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	. 11	0.74	ug/kg	
75-00-3	Chloroethane	ND	. 11	2.5	ug/kg	
67-66-3	Chloroform	ND	11	0.70		100
74-87-3	Chloromethane	ND :	. 11	D.36	ug/kg	
110-82-7	Cyclohexane	ND	. 11	0.33	ug/kg	100
96-12-8	1,2-Dibrumo-3-chloropropane	ND	22	1,2	ug/kg	
124-48-1	Dibromochloromethane	ND	11	0.24	ug/kg	
106-93-4	1,2-Dibromoethane	ND ·	2.2	0.30	ug/kg	A A S
95-50-1	1,2-Dichlorobeazene	ND	11	0.59	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	11	0.60	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	11	0.74	ug/kg	
75-71-8	Dichlorodifluoromethane	ND ·	11	2.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	11	0.30	ug/kg	
107-06-2	1,2-Dichlornethane	ND	2.2	0.76	ng/kg	
75-35-4	1,1-Dichlornethene	ND	11	1.5	og/kg	
156-59-2	cis-1,2-Dichloroethene	ND	11	0.53	ng/kg	
158-60-5	trans-1,2-Dichloroethene	ND	11	0.53 0.59	ug/kg	
78-87-5	1.2-Dichloropropane	ND	J1	0.29	ng/kg	
10061-01-5	cis-1,3-Dichloropropene	ND .	11	0.29	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	11		ug/kg	
100-41-4	Ethylbenzene	2,6	2.2	0,21	ug/kg	
76-13-1	_ * .	ND	11	0.82	tig/kg	
591-78-6		ND	11	1.2	ug/kg	
98-82-8		ND.	11	2.1	ug/kg	
	F . [C] specialist	NIZ.	11	1.1	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Client Sample ID: TANK-1 (T-1)

Lab Sample ID:

JA23828-1

Date Sampled: 07/23/09

Matrix: Method: SO - Sott SW846 8260B

Date Received; Percent Solids:

07/23/09 47.4

Project:

Barretto Point Remediation, Hunts Point, NY

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q.
79-20-9	Methyl Aceiate	ND	11	1.8	ug/kg	
108-87-2	Methylcyclohexane	ND	11	1.4	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	3.G:	2.2	0.62	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND.	11	1.8	ug/kg	
75-09-2	Methylene chloride	9.9	11	0.49	ug/kg	J
100-42-5	Styrene	ND :	11	0.24	ug/kg	J
79-34-5	1,1,2,2-Tetrachloroethane	ND -	11	0.64	ng/kg	1 9
127-18-4	Tetrachlorouthene	ND .	11	0.32	ug/kg	
108-88-3	Toluene	267	2.2	0.64	ug/kg	14.3
120-82-1	1,2,4-Trichlorobenzenc	ND	11	0.76	ug/kg	Paris s
71-55-6	1,1,1-Trichloroethauc	ND	11	0.28	ng/kg	5000
79-00-5	1,1,2-Trichlorgethane	ND	11	0.41	ug/kg	
79-01-6	Trichloroethene	ND	11	1.2	ug/kg	
75-69-4	Trichlorofluoromethane	ND	11	0.50	ng/kg	× .
75-01-4	Vinyl chloride	ND	. 11	0,39	ug/kg	
	m,p-Xylenc	8.8	4.4	1.0	ug/kg	4.3
95-47-6	o-Xylene	3.2	2.2	1.0	og/kg	t. 196.
1330-20-7	Xylene (total)	12.0	4.4	1.0	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limit	3	·
1868-53-7	Dibromoffuoromethang	98%	.111%	. es 10	70/	
17060-07-0	1.2-Dichloroethane-D4	90%	103%	67-12 65-13		
2037-26-5	Toluene-D8	104%.	106%			1. 11.11
460-00-4	4-Bromofluorobenzeng	95%	97%	74-12: 62-13:		
				412-19	0 70	

⁽a) Result is from Run# 2

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 1

Report of Analysis

 Client Sample ID:
 TANK-1 (T-1)

 Lab Sample ID:
 JA23828-1
 Date Sampled:
 07/23/09

 Matrix:
 SO - Soil
 Date Received:
 07/23/09

 Method:
 SW846 8270C
 SW846 3510C
 Percent Solids:
 47.4

Project: Barretto Point Remediation, Hunts Point, NY

ĺ	Run#1	Füe ID F82682.1)	DF	Analyzod 08/07/09	By NAP	Prep Date	Prep Batch	Analytical Batch	=
	Run #Z	* *************************************	•	WO/01100	14146	08/06/09	OP39207	EF3910	

Initial Volume Final Volume
Run #1 100 ml 1.0 ml
Run #2 -

ABN TCLP Loachate

TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0,050	0.014	mg/I	•
	3&4-Methylphenol	ND	D024	200	0.050	0.015	mg/I	
87-86-5	Pentachlorophenol	ND	D037	100	0.20	0.012	mg/l	
95-95-4	2.4.5-Trichlorophenol	ND	D041	400	0.050	0.020	mg/l	
58-06-2	2.4.6-Trichlorophenal	ND	D042	2,0	0,050	D,016	mg/I	
106-46-7	1.4-Dichlorohenzene	ND	D027	7.5	0.020	0.0035		•
121-14-2	2,4-Dinitrotoluene	ND :	D030	0.13	0.020	0.0045	mg/l	
118-74-1	Hexachlorobenzene	ND :	D032	0.13	0,020	0.0045	mg/l	
87-68-3	Hexachlorobutadiene	ND	D032	0.50	0.020		mg/l	. :
67-72-1	Hexachloroethane	ND.	D033			0.0038	mg/i	
98-95-3	Nitrobenzene	ND		3.0	0.050	0,0030	mg/J	
110-86-1	Pyridine	_	· Dosa	2.0	0.020	0.0066	mg/l	
7 KN-041-1	rymme	ND	D038	5.0	0.020	0.0021	mg/I	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Li	mits			
367-12-4	2-Fluorophenol	38%		12	-68%			. :
4165-62-2	Phenol-d5	23%			-49%			
118-79-6	2,4,6-Tribromophenol	84%			- 			
4165-60-0	Nitrobenzene-d5	75%						4.12 B
321-60-8	2-Fluorobiphenyl	77%			-112%			
1718-51-0	Terphenyl-d14				-106%			
7 : TO_D.T.Q	∓ ei buttil\1.81 &	74%		14	-122%			

ND = Not detected MDL - Method Detection Limit MCL = Maximum Contamination Level (40 CFR 261 6/96)

MCL = Maximum Contamination Level (40 GFR 261 6/96) E = Indicates value exceeds calibration range J = Indicates an estimated value

B=Indicates analyte found in associated method blank N=Indicates presumptive evidence of a compound



Page 1 of 3

Client Sample ID: TANK-1 (T-1)

Lab Sample ID: JA23828-1 Date Sampled: 07/23/09

Matrix: SO - Soil Date Received: 07/23/09

Method: SW846 8270C SW846 3550B Percent Solids: 47.4

Project: Barretto Point Remediation, Hunts Point, NY

File ID DF Analyzed Вy Prep Date Analytical Batch Prep Batch Run #1 Z49828.D 1 07/31/09 VN07/29/09 OP39135 EZ1804 Ruո #2

