Remedial Investigation Work Plan

Sun Chemical Corporation
441 Tompkins Avenue
Staten Island, New York
Site C243024
Brownfield Site Cleanup Agreement
Index #A2-0614-0109

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1 Introduction

1.1 Purpose and Scope

ENVIRON International Corporation (ENVIRON) has prepared this Remedial Investigation Work Plan (RIWP) on behalf of Sun Chemical Corporation ("Sun Chemical") regarding its property located at 441 Tompkins Avenue in Staten Island, New York (the "Site"). The Site is located in the Rosebank neighborhood in the northeastern portion of Staten Island, as shown on Figure 1. A site layout map, depicting former buildings and other historical site features, is included as Plate 1. The RIWP was prepared in accordance with the terms of the Brownfield Cleanup Agreement (BCA) between by Sun Chemical and the New York State Department of Environmental Conservation (NYSDEC), dated March 9, 2009. In addition, this RIWP incorporates comments received from NYSDEC regarding the proposed scope of work and reflects the agreements reached with ENVIRON and Sun Chemical regarding the proposed scope of work.

As presented in the December 2007 *Site Characterization and Remedial Investigation Report* (the "RIR") submitted with the Brownfield Cleanup Program (BCP) application and supporting materials, and per the project flow indicated in the Division of Environmental Remediation December 2002 Draft *Technical Guidance for Site Investigation and Remediation* (known as and referred to herein as DER-10), Sun Chemical completed site characterization activities at the Site in August through October 2006 evaluating soil quality in 17 areas of concern (AOCs). The locations of these AOCs and sampling locations are provided on Plate 2. Certain constituents (i.e., metals, semi-volatile organic compounds [SVOCs] and polychlorinated biphenyls [PCBs]) were identified at concentrations exceeding the Commercial Use Soil Cleanup Objectives (SCOs) used by the BCP (the SCOs are provided in Attachment A). Based on those findings, and plans for facility demolition and associated excavation of foundations and footings, ENVIRON conducted supplemental delineation soil sampling in select AOCs in June 2008, as well as initial soil sampling beneath certain building slabs. The results of these sampling programs collectively identified areas of the Site where constituents were present above SCOs, including beneath portions of several buildings. Accordingly, ENVIRON prepared the September 2008 *Supplemental Remedial Investigation Report, Remedial Action Selection Report and Interim Remedial Measures Work Plan* (the "IRM Work Plan") to describe the basis and scope of soil remediation that would be required as part of the overall demolition project. NYSDEC provided comments and input to the IRM Work Plan in correspondence to ENVIRON dated September 25, 2008. Those comments related to the format and contents of the work plan, additional recommended components of the IRM program (e.g., dust/air monitoring), proposed soil sampling during the IRM activities and related soil erosion control and soil staging provisions.

As discussed in greater detail below, the IRM was implemented between August 2008 and March 2009 as proposed, incorporating NYSDEC's comments to the extent practicable. Based on analytical results of post-excavation and other soil samples collected during the IRM, and on prior soil sampling results, additional on-site soil sampling is considered necessary to fully delineate the extent of any constituent concentrations remaining above the SCOs, as well as to respond to NYSDEC's comments regarding the scope of work needed at the Site. This delineation sampling will support the development of a Remedial Work Plan to address

exceedances of the SCOs that remain after implementation of the IRM Work Plan. Groundwater sampling will also be performed to document current groundwater quality at existing and proposed monitoring wells.

1.2 Report Organization

The RIWP presented herein was completed in accordance with NYSDEC regulations and guidance, particularly 6 NYCRR Part 375 and DER-10. Section 2 presents site characterization information regarding site setting, historical site operations and other facility details requested in DER-10 Section 3.3(b)3, 4 and 5. This information was previously provided to NYSDEC in the December 2007 report noted above. Section 2 also presents the analytical results of site characterization activities, also included in the December 2007 report. Section 3 provides discussion of the June 2008 pre-demolition remedial investigation that largely formed the basis for the IRM Work Plan. A qualitative exposure assessment is included in Section 4. Section 5 presents the required fish and wildlife resource analysis. A discussion of the IRM activities is provided in Section 6, as needed to support the proposed additional sampling included in the RIWP. The RIWP is presented in Section 7, and includes schedule and staffing information for the proposed activities.

2 Overview of Site Characterization and Remedial Investigation for Soils

2.1 Overview

Based on the detailed review of historical documentation and discussions with Sun Chemical personnel, ENVIRON identified 17 AOCs warranting further evaluation[1]. These AOCs, and the specific environmental concerns, are presented in Table 1. The Site characterization was completed in August 2006 to provide an initial understanding of soil quality at the Site. ENVIRON, on behalf of Sun Chemical, implemented a remedial investigation (RI) plan in October 2006 to provide additional data regarding the nature of soil and groundwater quality at the Site. The analytical results of these sampling programs were presented in the December 2007 report noted above. Additional soil sampling was also completed in June 2008. Analytical results of the sampling programs are discussed by individual AOC below.

2.2 Industrial Operations, Site History and Prior Site Investigations

2.2.1 Introduction

In accordance with Section 3.1.1(a) of DER-10, Sun Chemical and ENVIRON completed a detailed records search, including interviews with current and former Sun Chemical employees to develop a history of manufacturing operations and locations of the handling, storage and potential release of hazardous substances, as needed to identify potentially contaminated AOCs at the Site. As discussed in detail in Section 3 of this report, in August 2006, ENVIRON conducted field characterization and remedial investigation activities based on information gathered during this records search. The remainder of this section discusses the findings of the records search, including: (1) recent and historical industrial operations, (2) the history of Site ownership and development; and (3) prior Site evaluations.

2.2.2 Recent and Historic Industrial Operations

Based on information from current and former Sun Chemical employees and available documentary information, ENVIRON determined that the Site had continuously operated for the production of pigments for the printing and cosmetics industries since development of the property for industrial purposes in 1907 until Sun Chemical ceased operations in February 2008. Sun Chemical operated the Site since 1957, primarily producing red pigments, but also lesser quantities of blue, yellow and green pigments, in portions of the facility designated as the Red and Blue Wings (see Plate 1). Although the specific nature of the pigments manufactured by Sun Chemical changed over time, the overall production processes remained relatively constant. Specific details regarding pigment manufacturing processes of prior Site owners and operators is not available but based on information regarding raw materials stored on-Site available from historical resources (e.g., Sanborn Fire Insurance maps), Sun Chemical believes that the basic processes employed at the Site prior to 1957 were comparable to those conducted more recently, with the use of inorganic pigments (e.g., lead chromate) considered likely.

Sun Chemical produced pigments as pH-buffered aqueous slurries through the reaction of organic and non-toxic inorganic pigments, such as barium, in an acidic or basic solution

[1] As discussed in Section 7, additional AOCs have since been identified, both based on data collected during the IRM and per NYSDEC comments.

depending on the pigment. Raw materials were kept in plastic and plastic-lined paper bags stored in several areas of the main building. Acids and caustic solution were stored in aboveground storage tanks located adjacent to the building, as shown on Plate 1. These operations were conducted in various aboveground tanks located in the Red Wing and Blue Wing of the main manufacturing building (see the detailed interior plan provided as Plate 1). At completion of the reaction, the resulting pigment slurry was drained via gravity to one of 19 filter presses on the ground floor that removed the majority of the free liquid by mechanical pressure. The resulting wastewater, which was either acidic or basic depending on the specific pigment being produced, was treated via pH adjustment in an on-Site wastewater treatment plant prior to discharge to the Port Richmond Wastewater Treatment Plan under a former permit issued by the New York City Department of Environmental Protection. The wet pigment cake was removed to a cart and taken to an oven for drying. The dried pigment cake was then ground to a fine powder, and placed in bags or plastic-lined fiber drums prior to shipment to customers. According to Sun Chemical personnel, other than a reported 1988 release of caustic solution, described below in Section 2.2.4.1, there have been no significant releases of hazardous substances at the Site. During drain maintenance, Sun Chemical identified evidence of leaks from the industrial wastewater system beneath the Red and Blue Wings. These areas were evaluated through interior soil sampling completed in AOC 16, as discussed in detail in Section 2.4.16.

2.2.3 Site History

ENVIRON, on behalf of Sun Chemical, completed an evaluation of the history of Site development, industrial operations and activities based on the ownership and operational history of the Site. This evaluation was conducted consistent with DER-10 and was also in general conformance with the scope and limitations of ASTM International's *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* E-1527-05 (the "ASTM Standard"). ENVIRON reviewed historical Site information, including that available electronically from Environmental Data Resources, Inc. (EDR). The specific resources reviewed by ENVIRON included:

- Deeds for the property.
- Sanborn Fire Insurance maps from 1898, 1917, 1937, 1950, 1962, 1977, 1981, 1983 and 1986 though 1996. Attachment B provides seven facility layout enlargements based on the Sanborn maps from 1898 through 1977, as well as 1986. The maps dated 1981 through 1996 are identical; the 1986 map was selected as representative of this series because it is the most clear.
- City Directory abstracts from 1928, 1934, 1960, 1965, 1970, 1979, 1984, 1990 and 2000.
- Aerial photographs from 1954, 1966, 1975, 1984 and 1995.
- A search of available federal, state and local database records for information regarding historical releases, spills and underground storage tank (UST) issues.

ENVIRON also requested, and when available reviewed, Site-related files from the New York City Department of Health and Building Departments, as well as the New York Fire Department. Available records did not provide information specific to issues of potential environmental concern at the Site. Last, ENVIRON collected information from Sun Chemical employees

regarding historical raw material, waste and wastewater handling practices. These interviews provided information relevant to the understanding of the handling of industrial wastewater and the locations of former releases.

Based on these resources, ENVIRON has developed the following Site history. The 5.3-acre property comprises two tax lots in Tax Block 2846, including: (1) Lot 12, is a 4.7-acre lot comprising the majority of the property and the land on which manufacturing operations have occurred; and (2) Lot 54, the 0.5-acre lot designated in tax records as 88 Chestnut Avenue, is located east of Lot 12 and formerly a portion of a passenger and freight railroad. For purposes of this summary of Site history, references are provided relative to these specific lots as appropriate. Significant historical Site features are shown in blue on Plate 1. Figures 2 through 8 provide enlargements of the Site and immediately surrounding properties based on Sanborn Fire Insurance maps from 1898, 1917, 1937, 1950, 1962, 1977 and 1986. Other Sanborn maps, from 1981, 1983 and after 1986, provide identical information as the 1986 map and are therefore not included.

1898 (Sanborn Map)

Lot 12 appears to consist of three parcels. The western parcel, at the corner of Chestnut and Tompkins Avenues, is the Site of a pavilion. The Caprera Hotel is located on the central parcel, along Chestnut Avenue. A shooting gallery and adjoining shelter are shown at the southern (rear) end of this parcel. The largest parcel, which fronts Chestnut and Tompkins Avenues, as well as the Staten Island Metro Transit railroad (the future location of Lot 54) to the west, is undeveloped with an embankment shown in the northeastern corner.

1907-8 (Sun Chemical and 1917 Sanborn Map)

Lot 12 was acquired by the G. Siegle & Co. Color Works (Siegle). Siegle constructed a pigment production facility, which appears to have been in operation as of 1908.

1917 (Sanborn Map)

Lot 12 is shown as a single parcel that has been developed as the G. Siegle & Co. Color Works (built 1908), with two dwellings and five auxiliary buildings also on-Site. A two-wing production building is present, although additions to the west and south have not yet been constructed. A coal pile is shown at the southeastern corner of the Site (furnaces were presumably coal-fired at this time). Interior features include two precipitation and drying/grinding areas. Exterior features include a furnace, a pool (aboveground water storage feature for fire protection) and a supply storage area along the southern perimeter. No specific chemical or hazardous materials storage locations are shown. Lot 54 is the Staten Island Rail Transport Railway, with a single rail spur entering Lot 12 along its eastern perimeter and extending to the northeastern corner of the Site.

1928 (City Directory)

According to New York Telephone records, two residences were located at the current Site address. This is consistent with the two dwellings shown on the 1917 and 1937 Sanborn maps.

1937 (Sanborn Map)

The facility located on Lot 12 is designated as The Ansbacher-Siegle Corp., manufacturers of dry colors. The main building is shown on Lot 12 as is the southern of the two dwellings shown on the 1917 map. The main building has been expanded, particularly around the north wing, extending over a portion of the rail spur entering the property from the south. A number of additional features are evident, suggesting expansion of industrial activities. For example, a relatively small one-story addition has been constructed on the western end of the main building. Individual blue pulp, bichromate and acid tank storage areas (number of tanks not specified) abut the southern side of the main building. In addition, a chrysophenine plant has been constructed along the southern property line, at the location of the former supply storage area noted on the 1917 Sanborn map. Chrysophenine (4,4'-diaminostilbene-2,2'-disulfonic acid or DSD acid), is a yellow pigment or a fluorescent whitening agent (present-day application). A miscellaneous materials storage area is adjacent to and west of the chrysophenine plant. Two greenhouses are also located on-Site, one adjacent to the miscellaneous materials storage area and the other further to the east behind an automobile garage associated with the dwelling at the southwestern property corner. The pool has been replaced by a 100,000-gallon reservoir. A boiler room is shown to the rear of the Site with a notation that it was constructed in 1908 (it was not shown on the 1917 map). The coal pile is absent. Lot 54 is unchanged.

1950 (Sanborn Map)

The Lot 12 parcel is still shown as The Ansbacher-Siegle Corp., manufacturers of dry colors. There are four primary changes to this lot evident since the 1937 map was prepared. First, the small one-story western addition has been replaced by a larger two-story addition (built in 1942) housing color tanks. Second, two underground fuel oil storage tanks (size not specified) are shown at the southeastern property corner, the former coal pile location. Third, the chrysophenine plant has been removed; a machine and carpentry shop with attached office is now shown at that location. A four-section storage building has also been built to the east (rear) of the carpentry shop. A dust collector is shown directly east of the portion of the building that connects the two wings. Last, two additional structures are located proximate to the automobile garage (uses unspecified). Although Lot 54 is unchanged, the Rosebank Passenger Station for the railroad is now evident at the eastern terminus of St. Mary's Avenue, adjacent to Lot 54.

1954 (Aerial Photograph)

The northwestern corner of Lot 12 appears wooded with a single dwelling. The remainder of the Site (both lots) appears largely as it did on the 1950 Sanborn map with the exception of disturbed ground along the western side of the plant, likely from on-going construction of building additions which were finished in 1955 (see entry for 1962 Sanborn map). No areas of significant exterior storage are evident. Given the small scale of this photograph and the relatively close spacing of the buildings, the aboveground storage tank areas are not visible. A railroad is present on Lot 54. .

1957 (Deed)

The Ansbacher-Siegle Corporation sold Lot 12 to Sun Chemical on December 1, 1957.

1962 (Sanborn Map)

Lot 12 remains as The Ansbacher-Siegle Corp., manufacturers of dry colors. There have been four significant changes to the property configuration since 1950. First, an L-shaped, three-part addition was built in 1955 on the western end of the main building, connecting the northern and southern wings. The largest section of the addition is designated for manufacturing. Second, the residential property at the corner of Chestnut and Tompkins Avenue has been partially converted to an office. A warehouse building with 2nd-floor office space has been constructed between that dwelling and Tompkins Avenue. Third, two free-standing acid tanks have been installed near the northwestern corner of the main building (the blue pulp, dichromate and acid tanks are shown as remaining). Last, all four of the auxiliary buildings between the other dwelling (which fronts Tompkins Avenue) and the machine and carpentry shop have been demolished. Lot 54 is unchanged since the 1950 map.

1965 (City Directory)

According to New York Telephone Company records, there are two listings related to Sun Chemical for 92 Chestnut Avenue, an address which Sanborn maps of this vintage indicate as being located at the northeast corner of the Sun Chemical Site. These listings include “Ansbacher Siegle Div of Sun Chemcl Corp Colrs” and “Sun Chemcl Corp”. However, there are no listings for 1965 for the current facility address. In addition, there were no subsequent City Directory listings for 92 Chestnut Avenue.

1966 (Aerial photograph)

Lot 12 of the Site appears largely the same as on the 1962 Sanborn map. A relatively large storage area is located between the northern side of the warehouse and Chestnut Avenue. The materials are staged in orderly rows suggesting that they include pallets of drums, bags, raw materials and/or finished goods. There also appears to be miscellaneous storage of materials along the southern fence line, an area which GZA designated as the “drum and bag storage area” by GZA in a July 2000 Preliminary Site Assessment Work Plan it prepared for NYSDEC (discussed below). No stained areas are apparent.

1970 and 1975 (City Directory)

The current Site address is listed in New York Telephone records under “Sun Chemcl Corp Pigmts Dept”.

1975 (Aerial photograph)

The dwelling on Lot 12 immediately east of the warehouse has been removed and another feature, slightly larger than the footprint of the former dwelling, appears to be under construction. Much of the outdoor storage of materials north of the warehouse appears to be gone; only several trucks are present. There continues to be storage of miscellaneous materials along the southern fence line; no stained ground is apparent. The remainder of the Site appears unchanged since 1966.

1977 (Sanborn Map)

The office/dwelling structure has been removed as have the blue pulp, dichromate and acid tanks along the southern side of the main building. There have been no other significant changes to the two lots at the Site.

1979 (City Directory)

The current Site address, with the street name compressed to “Tmpkns Ave”, is listed in New York Telephone records under “Sun Chemcl Corp Pigmts Dept”.

1981, 1983 and 1986 through 1996 (Sanborn Maps)

There are no significant changes to the facility noted to any of the two lots on these 13 maps. The property owner is shown as Sun Chemical Corp. beginning in 1986. The only structural change at the Site shown on these maps is the addition of a pump house and garage west of the machine and carpentry shop on the 1996 map.

1984 (Deed)

Sun Chemical acquired Lot 54 on June 19, 1984 from Staten-Island South Beach, Inc.

1984 (City Directory)

The Site address, with the street name compressed to “Tmpkns Ave”, is listed in New York Telephone records under “Sun Chemcl Corp Pigmts Dept”.

1984 (Aerial photograph)

Although materials storage is evident near the warehouse and the southern fence line, the small scale of this photograph does not enable the nature of those materials to be identified.

1986 (Deed)

On December 31, 1986, Sun Chemical was acquired by SUN/DIC Acquisition Corporation, the current owner of Lots 12 and 54.

1990 (City Directory)

The Site address, with the street name compressed to “Tmpkns Ave”, is listed in NYNEX Information Resource Company records under “Sun Chemcl Corp Pigmts Dept”.

1993 (Database Search)

Two 25,000-gallon fuel oil USTs were removed. The records indicate that the tanks were installed in 1946 and formerly held No. 5 or No. 6 fuel oil. A 10,000-gallon UST was then reportedly installed in approximately 1993 for No. 2 fuel oil storage. (This tank, actually an aboveground storage tank within a secondary containment structure, remains on-Site.)

1995 (City Directory)

The Site address is listed in NYNEX records under “Sun Chemcl Corp Pigmts Dept”.

1995 (Aerial photograph)

Relatively large material storage areas are evident east of the warehouse and west of the machine and carpentry shop. The warehouse storage location (which is asphalt-paved) is still used for the staging of bagged finished product and other materials. A vehicle/forklift track encircles the warehouse storage area.

2.2.4 Prior Site Evaluations

Several evaluations were completed at the Site prior to the recent Site assessment, as summarized below under the following subheadings: (1) summary of 1988 soils investigation; (2) summary of the 1994 study by NYSDEC; and (3) summary of the 2001 Preliminary Site Assessment.

2.2.4.1 Summary of 1988 Soil Investigation

Based on internal Sun Chemical documentation, discussions with Sun Chemical personnel and correspondence between Sun Chemical and regulatory agencies, on February 17, 1988 a bulk raw material storage tank located near the southern property boundary was overfilled resulting in the discharge of approximately 545 gallons of a 25% sodium hydroxide solution to the exposed soil surface. The solution flowed from the Sun Chemical Site onto portions of the adjacent St. Joseph's Parochial School property, entering two storm drains connected to the school's combined sewer system. Sun Chemical retained OH Materials, Inc. as its emergency response contractor, and immediately initiated emergency response measures to contain the released caustic material and evaluate any environmental impacts from the release. Based on soil sampling completed at that time by OH Materials, the pH of the near-surface soils on the two properties was greater than 12, as was the water in the storm sewers. Accordingly, Sun excavated the impacted soils and cleaned the affected storm sewers. Subsequent soil sampling confirmed that elevated pH levels requiring response had been effectively addressed. The March 29, 1988 Technical Report (Preliminary) prepared by the New York Department of Environmental Protection Division of Hazardous Materials Programs (DHMP) and included herein in Attachment C indicates that personnel from the DHMP were involved at the time of the release and subsequent remediation, and that those personnel concluded that remediation of the release was completed in March 1988. This conclusion was confirmed by the City of New York Department of Environmental Protection in its April 14, 1988 letter to NYSDEC.

Sun Chemical subsequently constructed a concrete retaining wall along the common boundary between the Site and the school to minimize the potential for future drainage of storm water off-Site. During these construction activities, discolored soil was observed on the Sun Chemical property and accordingly, soil samples were collected (from unspecified depths but which are believed to be less than 3 feet). Soil samples were taken from one location within the trench dug to accommodate the retaining wall and from three nearby locations on the school property. These four samples were analyzed for RCRA characteristics and RCRA metals by the EP Toxicity method (EP Tox). Three additional soil samples were collected from one off-Site and two on-Site locations, and analyzed for a broader suite of parameters, including RCRA characteristics and RCRA metals by EP Tox, total cyanide, total phenols, Priority Pollutant metals (PPMs)[2], TCL volatile organic compounds (VOCs), TCL pesticides and polychlorinated

[2] The PPMs include the following thirteen metals: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc.

biphenyls (PCBs), and TCL semi-volatile organic compounds (SVOCs). These results were provided to the DEP by Sun Chemical in 1988 as part of the emergency response action.

Those data indicated that pesticides and acid extractable compounds were not detected. In addition, only three VOCs (acetone, methylene chloride and toluene) were detected, all at *de minimis* levels. Further, acetone and methylene chloride also were present in the laboratory method blanks, confirming that the presence of those constituents most likely resulted from laboratory contamination. Cyanide was detected but also not at significant concentrations. Lead, PCBs and one base/neutral extractable organic compound (BN), di-octyl phthalate, were detected at elevated concentrations and consequently, in the April 14, 1988 letter noted above, the DHMP referred further investigation of the Site to the NYSDEC. No additional investigation or remediation was required by DHMP. However, in 2006 additional soil sampling was completed in this area, as discussed below, including analyses for metals, PCBs and BNs.

2.2.4.2 Summary of 1994 Hazardous Substances Disposal Site Study by NYSDEC

In a December 28, 1994 letter to Sun Chemical (provided in Attachment D), NYSDEC indicated that it had begun a Hazardous Substances Disposal Site Study (the "Study"), noting that the Sun Chemical Site was included in an inventory NYSDEC had compiled of potentially contaminated Sites. Based on its review of the historical data from the Sun Chemical facility reviewed as part of the Study, NYSDEC identified the following three contaminants of concern (provided with maximum concentrations) in soil at the Site in a draft "Hazardous Substance Waste Disposal Site – Description" form: lead (3,020 ppm), bis(2-ethylhexyl)phthalate (BEHP) (400 ppm) and PCBs (15 ppm). These constituents were identified by Sun Chemical during its response activities related to the 1988 caustic solution release. As indicated in the preceding subsection, other parameters for which analyses were conducted in 1988 were either not detected or were not identified at levels of potential concern to NYSDEC.

Sun Chemical is not aware of any additional actions taken by NYSDEC related to this listing prior to NYSDEC's July 9, 1999 letter (see Attachment D) notifying Sun Chemical that the Department had completed a December 1, 1998 addendum and would conduct a Preliminary Site Assessment (PSA). Subsequently, Sun Chemical and NYSDEC initiated discussions to address the site under the Voluntary Cleanup Program.

2.2.4.3 Preparation of 2001 Preliminary Site Assessment

Following the discussions with NYSDEC discussed in the preceding subsection, Sun Chemical retained ENVIRON to prepare a PSA Work Plan for submission to NYSDEC. ENVIRON submitted a PSA Work Plan to NYSDEC in April 2001 proposing soil sampling in the area of the Site and the adjoining school property that appeared to have been affected by the February 1988 caustic solution release. Based on comments received from NYSDEC in May 2001, ENVIRON updated the PSA and submitted a Revised PSA Work Plan to NYSDEC in August 2001.

The August 2001 Revised PSA Work Plan also documented the results of ENVIRON's July 2001 evaluation of the integrity of the floor beneath the pigment filter presses in response to NYSDEC's claims that the acidic and basic wastewaters released to the floor were hazardous waste. The intent of ENVIRON's inspections was to identify any areas of deterioration or damage to the interior concrete flooring through which filter press wastewaters could potentially

impact underlying soils. The August 2001 Revised PSA Work Plan indicated that no such damage was observed.

The PSA Work Plan was not implemented, and there was no further interaction between ENVIRON and NYSDEC related to soil and groundwater conditions on the Site.

2.3 Overview of 2006 Soil and Groundwater Sampling Program and Methodologies

SGS Environmental Drilling, Inc. of West Creek, New Jersey completed the soil borings using direct-push techniques under the supervision of an ENVIRON geologist. SGS also installed all monitoring wells at the Site using hollow-stem augers. At each soil boring, continuous soil cores were collected to enable logging of geologic conditions and screening of the soil cores with a photo-ionization detector (PID) to assist in determining whether there was evidence of impacted soils; no such impacts were observed. Soil boring logs, which provide soil classification information and field screening results, are provided in Appendix A. The summary data tables provided in Appendix B include the actual sampling locations, depths and analyses. All soil sampling locations are shown on Plate 2. That site plan also shows all former Sun Chemical buildings and other structures, as well as locations of historical industrial features.

At each location, ENVIRON attempted to collect soil samples from the intervals most likely to have been adversely impacted by former industrial operations. For AOCs designated based on surficial activities (e.g., aboveground storage tanks or railroad tracks), sampling was targeted to the soil surface directly beneath the pavement. At certain locations, however, the presence of crushed stone bedding for the pavement or rocky soils precluded sampling at that interval. In those instances, ENVIRON therefore collected the soil sample from the uppermost soil interval encountered.

All downhole drilling and sampling equipment was decontaminated between uses. Downhole components including direct-push rods and core barrels, were decontaminated with an Alconox solution followed by a tap water rinse.

All soil samples were placed directly into laboratory-provided glassware and stored on ice in a cooler under appropriate chain-of-custody protocol. Samples were delivered to Severn Trent Laboratories (STL) (now TestAmerica, Inc.) of Edison, New Jersey, a New Jersey-certified laboratory, for all of the required analytical services. Given the potential for historic use of inorganic pigment, soil samples from each AOC were analyzed for Priority Pollutant metals (PPM) plus barium by the applicable USEPA 6010 and 7000 series methods. In addition, soil samples from certain AOCs were also analyzed for VOCs by USEPA Method 8260B, PCBs by USEPA Method 8080, TCL SVOCs by USEPA Method 8270C. Summarized soil data are provided in tables included as Appendix B. A CD-ROM provided as Attachment E provides the STL laboratory reports for the August-October 2006 sampling program.

As discussed in each of the following subsections, the SC and RI determined whether there was contamination associated with each AOC targeted for sampling, identified the constituents of concern associated with a given AOC, and evaluated the lateral and vertical extent of those

impacts. Specific information regarding each AOC, and the associated analytical results, are discussed below.

The actual sampling depths and analyses for all AOCs discussed below are provided, by AOC, on the summary data tables included in Appendix B. Summarized analytical results are provided on Plate 2.

2.4 Soil Cleanup Objectives for Data Evaluation and Alternatives Analysis

NYSDEC regulations (at Part 375.6) require the use of the unrestricted-use SCOs as default cleanup objectives for a site, and that the feasibility of remediating a site to attain those SCOs (as well as other sets of SCOs, with environmental easements if needed) should be presented in an alternatives analysis. NYSDEC policies also indicate that if groundwater contamination is identified in or downgradient of an AOC, the ultimate remedy for a site would address each potential source for those impacts, as defined, in part, by the groundwater protection SCOs. In light of those requirements, ENVIRON screened all soil data generated to date relative to the unrestricted-use and commercial-use SCOs, including the August-October 2006 site characterization and remedial investigation, the June 2008 pre-demolition sub-slab sampling program, and the 2008-2009 IRM post-excavation sampling results. This information is provided herein as Table 1. Additionally, to aid in review of this information, Table 1 also provides certain details regarding each area of concern, including: (1) the number of soil samples collected, and the parameters for which those samples were analyzed; (2) the constituents detected above unrestricted and commercial–use SCOs; (3) the monitoring well(s) downgradient of each AOC and the analytical parameters for which groundwater samples from the well(s) were analyzed; (4) constituents detected above Part 703.5 standards at those wells; and (5) which of those detected constituents were also present in soil in the AOC above groundwater protection SCOs. The AOCs presented on Table 1 include the numbered AOCs and for the AOCs identified through later phases of sampling, including the June 2008 pre-demolition sampling program (discussed in Section 3) and the IRM (discussed in Section 6).

As presented on Table 1, that comparison indicated that in every sampling interval, at least one constituent was identified above the unrestricted-use SCOs, to the maximum site-wide sampling/excavation depth of 10 feet. As such, remediation of those soil intervals would result in addressing a substantially greater quantity of soil volume of soil than would require remediation using the commercial-use SCOs. Further, use of the unrestricted-use SCOs for this site would also require extensive additional delineation sampling, likely resulting in an impracticably large quantity of soil volume requiring remediation that would be materially larger than currently estimated using the existing data. Consequently, Sun Chemical and ENVIRON conclude that attainment of the unrestricted-use SCOs would be infeasible. Conversely, attainment of the commercial use SCOs would be practicable at the site, both based on the relatively limited and well-defined extent of such contamination (which is consistent with the locations of historical industrial activities) and with the current site zoning. Consequently, discussions of the soil data herein are presented relative to the commercial-use SCOs only.

2.5 Findings in Areas of Concern

Analytical results of the August-October 2006 site characterization and remedial investigation programs are summarized below for each of the 17 AOCs. As indicated, based on the scope of sampling and the absence of constituent concentrations above commercial-use SCOs (including after the IRM), Sun Chemical and ENVIRON believe that no further action is warranted in AOCs 1, 6 through 12 and 17. Further, Sun Chemical and ENVIRON conclude that although constituents are present above commercial-use SCOs in AOC 3, 4 and 5, additional sampling is not warranted prior to remediation of those areas given the relatively limited volume of remaining soils following completion of the IRM in adjacent soil areas. Last, delineation sampling is proposed in Section 7 to define constituent concentrations above the commercial-use SCOs in AOCs 2, 14 and 15. The additional actions proposed for AOC 2 will also address borings B1301 and B1606, the only locations within AOCs 13 and 16 that require further action.

2.5.1 AOC 1 – Former Shooting Gallery

AOC 1 is the location of a former shooting gallery, identified on the 1898 Sanborn Fire Insurance map for the Site. Although the predominantly residential character of adjacent property lots at that time suggested that live ammunition was not used at this shooting gallery, Sun Chemical nonetheless evaluated this area to determine if shooting activities resulted in impaired soil quality. ENVIRON advanced six borings in this AOC. The first two borings, B101 and B102, were completed in August 2006 for initial characterization and were advanced to a depth of 4 feet. Three soil samples were obtained from each location and analyzed for PPMs and barium. In addition, analyses for TCL VOCs were completed to provide additional data regarding VOC conditions at the Site. Borings B103 through B106 were completed in October 2006, with soil samples collected from each of these borings from one or two intervals. These samples were analyzed for PPMs plus barium, with soil samples from boring B106 (from 1.5-2.0' and 3.5-4.0') also analyzed for SVOCs to assist in the characterization of this portion of the Site and adjacent AOC 14.

Notably, there was no visual evidence of ammunition or other anthropogenic materials at these six borings. Analytical results of this sampling indicated that VOCs and SVOCs were generally not detected but when present, were well below commercial-use SCOs. Similarly, although metals were detected, none was detected at a concentration exceeding its commercial-use SCO. This absence of metals contamination, and in particular, lead contamination, indicates that the "shooting gallery" does not require further action.

2.5.2 AOC 2 – Former Railroad Tracks at Eastern Parking Lot

AOC 2 is the location of the former Staten Island Railroad/Rapid Transit railroad lines, and the associated rail spurs formerly servicing the Site. Soil samples were collected from AOC 2 from borings B201 through B204 and from MW5. Given concerns regarding impacts from historic loading/unloading operations, and constituents often associated with operating rail siding, soil samples from AOC 2 were analyzed for PPMs, barium and SVOCs. Soil samples from these borings were obtained from six-inch intervals generally at the soil surface (underlying the asphalt pavement) and from approximately 1.5-2.0'. In addition, deeper samples were collected from B202 (3.5-4.0'), B204 (2.0-2.5') and MW05 (3.5'4.0'). In addition, soil samples from boring B1606 and MW2, completed east of the Red Wing (see below under "AOC 16"), also provide

data relevant to AOC 2. Soil samples were collected from B1606 at 2.0-2.5' and 3.5-4.0', and from 2.0-2.5' and 4.0-4.5' from MW2.

There were scattered detections of polycyclic aromatic hydrocarbons (PAHs) at these six locations, including concentrations of benzo(a)pyrene above the commercial-use SCO in both intervals at boring B202 and the upper interval at B203. Metals were also detected but exceeded SCOs only in the upper interval at B203 and at 2.0-2.5' at B204, B1606 and MW2. Based on these data, additional sampling is needed to delineate concentrations of PAHs and metals. That sampling is proposed below in Section 6.

2.5.3 AOC 3 – Former Blue Pulp Aboveground Storage Tank South of Blue Wing

AOC 3 is the location of the former blue pulp aboveground storage tank south of the Blue Wing, evident on Sanborn Fire Insurance maps dating from 1937, 1950 and 1962. Soil boring B301 was completed in August 2006 directly south of the former tank location. The two soil samples from B301 (from 0.3-0.8' and 2.0-2.5') were analyzed for PPMs and barium. ENVIRON also completed boring B302 in October 2006 to the southwest of the former tank location, with one sample collected from 1.0-1.5' for PPM and barium analysis. Due to the existence of underground utility lines (particularly water and wastewater lines), as well as elevated concrete pads for former tanks, other locations proximate to the former tank area were not accessible.

Arsenic, barium and/or lead were detected in the upper sample from B301 and the sample from B302 at concentrations exceeding commercial-use SCOs. The potential source of arsenic is unclear. As discussed below, the only other arsenic concentrations above the commercial-use SCO detected at the Site were in proximity to AOC 3 (i.e., in AOC 4 and beneath the Storage Building, indicating that arsenic contamination is localized. Given that IRM activities, discussed below in Section 4, addressed soils immediately to the north and south of AOC 3 (as well as AOCs 4 and 5), further sampling is not needed prior to remediation of this portion of the site.

2.5.4 AOC 4 – Former Bichromate Aboveground Storage Tank South of Blue Wing

AOC 4 is the location of the former bichromate aboveground storage tank south of the Blue Wing. This tank is evident on Sanborn Fire Insurance maps dating from 1937, 1950 and 1962. Boring B401 was completed in August 2006, with a sample for PPM and barium analysis collected from 1.5-2.0'. ENVIRON also completed boring B402 in October 2006. Two soil samples were collected from B402 for PPM and barium analysis, including from 1.0-1.5' and 2.0-2.5'. Arsenic, barium and/or lead were detected in each of these samples at concentrations above commercial-use SCOs. As noted above, given the extent of IRM activities north and south of AOC 4, further sampling is not needed prior to remediation of this area.

2.5.5 AOC 5 – Former Acid Aboveground Storage Tank South of Blue Wing

AOC 5 is the location of the former acid aboveground storage tank south of the Blue Wing. This tank is evident on Sanborn Fire Insurance maps dating from 1937, 1950 and 1962. Although the information indicated that only acid was stored in this tank, rather than inorganic pigments, soil samples were collected from MW3 for PPM and barium analysis from 0.2-0.7' and 1.5-2.0'. Barium was detected in both samples at concentrations above the commercial-use SCO. As

noted above, given the extent of IRM activities north and south of AOC 5, further sampling is not needed prior to remediation of this area.

2.5.6 AOC 6 – Former Acid Aboveground Storage Tanks South of Red Wing

AOC 6 is the location of the former acid aboveground storage tanks south of the Red Wing (the pad remained until the demolition). These tanks are evident on Sanborn Fire Insurance maps dating from 1937, 1950 and 1962. ENVIRON completed boring B601 adjacent to the pad and collected a soil sample in August 2006 from 1.8-2.0 feet for PPM and barium analysis. Additional samples were collected proximate to B601 in October 2006 at borings B602 (2.0-2.5') and B603 (1.0-1.5'). These samples were also analyzed for PPMs and barium. In addition, three other borings (B604, B605 and B606) were completed in the courtyard where AOC 6 is located. Soil sampling was completed at those borings to more broadly characterize soil quality associated with the former AST as well as to determine soil conditions in areas that were historically used for raw material and finished product handling and storage. Soil samples were collected from 1.5-2.0 feet at each location, as well as from 3.5-4.0' and 4.0-4.5' at B604. All of these soil samples were also analyzed for PPMs and barium, with the samples from B604 also analyzed for SVOCs. Other than negligible concentrations of bis(2-ethylhexyl phthalate) below the commercial-use SCO, SVOCs were not detected. Metals present above commercial-use SCOs included barium and lead at B601, B602, B603 and B606. In addition, arsenic and mercury concentrations above commercial-use SCOs were identified at B606.