Run #1 35,0 g 1.0 ml

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-ChlorophenoI	ND ;	300	5D	ng/kg	
59-50-7	4-Chloro-3-mcthyl phenol	ND	300	73	ug/kg	
120-83-2	2.4-Dichlorophenol	ND .	300	63	ug/kg	
105-67-9	2.4-Dimethylphenol	ND .	300	74	ug/kg	
51-28-5	2,4-Dinitrophenol	ND:	1200	650	ng/kg	
534-52-1	4,6-Dinitro-o-cresol	ND .	- 1200	64	ug/kg	
95-48-7	2-Methylphenol	ND .	120	65	ng/kg	
•	3&4-Methylphenol	ND	120	R1	ug/kg	
88-75-5	2-Nitrophenol	ND.	300	63	ug/kg	
100-02-7 °	4-Nitrophenol	:ND.	600	77	ug/kg	
87-86 -5	PentachlorophenoI	ND	600	78	ug/kg	1 1 1
108-95-2	Phenoi	ND	120	46	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	300	65	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	300	80	ug/kg	
83-32-9	Acenaphibene	ND	60	32	ug/kg	
208-96-8	Acenaphthylene	ND	60	26	ug/kg	
98-86-2	Acetophenone	ND	300	30	ug/kg	7
120-12-7	Anthracene	ND	60	27	ug/kg	
1912-24-9	Atrazine	ND	300	38	ug/kg	
56-55-3	Benzo (a) anthracene	ND	60	36	og/kg	
50-32-8	Benzo(a)pyrene	ND	60	25	ng/kg	
205-99-2	Benzo(b)fluoranthene	ND	60	33	ug/kg	٠
191-24-2	Benzo(g.h.i)perylene	ND	60	29	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	60	30	ng/kg	
101-55-3	4-Bromophenyl phenyl other	ND	120	-33	ug/kg	
85-68-7	Butyl benzyl phinalate	ND	120	30	ug/kg	
92-52-4	1,1'-Biphenyl	ND	120	30	ng/kg	
100-52-7	Benzaldehyde	ND	300	180	ug/kg	
91-58-7	2-Chioronaphrhalene	ND	120	27	ng/kg	
106-47-8	4-Chloroaniline	ND	300	24	ug/kg	
86-74-8	Carbazole	ND	120	26	ug/kg	٠.
105-60-2	Caprolactam	ND	120	48	ug/kg	-

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 3

07/23/09

07/23/09

47.4

Client Sample ID: TANK-1 (T-1)

Lab Sample ID: JA23828-1 Date Sampled: Matrix: SO - Soil Date Received: Method: SW846 8270C SW846 3550B Percent Solids:

SW846 8270C SW846 3550B Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

Project:

CAS No.	Compound	Result	RL	MDL	Units	Q	
218-01-9	Chrysene	ND	60	28	ug/kg		
11-1-91-I	bis(2-Chloroethoxy)methane	ND	. 120	30	ug/kg		
111-44-4	- bis(2-Chloroethyl)ether	ND	120	28	ug/kg		
108-60-1	bis(2-Chlorolsopropyl)ether	ND ·	120	31	ug/kg		
7005-72-3	4-Chlorophenyl phenyl ether	ND	120	40	ug/kg		
121-14-2	2.4-Dinitrotoluene	.ND	120	33	ug/kg		
606-20-2	2.6-Dinitrotoluene	ND	120	27	ug/kg		
91-94-1	3,3'-Dichlorobenzidine	ND ·	. 300	100	ug/kg		
53-70-3	Dibenzo(a,h)anthracene	MD	60	29	ug/kg		
132-64-9	Dibenzofuran	ND ·	120	28	ug/kg		
84-74-2	Di-n-butyl phthalate	ND	120	38	ug/kg		
117-84-0	Di-n-octyl phthalate	.ND	. 120	27	ug/kg		
84-66-2	Dictinyl phthalate	ND · ·	120	27	ug/kg		
1 31-1 1-3	Dimethyl phthalate	:ND	120	29	ug/kg		
117-81-7	bis(2-Ethylhexyl)phthalate	64.9	120	32	ug/kg	J	
206-44-0	Fluoranthene	ND	. 60	27	ug/kg	,	
86-73-7	Fluorene	ND	60	28	ug/kg		
118-74-1	Hexachlorobenzene	ND	120	34	ug/kg		
87-68-3	Hexachlorobutadiene	ND	60	29	ug/kg		
77-47-4	Hexachlorocyclopentadiene	ND	1200	57	ug/kg		
67-72-1	Hexachloroethane	ND ·	300	39	ug/kg		٠.
193-39-5	Indeno(1,2,3-cd)pyrene	'ND	60	22	ug/kg		
78-59-1	Isophorone	ND	120	53	ug/kg		
91-57-6	2-Methylnaphthalone	128	120	27	ug/kg		
88-74-4	Z-Nitroaniline	ND	300		ug/kg		٠.
99-09-Z	3-Nitroaniline	ND	300	24	ug/kg		
100-01-6	4-Nitroaniline	ND	300	38	ug/kg		
91-20-3	Naphthalene	57.9	60	2G	ug/kg	J	
98-95-3	Nitrobenzene	ND	120	27	ng/kg	•	
621-64-7	N-Nitroso-di-n-propylamine	ND	120	37	ug/kg		
86-30-6	N-Nitrosodiphenylamine	ND	300	41	ng/kg		
85-01-8	Phenanthrene	ND	60	30	ug/kg		
129-00-0	Pyrene	ND	60	27	ng/kg		
CAS No.	Surrogate Recoveries	Run#1	Run# 2	Limi	it <i>s</i>		
367-12-4	2-Fluorophenol	79%		30-14	09%		
4165-62-2	Phenol-d5	78%		28-11			
118-79-6	2,4,6-Tribromophenol	86%		28-17			
4165-60-0	Nitrobenzene-d5	82%		28-1			

ND = Not detected

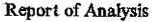
MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found to associated method blank



Page 3 of 3

Client Sample ID: TANK-J (T-I)

Lub Sample ID:

JA23828-1

Matrix:

SO - Soil

SW846 8270C SW846 3550B

Date Sampled:

07/23/09

Data Received: Percent Solids:

07/23/09 47.4

Method: Project:

Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

 CAS No.
 Surrogate Recoveries
 Run# 1
 Run# 2
 Limits

 321-60-8
 2-Fluorobiphenyl
 77%
 38-107%

 1718-51-0
 Terphenyl-d14
 69%
 31-116%

ND = Not detected

RL = Reporting Limit
E = Indicates value exceeds calibration range

MDL - Method Detection Limit

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 1

Client Sample ID: TANK-1 (T-1) Lab Sample ID:

Matrix:

JA23828-1 SO - Soil

Date Sampled:

07/23/09

Date Received: Porcent Solids:

07/23/09

47.4

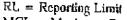
Project:

Barretto Point Remediation, Hunts Point, NY

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	Units	DF	Prep	Analyzed	Ву	Method	Prep Method
Arsenic Barlum Cadmium Chromium Copper Lead Mercory Nickel Selenium Silver Zinc	<0.50 <1.0 <0.0050 <0.010 <0.025 <0.50 <0.00020 0.066 <0.50 <0.610	D004 D005 D006 D007 D008 D009 D010 D011	1.0	0.50 1.0 0.0050 0.010 0.025 0.50 0.00020 0.040 0.50 0.010	mg/l mg/l mg/l	1 1 1 1 1 1 1 1 1	08/03/09 08/03/09 08/03/09 08/03/09 08/03/09 08/03/09 08/03/09	08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09	ND ND ND ND	SW846 ADIOB ¹ SW846 6010B ¹ SW846 6010B ¹ SW846 6010B ¹ SW846 7470A ² SW846 6010B ¹	SW846 3016A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3

⁽I) Instrument QC Batch: MA22913



MCL = Maximum Contamination Level (40 CFR 261 6/96)



⁽²⁾ Instrument QC Batch: MA22914

⁽³⁾ Prep QC Barch: MP49086

⁽⁴⁾ Prep QC Batch: MP49099

Page 1 of)

Client Sample ID: TANK-1 (T-1) Lab Sample ID:

Matrix:

JA23828-1 SO - Soil

Date Sampled: 07/23/09

Date Received:

Percent Solids:

07/23/09 47.4

Project:

Barretto Point Remediation, Hunts Point, NY

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	Ву	Method
Corrosivity as pH Cyanide Reactivity Ignitability (Plashpoi Solids, Percent Sulfide Reactivity	4.52 NC <11 >200 47.4 <210	11 210	su mg/kg Deg. F % mg/kg	1 1 1 1	08/10/09 08/04/09 11:30 08/10/09 08/11/09 08/06/09	LMM JA LMM DD ST	SW846 CHAP7 SW846 CHAP7 SW846 CHAP7/ASTM D03 ASTM 4943-00 SW846 CHAP7/0034

Page 1 of 1

Client Sample ID: TANK-3 (T-3) Lab Sample ID: JA23828-2

Matrix: Method: SO - Soil

SW846 8260B SW846 1311

Date Sampled: 07/23/09 Date Received: 07/23/09

Percent Solids: 61.3

Project:

Barretto Point Remediation, Hunts Point, NY

Transport	y Prep Date Prep Batch Analytical Batch #AH 07/29/09 GP50027 VL5579 #AH 07/29/09 GP50027 VL5582
-----------	---

Purge Volume Run #I 5.0 ml Run #2 -5.0 ml

VOA TCLP Leachate

TCLP Leachate method SW846 1311

CAS No.	Compound	Rezult	HW#	MCL	RL	MDL	Units Q
71-43-2 78-93-3 56-23-5 108-90-7 67-66-3 106-46-7 107-06-2 75-35-4 127-18-4 79-01-6 75-01-4	Benzene 2-Butanone (MBIC) Carbon tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene 1,2-Dichloroethape 1,1-Dichloroethape Tetrachloroethene Trichloroethene Vinyl chloride	0.0247 1.75 * ND ND ND ND ND ND ND ND	D018 D035 D019 D021 D022 D027 D028 D029 D039 D040	0.50 200 0.50 100 6.0 7.5 0.50 0.70 0.70 0.50	0.0050 0.50 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.0012 0.041 0.0013 0.0019 0.0012 0.0014 0.0017 0.0020 0.0013 0.0012 0.0022	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l
CAS No. 1868-53-7 17060-07-0 2037-26-5 460-00-4	Surrogate Recoveries Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	Run# 1 95% 98% 94% 87%	Run# 2 97% 108% 94% 90%	Li 76 64 76	mits -120% -135% -117% -122%	N. G. VIDE	mg, i

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit MCL = Maximum Contamination Level (40 CFR 261 6/96) E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 2

Client Sample ID: TANK-3 (T-3)

Lab Sample ID: JA23828-2 Date Sampled: 07/23/09

Matrix: SO - Soil Date Received: 07/23/09

Method: SW846 8260B Percent Solids: 61.3

Project: Barreito Point Remediation, Hunts Point, NY

| Pile ID | DP | Analyzed By | Prep Date | Prep Batch | Analytical Batch | Run #1 a | 3C53245.D | 1 | 07/31/09 | ND] | n/a | n/a | V3C2329

Run #2

Initial Weight Final Volume Methanol Aliquot
Run #1 10.0 g 10.0 ml 20.0 ul
Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	- 7 -	Result	RL.	MDL	Units	Q
67-64-1	Acetone	1.	ND .	5700	1300	ug/kg	
71-43-2	Benzene	2.0	1200	570	190	ug/kg	
75-27-4	Bromodichioromethane	1.3	ND	2800	150	ug/kg	1000
75-25-2	Bromoform		ND ···	2800	85	ng/kg	
74-83-9	Bromomethane	400	ND	2800	230	ug/kg	Alas Marie
78-93-3	2-Butanone (MEK)		ND	5700	1100	ug/kg	and the
75-15- 0	Carbon disulfide	44.5	ND	2800	170	ug/kg	7.00
56-23-5	Carbon tetrachioride	200	ND	2800	310	ug/kg	
108-90-7	Chlorobenzene	1 1 1	ND	2800	190	ng/kg	
75-00-3	Chloroethane		ND ·	2800	640	ug/kg	
67-66-3	Chloroform		ND ··	2800	180	ug/kg	
74-87-3	Chloromethane		,ND	. 2800	93	ug/kg	100 100
110-82-7	Cyclohexane		.ND	2800	85	ug/kg	
96-12-8	1,2-Dibromo-3-chloropro	pane	ND	5700	310	ug/kg	100
124-48-1	Dibromochloromethane		ND	2800	62	ug/kg	
106-93-4	1,2-Dibromoethane		ND	570	77	ug/kg	$-2T_{A}(\alpha_{2},\alpha_{3})$
95- 50- 1	1,2-Dichlorobenzene	. 1-1	ND	2800	150	սց/kg	100
541-73-1	1,3-Dichlorobenzene		ND.	2800	160	ug/kg	
106-16-7	1,4-Dichlorobenzene		ND ·	2800	190	ng/kg	100
75-71-8	Dichlorodifluoromethane		ND	2800	530	ug/kg	
75-34-3	1,1-Dichloroethane		ND	2800	78	ug/kg	
107-06-2	1,2-Dichloroethane		ND .	570	200	ug/kg	
75-35-4	1,1-Dichloroethene		ND	2800	370	ug/kg	
156-59-2	cis-1,2-Dichloroethene		ND	2800	140	ug/kg	
156- 6 0-5	trans-1,2-Dichloroethene		NĐ	2800	250	ug/kg	
78-87-5	1,2-Dichloropropage		ND	2800	74	ug/kg	
10061-01-5	cis-1,3-Dichloropropene		ND	2800	75	ug/kg	
10061-02-6	trans-1,3-Dichloropropen	C	ND	2800	54	ng/kg	
100-11-4	Ethylbenzene		3320	570	210	ug/kg	
76-13-1	Freon 113		ND	2800	320	ug/kg	
591-78-6	2-Hexanone		ND	2800	540	ng/kg	
98-82-8	Isopropylhenzene		579	2800	290	ng/kg	J

ND = Not detected 1

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

Client Sample ID: TANK-3 (T-3) Lab Sample ID:

JA23828-2

Date Sampled: 07/23/09 Date Received: 07/23/09

Matrix: Method: SO - Soil SW846-8260B

Percent Solids: 61.3

Project:

Barretto Point Remediation, Hunts Point, NY

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	ND .	2800	470	ug/kg	
108-87-2	Methylcyclohexane	683	2800	370	ug/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	570	160	ug/kg	-
108-10-1	4-Methyl-2-pentanone(MIBK)	ND .	2800	460	ug/kg	
75-09-2	Methylene chloride	ND	2800	130	ug/kg	
100-42-5	Styrene	ND	2800	61	ug/kg	
79-34-5	1,1.2.2-Tetrachloroethane	.ND	2800	170	ug/kg	
127-18-4	Tetrachloroethene	ND	2800	82	ug/kg	
108-88-3	Toluene	7910 ·	570	170	ug/kg	
120-82-1	1.2.4-Trichlorobenzene	ND	2800	200	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2800	72	ng/kg	٠.
79-00-5	1,1,2-Trichloroethane	ND :	2800	100	ng/kg	
79-01-6	Trichloroethene	ND	2800	300	ng/kg	
75-69 -4	Trichiorofluoromethane	·ND	2800	130	ug/kg	. }
75-01-4	Vinyl chloride	.ND	2800	100	ug/kg	$t = t_1(t)$
	m.p-Xylene	15200	1100	270	ug/kg	: .
95-47-6	o-Xylene	4400	570	270	ug/kg	25.5
1330-20-7	Xylene (total)	19600	1100	270	ug/kg	\$1.500
CAS No.	Surrogate Recoveries	Run#1	Run# 2	Limi	ts ···	4 F
1868-53-7	Dibromoficoromethane	100%		67-12	17%	
17060-07-0	1,2-Dichiornethane-D4	107%		65-13	2%	1 111
2037-26-5	Toluene-D8	100%		74-12	9%	
460-00-4	4-Bromofluorobenzene	89%		62-13	8%	* : .