As discussed below, the IRM addressed soils in the courtyard area, in which B601, B602, B603 and B606 were completed. Post-excavation sampling confirmed that metals concentrations were below commercial-use SCOs. In addition, three other soil samples (SP01, SP02 and SP03) were collected during the IRM from the former location of the Red Wing as additional confirmation of soil quality. Metals were below commercial-use SCOs in those samples. Given those data, and the absence of exceedances of SCOs at B604 and B605, Sun Chemical and ENVIRON believe that no further action is warranted in AOC 6.

2.5.7 AOC 7 – Former Chrysophenine Plant

AOC 7 is the location of the former chrysophenine plant evident on the 1937 Sanborn Fire Insurance map. This structure was located along the southern property boundary, partially beneath the later locations of the machine and carpentry shop, Blue Wing ice plant and the storage building. ENVIRON completed three soil borings to evaluate soil conditions at the former chrysophenine plant, including borings B701 and B702 in August 2006, and boring B703 in October 2006. The first two borings were advanced to 4 feet, and soil samples collected from 0.5-1.0' and from a six-inch interval between 1 and 2 feet. These samples were analyzed for TCL VOCs, PPMs and barium. One soil sample was collected from Boring B703 (0.5-1.0') for PPM and barium analysis. VOCs were not detected in this AOC. The only metal exceedance was barium in the upper interval at B701.

As discussed below, B701 was located within an area ultimately addressed as part of IRM activities associated with the three former Sun Chemical buildings along the southern property boundary. Analytical results of post-excavation samples confirmed that barium concentrations

are below the commercial-use SCO. As such, Sun Chemical and ENVIRON believe that no further action is warranted in AOC 7.

2.5.8 AOC 8 – Former Southern Material Storage Area

AOC 8 is the location of the former southern material storage area, located east of the machine and carpentry shop. One boring, B801, was advanced in that area in August 2006. Two soil samples were collected from that boring from 0.5-1.0' and 2.0-2.5 feet for PPM and barium analysis. In addition, the deeper soil sample was also analyzed for TCL VOCs. No VOCs were detected and no metals were identified at concentrations above commercial-use SCOs. Accordingly, Sun Chemical and ENVIRON believe that no further action is warranted in AOC 8.

2.5.9 AOC 9 – Former Drum and Bag Storage Area

AOC 9 is the location of the former drum and bag storage area, including the rainwater and spill containment sump. A portion of this area also includes the location of two former caustic aboveground storage tanks. A total of five soil borings (B901 through B905) were completed in this AOC in August 2006. Two soil samples were collected from each boring, generally from the soil surface and a deeper interval between 2 and 3 feet below grade. These soil samples were analyzed for TCL VOCs, PPMs and barium. VOCs were generally not detected, but where present, were identified at *de minimis* concentrations were below commercial-use SCOs. Similarly, no metals were detected at concentrations exceeding SCOs. Accordingly, Sun Chemical and ENVIRON believe that no further action is warranted in AOC 9.

2.5.10 AOC 10 – Blue Wing Filter Press Wastewater Conveyance Components

AOC 10 consists of the wastewater conveyance components specifically associated with the six Blue Wing filter presses (Presses 1 through 6). As described in prior reports submitted to NYSDEC, wastewater was mechanically removed from pigment slurries at these filter presses. The wastewater at these Blue Wing filter presses drained to a concrete floor (some epoxy-coated), with areas of overlying acid-resistant brick, and to trench drains located in front/north of the presses as well as behind/south of the units. These drains directed the wastewater to the on-site wastewater treatment plant.

As part of its annual maintenance program at the facility, completed over a two-week period each July, Sun cleaned, inspected and, if necessary, repaired the production-area floors, including floors beneath the filter presses. The goal of this annual maintenance program was to identify and mitigate any areas where the flooring may have become worn or damaged during the prior year. All damaged and/or worn areas, including floors beneath the filter presses, were then repaired (consistent with OSHA requirements [e.g., to address potential trip hazards] given that employees worked in the areas beneath the presses). During each maintenance shutdown, most recently in July 2007, Sun Chemical also completed a thorough cleaning of the floors using high-pressure water.

Based on ENVIRON's most recent inspection of flooring in the Blue Wing press area in July 2007, there had been surficial wear to the concrete and acid brick flooring, including spalling and cracking. However, ENVIRON's physical inspections of those areas revealed that all wear appeared to be superficial, not penetrating the floor. These observations were consistent with

information provided by Sun Chemical indicating that there had been no significant damage identified to the flooring and trenches associated with the Blue Wing filter presses over time. As such, because there was no evidence of deterioration such that would enable releases of pigment liquids to the underlying soil, sampling was not considered necessary at this AOC. However, sampling was ultimately completed through the Blue Wing slab at locations SB14, SB14A and SB15 as part of the pre-demolition sampling discussed below in Section 3, and based on those data, remediation was conducted as part of the IRM (see Section 4). In light of the IRM activities and resulting post-excavation sampling results discussed herein, soils in AOC 10 have been fully addressed such that no further action is needed with respect this AOC.

2.5.11 AOC 11 – Red Wing Filter Press Wastewater Conveyance Components

AOC 11 consists of the wastewater conveyance components specifically associated with the ten Red Wing filter presses (Presses 10, 51, and 54 through 61). Pigment slurries generated in the Red Wing were dewatered in these filter presses in the same manner as described above for the Blue Wing. The floor inspection processes were the same as described above for AOC 10 and, as with that AOC, no significant damage to the flooring and trenches has been identified in the Red Wing filter press area and thus, any release of pigment liquids to the underlying soil was unlikely. Consequently, sampling was not performed at AOC 11.

However, certain soils beneath the Red Wing slab were ultimately addressed as part of the IRM (see Section 4). In light of the IRM activities and resulting post-excavation sampling results discussed herein, soils in AOC 11 have been fully addressed such that no further action is needed with respect this AOC.

2.5.12 AOC 12 – Two Former 25,000-Gallon No. 6 Fuel Oil Underground Storage Tanks

AOC 12 is the location of the two former 25,000-gallon No. 6 fuel oil USTs near southeastern property corner. These tanks, and adjacent soils, were removed in 1993. Post-excavation soil samples were collected and petroleum constituents were not detected at levels of concern. Based on those analytical results, NYSDEC approved no further action (NFA) for the tank closures in 1994. In light of the prior soil findings and the Department's 1994 NFA approval, soil sampling was not necessary in this AOC. However, as discussed below under "AOC 13" and "Groundwater", soil and groundwater sampling was completed immediately southeast and downgradient of this AOC for other purposes. That sampling did not identify UST-related contamination, supporting the prior NFA approval.

2.5.13 AOC 13 – Former Coal Pile

AOC 13 is the location of the former coal pile located at the southeastern property corner. This pile is evident on Sanborn Fire Insurance maps dating from 1917 and 1937, and was associated with the coal-fired boilers shown on those maps. The location of this pile largely coincides with footprint of AOC 12, the two former 25,000-gallon No. 6 fuel oil USTs. As discussed above under "AOC 12", these tanks and adjacent soils were remediated in 1993, and the excavation backfilled with certified clean fill. Given that potential impacts, if any, associated with former coal storage would be present in surface soils, the UST remedial action described above in AOC 12, would have adequately addressed any coal pile-related contamination existing within the excavation boundary. Accordingly, ENVIRON targeted only one location, beyond the

boundary of the UST excavation, for soil sampling to evaluate soil quality within the former coal pile storage area.

Boring B1301 was completed within the footprint of the former coal pile. Two soil samples were obtained from this boring (1.5-2.0', the interval below crushed stone fill underlying the asphalt pavement, and 3.5-4.0') and analyzed for TCL VOCs and SVOCS, PPMs and barium. VOCs were not detected, and although certain SVOCs were identified in both samples, the reported concentrations were below commercial-use SCOs. Arsenic was detected in both samples above the commercial-use SCO, the only metal present above those levels. In light of the proximity of B1301 to the former railroad lines in AOC 2, additional sampling in AOC 13 will be addressed through the planned actions in AOC 2, proposed below in Section 6.

2.5.14 AOC 14 – Former Caustic Release Area

AOC 14 is the on-site portion of the former caustic release area. As discussed above and in documents previously submitted to NYSDEC, available documentation regarding that release indicates that regulatory authorities were satisfied with the remedial action undertaken to address the release. However, sampling related to contemporaneous excavation of soils in this area identified other constituents (i.e., lead, bis(2-ethylhexyl)phthalate and PCBs) most likely related to other industrial activities. Additional soil sampling was therefore completed in 2006 to evaluate the nature and extent of those and other constituents. Specifically, ENVIRON completed four soil borings in August 2006 (B1401 through B1404). Soil samples were collected from each boring for TCL SVOC, PCB, PPM and barium analyses. These samples were obtained from the soil surface, with a sample also obtained an underlying six-inch interval at each boring, except B1403. ENVIRON also completed seven borings in October 2006 (B1405 through B1411). As with the initial borings, soil samples were collected from two depths, including the soil surface and a deeper interval between 3.5 and 4.0 feet. These samples were also analyzed for TCL SVOCs, PCBs, PPMs and barium. In addition, the soil samples from B1407, the westernmost of the AOC 14 sampling points, were also analyzed for VOCs to provide broader understanding of potential VOC concentrations across the Site.

VOCs and SVOCs, where detected, were present only at concentrations below the commercial-use SCOs, with the exception of PAHs at B1407 and B1408. Notably, phthalates were not identified above commercial-use SCOs. There were also scattered concentrations of arsenic, barium and copper above SCOs at borings B1405 through B1408. Last, PCBs were identified above the commercial-use SCO at borings B1401, B1402, B1403, B1406, B1407, B1408 and B1410. Based on these data, additional sampling is needed to delineate concentrations of SVOCs, PCBs and metals. That sampling is proposed below in Section 6.

2.5.15 AOC 15 – Former Aboveground Acid Storage Tanks

AOC 15 is the location of the former acid ASTs adjacent to the western end of the Blue Wing. Based on information indicating that during a prior excavation related to the installation of these tanks, discolored soils were observed, two soil borings, B1501 and B1502, were completed in this area in October 2006. Two soil samples were obtained from each boring and analyzed for PPMs and barium. Other than the lead concentrations in the upper sample at B1501, no metals

were present above commercial-use SCOs. Delineation sampling in this AOC is proposed below in Section 6.

2.5.16 AOC 16 – Wastewater System

AOC 16 was the underground piping associated with the facility wastewater system; this system is distinct from the drainage system components specifically associated with the filter presses (i.e., features discussed under AOCs 10 and 11). Based on discussions with Sun Chemical regarding the wastewater system, ENVIRON identified certain areas where given prior underground wastewater line repairs or replacement, there were concerns regarding potential leakage. Three such areas were identified and were targeted for sampling to evaluate soil conditions. That sampling consisted of completing six soil borings (B1601, and B1603 through B1607). These areas, and the borings completed therein, included: (1) the original main wastewater discharge line located north of the Red Wing (B1601); (2) trenches in the refrigeration area where water seeped into the underlying basement (B1603, B1606 and B1607); and (3) wastewater lines north of Presses 60 and 61 on the western end of the Red Wing (B1604 and B1605).

At each of these locations, soil samples were collected from two depths, typically 2.0-2.5' (the approximate depth of piping inverts) and 3.5-4.0', for PPM and barium analysis. Based on observations made of the soil cores, ENVIRON did not note evidence of wastewater leakage (e.g., stained soils).

Metal concentrations above commercial-use SCOs (i.e., barium, cadmium, lead and nickel) were reported at B1604 through B1607. As discussed below in Section 4, the IRM addressed soils at locations B1604, B1605 and B1607. Analytical results of associated post-excavation soil samples documented metals concentrations below commercial-use SCOs at these borings such that no further actions are needed. Delineation sampling near B1606 will be addressed as part of further actions in AOC 2, given the proximity of that boring to the rail lines.

2.5.17 AOC 17 – Former Aboveground Fuel Oil Storage Tank

AOC 17 is the location of the former fuel oil AST installed in 1993. This tank is contained within a secondary containment enclosure. Sun Chemical is not aware of any releases or other issues of potential concern associated with this AST. Accordingly, soil sampling was not performed at this AOC.

However, as a means to confirm the integrity of the secondary containment enclosure, MW4 was installed directly southeast of this AOC to conduct groundwater sampling. The results of that sampling, discussed below in Section 2.4, indicated that petroleum constituents were not present in groundwater at MW4 and therefore there is no evidence of releases from the tank. Accordingly, this AOC requires no further action. The tank was removed as part of the 2008 demolition program. The retaining wall and associated concrete pad will be removed as part of a subsequent phase of remedial action.

2.6 Groundwater

2.6.1 Geology and Hydrogeology

A total of eight monitoring wells have been installed at the Site. Based on the Site topography and location of nearby surface water bodies to which shallow groundwater at the Site likely discharges, ENVIRON concluded that a southeasterly groundwater flow direction was likely. Accordingly, in August 2006 ENVIRON installed wells MWs 1 and 5 at the presumed upgradient and downgradient corners of the Site, respectively. MWs 2 and 4 were installed near and downgradient of the Blue Wing and Red Wing, the two primary sections of the main building. In addition, MW3 was installed proximate to and downgradient of former pigment aboveground storage tanks along the southern side of the Blue Wing, the primary Blue Wing sub-floor industrial wastewater system components, and the confluence of underground wastewater lines prior to aboveground piping into the former wastewater neutralization system. These five wells were completed to monitor the first saturated zone, which given the variations in Site topography was encountered at depths ranging from approximately 5 feet at MW5 to 35 feet at MW3. Logs for these and the other monitoring wells at the Site are included in Appendix A.

Groundwater elevations were measured at these wells on September 11, 2006 and confirmed a southeasterly groundwater flow direction. Given the initial groundwater data (discussed below), ENVIRON installed three additional wells in October 2006, including MWs 6 and 7 at the southwestern and northeastern corners of the Site to better understand groundwater quality upgradient of the Site (MW6) and at the downgradient corner of the Site where a well had not yet been installed (MW7). In addition, because MW5 was screened above a peat layer and was determined to likely monitor a perched water interval, ENVIRON installed a deeper well, MW5D at this location. That deeper well was installed as a double-cased well, and was drilled with mud rotary drilling techniques to a final depth of 20 feet.

As indicated in the logs, unconsolidated soils were encountered to the maximum drilling depth of 35 feet. These soils consisted of clayey silt and sand, with minor coarser layers. Soils encountered during the IRM were of the same consistency, with occasional boulders present. As noted above, a peat layer was also encountered in the southeastern portion of the site at MW5. The presence of a peat layer and the associated perched water appears to be localized given that these conditions were not evident at nearby MW4, completed at the same topographic elevation approximately 130 feet to the west-northwest.

Groundwater elevations were measured on October 17, 2006. This more comprehensive measurement event confirmed that groundwater flows in an overall southeasterly direction, as predicted based on local topography and surface water drainage patterns. The October 2006 groundwater elevations and interpreted contours are provided on Plate 4.

2.6.2 Groundwater Quality Summary

Groundwater samples were collected from MWs 1, 4 and 5 for TCL VOC, PPM and barium analyses on September 11, 2006; there was not enough water present in MWs 2 and 3 to enable sampling at that time. Analytical results from this sampling round identified scattered detections of VOCs, as shown in Appendix B and on Plate 4. The VOCs detected above NYSDEC Part 703.5 standards for Class GA groundwater were primarily chlorinated VOCs

(CVOCs), present both at upgradient well MW1 and at downgradient well MW4. Benzene was also present above the Part 703.5 standard at MW4. No VOCs were detected at MW5. Metals were typically detected at only trace concentrations, as shown in Appendix B.

An additional groundwater sampling round was completed on October 17, 2006, including sampling at all eight wells for TCL VOCs, PPMs and barium. Only one metal, nickel, was present above Part 703.5 standards and at only one well, MW3. VOCs were not detected at MW6 and MW7 but were identified at the other wells. The specific constituents included benzene and CVOCs at wells MWs 3 and 4, with lesser CVOC concentrations noted in MW5D (see Plate 4). Because the CVOCs detected at the highest concentrations in the September and October 2006 samples were primarily dichlorinated ethanes and ethenes, with potential parent VOCs (e.g., trichloroethylene or 1,1,1-trichloroethane) largely absent or degraded, it is likely that any release that may have resulted in the detected CVOC concentrations was not a recent event. As noted above, extensive soil sampling across the Site indicated that material VOC concentrations were not present in soil, including at these wells, such that a residual soil source is likely not present. The absence of any material PID readings observed during the IRM activities, including in the relatively deep Blue Wing excavations directly upgradient of MWs 3 and 4, further supports this conclusion.

Given that the October 2006 groundwater data are the most recent results available for the Site, current data are needed to evaluate the extent of any exceedances of Part 703.5 standards and the scope of any further actions that could be therefore required. Accordingly, groundwater sampling is proposed below as part of the RIWP.

3 June 2008 Pre-Demolition Remedial Investigation of Sub-Slab Soils

3.1 Introduction

As discussed in the IRM Work Plan, sub-slab soil sampling was completed prior to initiation of the building demolition program in June 2008. This sampling targeted all primary areas of the main production complex and associated buildings. As shown on Plate 1, the main building complex was constructed straddling a relatively steep, generally eastward-sloping hill, such that there was a level of production and storage spaces topographically lower than the main production floor of the Blue and Red Wings. These areas, primarily the Grind & Mix Department, the northern section of the Red Wing and the basement, were located north and east of a load-bearing interior retaining wall, also shown on Plate 1. The main production floor and associated hallways and other spaces extended over these lower areas.

The pre-demolition soil sampling locations are shown on Plate 3. Soil samples were collected from a total of 29 interior locations, including 26 borings in the main building complex (SB-1 through SB-22, SB-14A, and SB-26 through SB-28), two borings in the Maintenance and Carpentry Shop (SB-23 and SB-24) and one boring in the Storage Building (SB-25). The 26 borings in the main building complex were completed in all four primary building areas, including nine borings in the Red Wing (SB-1 through SB-6 and SB-26 through SB-28), ten borings in the Blue Wing (SB-7 through SB-15, and SB-14A), three borings in the Grind and Mix Department (SB-16 through SB-18) and four borings in the basement (SB-19 through SB-22). Sub-slab sampling was not completed in the Powerhouse/Boiler Building or the Warehouse primarily because liquid industrial materials were not widely handled in those buildings and there had been no discharges of industrial wastewater to sewers under those slabs. Further, historical activities at the property prior to facility construction in these portions of the Site were not of potential environmental concern.