⁽a) Diluted due to high concentration of non-target compound.

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

] = Indicates an estimated value

B = Indicates analyte found in associated method blank

NAP

Page 1 of 1

Client Sample ID: TANK-3 (T-3)

Lab Sample ID: Matrix:

JA23828-2

SO - Sott

SW846 8270C SW846 3510C

Date Sampled: Date Received:

Prep Date

08/06/09

07/23/09 07/23/09

Percent Solids: 61.3

Mothod: Project:

Barretto Point Remediation, Hunts Point, NY

08/07/09

File ID DF By Analyzed Run #1 F82683.D

7

Prep Batch Analytical Betch OP39207 EF3910

Run #2

Initial Volume $100 \, m$

1.0 ml

Final Volume

Run #1 Run #2

ABN TCLP Leachate

TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units Q
95-48-7	2-Methylphenol	ND	D023	200	0,050	0.014	mg/l
	3&4-Methylphenol	ND	D024	200	0.050	0.015	mg/l
87-86-5	Pentachlorophenol	ND	D037	100	0.20	0.012	mg/l
95-95-4	2,4,5-Trichlorophenol	ND:	D041	400	0.050	0.020	mg/l
88-06-2	2,4,6-Trichlorophenol	ND :	D042		0.050	0.016	mg/)
106-46-7	1,4-Dichlorobenzene	ND.	D027	7.5	0.020	0.0035	mg/l
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.020	0.0045	mg/l
118-74-1	Hexachlorobenzene	ND .	D032	0.13	0,620	0.0045	mg/l
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.020	0.0038	mg/l
67-72-1 ·	Hexachloroethane	ND ·	D034	3.0	0.050	0.0030	mg/l
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0066	mg/l
110-86-1	Pyridine	ND	D038	5,0	0.020	0.0021	mg/l
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Li	mits	ara in la la la la la la la la la la la la la	
367-12-4	2-Fluorophenol	39%		12	-68%		
41 6 5-62-2	Phenol-d5	23%		4.5	-49%		
118-79-6	2,4,6-Tribromophenol	89%			-130%		
4165-60-0	Nitrobenzene-d5	81%			-130 <i>7</i> 8 -112%	* .	•
321-60-8	2-Fluorobiphenyl	83%			-11276 -106%		
1718-51-0	Terphenyl-d14	73%			-122%		

ND = Not detected MDL - Method Detection Limit MCL = Maximum Contamination Level (40 CFR 261 6/96) E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Вy

VN

Page 1 of 3

Client Sample ID: TANK-3 (7-3) Lab Sample ID: JA23828-2 Matrix: SO - Soll

Method: Project:

SW846 8270C SW846 3550B

Date Sampled: Date Received:

07/23/09 07/23/09

Percent Solids: 61.3

Barretto Point Remediation, Hunts Point, NY

File ID Run #1 a Z49827.D Ron #2

DF Analyzed 07/31/09

Prep Date Prep Batch 07/29/09 OP39135

Analytical Batch EZ1804

Initial Weight Final Volume Run #1 35,0 g 5.0 mI

Run #2

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q :
95-57-8	2-Chlorophenol	ND	1200	190	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	1200	280	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	. 1200	240	ug/kg	
105- 6 7-9	2, 4-Dimethylphenol	ND	. 1200	280	ug/kg	1 1
51-28-5	2,4-Dinttrophenol	ND:	4700	2500	ug/kg	
534-52-1	4.6-Dinitro-o-cresol	ND	4700	250	ug/kg	The second
95-48-7	2-Methylphenol	ND	470	250	ng/kg	
	3&4-Methylphenol	ND	470	310	ug/kg	
B8-75 -5	2-Nitrophenol	ND :	1200	240	ug/kg	
100-02-7	4-Nitrophenol	ND	2300	300	ug/kg	3 30
87-86-5	Peniachlorophenol	ND	2300	300	ug/kg	188
108-95-2	Phenol	ND	470	180	ug/kg	** *
95-95-4	2,4,5-Trichlorophenol	ND	1200	250	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND ···	1200	310	ug/kg	
83-32-9	Acenaphthene	ND	230	120	ug/kg	•
208-96-8	Acenaphthylene	ND ·	230	100	ug/kg	
98-86-2	Acetophenone	ND	1200	110	ug/kg	
120-12-7	Anthracene	ND	230	100	ug/kg	
1912-24-9	Atrazine	ND	1200	150	ug/kg	
56-55-3	Benzo(a)anthracene	ND	230	140	ug/kg ug/kg	
50-32-8	Benzo(a)pyrene	ND	230	96	ng/kg	e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La companya de l
205-99-2	Benzo(b)fluoranthene	ND	230	130	ug/kg	1.1
191-24-2	Benzo(g,h,f)perylene	ND	230	110	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	230	120	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND .	470	130	ng/kg	
85-68-7	Butyl benzyl phthalate	ND	470	120	ug/kg	
92-52-4	1.1'-Biphenyi	ND	470	120	ug/kg	
100-52-7	Benzaldebyde	ND	1200	680	ug/kg	
91-58-7	2-Chloronaphthalene	ND	470	100	ug/kg	
106-47-8	4-Chlornaniline	ND	1200	95	ng/kg	
86-74-8	Carbazole	ND	470	99	ug/kg	
105-60-2	Caprolactam	ND	470	190	ug/kg ug/kg	
	•	- · · · ·	710	EUI	MR/KB	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 3

Client Sample ID: TANK-3 (T-3) Lub Sample ID: JA23828-2

JA23828-2 SO - Soil Date Sampled: Date Received:

07/23/09

Matrix: Method:

SW846 8270C SW846 3550B

Date Received: 07/23/09 Percent Solids: 61,3

Project:

Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	ND .	230	110	ng/kg	the same
111-95-1	bis(2-Chloroethoxy)methane	ND · ·	470	120	ug/kg	
111-44-4	 bis(2-Chloroethyl)ether 	ND	470	110	ug/kg	
108-60-1	bis(2-Chiornisopropyl)ether	ND	470	120	ug/kg	1 1 1 1 V
7005-72-3	4-Chlorophenyl phenyl ether	ND	470	160	ng/kg	
121-14-2	2,4-Dinitrotoluene	ND	470	130	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND.	470	110	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	1200	400	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	230	110	ug/kg	
132-64-9	Dibenzofuran	ND	470	110	ug/kg	
84-74-Z	Di-n-hutyl phthalate	1360	470	150	ug/kg	
117-84-0	Di-n-octyl phthalate	969	470	100	ng/kg	
84-66-2	Diethyl phthalate	ND	470	110	ug/kg	
131-11-3	Dimethyl phthalate	ND	470	110	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	1010	200	120	ug/kg	
206-44-0	Fluoranthene	ND	230	110	ug/kg	
86-73-7	Fluorene	ND	230	110	ug/kg	
118-74-1	Hexachlorobenzene	ND :	470	130	ug/kg	
87-68-3	Hexachlorobutadiene	ND	- 230	110	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	4700	220	ug/kg	
67-72-1	Fiexachloroethane	ND	1200	150	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND .	230	86	ug/kg	
78-59-1	Isophorone	ND	470	200	ug/kg	
91-57-6	2-Methylnaphthalene	549	470	100	ug/kg	
88-74-4	2-Nitroanlline	ND :	1200	170		
99-09-2	3-Nitroaniline	ND .	1200	94	ug/kg	
100-01-6	4-Nitroaniline	ND	1200	150	ug/kg	
91-20-3	Naphthalone	1190	230	100	ug/kg	
98-95-3	Nitrobenzene	ND	470	110	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	470		ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	1200	140	ng/kg	
85-01-8	Phenanthrene	120	230	160	ug/kg	-
129-00-0	Pyrene	ND .	230	110 100	ug/kg ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi		
367-12-4	2-Fluorophenol	83%		30-10	19%	
4185-62-2	Phenol-d5	79%		28-10		
118-79-6	2,4,6-Tribromophenol	82%		28-12		
4165-60-0	Nitrobenzene-d5	80%		28-11	3%	