3.2 Sub-Slab Remedial Investigation

3.2.1 Scope of Sub-Slab Soil Sampling Program

At each soil sampling location, a soil sample was collected from the six- to 12-inch interval beneath the concrete floor/building slab and underlying crushed stone sub-base. Samples were also obtained from deeper intervals, typically from 2.0-2.5 feet and 4.0-4.5 feet, unless there was evidence of impact, where deeper intervals were targeted for sampling based on soil conditions specific to that location. At locations where no evidence of contamination was observed, the upper soil sample was analyzed for PPMs+Ba, and the deeper samples held pending receipt of the initial data. The deeper soil samples were analyzed for PPMs+Ba only if any metals were detected in the upper sample above commercial-use SCOs.

Additionally, where evidence of potential contamination was observed, select samples were analyzed for the expanded parameter list (i.e., TAL metals, TCL SVOCs+25, TCL VOCs+15, pesticides, PCBs and cyanide). Unlike the approach discussed above for the metals analyses, analyses were performed for the full parameter list to provide a more complete assessment of soil quality at these locations. These analyses for all Part 375-regulated constituents, addressing preliminary NYSDEC comments received on October 2, 2008 regarding the September 2008 IRM Work Plan and specifically, to the proposed pre-demolition soil sampling.

These expanded analyses were also responsive to recommendations in DER-10 (Section 2.1(h)2).

3.2.2 Findings of Sub-Slab Soil Sampling Program

Analytical results of the initial sub-slab soil sampling program were compared to the commercial-use SCOs and additional analyses conducted, as needed, to complete delineation of constituent concentrations above those objectives. The analytical results obtained as part of this program were consistent with results of the 2006 site characterization and remedial investigation. In particular, only certain metals (i.e., barium, copper, lead and nickel) and one TCL BN (hexachlorobenzene) were detected above commercial-use SCOs. The sub-slab sampling confirmed that VOCs, PCBs, PAHs, pesticides, phenolic compounds, cyanide and the other metals were generally not detected, but where present, were identified at concentrations below commercial-use SCOs.

Following an overview of field screening results and visual observations, analytical results for the sub-slab sampling program are summarized below; data for metals, the primary site contaminants, are presented separately. Where appropriate, analytical results are also presented for sampling locations 1604 through 1607, the four sub-slab sampling points completed in the Red Wing in October 2006.

3.2.2.1 Field Screening and Visual Observations

Soil staining and elevated PID readings were noted in two areas, including a section of the Blue Wing and in a secondary production area of the Red Wing, suggesting that contamination was potentially present at these locations. In the Blue Wing, red, blue and/or green soil staining was observed at borings SB-10 through SB13 and SB-14A. This staining was most pronounced in the more shallow intervals, diminished in degree with depth, and was no longer evident at depths ranging from 5 feet at SB-11 and SB-12 to 8 feet at SB-13 and SB-14A. These stained soils exhibited no strong odors (other than a paint-like odor in shallow green-stained soils at SB-14A), elevated PID readings or other evidence of contamination. In light of these observations, ENVIRON proceeded with analyses for the full parameter list on the three soil samples obtained from borings SB-10 and SB-13 (six samples total) where the most staining was observed. These analyses targeted both the stained intervals and an underlying horizon where the staining was absent. In addition, the upper soil sample from SB-14A was analyzed for the full parameter list given the odors noted at that boring, and the presence of green staining that had not been observed at other locations in the Blue Wing.

The other potentially impacted location was identified in the northern section of the Red Wing where elevated PID readings were recorded at boring SB-27 to a maximum level of 87 ppm at 7.5-8.0 feet and at SB-28 to a maximum level of 53 ppm at 0.5-1.0 feet. At these locations, PID readings were generally non-detect in intervals only slightly deeper than those in which the maximum PID readings had been recorded. Given these observations, ENVIRON proceeded with analyses for the full parameter list on both soil samples collected from SB-27 (i.e., from 0.5-1.0' and 7.5-8.0') as well as on the interval at SB-28 (0.5-1.0'); these analyses targeted the interval at each boring where the highest PID reading was noted.

Last, although conditions suggestive of potential contamination were not identified beneath other slab areas, three additional samples were analyzed for the expanded parameter list to provide a more site-wide understanding of soil quality, as recommended by NYSDEC. These samples included those from the upper sampling intervals at borings SB-2, SB-17 and SB-20.

3.2.2.2 Metals

Analytical results from this sampling program indicate that, in general, metals were not detected above commercial-use SCOs. In fact, there were only scattered exceedances reported at eight of the recent borings, including SB-10 through SB-13 (Blue Wing), SB-16 and SB-17 (Grind & Mix Department), SB-25 (Storage Building) and SB-28 (Red Wing). Six metals were detected above commercial-use SCOs, including arsenic, barium, chromium, copper, lead and nickel. In addition, four metals (barium, cadmium, nickel and lead) were detected above commercial-use SCOs at borings B1604, B1605 and B1607 completed in October 2006 on the main level of the Red Wing.

As indicated on Plate 3, barium and lead were most often detected above the commercial-use SCOs, identified in ten and seven samples, respectively. In addition, barium and lead exceedances co-occurred in four sampling intervals at three contiguous borings, SB-11, SB-12 and SB-13. The other five metals were detected above the commercial-use SCOs in only one to three samples each. The copper and chromium exceedances coincided with barium and/or lead exceedances, whereas arsenic, cadmium and nickel concentrations above the commercial-use SCOs were most often isolated, with no other metal impacts identified.

Based on these analytical results, the following conclusions can be reached regarding metals contamination beneath buildings with respect to the scope and nature of IRM activities:

- Metals contamination is present in discolored soil in the upper sampling intervals at contiguous locations SB-10 through SB-13. This discoloration likely results from former pigment manufacturing activities, although the specific source of the staining is not known. However, given its proximity to an underground sewer line, this contamination may have resulted from leakage from the drains. The layout of known industrial sewer system components at the Site is provided on Plate 1. Concentrations of metals were below commercial-use SCOs in the deepest sampling intervals analyzed at SB-10, SB-12 and SB-13, in which staining was not observed. Conversely, the barium concentration exceeded the commercial-use SCO in the deepest sample from SB-11, where soil discoloration was apparent. These data therefore suggest that in the vicinity of these locations, the presence of this soil discoloration can be used as an indicator of metals contamination for purposes of soil removal during the IRM.
- Stained soils at boring SB-14A also likely result from former industrial wastewater discharges given that this boring was completed proximate to an underground 8-inch PVC sewer line. Although metals contamination was not detected in green-stained soils at SB-14A, given that not all significantly stained intervals at this boring were characterized, the other data from soils beneath the Blue Wing suggest that soils at SB-14A with significant pigment staining should be presumed to be metals-impacted absent data to the contrary.

- Barium impacts were detected in surface soils at borings SB-16 and SB-17 in the Grind & Mix Department. The absence of barium impacts in the deeper sampling interval from 2.0-2.5' at these locations, and the marked decline in barium levels with depth, indicates that barium contamination at these locations is limited to surface and near-surface soils. This distribution of contamination suggests that the barium contamination likely results from surficial activities, such as potential leakage through the concrete flooring, rather than discharges from any drains.
- Arsenic contamination was identified in the three sampling intervals at boring SB-25 at the Storage Building. A lead concentration of 1,750 ppm, above the commercial-use SCO, was also detected in the upper sampling interval. This boring is the only location at which arsenic impacts were identified during the most recent sampling round. However, elevated near-surface arsenic concentrations above the commercial-use SCO (ranging from 30.8 to 559 ppm) were previously identified at borings B301, B302, B401 and B402 completed in 2006 directly north and northwest of SB-25. Arsenic concentrations above the commercial-use SCO were also detected at other, scattered locations sampled in 2006. The source of elevated arsenic concentrations at and near SB-25, as well as at other locations at the Site, is not known at this time. However, other metals contamination generally did not coincide with arsenic impacts (other than one elevated barium concentration and four elevated lead concentrations). This, and the lack of any soil discoloration at SB-25, suggests that the arsenic derives from activities distinct from pigment production operations previously occurring in other portions of the Site.
- Nickel contamination was detected at SB-28 and B1604, the only locations where such contamination was identified. The isolated occurrence of those concentrations, and the relatively similar levels with depth, suggest that the nickel concentrations are likely not associated with surficial industrial operations.

3.2.2.3 Organic Constituents

Analytical results from the SRI indicated that VOCs, SVOCs, PCBs, pesticides, and cyanide were either not detected or where present, were identified at concentrations well below the commercial-use SCOs, except for a single detection of hexachlorobenzene in the upper sampling interval at boring SB-10. In addition, tentatively identified compounds (TICs) were not reported for the VOC and SVOC analyses, except for several negligible concentrations. Sun Chemical and ENVIRON believe that these data demonstrated that with the possible exception of certain Blue Wing soils, organic constituents are not of concern for sub-slab soils that were encountered during planned demolition activities such that no additional analyses for these parameters were warranted. However, as discussed below in Section 4, Sun Chemical proposed that soils identified during demolition activities would be screened for evidence of contamination, with any potentially impacted soils identified, other than those locations already sampled, evaluated through additional sampling.

4 Qualitative Exposure Assessment

4.1 Introduction

In accordance with the guidance provided in DER-10 Section 3.14(b)17, a qualitative exposure assessment is to be included in a Remedial Investigation Report. Accordingly, ENVIRON conducted an assessment based on the guidance provided in Appendix 3B in DER-10. This assessment evaluated site conditions to determine the potential presence of an exposure pathway, which per DER-10 consists of the following five components:

- A contaminant source, the known release or discharge, or in the case where a specific source is not known, such as in the case of contamination from historical industrial operations, the impacted environmental media.
- Contaminant release and transport mechanisms, the means by which constituents at a contaminant source can be carried to potential receptors.
- A point of exposure, the actual or potential physical location at which a person may come in contact with site contaminants.
- A route of exposure, the means by which contaminants enter the human body (i.e., direct contact, ingestion or inhalation).
- A receptor population, those individuals who are or may become exposed at the point of exposure.

An exposure pathway is confirmed when all five components are documented as present. The possible presence of these components for the Site are discussed below. As indicated, although certain components are present, Sun Chemical and ENVIRON have not identified the presence of all five components for either soil or groundwater, such that no exposure pathways are documented for either environmental medium.

4.2 Qualitative Exposure Assessment – Soil

4.2.1 Contaminant Source

Constituents have been identified in soils at concentrations exceeding commercial-use SCOs. In light of the IRM activities completed at the Site, and the planned redevelopment of the Site for commercial or retail purposes, the remaining contaminant sources include soils underlying remaining asphalt and concrete pavement and in other subsurface soils. Given that surface soils do not contain constituent at concentrations above these SCOs, they are not considered a contaminant source.

4.2.2 Contaminant Release and Transport Mechanisms

Given that the contaminant source is present beneath pavement or soil cover, potential release and transport mechanisms that might otherwise be applicable to soils (e.g., storm water runoff and wind-borne transport of soil particulates) are not considered relevant for this site. Accordingly, there are no transport mechanisms for contaminated soils.

4.2.3 Point of Exposure

Points of on-site exposure are unlikely given that the contaminant source is subsurface and because the site has 24-hour security and complete perimeter fencing to prevent unauthorized entrance to the property.

4.2.4 Route of Exposure

The Site is currently fenced and secured to preclude unauthorized personnel from entering the Site. Further, as part of their prescribed activities, guards do not enter areas overlying soil contamination. As such, direct contact and ingestion of Site soils would not be reasonably anticipated. Inhalation is also not a reasonably anticipated route of exposure because the contaminant source is not present at the surface.

4.2.5 Receptor Population

Given the absence of any potentially relevant routes of exposure, there is no receptor population identified for site soils.

4.2.6 Conclusion

In light of the above, Sun Chemical and ENVIRON believe that no exposure pathway exists.

4.3 Qualitative Exposure Assessment – Groundwater

4.3.1 Contaminant Source

Benzene and certain CVOCs were previously detected in groundwater above Part 703 standards based sampling completed in 2006. More recent data are not available and thus, it is unknown whether any of these constituents remains at concentrations above Part 703 standards. The source for these constituents is not known.

4.3.2 Contaminant Release and Transport Mechanisms

VOCs, if any, in groundwater could be transported via the off-site migration of groundwater, and associated dispersion of VOCs into soil vapor.

4.3.3 Point of Exposure

For groundwater, there are no potential on-site exposure points. Off-site exposure points potentially exist, although, as indicated below, there is no evidence that any such exposure actually occurs.

4.3.4 Route of Exposure

Direct contact and ingestion are not potential routes of exposure for groundwater in that there is no local use of groundwater for domestic or industrial supply. Inhalation could be a potential route of exposure if groundwater contaminants enter occupied off-site buildings. However, such exposure would not reasonably be expected given that only very low-level VOC concentrations were detected on-site, the decreasing trend in those concentrations toward the downgradient property boundary, and the distance from the property boundary to the dwellings.

4.3.5 Receptor Population

Occupants of buildings adjoining the downgradient property boundary represent the potential receptor population.

4.3.6 Conclusion

In light of the above, Sun Chemical and ENVIRON believe that no exposure pathway exists. This conclusion will be confirmed through completion of confirmatory groundwater sampling proposed below in Section 6, and related estimates of the downgradient extent of any identified contaminants.

5 Fish and Wildlife Resources Impact Analysis

In accordance with the guidance provided in DER-10 Section 3.10.1(a), this RIWP includes an evaluation of whether a fish and wildlife resource impact analysis (FWRIA) should be completed to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern. As specified in DER-10, Sun Chemical followed the methodology in DER-10 Appendix 3C, which provides a decision key enabling a party to determine whether an FWRIA is required based on certain site-specific parameters. The decision key and applicable responses for the Site are provided in Table 2. As indicated therein, based on the nature of the Site, the identified contamination and the nature of neighboring properties, Sun Chemical does not believe that an FWRIA is required at this time.

Table 2: Fish and Wildlife Resources Impact Analysis Decision Key – Appendix 3C from NYSDEC DER-10
Sun Chemical Corporation, 441-443 Tompkins Avenue, Staten Island, New York Site No. C243024

Decision Key Question	If YES Go to:	If NO Go to:	Sun Chemical Response
1. Is the site or area of concern a discharge or spill event?	13	2	**NO. See # 2.**
2. Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3	**NO. See # 3.**
3. Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9	**NO. See # 9. (NO selected given presence of semi-wooded Nicholas de Matti Playground property to the west.)**
4. Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5	
5. Has the contamination gone off site?	6	14	
6. Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14	
7. Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8	
8. Does contamination exist at concentrations that could exceed SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14	

**Table 2: Fish and Wildlife Resources Impact Analysis Decision Key – Appendix 3C from NYSDEC DER-10
Sun Chemical Corporation, 441-443 Tompkins Avenue,
Staten Island, New York Site No. C243024**

Decision Key Question	If YES Go to:	If NO Go to:	Sun Chemical Response
9. Does the site or any adjacent or downgradient property contain any of the following resources? a. Any endangered, threatened or special concern species or rare plants or their habitat b. Any NYSDEC designated significant habitats or rare NYS Ecological Communities c. Tidal or freshwater wetlands d. Stream, creek or river e. Pond, lake, lagoon f. Drainage ditch or channel g. Other surface water feature h. Other marine or freshwater habitat i. Forest j. Grassland or grassy field k. Parkland or woodland l. Shrubby area m. Urban wildlife habitat n. Other terrestrial habitat	11	10	**YES for RESOURCE "m" - "Urban wildlife habitat" – The semi-wooded Nicholas de Matti playground and park is located across Tompkins Avenue to the west.** **NO for all other listed resources.** **See # 11.**
10. Is the lack of resources due to the contamination?	Section 3.10.1	14	
11. Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12	**YES. There is no evidence suggesting that site-related contamination has migrated to the Nicholas de Matti playground property. See #14.**
12. Does the site have widespread soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	13	
13. Does contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact NYSDEC for information regarding endangered species.)	Section 3.10.1	14	
14. No Fish and Wildlife Resources Analysis needed.			

6 Interim Remedial Measures

6.1 Introduction

In late June 2008, Sun Chemical's subcontractor LVI/Mazzocchi Wrecking, Inc. (LVI/Mazzocchi) initiated demolition of the Site structures as part of Sun Chemical's cessation of operations and planned marketing of the property for sale. Demolition of all buildings (except the guardhouse) was completed on September 2, 2008. Following demolition of these buildings, Sun Chemical subsequently removed all building slabs, foundation members and retaining walls, completing that work in February 2009.

Given that the demolition activities would expose and disturb soils beneath the then-standing buildings, prior to any building demolition, Sun Chemical first completed sampling in early June 2008, as discussed in the preceding section, to identify any environmental impacts in soils underlying the buildings. The September 2008 IRM Work Plan was developed based in part on those data, detailing the procedures to be followed to address any known and potential soil conditions encountered during below-grade demolition activities. NYSDEC issued comments to the IRM Work Plan in correspondence to ENVIRON on September 25, 2008. Where appropriate, those comments, and actions that Sun Chemical took in response, are discussed in this section.

The remainder of this section discusses the IRM program in detail, including post-remedial sampling procedures and results, and site restoration activities. This section also identifies soil contamination within certain demolition project areas that Sun Chemical determined require additional characterization before remediation can properly proceed to completion.

6.2 Interim Remedial Measures

6.2.1 Soil Cleanup Goals and Remedial Action Objectives

As proposed in the September 2008 IRM Work Plan, soil remediation completed as part of the IRM was designed to address soils with constituent concentrations above the commercial-use SCOs, the soil cleanup goals (SCGs) selected for this program. These SCGs, provided by constituent category in Attachment A, are appropriate given the planned future commercial redevelopment of the Site and the current industrial zoning of those portions of the property where the IRM was conducted.

The primary remedial action objective (RAO) for the IRM was to prevent direct future contact with contaminated soil during site redevelopment. In addition, the IRM would prevent off-site migration (such as via storm water runoff) of any contaminated surface soils exposed as part of the demolition activities. These RAOs were achieved through excavation/removal and off-site disposal of soils with contaminant levels exceeding the SCGs. Areas with residual soil contamination were either not disturbed as part of the IRM or were covered with "clean" soils pending additional sampling (discussed herein).

The IRM also addressed any other soils that could not be reused on-site per NYSDEC regulations and other considerations. For example, all soils with significant pigment staining were disposed of off-site as contaminated media, regardless of actual chemical signature, given that: (1) available data obtained at the Site suggests that the presence of staining may indicate

coincident soil contamination (as discussed in Section 3) and (2) these soils may meet the NYSDEC definition of soils with nuisance characteristics. For purposes of this IRM, Sun Chemical therefore conservatively assumed that any soils with pigment staining required remediation.