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 3 of 3

Client Sample ID: TANK-3 (T-3)

Lab Sample ID:

JA23828-2

Matrix: Method: 50 - Soll

Date Sampled: Date Received:

07/23/09

SW846 8270C SW846 3550B

Percent Solids: 61,3

07/23/09

Project:

Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

CAS No. Surrogate Recoveries Run#1

Run#2 Limits

321-60-8

2-Fluorobiphenyl

79%

38-107%

1718-51-0 Terphenyl-d14

71%

31-116%

(a) Elevated detection limit due to high final volume of viscous extract.

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Page 1 of 1

Client Sample ID: TANK-3 (T-3)

Lab Sample ID: Matrix:

JA23828-2

SO - Soft

Date Sampled: Date Received:

Percent Solids:

07/23/09 07/23/09

61.3

Project:

Barretto Point Remediation, Hunts Point, NY

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	Units	DF	Prop	Analyzed	Ву	Mathod	Prep Method
Arsenic Barium * Cadmium * Chromium * Copper * Lead Mercury Nickel * Selenium Silver * Zinc *	<0.50 <1.0 <0.025 <0.050 <0.13 <0.50 <0.00020 3.4 <0.50 <0.050	D004 D005 D006 D007 D008 D009 D010 D011	5.0 190 1.0 5.0 5.0 0.20	0.050	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	1 1 1 1 1 1 1 1 1 1	08/03/09 08/03/09 08/03/09 08/03/09 08/03/09 08/03/09 08/03/09	08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09 08/04/09	000 000 000 000 000 000 000 000 000	SW846 6010B ¹ SW846 0010B ¹ SW846 6010B ¹ SW846 6010B ¹ SW846 6010B ¹ SW846 7470A ² SW846 6010B ¹ SW846 8010B ¹ SW846 6010B ¹ SW846 6010B ¹	SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3 SW846 3010A 4 SW846 3010A 3 SW846 3010A 3 SW846 3010A 3

(1) Instrument QC Batch: MA22913

(2) Instrument QC Batch: MA22914

(3) Prep QC Batch: MP49086

(4) Prep QC Batch: MP49099

(a) Elevated sample detection limit due to difficult sample matrix.





Page 1 of 1

Client Sample ID: TANK-3 (T-3)

Lab Sample ID:

JA23828-2

Date Sampled: 07/23/09

Matrix:

SO - Snil

Date Received: 07/23/09 Percent Solids: 61,3

Project;

Barretto Point Remediation, Hunts Point, NY

General Chemistry

Aı	nalyte	Result	RL	Units	DF	Analyzed	Ву	Method
C ₎ Igr So	orrosivity as pH vanide Reactivity nitability (Flashpoint) lids, Percent lide Reactivity	5.28 NC < 8.2 > 200 61.3 < 160	8.2 160	su mg/kg Deg. F % mg/kg	I I 1 1	08/10/09 08/04/09 11:31 08/10/09 08/11/09 08/06/09		SW846 CHAP? SW846 CHAP? SW846 CHAP?/ASTM D93 ASTM 4843-00 SW846 CHAP?/9034

Page 1 of 1

Client Sample ID:	TANK-2 (T-2)
Lab Sample ID:	JA23828-3

File ID

Matrix: Method:

SO - Soll

SW846 8260B SW846 1311

Date Sampled: Date Received:

07/23/09 07/23/09

Percent Solids: 89.1

Project:

Barretto Point Remediation, Hunts Point, NY

Run #1

DF L233033.D 5

Analyzed 08/07/09

Вy Prep Date MAH 08/05/09

Prep Batch GP50115

Analytical Batch VL5585

Run #2

Purge Volume

Run #1 5.0 ml

Run #2

VOA TCLP Leachate

TCLP Leachato method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2 78-93-3 56-23-5 108-90-7 67-66-3 106-46-7 107-06-2 75-35-4 127-18-4 79-01-6	Benzene 2-Butanone (MEK) Carbon tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethene Tetrachloroethene Trichloroethene Vinyl chloride	ND 0.0499 ND ND ND ND ND ND ND ND ND ND ND ND ND	D018 D035 D019 D021 D022 D027 D028 D029 D039 D040 D043	0.50 200 0.50 100 6.0 7.5 0.50 0.70 0.70 0.50 0.20	0.0050 0.10 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.0012 0.0081 0.0013 0.0019 0.0012 0.0014 0.0017 0.0020 0.0013 0.0012 0.0022	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	J
CAS No.	Surrogate Recoveries	Run# 1	Run#2	Li	mits		:	
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	92% 101% 90% 102%		64 7 6 -	-120% -135% -117% -1 22 %			

ND = Not detected MDL - Method Detection Limit MCL = Maximum Contentination Level (40 CFR 261 6/96) E = Indicates value exceeds calibration range

^{) =} Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 2

 Client Sample ID:
 TANK-2 (T-2)

 Lab Sample ID:
 JA23828-3
 Date Sampled:
 07/23/09

 Matrix:
 SO - Soil
 Date Received:
 07/23/09

 Method:
 SW846 8260B
 Parcent Solids:
 89.1

Project: Barretin Point Remediation, Hunts Point, NY

File ID DF Analyzed Вy Prep Date Prep Batch Analytical Batch Run #1 a 3C53311.D I 08/04/09 NDJ π/a n/a V3C2332 Run #2

Initial Weight Final Volume Methanol Aliquet
Run #1 5.0 g 10.0 ml 100 ul
Run #2

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1200	260	ug/kg	
71-43-2	Benzene	ND	120	40	ng/kg	
75-27-4	Bromodichloromethane	ND	590	30	ng/kg	A S
75-25-2	Bromoform	ND	590	18		
74-83-9	Bromomelhane	ND	590	48	ug/kg	
78-93-3	2-Bulanone (MEK)	614	1200	230	ug/kg	19 19. •
75-15-0	Carbon disulfide	ND · :	590	250 35	ug/kg	Ţ
56-23-5	Carbon tetrachloride	ND:	590	GF	ug/kg	t Maria
108-90-7	Chlorobenzene	ND	. 590		ug/kg	
75-00-3	Chloroethane	ND	· 590	40	ug/kg	11.
67-88-3	Chloroform	3.753	: 590	130	пВ/КВ	
74-87-3	Chloromethane	1.773	590	38	ug/kg	
110-82-7	Cyclobexane	ND.	590 590	20	ug/kg	
96-12-8	1,2-Dibramo-3-chloropropa	ne ND · · ·	1200	18	ug/kg	
124-48-1	Dibromochloromothane	ND .	590	64	ug/kg	
106-93-4	1,2-Dibromoethanc	ND	120	13	ng/kg	
95- 50- 1	1,2-Dichlorobenzene	ND	590	16	ng/kg	$\mathbb{R}^{d_1d_2} = \mathbb{R}^{d_1}$
541-73-1	I,3-Dichlorobenzene	ND		32	ug/kg	4.
106-46-7	1,4-Dichlorobenzenc	ND	590 500	33	ug/kg	: 1,
75-71-8	Dichlorodifluoromethane	ND	590 500	40	ug/kg	
75-34-3	I, I-Dichloroethane	ND	590 	110	ug/kg	
107-06-2	1,2-Dichloroethanc	ND	590	16	ug/kg	
75-35-4	1,1-Dichloroethene	ND · ··	120	41	ug/kg	
156-59-2	cls-1,2-Dichloroethene		590	78	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	590	28	ng/kg	
78-87-5	I,Z-Dichloropropane	ND .	590	53	ոց/Էց	
10061-01-5	cis-1,3-Dichloropropene	ND	590	15	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND .	590	16	ug/kg	
100-41-4	Ethylbenzene	ND	590	11	ng/kg	
76-13-1	Frenn 113	515	120	44	ug/kg	
591-78-6	Z-Hexanone	ND	590	37	ug/kg	
98-82-8		ND	590	110	ug/kg	•
	Isopropylbenzene	144	590	61	ug/kg	J