6.2.2 Overall IRM Approach

Based on the nature of contamination and completion of the site remediation under the BCP, Sun Chemical proceeded with the IRM with the following overall components, as proposed:

- site preparation and re-surveying of prior soil sampling points;
- evaluation of potential permitting obligations;
- excavation and segregation of unsaturated-zone soils determined through prior soil sampling to contain metal concentrations exceeding NYSDEC's commercial-use SCOs;
- excavation and segregation of other unsaturated-zone soil that, based on visual observations during demolition activities exhibited indications of potential contamination;
- post-remedial soil sampling, and completion of additional soil remediation as needed based on the analytical results of those samples;
- waste characterization sampling of excavated soils, as needed for profiling of the waste at selected off-site disposal facilities;
- off-site disposal of contaminated soil and wastewater; and
- site regrading.

The scope of each of these interim remedial action components is discussed below.

6.2.3 Site Preparation

Analytical results of the prior soil sampling programs identified a total of ten sampling points beneath the main building complex and one location beneath the former storage building where concentrations of certain metals exceeded the commercial-use SCOs. In preparation for facility demolition, these and other sampling locations were surveyed on July 12, 2008 by Control Point Associates, Inc. (CPA) of Somerville, New Jersey. Based on the location of these points, ENVIRON defined the areas shown on Plate 3 where soils containing metal concentrations above the SCOs and pigment staining were known and assumed to be present. Plate 3 also indicates the assumed maximum depths of that contamination, based on prior sampling results and observations during the June 2008 sampling program. Following completion of above-grade demolition activities on September 2, 2008 and subsequent removal of accumulated demolition debris, these soil sampling points were again re-surveyed and the targeted remediation areas marked prior to the onset of slab removal.

6.2.4 Evaluation of Potential Permitting Obligations

Other than requisite New York City permits secured by LVI/Mazzocchi related to the demolition itself, Sun Chemical did not identify any additional permitting requirements related to the planned activities. The IRM Work Plan indicated that two permits were potentially required,

including those related to: (1) the USEPA National Pollution Discharge Elimination System Phase 2 storm water requirements and (2) the NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001). However, through subsequent evaluations, Sun Chemical and ENVIRON determined that the demolition program was exempt from these permitting requirements because the facility storm water drainage system discharges entirely to a combined sewer system. As NYSDEC is aware, soil erosion and sediment control provisions are one aspect of the referenced permits. Although those permits were not required for this project, Sun Chemical nonetheless implemented soil erosion and sediment control measures consistent with accepted industry practices. In particular, silt fencing was installed around all active soil remediation, handling and staging areas, with hay bales also placed around all storm water catch basins. Upon completion of the IRM, silt fencing and hay bales were replaced.

6.2.5 Excavated Soil Management

Sub-slab soils encountered during the planned demolition activities were screened, segregated and staged in accordance with the IRM Work Plan, as summarized in this subsection. As such, these soils were managed based on: (1) screening observations of soil quality made at the time the soils are exposed and disturbed and (2) existing analytical results. The specific soil management procedures are reviewed below.

6.2.5.1 Soil Screening

Any soils without prior characterization data were screened using the three methods noted below to identify soils that had evidence of potential contamination and therefore required segregation and characterization to determine ultimate disposition.

Visual inspection: Soils were visually inspected for evidence of potential contamination, particularly the presence of pigment-related soil staining. Given that the highest sub-slab concentrations of metals identified in the June 2008 sampling program had associated pigment staining, for purposes of the IRM it was assumed that any soils with comparable staining were potentially contaminated. As noted above, Sun Chemical elected to proceed conservatively with the off-site disposal of any pigment-stained soil regardless of the actual constituent concentrations identified in those soils.

Screening with a photo-ionization detector: Soils being excavated were screened with a photo-ionization detector (PID). The IRM Work Plan proposed that these soils would be excavated and segregated following the collection of in-place soil samples to evaluate the concentrations of VOCs. However, no soils with elevated PID readings were identified.

Olfactory screening: As a supplement to PID screening and visual inspection, soils were evaluated for unusual odors. The IRM Work Plan proposed that such soils be staged separately pending confirmatory sampling. However, no soils with unusual odors were identified.

In the Soil Management Plan component of its IRM Work Plan, Sun Chemical indicated that soils with evidence of potential contamination would require sampling to determine whether the soils were contaminated above the commercial-use SCOs such that they required off-site disposal or, alternately had constituent concentrations below the commercial-use SCOs and

therefore were appropriate for beneficial use on-site in accordance with NYSDEC's Beneficial Use Determination (BUD) regulations at Subpart 360-1.15(b). However, such sampling was not needed given that the potentially contaminated soils encountered were only those with pigment staining, all of which Sun Chemical disposed of off-site.

6.2.5.2 Soil Staging

All excavated soils, both from within the areas of defined contamination and from areas with potential contamination, were staged on and under plastic sheeting on asphalt pavement pending waste classification sampling required by the disposal facility selected for these soils. These staging areas were conducted per specifications provided by NYSDEC in its September 25, 2008 comments to the IRM Work Plan. As requested by NYSDEC, the soil staging areas were prepared with a double thickness of 8-mil plastic sheeting; the same double layer of plastic sheeting was used to cover the soil piles. In addition, the plastic sheeting covering each soil pile was secured when soils were not being added to or otherwise handled at a given pile. The soil piles were also surrounded by hay bales for erosion control. Installation of silt fencing was not feasible given that the soil staging areas were located on pavement or concrete pads.

Based on the analytical data obtained to date, soils with known contamination were segregated as indicated below. These soils were placed in the soil staging areas discussed below. These staging areas were selected because they were level and paved, were proximate to the IRM locations, and were not subject to demolition equipment traffic.

- Pigment-stained soils from the Blue Wing at and near locations SB-10 through SB-14A were staged separately on a concrete pad west of the Machine Shop. These soils were segregated because they contained barium, chromium, and lead concentrations higher than other soils analyzed from the site, and also believed to have likely contained hexachlorobenzene.
- Other soils with elevated barium and lead concentrations were staged in an additional soil piles on asphalt pavement in the former drum storage area in AOC 9. This staging area received soils from locations 1607 and SB-16/SB-17.
- Soils from the vicinity of SB-25, and from adjacent areas beneath and west of the Storage Building were staged separately directing soil of this remediation area given a cinder fill material encountered immediately below the building slab and adjoining pavement.
- Soils from beneath the Powerhouse were staged on asphalt pavement at the southern end of AOC 2 based on the presence of anthropogenic materials, as discussed above.
- Soils from all other locations were staged on asphalt pavement north of the former Warehouse. Soils staged in this area included those from borings B1604, B1605 and SB-28.

In the IRM Work Plan, Sun Chemical proposed certain soil sampling of staged soils to evaluate soils for potential on-site reuse. In its September 25, 2008 comments to the work plan, NYSDEC indicated that all soils should be analyzed for TCL organic compounds and the Target Analyte List inorganics, and that such soils should not be reused on-site prior to NYSDEC data review and approval. The Department also commented that the scope of these analyses could be reduced based on site-specific information. Accordingly, ENVIRON provided, in an October 2, 2008 email, information proposing that soils considered for on-site reuse need only

be analyzed for PPMs+Ba and SVOCs given that prior soil sampling confirmed the absence of other constituents of concern. Although NYSDEC did not respond in detail to that proposal, Sun Chemical ultimately elected to proceed with off-site disposal of excavated soils such that the proposed soil pile sampling (i.e., to evaluate potential on-site reuse) was not required.

6.2.6 Soil Remediation and Post-Excavation Sampling

The June 2008 soil sampling defined eight primary sub-slab locations with contamination above commercial-use SCOs and/or pigment staining, shown on Plate 3. These estimated excavation boundaries were determined based on the analytical results and the observations of pigment staining, as well as by the locations of building structural components and former operational activities. For example, the northern, southern and western boundaries of the impacted area in the Blue Wing (at borings SB-10 through SB-14A) were defined based on the absence of soil contamination and significant pigment staining at neighboring borings SB-7, SB-8, SB-9, SB-14 and SB-15. The eastern boundary of this remediation area was defined by the position of a retaining wall that forms the western side of the Grind & Mix Department, located one floor level below the Blue Wing (as noted above, the main building was constructed in several levels on a hill). The actual extent of IRM activities is provided on Plate 5.

Post-excavation soil sampling was completed to document the effectiveness of the IRM in meeting the remedial goals. As proposed, this sampling was conducted in accordance with the post-excavation sampling frequencies specified in DER-10. DER-10 specifies those sampling frequencies based on the perimeter of an excavation. As all excavations at the Site were between 20 to 300 feet in perimeter, per DER-10, one post-excavation sidewall sample was obtained per 30 linear feet of sidewall and one basal sample was obtained per 900 square feet of excavation floor. These post-excavation sampling locations are shown on Figures 2 through 8 (to locate for specific excavation-area details, refer to the enlargement key provided on Plate 5).

The sidewall samples for a given excavation were obtained from the interval(s) at which soil contamination requiring remediation was identified. For example, post-excavation sampling proximate to locations SB-16 and SB-17 was conducted at 0.5-1.0', the only depth interval at which soil contamination was detected. Post-excavation sampling near locations SB-10 through SB-13, where soil contamination was detected at multiple depth intervals, targeted the uppermost and deepest intervals (i.e., 0.5-1.0' and 4.0-4.5') in which metals were detected above commercial-use SCOs. The actual post-excavation sampling depths for each IRM area are provided in the tables in Appendix B and in the databoxes included on the detail figures.

As proposed, all post-excavation soil samples were analyzed for PPMs+Ba, with those from the Blue Wing excavation also analyzed for SVOCs. The analytical results were compared to the commercial-use SCOs, and if no constituents were present above those objectives, the remediation was considered complete, enabling the demolition to proceed. SVOCs were not detected above commercial-use SCOs in any of the Blue Wing post-excavation samples. However, certain metals were identified at concentrations above the commercial-use SCOs in some of the initial post-excavation samples indicating that additional soil excavation and post-excavation sampling was needed to meet the SCGs. The excavation details on Figures 2 through 8 depict the successive phases of excavation completed in each IRM area to address soils above the commercial-use SCOs. As shown on those figures, the sampling frequencies

and depths for these successive rounds of post-excavation sampling were consistent with the methodologies described above for the initial phase of soil remediation. In addition, Sun Chemical conservatively analyzed these follow-up post-excavation samples for the full PPMs+Ba analysis.

Through these phases of soil remediation, Sun Chemical achieved the SCGs in all IRM areas, with the exception of the SB28 area, where nickel concentrations currently remain above the commercial-use SCO. As such, additional sampling is proposed in that area below in Section 6.

6.2.6.1 Former Warehouse Area

Following the removal of the concrete slab of the former warehouse (see Figure 2), trace amounts of green and yellow pigment staining were noted in soils at a depth of approximately 0.5 feet surrounding a former sealed floor drain that ran east-west in the northeast portion of the building. Excavation activities were conducted on October 14, 2008, when an area of approximately 400 square feet was removed to a depth of 1 foot. One basal post-excavation sample (WH01) and three sidewall samples (WH02, WH03, and WH04) were collected for PPMs+Ba analysis. Note that due to the presence of a concrete footer extending approximately 2 feet below grade, no sample was necessary at the eastern sidewall of the excavation.

During slab removal conducted on October 15, 2008, additional blue/green pigment staining in soils was noted at a depth of 2 feet during removal of a concrete footer in the northern portion of the former warehouse (also shown on Figure 2). An approximately 9' by 5' area was excavated to a depth of 4 feet', and one base sample (WHN03) and two sidewall samples (WHN01 and WHN02) were collected for PPMs+Ba analysis.

Analytical results for sampling associated with these two excavation areas are summarized in Appendix B and on Figure 2. As reported, metals concentrations for all samples were below the commercial-use SCOs such that no further remedial action was warranted.

6.2.6.2 Blue Wing Ice Plant

On October 21, 2008, during removal of a portion of the concrete Blue Wing Ice Plant slab by LVI/Mazzocchi, ENVIRON observed cinder-bearing fill material evident directly beneath the slab. Although this area was not initially designated as an IRM location, remediation was conducted at this location based on the presence of the fill material. The soil excavation encompassed an area beneath the former Ice Plant slab of approximately 60' by 18' area, removed to a depth of 1.5' (see Figure 3). This initial excavation removed all of the cinder fill, which extended to maximum depth of only six inches, and the upper interval of underlying native soils. Six sidewall samples (BWIP01 through BWIP06) and two base samples (BWIP07 and BWIP08) were collected for PPMs+Ba and semi-volatile organic compound (SVOC) analyses. Analytical results for all post-excavation samples are summarized in Appendix B and on Figure 3. Reported SVOC and metals concentrations for all samples were below the commercial-use SCOs, with the exception of BWIP05 in the southwestern portion of the excavation, where the concentration of nickel (327 mg/kg) slightly exceeded the commercial-use SCO of 310 mg/kg. Additional soils were removed in one-foot increments on October 24 and 29 to complete remediation in this area. The first follow-up post-excavation sample (BWIP05-SS02) still had a nickel concentration above the commercial-use SCO, but the final, deepest sample (BWIP05-

SS03) had a nickel concentration of 210 mg/kg, below the commercial-use SCO. As such, no further delineation is required in this area.

6.2.6.3 Storage Building

Soil excavations were conducted on October 22 – 23, 2008 beneath the former Storage Building slab (as shown on Figure 4) in the southern portion of the Site to remove an approximately 25' by 30' area to a depth of 5' to address arsenic and lead concentrations at boring SB25. Five post-cleanup verification soil samples for PPMs+Ba were collected immediately following the initial excavation, including one basal sample (PE01) from 5.0' – 5.5'. Four deep sidewall samples (PE02 through PE05) were collected at 4.0' – 4.5'. The IRM Work Plan proposed collection of sidewall post-excavation samples from 0.5-1.0'. However, such shallow soils could not be sampled due to the presence of a concrete footer that extended to a depth of approximately 2.0' below grade.

Analytical results for samples collected from the Storage Building excavation are summarized in Appendix B and on Figure 4. Metal concentrations were below the commercial-use SCOs, except at location PE02 where arsenic (at 16.3 mg/kg) exceeded the commercial-use SCO. As such, an additional 1 foot of soil was removed from this area on October 29th and re-sampled at the 5.0' – 5.5' interval. Reported arsenic concentrations at this sample interval (3 mg/kg) were well below the commercial-use SCO.

During concrete slab removal to the south of the original Storage Building excavation, a thin layer of black slag or cinder-like material was noted. This approximately 16' by 20' area was excavated to a depth of 2.5' on October 22nd. One base sample (PE07) and three sidewall samples (PE06, PE08, and PE09) were collected for PPMs+Ba analysis. In addition, given the cinder-like appearance of the material directly beneath this portion of the building slab, these samples were also analyzed for SVOCs.

Reported concentrations of benzo(a)pyrene in the base sample (PE07 at 5.1 mg/kg) and two sidewall samples (PE08 at 1.7 mg/kg and PE09 at 1.9 mg/kg) slightly exceeded the commercial-use SCO of 1 mg/kg. Reported concentrations of arsenic, barium, cadmium and lead also exceeded the respective commercial-use SCO in several samples, including the PE07 base sample and the PE06 and PE08 sidewall samples. However, due to the presence of a concrete footer extending to a depth of approximately 1 foot, remaining delineation sampling could only target the deeper sampling interval at each location.

Additional soil removal and post-excavation sampling activities were conducted in the southern portion of the Storage Building on October 29th and October 31st. The eastern and southern sidewall samples PE06-SS02 and PE09-SS02 had lead concentration of 1,320 mg/kg and 1,290 mg/kg, slightly above the commercial-use SCO of 1,000 mg/kg. Upon further excavation and sampling at both sidewalls (see Figure 4), lead concentrations at these sidewalls were below the commercial-use SCO (i.e., PE06A at 58.2 mg/kg and PE09A at 959 mg/kg).

Upon removal of additional soils in the base of the excavation, additional samples were collected near prior base sample locations PE07 and PE08 and submitted for SVOC and/or PPMs+Ba analysis. The benzo(a)pyrene concentration at PE07-SS03 (0.074 mg/kg) was well

below the commercial-use SCO. The reported benzo(a)pyrene concentration for PE08-SS02 was 0.22 mg/kg, well below the commercial commercial-use SCO of 1 mg/kg; metals concentrations of arsenic (3.9 mg/kg), barium (58.4 mg/kg), and lead (280 mg/kg), below the corresponding commercial-use SCOs of 16 mg/kg, 400 mg/kg, and 1,000 mg/kg. An additional base sample (PE14 at the 1.5' – 2.0' interval) was also collected in the northernmost portion of the excavation to confirm SVOC and metal concentrations in this area; no exceedances were reported.

A thin layer of slag/cinder-like material was also noted directly beneath the slab in the remaining northern portion of the Storage Building. That material was excavated to a depth of one foot on October 23, 2008. One base sample (PE11) and three sidewall samples (PE10, PE12, and PE13) were collected on October 23, 2008 and submitted for PPMs+Ba analysis. Analytical results for these samples, also summarized in Appendix B, reported no exceedances for metals. As such, no further remediation was required in this area.

6.2.6.4 Secondary Production Area (Location SB-28) Excavation Area

Soils excavation in the vicinity of the Red Wing Secondary Production Area (as shown on Figure 5) began on October 24, 2008 to address exceedances of nickel identified at SB-28 during the June 2008 SRI. An initial area of approximately 18' by 23' was removed to a depth of 4.5' and one base sample (PE01) and four sidewall samples (PE02 through PE05) were collected for PPMs+Ba analysis. As proposed in the IRM Work Plan, two intervals were sampled per sidewall (from 0.5-1.0' and 2.0-2.5'), with the exception of the north (PE03) sidewall due to the presence of a subsurface concrete footer extending to a depth of approximately 3 feet. As such, only one sample at the 3.0' – 3.5' interval was collected at that location.

Analytical results for samples collected in the SB-28 excavation are summarized in Appendix B and on Figure 5. Reported metals concentrations in the base sample and the northern and eastern sidewall samples (PE03 and PE04), respectively, were all below the corresponding SCO. However, the upper and lower intervals from both the western (PE02) and southern (PE05) sidewall samples exceeded the SCO for nickel. As such, additional soil removal and a second round of post-excavation sampling took place on November 12, 2008. Due to a concrete footer extending approximately 1.5 feet below grade, no additional shallow-interval sidewall samples could be collected along the western "PE02" sidewall. Reported nickel concentrations from one sample, the "PE05A" upper interval sample at 26.4 mg/kg, were well below the commercial-use SCO of 310 mg/kg. However, all other samples exceeded that SCO. Additional soil excavation and delineation sampling was therefore undertaken on two occasions (January 6 and 8, 2009). As shown on Figure 5, nickel concentrations at these sidewalls remained above that SCO. As such, Sun Chemical concluded that delineation sampling was warranted prior to proceeding with any additional remediation in this area. In addition, further soil removal was not needed at this location to facilitate completion of the facility demolition and site regrading. ENVIRON marked this area with survey stakes. The staked locations were surveyed by Control Point Associates on March 11, 2009. Additional sampling in this area is proposed below in Section 6.

6.2.6.5 Red Wing: Eastern End Main Production Area

Soils in the vicinity of the eastern end of the main production area were excavated on October 29, 2008, consisting of an area approximately 20' by 32' to a depth of 5.0' to address elevated barium and chromium concentrations at B1607 as identified in ENVIRON's October 2006 remedial investigation. As shown on Figure 6, one base sample (PE04) and three sidewall samples (PE01 through PE03) were collected for PPMs+Ba analysis. As proposed in the IRM Work Plan, samples were collected from two intervals at each sidewall (2.0-2.5' and 3.5-4.0'), targeting the impacted intervals at B1607. Reported concentrations of PPMs+Ba are summarized in Appendix B and are shown on Figure 6. Metals above the commercial-use SCO of 400 mg/kg were present at only one sidewall sample, PE03 at the 2.0' – 2.5' interval, where barium (441 mg/kg).

Accordingly, an additional 12' by 15' area was removed from the northwest portion of the excavation to a depth of 5.0' on October 31, 2008, as shown on Figure 6. One sidewall sample (PE03A) was collected for PPMs+Ba analysis. In addition, due to the presence of dark gray/black soils noted at the base of this portion of the excavation, an additional base sample (PE05) was collected from this area from 5.0-5.5' and submitted for PPMs+Ba analysis. Analytical results for these additional samples confirmed that all metals concentrations were well below the corresponding commercial-use SCOs (see Figure 6). As such, no further remedial action is warranted in this area. In addition, these data indicated that the gray/black coloration of the soils in this area likely representing native soil conditions. As discussed below in Section 5.2.6.7, additional sampling of this soil type was subsequently conducted and again confirmed the absence of any metals above commercial-use SCOs.

6.2.6.6 Red Wing: Western End Main Production Area

Soils were excavated from the areas surrounding borings B1604 and B1605 in the western portion of the former Red Wing on October 30, 2008. An area approximately 40' in length and 20' in width was excavated to a depth of 3.5 feet in the vicinity of boring B1604 to address metals concentrations in exceedance of the commercial-use SCO for nickel detected at the 2.0' – 2.5' interval identified during the October 2006 remedial investigation. Adjacent to the southern boundary of this excavation, an additional 15' by 20' area proximate to boring B1605 was excavated to a depth of 5.0 feet to address reported exceedances of the commercial-use SCO for cadmium in the 2.0' – 4.0' interval.

A total of six post-cleanup verification soil samples were collected for PPMs+Ba analysis immediately following the excavation of both areas, including one basal sample (1604-PE03) at the 3.5' – 4.0' interval from the center of the northern "B1604" excavation, one basal sample (1605-PE03) at the 5.0' – 5.5' interval from the center of the southern "B1605" excavation, and four sidewall samples from 2.0' – 2.5' and 3.0' – 3.5'. As shown on Figure 7, no samples were collected from the "B1604" excavated area from the western sidewall, as a concrete footer extended to a depth of approximately 3.5' along the entire length of the excavation. As such, only one sidewall sample, 1605-PE02 in the southern-most "B1605" area excavation, was collected, targeting the 4.0' – 4.5' interval at the western sidewall.

Analytical results for samples collected in the B1604 and B1605 area excavations are presented in Appendix B and on Figure 7. Reported metals concentrations were below the commercial-

use SCOs for all constituents in the B1605 excavation. In the B1604 excavation, one base sample and its duplicate, 1604-PE03, had nickel concentrations of 349 mg/kg and 356 mg/kg, slightly above the commercial-use SCO of 310 mg/kg. In addition, sidewall samples 1604-PE01, 1604-PE02 and 1604-PE03 had cadmium concentrations above the commercial-use SCO at 2.0' – 2.5' and/or 3.0' – 3.5'.

Further excavation was therefore conducted in the base and along the western wall of the "B1604" area on November 4, 2008. The depth of the excavation was extended an additional one foot, to a total depth of 5 feet. The western edge of the additional excavation extended to an interior footing wall that extended to a depth of approximately 4.5 feet, such all remaining impacted soils were removed, with additional sidewall post-excavation sampling not possible. A confirmatory basal post-excavation sampling (sample PE03-SS02) was obtained at a depth of 4.5' – 5.0' for PPMs+Ba analysis. Analytical results for this sample, also presented on Figure 7, confirmed that metal concentrations at the excavation floor were below the commercial-use SCOs. As such, no further IRM actions were required in these areas.

On March 9, 2009, during rough-grading activities, an area of gray-stained soils surrounding a clay drainage pipe was uncovered to the east of the "B1605" excavation, at approximately five feet below grade. Due to the volume of material that appeared to be impacted and because the staining appeared to extend a depth well below that subject to grading activities, these soils were left in place, and an approximately 20' by 15' area was marked with survey stakes and surveyed by Control Point Associates on March 11, 2009. These staked locations are shown on Figure 7. Additional soil sampling in this area is proposed below in Section 6.

6.2.6.7 Courtyard Excavation Area

The Courtyard area between the Blue and Red Wings was not initially planned as an IRM component. However, given the extent of excavation north and south of the Courtyard, and the intent to regrade the property without imported fill material, Sun Chemical concluded that removal of some volume of soil from the Courtyard was necessary. Accordingly, soils in that area were addressed consistent with the methodologies employed for the IRM areas, given that metals had been detected above commercial-use SCOs at four borings (B601, B602, B603 and B606) completed in the Courtyard in 2006.

Following removal of an approximately 120' by 20' section of asphalt slab and surface soils in the area between the Red Wing and Blue Wing, as shown on Plate 6, pigment-stained soils were noted at intervals ranging in depth from 1.5' – 2.5'. Excavation of this material was conducted from January 12 to January 14, 2009, and a total of five base samples (PE01, PE02, PE06, PE07, and PE08) collected at depths ranging from 3.0' – 4.0'. In addition, six sidewall samples were collected at the northern sidewall (PE03, PE04, PE05, PE10, and PE11) and western sidewall (PE09) at the 1.5' – 2.0' interval. All post-excavation samples were analyzed for PPMs+Ba. Note that no samples were collected along the eastern or southern sidewalls, as concrete footers were present to depths greater than 4.0' precluding sample collection. In addition, there was no visible evidence of pigment-impacted soil below approximately 3' in the Courtyard area.

Analytical results for all samples collected in the Courtyard Area excavation are presented in Appendix B and summarized on Plate 6. Reported barium concentrations were above the commercial-use SCO at two sidewall sample locations, PE03 at 1,230 mg/kg and PE05 at 2,340 mg/kg, with nickel also present above the commercial-use SCO at PE10 (at 409 mg/kg). Accordingly, on January 15th and 20th, additional soil was excavated in these areas and further post-excavation samples were collected. Analytical results for these samples are also summarized on Plate 6. As shown, all metals concentrations were below the commercial-use SCOs. In light of these data, and because the remediation addressed soils at borings B6012, B602, B603 and B606, no further remedial activities were required in this area.

6.2.6.8 Blue Wing

Soil excavation activities beneath the former Blue Wing slab took place from January 15 to February 19, 2009, where as proposed in the IRM a total area of approximately 30' by 110' was removed to a depth of 8' to address metals and SVOC exceedances found in soils from borings SB-10 – SB-13 and SB-14A during the Supplemental RI sampling event in June 2008, as shown on Plate 6. A total of fifteen post-excavation samples were originally collected, including nine sidewall soil samples at three intervals each, 0.5' – 1.0', 2.0' – 2.5', and 4.0' – 4.5', and six basal samples from 8.0' – 8.5' in the center of the excavation. Note that no sidewall samples could be collected from the eastern, western and southwestern portions of the excavated area, as the excavation abutted the outer edges of the former Blue Wing footers (extending to a depth of 5 feet) in these areas.

Analytical results for samples associated with the Blue Wing excavation are presented in Appendix B and summarized on Plate 6. Reported metals and SVOC concentrations for all samples were below the commercial-use SCO, with the exception of metals at two sidewall samples at multiple intervals: BW04 with exceedances for barium (456 and 772 mg/kg) and nickel (392 mg/kg) and BW07, with two exceedances for nickel (315 and 448 mg/kg). One base sample, BW06 (349 mg/kg), also exceeded the commercial-use SCO for nickel of 310 mg/kg. As such, an additional 1 foot of soil (to a total depth of 9') was removed in the base of the excavation at this location, and a second base sample (BW06-SS02) was collected and analyzed for PPMs+Ba. After further excavation at the BW04 sample location, three additional sidewall samples were collected, BW04A, BW04B, and BW04C. However, after reported exceedances of nickel were found in six of the nine intervals sampled at these sampling locations, Sun Chemical concluded the excavation would be extended north to the outer-edge footer of the former Blue Wing Building. As such, an additional approximately 22' by 40' area (as shown on Plate 6) was excavated to a depth of 9' and staged for disposal.

Analytical results for samples associated with additional delineation activities in the Blue Wing excavation are also summarized on Plate 6. The nickel concentration for the second base sample, BW06-SS02, was 238 mg/kg, well below the commercial-use SCO. As such, these additional remedial actions fully addressed metals contamination beneath the former Blue Wing such that no further action is needed.

6.2.6.9 Grind & Mix Department

Soils were excavated from the former Grind & Mix Department in February 2009 over a 16' by 66' area to a depth of 2 feet to address elevated metals concentrations at the 0.5' – 1.0' interval

at borings SB-16 and SB-17 during the June 2008 Supplemental RI sampling event. Five post-excavation soil samples were collected immediately following the excavation for PPMs+Ba analysis, including two basal samples (GM02 and GM05) in the south-central and north-central portions of the excavation, respectively, and three sidewall samples (GM01, GM03, and GM04) at the 0.5' – 1.0' interval. As shown on Figure 8, no samples were collected on the eastern and northwestern sidewalls of the excavation due to the presence of a concrete footer along the entire length of the eastern edge of the excavation, and a concrete vault in the northwest portion of this excavation.

Analytical results associated with samples collected in the former Grind & Mix Department excavation are presented in Appendix B and are summarized on Figure 8. Reported metals concentrations for all samples were below the commercial-use SCO, with the exception of the northernmost base sample GM05 and its duplicate, (at 509 mg/kg and 461 mg/kg, respectively), which exceeded the commercial-use SCO for barium of 400 mg/kg. Additional soil excavation took place in the vicinity of GM05, and a base sample was collected at the 3.0' – 3.5' interval.

Reported barium concentrations for additional delineation sample GM05-SS02, 55.5 mg/kg, were well below the commercial-use SCO for barium of 400 mg/kg. As such, no further action is warranted in this area.

During concrete footer removal activities in the Grind & Mix Department, a large metal cylinder, apparently lead-lined and approximately 4 feet in diameter, was discovered directly beneath the concrete slab to the southwest of the SB-18 boring location. According to facility personnel, this tank was likely used historically for pigment production. This tank was empty and was therefore lifted from the excavation and staged on plastic sheeting pending off-site disposal. During continued footer removal activities in the northwestern portion of the Grind & Mix Department, a concrete 'vault' approximately 8' by 18' and 6' deep, and containing two tanks plus associated piping was uncovered, immediately adjacent to the proposed Grind & Mix excavation area. Water contained by the vault was pumped into an on-site Baker tank, and the tanks and all associated piping and equipment removed from the excavation on February 9, 2009.

Following the demolition of the vault and removal of all concrete pieces from the subsurface, both locations (to the northwest and southwest of G & M area excavation) were marked with survey stakes and surveyed by Control Point Associates on March 11, 2009.

6.2.6.10 Additional Red Wing Soil Sampling

As shown on Figure 9, seven additional samples targeting areas of potentially discolored soils were collected from various locations within the former Red Wing Building on November 6, 2008 and January 27, 2009. Four samples, NRW-SW01 through NRW-SW04, collected for PPMs+Ba analysis, were collected on November 6, 2008, biased to the location of a former heating duct running approximately 1 foot below the concrete slab adjacent to the northern wall of the Red Wing, which collapsed shortly after the initiation of slab removal activities. Additionally, three samples were collected on January 27, 2009 following the exposure of gray-colored soils approximately 6 feet below the original concrete slab during site grading activities extending from the northeastern (at sample SP01) to the central (at samples SP02 and SP03) portions of the former Red Wing.

Analytical results associated with the additional Red Wing soil sampling are provided in Appendix B and Figure 9. As no samples reported metals exceedances, no remedial activities were warranted in these areas. Further, these data confirmed that the gray soil coloration was not indicative of contamination but rather, likely represented a native soil hue.

6.2.7 Community Air Monitoring Program

In its September 25, 2008 comments to the IRM Work Plan, NYSDEC recommended that Sun Chemical implement a Community Air Monitoring Program (CAMP) consistent with the New York State Department of Health (NYSDOH) guidance for a generic CAMP provided in DER-10 Appendix 1A. In that guidance, NYSDOH recommends completion of real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. Specifically, NYSDOH suggests continuous monitoring during demolition of contaminated or potentially contaminated structures and related ground intrusive activities. For those situations, NYSDOH suggests monitoring of particulate concentrations continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations using real-time monitoring equipment to measure particulate matter less than 10 micrometers in size (PM-10) over a period of 15 minutes. These data are compared to the airborne particulate action level of 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (i.e., at the upwind perimeter) for a given 15-minute period. Additional dust control measures would be employed if that action level is exceeded or if visible dust is observed migrating from the work area.

Consistent with NYSDOH guidance and DER-10, ENVIRON implemented a CAMP during all above-grade demolition activities, and visually monitored dust conditions during the work. As detailed below, through this continuous monitoring, ENVIRON documented that PM-10 readings never exceeded the airborne particulate action level on the prescribed 15-minute weighted-average basis. Further, ENVIRON observed no visible dust migrating from the work area at any time.

ENVIRON conducted continuous dust monitoring and data logging at upwind and downwind locations with two Thermo Electron, Inc. data-logging aerosol monitors and 10-micrometer (PM-10) filters. Parameters, including temperature, relative humidity, particle size diameter, and total particle concentrations, were measured continuously and recorded by each unit at 15-minute intervals. Both monitors were equipped with an audible alarm and flashing lamp, set to indicate exceedances of the action level (100 $\mu g/m^3$ above the upwind level) as indicated in the CAMP guidance as well as in ENVIRON's Site Health and Safety Plan. In addition, ENVIRON used a photo-ionization detector (PID) to screen the downwind perimeter air during intrusive activities (*i.e.,* subsurface concrete removal, soil excavation); no readings above background were observed consistent with prior soil sampling which demonstrated that elevated VOC concentrations were not present in Site soils.

Average downwind concentrations over the course of the 17-day monitoring program ranged from 5.92 to 51.25 $\mu g/m^3$ compared to upwind concentrations ranging from 6.19 to 43.43 $\mu g/m^3$. Based on its review of these data, ENVIRON determined that many of the higher concentrations occurred during concrete pile hammering and/or load-out activities, not during intrusive soil

excavations. The complete set of upwind and downwind data sheets and their associated dust concentration graphs can be found in Appendix C.

As part of the demolition project, and consistent with requirements of its demolition permits with the New York City Department of Building (DOB) and demolition-related New York City regulations, LVI/Mazzocchi implemented various dust control measures during all abovegrade demolition activities. These measures included applying a continuous water spray to the specific locations of any building demolition or concrete debris handling. Water was applied via high-pressure hoses or using LVI/Mazzocchi's patented Water Boss® equipment, which disperses water via a large fan. DOB and other New York City agencies periodically inspected the Site during the demolition program and found the dust control measures to be in compliance with applicable regulations (i.e., no violations were issued).

6.2.8 Waste Classification Sampling and Off-Site Disposal

All soils with constituent levels above SCOs, as well as other soils that Sun Chemical determined were inappropriate to leave on-site (e.g., pigment-stained soils), were disposed of off-site either at the Pure Earth, Inc. facility in Vineland, New Jersey ("Pure Earth", for non-hazardous waste) or at the Casie Ecology Oil Salvage, Inc. facility in Vineland, New Jersey ("Casie", for hazardous waste). As summarized below, composite soil samples were first collected from excavated soils for waste classification purposes as required by these disposal facilities. The frequency of this sampling was also determined by disposal facility requirements, as well as by the locations from which a given quantity of soil was derived.

For example, ENVIRON collected a minimum of one waste classification sample from each soil pile generated per the soil segregation specifications provided above in Section 5.2.5, and thus, at least one waste classification soil sample was collected from each IRM area. For certain IRM areas from which relatively large soil volumes were removed or when the total soil volume was removed over a relatively extended period of time (e.g., the Blue Wing), several waste classification samples were collected to ensure that the soil volume was fully characterized. Separate waste classification samples were also collected from soils segregated based on visible evidence of potential contamination, including pigment staining or anthropogenic fill materials (i.e., at the Storage Building and Powerhouse).

Per Pure Earth/Casie requirements, all waste classification soil samples from the Site were analyzed for the following constituents/parameters:

- RCRA characteristics (i.e., ignitability, corrosivity and reactivity);
- Full RCRA inorganic and organic list by TCLP;
- PPMs+Ba;
- PCBs;
- VOCs (total); and
- Gasoline-range and diesel-range organics.

Analytical results from these samples are provided in Appendix B and indicate that with one exception, all soils excavated from the Site were classified as RCRA non-hazardous waste. The only exception, fill material and soils removed from directly beneath the Powerhouse slab, were classified as RCRA characteristic waste for lead (USEPA waste code D008) due to a lead concentration of 7.3 mg/l in the sample, compared to the maximum allowable concentration of 5.0 mg/l. Conversely, underlying native soils removed from the Powerhouse area were classified as non-hazardous waste. The lead concentration from that native-soil sample, only 0.07 mg/l, indicates that lead contamination in this area was most likely associated with the fill material, which has been removed. Confirmatory soil sampling is, however, proposed in this area as part of the RIWP (see Section 6.3.7).

All soils excavated during the IRM have been removed from the Site. Between December 23, 2008 and March 20, 2009, a total of approximately 7,200 tons of non-hazardous waste soils were disposed of at the Pure Earth facility. Off-site disposal of an estimated 200 tons of D008 soils was completed on March 19 and 20, 2009 at the Casie facility. Disposal documentation related to soil disposal is provided in Attachment F on CD.