ND = Not detected MDL - Method Detection Limit RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

Client Sample ID; T Lab Sample ID; J

TANK-2 (T-2) JA23828-3

Date Sampled: Date Received:

07/23/09

Matrix: Method: SO - Soll SW846 8260B

Percent Solids: 89,1

07/23/09

Project:

Barretto Point Remediation, Hunts Point, NY

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	282	590	97	ng/kg	·J
108-87-2	Methylcyclohexane	ND	590	77	ng/kg	-
1634-04-4	- Methyl Tert Butyl Ether	ND	120	33	ng/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	590	96 "	ug/kg	
75-09-2	Methylene chloride	ND · ·	590	2 6	ug/kg	
100-42-5	Styrene ·	ND	590	13	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	590	35	ug/kg	
127-18-4	Tetrachloroethene	.1500	590	17	ug/kg	
108-88-3	Toluene	60.6	120	35	ug/kg	J
120-82-1	1,2,4-Trichlorobenzene	ND	590	41	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	590	15	ug/kg	
79-00-5	1.1.2-Trichloroethane	ND	590	22	ид/ка	1.5
79-01-6	Trichloroethene	ND	590	62	ug/kg	
75- 6 9-4	Trichlorofluoromethane	ND ;	590	27	ug/kg	. 8
75-01-4	Vinyl chloride	.ND	590	21	ug/kg	
	m.p-Xylene	1970	240	56	սց/kg	4 %
95-47-6	o-Xylene	525	120	56	ug/kg	
1330-20-7	Xylene (total)	2500	240	56	ug/kg	. "
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts	
1868-53-7	Dibromofluoromethane	79%	1 5 5 5 S	67-12	27%	
17060-07-0	1,2-Dichloroethane-D4	79%		65-13	32%	
203 7-26 -5	Toluene-D8	85%		74-12		
460-00-4	4-Bromofluorobenzene	97%		62-13		

⁽a) Diluted due to high concentration of non-target compound.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



MDL - Method Detection Limit

Page 1 of 1

Client Sample ID: TANK-2 (T-2)

Lab Sample ID: Matrix:

JA23828-3

SO - Soil

DF

1

Date Sampled: Date Received:

07/23/09 07/23/09

Method:

SW846 8270C SW846 3510C

Percent Solids: 89.1

Project:

Barretto Point Remediation, Flunts Point, NY

Analyzed $\mathbf{B}\mathbf{y}$ 08/07/09 NAP Prep Date 08/06/09

Prep Batch OP39207

Analytical Batch BF3910

Rpn #1 Run #2

Initial Volume

F82686.D

File ID

Final Volume

Run #1

1.0 ml

Run #2

50.2 ml

ABN TCLP Leachate

TCLP Leachate method SW846 1311

							* *.
CAS No.	Compound	Result	#W#	MCL	RL	MDL	Units Q
95-48-7	2-Methylphenol	ND ···	D023	200	0.10	0.027	mg/i
	3&4-Methylphenol	ND	D024	200	0.10	0.029	mg/l
87-86-5	Pentachlorophenoi	ND	D037	100	0.40	0.024	mg/l
95-95-4	2,4,5-Trichlorophenal	ND	., D041	400	0.10	0.039	mg/l
88-05-2	2,4,6-Trichlorophenol	ND	D042	2.0	0,10	0,031	mg/l
106-46-7	1,4-Dichlorobenzene	.ND .:	D027	7.5	0,040	0.0070	mg/l
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.040	0.0090	mg/l
118-74-1	Hexachlorobenzene	.ND	D032	0.13	0.040	0.0089	mg/l
87-68-3	Hexachiorobutadiene	ND	•	0.50	0.040	0.0075	
67-72-1	Hexachlornethane	ND	D034	3.0	0.10	0.0060	mg/l
98-95-3	Nitrohenzene	ND	D036	2.0	0.040	0.013	mg/i
110-86-1	Pyridine	ND		5,0	0.040	0.0042	mg/l mg/l
CAS No.	Surrogate Recoveries	Run#1	Run# 2	Li	mits		
367-12-4	2-Fluorophenni	33%		12	-68%		
4165-62-2	Phenol-d5	20%			-49%		1
118-79-6	2,4,6-Tribromophenol	96%			-130%		
4165-60-0	Nitrobenzene-d5	70%			-112%		
321-60-8	2-Fluorobiphenyl	284% a			-112% -106%		
1718-51-0	Terphenyl-d14	18%			-122% -122%		

(a) Outside control limits due to matrix interference.

ND = Not detected

MDL - Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 261 6/96)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 1 of 3

Client Sample ID: TANK-2 (T-2) Lab Sample ID: JA23828-3

SO - Soll

Date Sampled: 07/23/09 Date Received: 07/23/09

Matrix: Method:

SW846 8270C SW846 3550B

Percent Solids: 89.1

Project:

Barretto Point Remediation, Hunts Point, NY

-							
	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
Run #1 #	Z49816.D	.1	07/30/09	VN	07/29/09	OP39135	EZ1803
Run #2	249825.D	2	07/31/09	VN	07/29/09	OP39135	EZ1804

_			 				
	Initial Weight	Final Volume	 				
Run #1	15.0 g	10.0 ml		4 - 4	. '	:	
Ron #2	15.0 g	10,0 ml					

ABN TCL List (CLP4,2 list)

CAS No.	Compound	Remit	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND.	3700	620	ng/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	3700	910	ug/kg	
120-83-2	2,4-Dichlorophenol	ND :	3700	780	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	3700	910	ug/kg	
51 -28-5	2,4-Dinitrophenol	ND	15000	8100	ng/kg	
534-52- 1	4,6-Dinitro-o-cresol	ND:	15000	790	ng/kg	
95-48-7	2-Methylphenol	ND	150 0	810	ug/kg	
	3&4-Methylphenol	ND.	1500	1000	ng/kg	
88-75-5	2-Nitrophenol	ND	3700	790	ug/kg	
100-02-7	4-Nitrophenol	ND	7500	960	ug/kg	
87 -86 -5	Pentachlorophenol	ND	7500	970	ng/kg	et e
108-95-2	Phenol	ND	1500	570	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	3700	810	ug/kg	
88- 06-2	2,4,6-Trichlorophenol	ND .	3700	1000	ug/kg	* .
83-32-9	Acenaphthene	ND	750	46D	ug/kg	
208-96-8	Acenaphthylene	ND .	750	320	ng/kg	
98-86-Z	Acetophenone	ND	3700	370	ug/kg	7
120-12-7	Authracene	ND	750	340	ug/kg	•
1912~24-9	Atrazine	ND	3700	470	ug/kg	
56-55-3	Benzo(a) anthracene	ND	750	450	ug/kg	
50-32-8	Benzo(a) pyrene	ND	750	310	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	750	410	ng/kg	
191-24-2	Benzo(g,h,i)perylene	ND	750	360	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	750	380	ug/kg	
101-55-3	4-Bromopheny) phenyl ether	ND	1500	410	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	1500	370	ug/kg	
92-52-4	1,1'-Biphenyl	ND	1500	380	ug/kg	
100-52-7	Benzaldehyde	ND	3700	2200	ug/kg	
91-58-7	2-Chloronaphthalene	ND .	1500	330	ng/kg	
106-47-8	4-Chloroaniline	ND	3700	300	ug/kg	
8G-74-8	Carbazole	ND	1500	320	ng/kg	
105-60-2	Caprolactam	ND ·	1500	600	ug/kg	