6.2.9 Wastewater Management and Disposal

Given the depth to groundwater at the Site, the IRM activities did not encounter saturated soils. However, due to inclement weather during the demolition program, storm water did accumulate in certain excavations completed to address soils discussed herein. Accumulated storm water that was in contact with known or potentially contaminated soils was containerized on-site in two temporary aboveground storage tanks (e.g., Baker tanks) prior to waste classification sampling.

Based on the constituents of concern in soils at the Site and on disposal facility requirements, samples of accumulated wastewater were analyzed for PPMs+Ba. Analytical results for these samples (see Appendix B) indicated that all of the recovered wastewater was classified as RCRA non-hazardous waste. All of the wastewater recovered during the IRM (a total of approximately 46,000 gallons) was disposed of off-site at the Casie facility. Disposal documentation related to this wastewater disposal is provided on CD in Attachment F.

6.2.10 Site Restoration and Regrading

As part of the IRM activities discussed herein, Sun Chemical completed a post-IRM regrading of the Site to prevent accumulation of storm water, to control soil erosion and to prevent the off-site overland migration of soil to the storm water drainage system and/or to neighboring properties. Grading activities were of particular importance given the removal of the retaining walls shown on Plate 1. Although there were relatively significant topographic changes across the retaining walls and there were also relatively large below-grade spaces, particularly the main basement, soil fill was not required to achieve the final rough grade. Rather, Sun Chemical achieved the current site topography by grading existing soils that through sampling discussed above under Section 5.2.6, had been demonstrated to have constituent levels below the commercial-use SCOs, including in the Red Wing and the former courtyard between the Blue and Red Wings.

7 Remedial Investigation Work Plan

7.1 Introduction

This section proposes additional soil sampling in AOCs in which prior sampling identified constituents at concentrations above commercial-use SCOs but did not define the extent of those concentrations to a degree consistent with the Department's DER-10 guidance (i.e., to define the lateral and vertical extent of contamination, as well as the mass of contamination in soils at or emanating from the site). Such information is also crucial to the development of an appropriate RAWP and implementation of an effective remedial action. Further, this section proposes additional sampling in certain locations identified during the IRM, either via post-excavation sampling or visual observations, where soil contamination is known or suspected to remain. Additionally, this RIWP includes sampling requested by NYSDEC to more fully characterize AOCs in which sampling was previously conducted as well as to evaluate other areas in which sampling has not yet been performed. Last, groundwater sampling is proposed to confirm current groundwater quality at existing monitoring wells, to more fully understand the groundwater flow regime, and to assist in evaluating the potential vapor intrusion pathway. The remainder of this chapter discusses applicable quality assurance/quality control provisions and methodologies for the RI program (Section 7.2), the specific scope of proposed soil and groundwater sampling (Section 7.3), health and safety protocols (Section 7.4), project reporting and schedule milestones (Section 7.5), project contract information (Section 7.6) and citizen participation (Section 7.7).

7.2 Quality Assurance/Quality Control and Sampling Methodologies

This section discussed the quality assurance/quality control (QA/QC) procedures and other methodologies pertinent to the remedial investigation. These procedures include those related to completion of soil borings and monitoring wells, collection and analysis of soil and groundwater samples, and management of wastes generated during the sampling programs.

Two individuals will share responsibility for successful completion of the RI in accordance with the procedures outlined below. Mr. William Kraft, a Senior Manager with ENVIRON, will serve as the Project Manager and will be responsible for the overall successful implementation of the RIWP, including the associated QA/QC protocols. Mr. Jay Shipley, a Senior Associate with ENVIRON, will direct implementation of the RI activities and will therefore also be responsible for following QA/QC procedures during the site work. Resumés for Messrs. Kraft and Shipley are provided in Appendix D.

7.2.1 Drilling Methodologies

The additional soil sampling activities will be completed by direct-push soil coring techniques. A continuous soil core will be collected from each direct-push location for logging and sampling by an ENVIRON geologist. Following soil sample collection, each soil boring will be abandoned with soil cuttings. All non-disposable downhole sampling equipment will be decontaminated between sampling locations using an Alconox-water solution followed by a tap water rinse. All wash and rinse water from this equipment decontamination will be containerized and managed in accordance with the protocols set forth in Section 7.2.6.

7.2.2 Monitoring Well Development Procedures

Each newly installed monitoring well will be developed with a submersible pump for a period of time necessary to remove soil material from the well casing and until the pumped water is largely free of turbidity (or until the level of turbidity stabilizes). Additionally, it is possible that Sun Chemical will redevelop certain existing monitoring wells following the methodology for new wells.

7.2.3 Groundwater Sampling Methodologies

Groundwater samples will be collected following NYSDEC guidance and recommendations. For example, prior to the collection of groundwater samples, ENVIRON will purge approximately three well volumes from each well with a peristaltic or submersible pump. Conductivity, pH, turbidity, dissolved oxygen, temperature and oxidation/reduction potential will be monitored approximately once for each well volume with a Horiba U-22 fitted with a flow-through cell. Each well will be purged until these field parameters have stabilized. The wells will be allowed to recover to within 2 feet of static water level prior to sampling. The groundwater samples will be collected thereafter using a disposable Teflon-coated bailer.

7.2.4 Sample Management and Analytical Methodologies

All samples will be placed in laboratory-provided sample container and stored on ice to maintain a maximum sample temperature of 4^{o}C until daily sample delivery at the laboratory. ENVIRON will follow appropriate chain of custody procedures as part of this RI. All soil and groundwater analyses proposed herein will be conducted by TestAmerica, Inc. of Edison, New Jersey, a laboratory certified by the State of New York to perform the proposed analyses (New York Certification #11452). These analyses will be conducted using the methodologies listed below, which are in accordance with the NYSDEC's July 2005 Analytical Services Protocol (ASP).

Parameter	Analytical Methodology by Matrix	Holding Times	Preservative
TAL Metals	SW-846 Series 7000 Series / 6010 / 6020 (soil)	180 days (except Hg, which has a 28-day holding time)	None
PCBs	SW-846 8082 (soil)	14 days	None
TCL Pesticides	SW-846 8081A (soil)	14 days	None
TCL SVOCs	SW-846 8270C (soils)	14 days	None
TCL VOCs	SW-846 8260B (soils) SW-846 624 (water)	7 days	HCl
Cyanide	SW-846 9102A	14 days	None

Notes:
1. Holding times and preservatives are consistent with both SW-846 and NYSDEC ASP requirements.

Additionally, per DER-10, the following quality assurance/quality control sampling will also be completed as part of the supplemental RI activities:

- Duplicate samples will be collected at a rate of 1 duplicate pair per 20 samples.
- Equipment blanks and trip blanks will be collected as part of the groundwater sampling program, but are not required as part of the proposed soil sampling.

7.2.5 Decontamination Procedures

All downhole equipment used for monitoring well installation, including hollow-stem auger flights and drilling heads, will be decontaminated using high-pressure steam. This decontamination will be completed on a decontamination pad to be constructed on the concrete pavement west of the former Red Wing. Downhole equipment used in the collection of soil samples via direct-push sampling methods will be decontaminated with an Alconox-water solution following by a tap water rinse. All decontamination residuals, including plastic sheeting from the decontamination pad, wastewater and accumulated soils, will be placed in steel 55-gallon drums pending off-site disposal, as discussed below in Section 7.2.6.

Dedicated disposable equipment will be used to collect soil and groundwater samples, such that no decontamination of those items will be required.

7.2.6 Investigation-Derived Waste Management

Investigation-derived wastes (IDW) will consist of soil cuttings from monitoring well installation, development and purge water from on-site monitoring wells, and disposable sampling equipment. These wastes will be contained in steel 55-gallon drums and staged in a secure paved location on-site pending off-site disposal. The off-site disposal will be arranged based on waste classification data from the soil cuttings, and analytical results from the groundwater sampling. Based on waste characterization data generated during the IRM, it is anticipated that IDW from the future RI will be managed as non-hazardous waste.

7.3 Remedial Investigation Work Plan

Details regarding the rationale and scope of additional RI activities considered necessary in areas of known or potential soil contamination are presented below. Soil sampling is proposed for the following nine areas: (1) AOC 2; (2) AOC 9; (3) AOC 14; (4) AOC 15; (5) secondary production area (sampling location SB28); (6) Red Wing western end piping; (7) Grind & Mix Department tank area; (8) Powerhouse; and (9) Warehouse / Office / Laboratory (WOL). In addition, this subsection also describes the scope of planned sampling of storm water drainage system sediments and groundwater, and discusses the potential need for a geophysical investigation in certain portions of the facility. The proposed sampling locations are shown on Plate 7.

This RIWP incorporates comments provided by NYSDEC to prior draft versions of the RIWP, most notably those provided during a June 19, 2009 site inspection and NYSDEC's subsequent letter dated July 20, 2009. (At NYSDEC's request, however, detailed discussions of these comments and associated changes to the RIWP have been removed from this RIWP and instead have been memorialized in a separate document.) Following an August 2009 teleconference regarding those comments, Sun Chemical memorialized its responses in ENVIRON's September 18, 2009 letter to NYSDEC. Of particular note related to the scope of sampling proposed in this subsection were NYSDEC's comments regarding the scope and

depth of additional soil sampling it required for screening purposes. Specifically, NYSDEC had requested that: (1) 14 of the proposed borings be extended 10 feet below the water table to enable full characterization of the site; and (2) that the soil samples from those 14 borings, as well as from other borings NYSDEC requested, be analyzed for the full TAL/TCL analyte list. During the August 2009 teleconference, NYSDEC explained that the overall goal of this deeper sampling and full-suite analytical program was to more fully screen soils for all NYDEC-regulated hazardous substances. NYSDEC also explained that saturated-zone soil characterization was required given that if groundwater levels have increased at the site, contamination previously above the water table might now be located within the saturated zone and thus, would not be identified without soil sampling within the saturated interval. Despite this hypothetical argument, Sun Chemical and ENVIRON indicated that there are no data to indicate that the depth to groundwater at the Site is currently more shallow than previously.

In light of the expressed concerns, Sun Chemical and ENVIRON concluded that a reduced scope of deeper soil borings and full-suite analyses appeared to meet the NYSDEC's stated goal of site screening equally well. Sun Chemical and ENVIRON also identified several specific technical reasons, based on both site use/configuration and soil sampling data obtained to date, indicating that such deeper sampling is not needed at all of the locations suggested by the Department. Specifically, Sun Chemical concluded that expanding the drilling program to this degree does not appear warranted given that contaminant concentrations consistently decrease with depth to below SCOs in soils above the water table. Further, industrial activities at this site were surficial (such as railroad tracks and drum storage). Consequently, there are no site-specific conditions or features suggesting that at-depth impacts would be reasonably anticipated. Last, significant groundwater impacts are not present, as would be expected if there were contaminated soils below the water table.

For these reasons, and based on negotiations with NYSDEC, Sun Chemical and ENVIRON agree to advance certain borings to depths below the water table to complete the screening NYSDEC recommended, and then complete the remaining sampling in the respective AOCs following evaluation of the screening-level data. The specific screening-level soil borings are described below, and would be completed in AOCs 2, 9, 14, SB-28, Grind & Mix, Powerhouse and WOL. This staged sampling approach also addresses NYSDEC's request for full TAL/TCL analyses on many of the proposed soil samples. Such soil samples will be collected from the screening-level borings, advanced to 10 feet below the water table, or to the surface of any confining unit, whichever is encountered first. Unless otherwise indicated below, two samples will be collected from each screening-level boring, including from soil directly below pavement (where present)[3] and from directly above the water table (or confining unit), as well as from other intervals with evidence of potential contamination, such as pronounced discoloration or elevated PID readings. Further, should conditions be identified suggesting that a varying nature or degree of potential impact (such as different soil appearances between borings), additional soil borings may be completed to enable additional testing. These samples will be analyzed for the full suite of TAL/TCL analytes.

[3] Per NYSDOH guidance, all surface soil samples will be obtained from 0-2" in depth, except that the samples for VOC analysis will be obtained from 18-24".

Analytical results from these screening-level samples will be compared to the commercial-use SCOs and suites of constituents present above those SCOs selected as the target constituents for future sampling in the targeted AOCs. Suites of constituents for which concentrations of all compounds were below the commercial-use SCOs would be assumed to no longer be of concern for that area such that further analyses for those compounds would not be conducted. The following sections provide additional details regarding the proposed screening-level sampling to be completed in each of the selected AOCs.

Table 3: Proposed Remedial Investigation Work Plan
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

Area of Concern	Rationale	Proposed Sampling Locations and Sampling Depths	Proposed Analyses
AOC 2	Lateral delineation of metals and PAHs, and confirmation of conditions along eastern property boundary	Borings B205, B209, B210, B213 and B216 Two soil samples: • Upper two inches / 1.5-2.0' (for TCL VOCs) • Six-inch interval above peat layer, or 9.5-10.' below water table Borings B206-B208, B211, B212, B214 and B215 Three soil samples: • 0.5-1.0' • 2.0-2.5' • Six-inch interval above peat layer	Full TAL/TCL AOC-specific target parameters
AOC 9	Complete characterization of area, per NYSDEC comments	Boring B907 Three soil samples: • Upper two inches / 1.5-2.0' (for TCL VOCs) • Six-inch interval above water table • Six-inch interval below water table Borings B905 and B906 Three soil samples: • Upper two inches • 3.0-3.5' • Six-inch interval above water table	Full TAL/TCL AOC-specific target parameters
AOC 14	Lateral delineation of lead, PCBs and BNs	Borings B1414, B1418 and B1420 Three soil samples: • Upper two inches • Six-inch interval above water table • 9.5-10.0' below water table or other deeper six-inch interval per field screening Borings B1412, B1413B1415, B1416, B1417 and B1419 Three soil samples: • 1.0-1.5' • 2.0-2.5' • 3.0-3.5'	PPMs, PCBs, BNs AOC-specific target parameters

Table 3: Proposed Remedial Investigation Work Plan
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

Area of Concern	Rationale	Proposed Sampling Locations and Sampling Depths	Proposed Analyses
AOC 15	Delineation of lead concentrations above the SCO	Borings B1503-B1505 Three soil samples: • 1.0-1.5' • 2.0-2.5' • 3.0-3.5'	Lead
Secondary Production Area (Sampling Location SB-28)	Delineation of nickel concentrations above the SCO	Boring B2801 Three soil samples: • 8.0-8.5' • Six-inch interval above water table • 9.5-10.0' below water table or other deeper six-inch interval per field screening Borings B2802-B2806 Three soil samples: • 8.0-8.5' • 10.0-10.5' • 12.0-12.5'	Full TAL/TCL Nickel, other AOC-specific target parameters
Red Wing Western End Piping	Characterize and delineation any contamination associated with soil staining	Borings RW01-RW04 Two soil samples (minimum): • Six-inch interval from stained soils • Six-inch interval from underlying unstained soils.	PPMs+Ba, SVOCs
Grind and Mix Department Tank Area	Characterize and delineation any contamination associated with former tanks and apparently associated soil staining	Borings GM09 and GM13 Three soil samples: • First six-inch stained interval / 1.5-2.0 (for TCL VOCs) • Six-inch below former excavation base • 9.5-10.0' below water table or other deeper six-inch interval per field screening Borings GM06-GM08 and GM10-GM12 Two soil samples (minimum): • Six-inch interval from stained soils • Six-inch interval from underlying unstained soils	Full TAL/TCL PPMs+Ba, SVOCs, other AOC-specific target parameters
Powerhouse	Characterize and delineation any residual contamination at former building footprint	Boring PH01 and PH15 Three soil samples: • Six-inch interval below geotextile / 1.5-2.0 (for TCL VOCs) • Six-inch interval above water table • 9.5-10.0' below water table or other deeper six-inch interval per field screening Borings PH02-PH14 and PH16-PH18 One to three soil samples (above the water table only): • 2.0-2.5' • 3.0-3.5' • 4.0-4.5'	Full TAL/TCL PPMs+Ba, other AOC-specific target parameters

Table 3: Proposed Remedial Investigation Work Plan
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

Area of Concern	Rationale	Proposed Sampling Locations and Sampling Depths	Proposed Analyses
Warehouse/ Office / Laboratory	Characterize conditions at loading docks and doorways	Boring BW04 Three soil samples: • Upper two inches / 1.5-2.0' (for TCL VOCs) • Six-inch interval above water table • 9.5-10.0' below water table or other deeper six-inch interval per field screening Soil borings BW01-BW03 One to three soil samples (above the water table only): • Upper two inches • 3.0-3.5' • 4.0-4.5'	Full TAL/TCL Lead, AOC-specific target parameters
Storm water drainage system	Characterize nature of any remaining sediment in drainage system north of Red Wing,	Sediment sampling SED1	TAL metals, SVOCs, PCBs
Groundwater	Evaluate deeper groundwater quality	Location to be determined	VOCs
Groundwater	Confirm current groundwater quality (and reinstall MW-3, damaged during demolition)	MW-1 through MW-7 and MW-5D	VOCs
Groundwater	Characterize groundwater quality along southern property boundary	MW-8 through MW-11	VOCs
Groundwater	Evaluate groundwater quality and flow regime in central portion of property and upgradient of where VOC impacts had been detected	MW-12, MW-13 and MW-14	VOCs, PPMs+Ba

7.3.1 AOC 2

Previous soil sampling in and near AOC 2 identified concentrations of metals and/or PAHs above commercial-use SCOs at five borings completed within or in proximity to the former rail lines, including at locations B202, B203, B204, B1301 and B1606. Soil contamination was not present, however, at borings B201, MW-2, MW-5 and MW-7. In light of these findings, additional soil sampling is considered necessary to complete the delineation of metals and PAH contamination. In addition, sampling is planned to document constituent concentrations in proximity to the eastern property boundary.

Although this AOC is large, measuring approximately 450 feet by 90 feet, given the uniformity of its former use, a relatively broad spacing of additional sampling is appropriate. As such, Sun Chemical proposes to collect additional soil samples to result in an overall spacing on the eastern and western boundaries of approximately 100 feet. In addition, several additional

borings are proposed in the central portion of the AOC to evaluate the distribution of contamination within the footprint of the rail lines, as well as the depth of any impacts. These proposed sampling locations are shown on Plate 7 and include 12 borings, B205 though B216.