ND = Not detected

MDL - Method Detection Limit

RL - Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 3

Client Sample ID: TANK-2 (T-Z) Lab Sample ID: JA23828-3 Matrix:

SO - Soil

Date Sampled: 07/23/09 Date Received: 07/23/09

Method:

SW846 8270C SW846 3550B

Percent Solids: 89.1

Project: Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	ND	750	340	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	1500	370	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	מא	1500	350	ug/kg	
108-60-1	his(2-Chloroisopropyl)ether	ND	1500	390	ug/kg	
7005-72-3	4-Chlorophenyl phonyl ether	ND ·	1500	500	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	1500	410	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	1500	340	ng/kg	
91-94-1	3.3'-Dichlorobenzidine	ND	3700	1300	ug/kg	
53-70-3	Dibenzo (a, h) anthracene	ND · ·	750	360	ug/kg	
132-64-9	Dibenzofuran	ND :	1500	350	ug/kg	
84-74-2	Di-n-butyl phthalate	17500	1500	470	ng/kg	
117-84-0	Di-n-octyl phthalate	ND	1500	330	ug/kg	
84-66-2	Diethyl phthalate	ND	1500	340	ug/kg	
131-11-3	Dimethyl phthalate	ND	1500	360	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	2690 🚉	1500	390	ug/kg	
206-44-0	Fluoranthene	ND	750	340	ug/kg	
86-73-7	Fluorene	·ND	750	350	ug/kg	
118-74-1	Hexachlorobenzene	ND	1600	430	ug/kg	
87-68 -3	Hexachlorobumdiene	ND	750	360	ug/kg	
77-47-4	Hexachlorocyclopentadiene	.ND	15000	710	ug/kg	
67-72-1	Hexachloroethane	ND	3700	480	ng/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	750	280	ug/kg	
78 -59-1	Isophorone	ND ·	1500	660	ug/kg	
91-57-6	2-Mcthylnaphthalene	1290	3500	340	ug/kg	J
88-74-4	2-Nitroaniline	ND	3700	550	ng/kg	,,
99-09-Z	3-Nitroantline	ND	3700	300	ug/kg	
100-01-6	4-Nitroaniline	ND .	3700	470	ug/kg	
91-20-3	Naplahalene	2090	750	330	ug/kg	
98-95-3	Nitrobenzene	ND	1500	340	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	1500	460	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	3700	510	ng/kg	
85-01-8	Phenanthrene	ND	750	370	ug/kg	•
129-00-0	Pyrene	ND	750	330	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts	
367-12-4	2-Fluorophenol	93%	90%	30-10	19%	
4165-62-2	Phenol-d5	78%	76%	28-10		
118-79-6	2.4,6-Tribromophenol	83%	91%	28-12		
4165-60-0	Nitrobenzene-d5	71%	58%	28-11		

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 3 of 3

Client Sample ID: TANK-2 (T-2)

Lab Sample ID; Matrix:

JA23828-3

SO - Soi)

Date Sampled:

07/23/09

Method:

SW846 8270C SW846 3550B

Percent Solids: 89.1

Date Received: 07/23/09

Project:

Barretto Point Remediation, Hunts Point, NY

ABN TCL List (CLP4.2 list)

CAS No. Surrogate Recoveries

Run# 1

Run#2

Limits

321-60-8 1718-51-0

2-Fluorobiphenyl Terphenyl-d14

71% 47%

100% 46% 38-107% 31-116%

(a) Elevated detection limit due to high final volume of viscous extract and low volume of sample extracted.

ND = Not detected RL = Reporting Limit

E = Indicates value exceeds calibration range

MDL - Method Detection Limit

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound

Page 1 of 1

Client Sample ID: TANK-2 (T-2) Lab Sample ID:

JA23828-3 SO - Soil

Date Sampled: 07/23/09

Date Received: 67/23/09

Percent Solids: 89.1

Project:

Matrix:

Barretto Point Remediation, Hunts Point, NY

Metals Analysia, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RĹ	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 0.50	D004	5.0	0.50	mg/l	1 .	08/07/09	08/10/09 ND	SWB46 6010B ²	SW848 3010A ³
Barium ^a	< 2.0	D005	100	2.0	mg/i	1	08/07/09	08/10/09 ND	: SW846 6010B ²	SW846 3010A ³
Cadmium ^{a -}	0.64	D006	1.0	0.10	mg/l	1	08/07/09	08/10/09 ND	SW846 6010B ²	SW846 3010A ³
Chromium ^a	< 0.20	D007	5.0	0.20	mg/l	1	08/07/09	08/10/09 ND	SW846 6010B ²	SW846 3910A ³
Copper ^a	0.59			0.50	mg/I	Ι	08/07/09	ON 00/01/80	SW846 6010B ²	SW846 3610A ³
Lead	< 0.50	D008	5.0	0,50	mg/I	1	08/07/09	08/10/09 ND	SW846 6010B ²	SW846 3010A ³
Mercury	< 0.0032	D009	0.20	0.0032	mg/I	1	08/07/09	08/07/09 JW	SW846 7470A ¹	SW846 7470A ⁴
Nickel ^ä	< 0.80			0.80	mg/I	1	08/07/09	08/10/09 NO	SW846 B010B ²	SW846 3010A ³
Selenium	< 0.50	D010	1.0	0.50	mg/l	1	08/07/09	08/10/09 ND	SW816 6010B 2	SW846 3010A ³
Silver a	< 0.20	D0I1	5.0	0.20	mg/l	1	08/07/09	08/10/09 ND	SW946 0010B ²	SW646 3010A ³
Zinc ^a	453			0.40	mg/l	3	08/07/09	08/10/09 ND	SW846 6010B ²	SW846 3010A ³

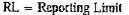
(i) Instrument QC Batch; MA22938

(2) Instrument QC Batch; MA22946

(3) Prep QC Batch: MP49118

(4) Prep QC Batch: MP49135

(a) Elevated sample detection limit due to difficult sample matrix.