As indicated above, NYSDEC had requested that certain of the proposed borings be extended 10 feet below the water table to enable full characterization of the site, including the following five proposed borings in AOC2: B205, B209, B210, B213 and B216 to more fully screen soils for potential contamination as well as to evaluate saturated-zone soils that might previously have been above the water table, should groundwater levels have increased at the site over time. As noted above in Section 7.3, Sun Chemical believes that a reduced scope of screening-level sampling meets NYSDEC's stated objectives equally well. Accordingly, Sun Chemical proposes to advance two borings to depths below the water table to complete the screening NYSDEC recommends, and then complete the remaining sampling following evaluation of the screening-level data. The specific screening-level borings will include B209, where the siding entered the former Red Wing, and B213, along the centerline of the former main tracks. These borings will be advanced to 10 feet below the water table, or to the surface of any confining unit, whichever is encountered first. Based on prior sampling in AOC 2, a peat-clay confining unit is anticipated less than 5 feet below the water table. Unless there is evidence of adverse impact in immediately overlying soils, Sun Chemical and ENVIRON propose that there would be no basis to drill into or through the confining unit, ensuring that the confining unit remains intact and protective of underlying groundwater quality. Two samples will be collected from each boring, including from 0.5-1.0, the upper interval in which soil impacts were previously defined (i.e., the soil interval immediately below the railroad ballast underlying the lines and ties) and from directly above the peat unit, or from another interval with pronounced discoloration or elevated PID readings. Should conditions be identified suggesting a varying nature or degree of potential impact (such as different soil appearances between borings), additional soil borings may be completed to enable additional TCL/TAL testing. These samples will be analyzed for the full suite of TAL/TCL analytes.

Analytical results from these screening-stage samples will be compared to the commercial use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for future sampling in AOC 2. In addition, if such analyses confirm that contamination is in contact with the peat unit, deeper sampling may be considered based on the nature of the identified impacts.

Each of the borings to be completed in the subsequent phase of sampling will be advanced to the first saturated interval, at a nominal depth of 5 feet. Soil samples will be collected from three intervals, including 0.5-1.0 and 2.0-2.5' (intervals consistent with those from prior sampling programs) and from the six-inch interval above the water table. Each of these samples will be analyzed for target analytes determined as noted above.

7.3.2 AOC 9

As discussed above, five soil borings were completed in AOC 9 during the August 2006 soil sampling program. Although no constituents were detected above commercial-use SCOs in the associated samples, and there was no evidence of potential contamination (such as soil discoloration), NYSDEC requested that four additional borings be completed to more fully

characterize soil quality in this area. NYSDEC also requested that these four borings be advanced to depths 10 feet below the water table and sampled for the full TAL/TCL list.

After discussions NYSDEC regarding further sampling in this AOC, the parties agreed that the appropriate scope of work would include completion of three borings based on the configuration of AOC 9 and the distribution of prior sampling points. Specifically, Sun Chemical proposes to complete boring B905 east of B901, boring B906 north of B902 and boring B907 in the former finished product and waste storage area, north of boring B904.

Sun Chemical and ENVIRON also do not believe that based on the surficial nature of storage activities in this AOC, and the absence of any soil impacts identified to date in this AOC, that all of the additional borings need to be advanced 10 feet below the water table. As an alternative, we therefore propose advancing boring B907 to that depth given that B907 will be completed in the area with the greatest density of former drum and material storage. Soil cores from this boring will be continuously screened with a PID to assist in determining the appropriate sampling intervals. Soil samples will be collected from B907 from the soil surface (from 0-2 inches), the six-inch interval above the water table, and from a deeper interval that either exhibits evidence of potential contamination (including elevated PID readings) or if no such evidence is observed, 9.5.-10.0 feet below the water table.

Analytical results from the screening-level samples from B907 will be compared to the commercial-use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for sampling at borings B905 and B906. Those borings will be advanced to the first saturated interval and soil samples collected from three intervals, including the soil surface, from 3.0-3.5', comparable to the deeper sampling interval in the initial soil samples, and from the six-inch interval above the water table. Each of these samples will be analyzed for target analytes determined as noted above. These borings would also be advanced to depths below the water table, and sampled consistent with the methodology for B907, if there is indication in B907 of impacts below the water table.

7.3.3 AOC 14

A total of ten borings have been completed in this AOC to evaluate the extent of soil contamination. Based on the analytical results of that sampling, summarized on Plate 2, concentrations of lead, PCBs and/or PAHs are present at borings B1401, B1402, B1405, B1406, B1407, B1408 and B1410 to a maximum depth of generally less than 2 feet, although PCB and metals impacts were present to 3 feet at boring 1406. Although the data for certain other borings in AOC 14 (i.e., B1404 and B1411) provide some delineation of those impacts, additional soil sampling is needed to complete that delineation.

During site meeting and inspection on June 19, 2009, NYSDEC suggested that some of the future soil samples collected from this AOC should be analyzed for the full TAL/TCL suite of analytes given that no such sampling had been completed to date. NYSDEC and Sun Chemical agreed that additional on-site soil sampling would be conducted to evaluate whether PCB concentrations along the southern property boundary were below the unrestricted-use SCO of 1 ppm, as needed to determine whether off-site soil sampling could be required.

As shown on Plate 7, Sun Chemical therefore proposes to complete ten additional borings, B1412 through B1421. Four of these borings (B1413-B1416) will be completed generally to the north of the impacted locations for delineation purposes whereas the other six borings (B1412 and B1417-B1421) will be completed along the southern property boundary. In addition, soil samples will be collected from proposed monitoring well MW-8, which will also be completed along the southern property line. For soil screening purposes, Sun Chemical will initially complete B1414, B1418 and B1420. These borings will be advanced 10 feet below the water table and soil samples collected from the soil surface (from 0-2 inches), the six-inch interval above the water table, and from a deeper interval that either exhibits evidence of potential contamination (including elevated PID readings) or if no such evidence is observed, 9.5.10.0 feet below the water table. Analytical results from these screening-level samples will be compared to the commercial-use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for sampling at the remaining proposed borings in AOC 14. Soil samples from those borings will be collected from 1.0-1.5', 2.0-2.5' and 3.0-3.5'. Each of these samples will be analyzed for target analytes determined as noted above.

7.3.4 AOC 15

Two borings, B1501 and B1502, were completed north and west of the former elevated concrete pad on which two pigment aboveground storage tanks had been located. Analytical results from those borings identified lead at 1.0-1.5' at boring B1501 above the commercial-use SCO, but not in the underlying sample from 3.0-3.5'. This near-surface lead contamination, in combination with the confirmed absence of lead impacts at boring B1502, as well as at nearby borings B104, B106, and B605, indicates that the lead impact at B1501 is relatively limited in lateral extent. However, additional sampling is considered appropriate to define the extent of lead contamination prior to development of a RAWP. As shown on Plate 7, Sun Chemical proposes to complete three additional soil borings, B1503, B1504 and B1505. Soil samples will be collected from each boring from 1.0-1.5', 2.0-2.5' and 3.0-3.5' for lead analysis.

7.3.5 Secondary Production Area (Sampling Location SB-28)

The IRM at location SB-28 ultimately entailed excavation of soils over an approximate area of 1,000 square feet to a final depth of 4.5 feet. As discussed above and as shown on Figure 5, post-excavation soil sampling on the southern and western sides of this IRM area indicated that nickel concentrations above the SCO remained. In light of the depth and location of these nickel concentrations, further soil removal was not needed to facilitate completion of the demolition or related site regrading. Further, such soil removal was considered inappropriate without prior delineation soil sampling. As such, further work in this area was deferred pending completion of such sampling. The excavated area was lined with 6-ounce geotextile fabric covered with approximately 3.5 feet of site soils to enable completion of the rough grading. The perimeter of this excavation was then surveyed to enable locating of the area in the future.

Sun Chemical proposes to complete six additional soil borings, B2801 through B2806, in proximity to the SB28 Area to delineate the extent of nickel concentrations above the SCO. As an initial step to address NYSDEC comments, boring B2801 will be advanced 10 feet below the water table and soil samples obtained for screening purposes. Based on the depth of the prior post-excavation samples and emplacement of site soils above this area for site grading, the

interval in which the nickel exceedances were detected following completion of the IRM is now an estimated 8 feet below current grade. Accordingly, soil samples collected from B2801 will be from 8.0-8.5 feet, the six-inch interval above the water table, and from a deeper interval that either exhibits evidence of potential contamination (including elevated PID readings) or if no such evidence is observed, 9.5.10.0 feet below the water table. Analytical results from these screening-level samples will be compared to the commercial-use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for sampling at the remaining proposed borings in AOC SB-28. Borings B2802 through B2806 will be advanced to a depth of 12 feet and soil samples collected from 8.0-8.5', 10.0-10.5' and 12.0-12.5'. These samples will be analyzed for nickel and any additional parameters detected at B2801 above commercial-use SCOs.

7.3.6 Red Wing Western End Piping

As discussed above in Section 6.2.6.6, discolored soils in the western end of the Red Wing were discovered during the final stages of the post-IRM rough grading. Based on exploratory excavation, the pipe and associated stained soils were present over an area of approximately 300 square feet east of the Boring B1605 excavation (see Figure 7). Due to the uncertainty as to the ultimate extent of the staining and nature of any adverse impacts, and given the goal of the IRM, Sun Chemical did not remove the soils, electing instead to incorporate a remedial investigation of the area as part of this work plan. This area was staked and surveyed to enable it to be located for future sampling.

Sun Chemical proposes to complete a minimum of four soil borings in this area, RW01 through RW04. These borings will be advanced to the water table and inspected for evidence of potential soil contamination, including soil discoloration and elevated PID readings. A minimum of one soil sample will be obtained from each boring from the visibly impacted interval(s). At least one additional soil sample will also be collected from each boring from an underlying interval without evidence of potential contamination, provided that the interval is above the water table. The actual number and depth of these samples will be determined during the field sampling program. Each of these soil samples will be analyzed for PPMs+Ba and TCL SVOCs. Additional soil borings would also be completed, and sampled as noted above, should the extent of soil discoloration or other evidence of presumed contamination be significantly more extensive than currently estimated.

7.3.7 Grind and Mix Department Tank Area

During demolition of the Grind and Mix Department, and related remediation of shallow soils at SB-16 and SB-17, Sun Chemical discovered three below-grade tanks, including two on the northern end of the area and one at the opposite/southern end. These tanks had riveted metal jackets and were lead-lined, and each appeared to be of approximately 150-250 gallons in capacity. The two northern vessels were located within a concrete vault, with discolored soils evident adjacent to the concrete walls. The southern tank did not appear to be within a vault, with stained soils also present in its vicinity.

As discussed above in Section 6, remediation was successfully completed at SB-16 and SB-17, fully addressing the elevated barium concentrations that had been present at those borings.

Discolored potentially contaminated soils in this area were not addressed given: (1) the uncertainty regarding the nature and extent of any soil contamination associated with the stained soils; and (2) that removal of the soils was not feasible given their proximity to the topographically much higher soils located near MW-3. As such, Sun Chemical concluded that it was more appropriate to complete further action in this area as part of the supplemental RI activities discussed herein. Figure 8 shows the locations of the former tanks and concrete vault locations.

Sun Chemical proposes to complete four soil borings in each of these two areas. These borings, GM06 through GM13. As an initial soil screening step, one boring will be completed next to each former reactor location (i.e, borings GM09 and GM13) and advanced 10 feet below the water table. Soil samples will be collected at the first stained soil interval, the six-inch interval below the base of the former excavation, and from a deeper interval that either exhibits evidence of potential contamination (including staining or elevated PID readings) or if no such evidence is observed, 9.5.-10.0 feet below the water table. Analytical results from these screening-level samples will be compared to the commercial-use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for sampling at the remaining proposed borings next to the respective former reactor location. The remaining borings will be advanced to the water table and inspected for evidence of potential soil contamination, including soil discoloration and elevated PID readings. A minimum of one soil sample will be obtained from each boring from the visibly impacted intervals. An additional soil sample will also be collected from each boring from an underlying interval without evidence of potential contamination, provided that the interval is above the water table. Each of these soil samples will be analyzed for PPMs+Ba and TCL SVOCs, constituents detected above the commercial-use SCOs in post-excavation samples, as well as any additional target analytes identified via the soil screening in this area.

7.3.8 Powerhouse

Soil sampling was not previously conducted in the Powerhouse (Boiler Building) area given that the site characterization did not identify any concerns regarding potential contamination. In particular, the Powerhouse was one of the original site structures, with no known prior industrial activities in that area. Further, the Powerhouse had no floor drains or industrial wastewater system components, and was not used for the storage of pigment materials, such that sub-slab soil contamination was considered unlikely.

As discussed above in Section 6, during removal of the Powerhouse slab and foundation members, an interval of fill material was observed directly beneath the slab. That material contained slab and/or cinders, and other anthropogenic items, comparable to material observed beneath the Ice Plant slab, and was therefore excavated and staged separately pending waste classification sampling. Apparently native soils were also excavated, from greater depths, as needed to remove the deep footers associated with this building and the former stack. These deeper soils were also staged, but separately from the soils containing non-native materials.

Two waste classification soil samples were collected from these Powerhouse soils, one from the native soils and the other from the soils containing non-native materials. Analytical results from the waste classification samples indicated that the deeper, native soils did not contain metals or

other constituents at concentrations above commercial-use SCOs and further, would be classified as nonhazardous waste. Conversely, the soils containing anthropogenic materials had concentrations of barium, copper and lead above commercial-use SCOs and a TCLP concentration of lead of 7.3 mg/l, indicating those soils were RCRA characteristic waste for lead.

Based on the observation of non-native materials in the upper soil intervals in this area, and on the waste classification sample obtained from that material, residual soil contamination is potentially present in the Powerhouse area. As discussed above, a 6-ounce geo-textile liner was placed over the footprint of the building and site soils (that had been cleared for on-site reuse via prior sampling) were used as backfill to bring this area to nearly original grade, as needed to promote proper drainage and prevent surface water accumulation.

Post-excavation soil sampling was not planned or completed as part of the demolition activities in this area. However, in light of the waste classification data, in combination with the observation of non-native materials underlying the former building slab (comparable to material observed at the Ice Plant, which contained SVOC concentrations above commercial-use SCOs), soil sampling is appropriate to evaluate residual constituent concentrations and delineate the extent of any concentrations above the commercial-use SCOs. In addition, NYSDEC has requested soil screening for all regulated parameters.

Accordingly, Sun Chemical proposes to complete 18 soil borings in this AOC to evaluate soil conditions. These borings will be completed at a density to satisfy the minimum post-excavation sampling requirements of DER-10. As such, borings will be placed at 30-foot intervals around the excavation perimeter and every 900 square feet in the former Powerhouse footprint. Based on the surveyed delineation of the former Powerhouse slab excavation, this area has a perimeter of approximately 360 feet and a footprint of 6,000 square feet. In accordance with DER-10, these dimensions therefore require collection of 12 sidewall samples and six basal samples. The locations of these borings are shown on Figure 10.

Soil sampling will initially be completed at borings PH01 and PH15 , per agreements reached with NYSDEC, to screen soils at sidewall and basal locations. These borings will be extended 10 feet below the water table and soil samples collected from the soil surface beneath the geo-textile fabric liner (located approximately 2 to 4 feet below grade), from the six-inch interval above the water table, from a deeper interval that either exhibits evidence of potential contamination (including elevated PID readings) or if no such evidence is observed, 9.5.-10.0 feet below the water table. These samples will be analyzed for the full TAL/TCL suite of parameters.

Soil samples at the remaining locations will be completed at 1-foot intervals from the soil surface beneath the geo-textile fabric liner to the water table, at a nominal depth of 5 feet. The uppermost soil sample from each boring will initially be analyzed on an expedited basis for PPMs+Ba and any additional constituents detected above commercial-use SCOs in the screening samples. Deeper soil samples and samples from adjacent borings will be analyzed as needed to delineate the lateral and vertical extent of any metal concentrations above commercial-use SCOs. If through this sampling, no metals or other constituents are found above commercial-use SCOs, Sun Chemical would conclude that any contaminated soil

formerly present in the Powerhouse area was removed as part of the demolition such that no further action would be warranted in this area.

7.3.9 Warehouse / Office / Laboratory

NYSDEC previously indicated that soil borings should be completed near this former building at every loading dock bay and any other opening. Regarding the latter, Sun Chemical later clarified that by "any other opening", NYSDEC refers to other doorways or points of entry for raw materials to finished products, not doorways solely designed for personnel access. The configuration of the former WOL included a row of three loading docks on the southern face of the building, and one overhead doorway into the warehouse on the eastern face, at the northeastern corner. These former features are shown on Plate 7.

In light of NYSDEC's comment, Sun Chemical proposes completion of four borings near the former WOL, including borings BW01-BW03 at the three loading docks located along the southern face of the building and boring BW04 at the northeastern corner in front of the large doorway that provided forklift access to the warehouse. Other than these four locations, there were no other points of entry into the building designed for other than personnel access.

Consistent with the soil screening approach proposed above for other AOCs, Sun Chemical proposed to complete boring BW04 for soil screening. This boring was selected given its proximity to locations where impacted soils were encountered during the IRM (i.e., along the northern side of the former building). Soil cores from this boring will be continuously screened with a PID to assist in determining the appropriate sampling intervals. Soil samples will be collected from BW04 from the soil surface (from 0-2 inches), the six-inch interval above the water table, and from a deeper interval that either exhibits evidence of potential contamination (including elevated PID readings) or if no such evidence is observed, 9.5.-10.0 feet below the water table.

Analytical results from the screening-level samples from BW04 will be compared to the commercial-use SCOs and suites of constituents present above those SCOs would be selected as the target constituents for sampling at borings BW01-BW03. If no such constituents are identified, soil samples from those borings will be collected for PPMs+Ba analyses, given that metals were identified above commercial-use SCOs during the IRM in the two excavations completed along the northern side of the WOL. Borings BW01-BW03 will be advanced to the first saturated interval and soil samples collected from three intervals, including the soil surface (from 0-2 inches), from 2.0-2.5' and from the six-inch interval above the water table.

7.3.10 Storm Water Collection System Sediment Sampling

NYSDEC requested that Sun Chemical collect a sediment sample from the most downgradient storm water catch basin north of the former Red Wing. As observed during the June 2009 site meeting within NYSDEC, there are relatively few catch basins at the property, which north of the Red Wing consisted entirely of narrow grated trench drains at the northwestern and uphill corner of that former building. Storm water flow at lower elevations along pavement bordering the northern face of the Red Wing was managed via a trench drain traversing the pavement proximate to the eastern end of the building (see Plate 7). In light of the configuration of the trench drains, Sun Chemical proposes to collect the requested sediment sample (SED1) from

the location shown on Plate 7, provided that there is a sufficient quantity of sediment to enable that sampling. This sample will be analyzed for the TAL metals, SVOCs and PCBs.

7.3.11 Geophysical Investigation

NYSDEC requested that Sun Chemical evaluate whether a geophysical survey was needed in areas of concern, both at locations of pre-industrial structures and over the remainder of the site after removal of remaining building slabs and other ground-surface interferences. In response to that request, Sun Chemical and ENVIRON have identified a number of site-specific factors believed to indicate that a site-wide geophysical survey is not warranted. Specifically, as discussed in detail below, when the development and operational history are considered in conjunction with the