MCL = Maximum Contamination Level (40 CFR 261 6/96)

Page 1 of 1

Client Sample ID: TANK-2 (T-2)

Lab Sample ID: Matrix:

JA23828-3

SO - Soil

Date Sampled: 07/23/09

Date Received: 07/23/09

Percent Solids; 89.1

Project:

Barretto Point Remediation, Hunts Point, NY

General Chemistry

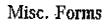
Analyto	Result	RL	Units	DF	Analyzed	Ву	Method
Corrosivity as pH Cyanide Reactivity Ignitability (Flashpoint) Solids, Percent Sulfide Reactivity	4.68 NC < 5.6 > 200 89.1 < 110	5.6 110	su mg/kg Deg. F % mg/kg	1 1 1 1	08/10/09 08/06/09 15:26 08/10/09 08/12/09 08/06/09	LMM JA LMM DD ST	SW846 CHAP7 SW846 CHAP7 SW846 CHAP7/ASTM D93 SM18 2540G SW846 CHAP7/8034











Custody Documents and Other Forms

Includes the following where applicable:

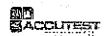
· Chain of Custody



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50 SL			TEL_132-32	9.02(A) WARN A	78.X: 71 (COMP) 11							IMA PI	there's					مود			<u>,23</u>	82	8
osilico Envinerental	Benefit	n Poin	_ <u>Project t</u>	lome	llan								B∍n	liaktar	i Amel	THE !	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	-	30E s	জ্যাট্			Maids Orders EW - Debloop Wals FW - Ground Water WAY - Wallic
DOUGH SOM OF DERECTIONS OF THE COMPANY OF THE COMPA	CON CAMP		722 	errord in Cornerity City City City	orden			m Tap	ort eq)	X q		des. dv	4. Will	stabilisty	16 VOC'S	L'sude's	19 11 Land 1.	47/1/ F					COV- Surface More SU- Study SU- Study SU- Study SU- Diverticate UN- Diverticate UN- Diverticate UN- Viting FEE and Times FEE and Times PEE Study F
Field ID / Point of Uniteditory V	ECHOLUM E	Des	ne or CD	W.	Harr Cort	es lateral	Ç Ž	T _B T	TICH	F 3	7 7 1 1 1	Reporter	Ļ		· · ·	7	7.	727					LAR LISE ONLY
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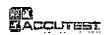
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Accutest Laboratories Sample Receipt Summary

Ne / Time Repeived: 7/23/2009	Client: POSILLIGO Delivery Method:	Other Courier Client Service Action	es Action Required: You Required at Lagin: No	
Croject: BARRETTO POINT	No. Goolers:	1 Alrbill #s;		
, .	D eggin	Sample Integrity - Documentation 1. Sample labels present on bottles: 2. Container tabeling complete: 3. Sample container tabel / COC agree; Sample integrity - Condition 1. Sample raced within HT:	Y or N- D Y or N D T T T T T T T T T T T T T T T T T T	
Quelity Control Preservetto Y	(bag) NVA	Ah containers accounted for Condition of sample:	Juliosi 🗅	
1. Trip Plank present/ cooler 2. Trip Blank listed on COC; 3. Samples preserved properly: A. VOCs headspace free;		Sample Integrity - Instructions 1. Analysis requested is close: 2. Bothes received for unspecified tests 3. Sufficient volume round for analysis: 4. Compositing instructions clear:		
Commonis		5. Filiering instructions clear:		
-23 of ance preserved voas are butha	áic. 6 of β voas rec'd wy magro blebles.			

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Sample Receipt Summary - Problem Resolution

Accutest Job Number: JA23828

GSR; Marle Meldhof

Response Date

Response: Please ensigns sample JA23828-3 as a soil; as per tho lab, appears to be a solitivater mix. Run the TCLP vools from one of the extractable bottles if necessary (reserve the unpres vools for the "irdəci" yor apelyels).

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Page 1 of 1

Client Sam Lab Sampl Matrix: Method: Project:	e ID: JA2644 SO - SI SW846	udge 8082 SW	846 3545 nediation, Hun	ts Point, N)	Date ! Perce	Sampled Received nt Solida	: 08/26/09	
Run #1 Run #2	File ID 1G47942.D	DF 1	Analyzed 08/27/09	By OPM	Prep I 08/27/		Prep Batch OP39503	Analytical Batch G1G1750
Run #1 Run #2	Initial Weight 17.2 g	Final Vo 10.0 ml	lume	***				
PCB List								
CAS No.	Compound		Result	RL	MDL	Units	Q	
12674-11-2	Aroclor 1016		ND ···	63	22	ug/kg		
11104-28-2	Aroclor 1221		ND .	63	42	ug/kg		
11141-16-5			ND · ·	: 63	20	tig/kg		
53469-21-9			МĎ	. 63	23	ug/kg		
12672-29-6			ND	63	12	ug/kg		
	Aroclor 1254		ND 🗆	63	16	ug/kg		
11096-82-5	Aroclor 1260		ND	- 63	24	ug/kg		
CAS No.	Surrogate Rec	overies	Run#1	Run#2	Lim	išta		
877-09-8	Tetrachloro-m-	zylene	89%] ~		33-1	41%		
877-09-8	Tetrachloro-m-		83%	••		4196		
2051-24-3	Decachlorobipl		72%			54%		
2051-24-3	Decachlorohipi		79%			54%		

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Page 1 of 1

Client Sam Lab Sampl Matrix: Method: Project;	e ID: JA2644 SO - SI SW846	udge 8082 SW84	16 3545 diation, Hunts	Point, N	Date l Percer	Sampled: Received: at Salids:	08/26/09 08/26/09 48.9	
Run #1 Run #2	File ID 1G47943.D	DF I		By OPM	Prep D 08/27/0		Prep Batch OP39503	Analytical Batch G1G1750
Run #1 Run #2	Initial Weight 10.0 g	Final Volu 10.0 ml	me					- Alt
PCB List	· · · · · · · · · · · · · · · · · · ·				****	-		
CAS No.	Compound		Result	RL ·	MDL,	Units	Q 1. 5/3 (1)	
12674-11-2 11104-28-2 11141-16-5 53469-21-9	Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242		ND ND ND	100 100 100	36 68 33	ng/kg ng/kg ng/kg		
12672-29-6 11097-69-1 11096-82-5	Aroclor 1248 Aroclor 1254 Aroclor 1260		ND ND ND ND	100 100 100 100	37 20 26 40	ug/kg ug/kg ug/kg ug/kg		
CAS No.	Surrogato Reco	over ies	Run# 1	Run# 2	Limi	ts	ingforest, a €	1.11
877-09-8 877-09-8 2051-24-3 2051-24-3	Tetrachloro-m-; Tetrachloro-m-; Decachlorobiph Decachlorobiph	rylene enyl	74% 82% 79% 84%		33-14 33-14 32-15 32-15	11% 54%		

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Page 1 of 1

Client Sam Lab Sampl Matrix; Method; Project:			oil 8082	346 3545 ediption, Her	nts Point, N	Date Sampled Date Received Percent Solids	: 08/26/09	
Run #1 Run #2	File ID 1G4794		DF l	Analyzed 08/27/09	Ву ОРМ	Prep Date 08/27/09	Prep Batch OP39503	Analytical Batch G1G1750
Run #1 Run #2	Initial V	Walght	Final	lme			70.0	

CAS No.	Compound	Result	RL	MDL	Unita	Q
12674-11-2	Arnelor 1016	ND:	. 45	16	ug/kg	
11104-28-2	Aroclor 1221	ND	45	30	ug/kg	4.1
11141-16-5	Aroclor 1232	ND:	. 45	14		
53469-21-9	Aroclor 1242	ND	45	16	ug/kg	
12672-29-6	Aroclor 1248	ND	45	8.9	ug/kg	
11097-69-1	Aroclor 1254	ND	45	11	ug/kg	
11096-82-5	Aroclor 1260	ND	45	17	ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run#1	Run# 2	Lim	ite -	
877-09-8	Tetrachloro-m-xylene	55%		22.4	1402	,
877-09-8	Tetrachloro-m-xylene	62%		33-1		
2051-24-3	Decachlerobiphenyl			33-1		•
2051-24-3	Decachlorobiphenyl	74%		. 3 2 -1.		197.5
5051 LT-()	recommon malatetta;	80%		32-1.	54%	

ND = Not detected MDL - Method Detection Limit RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound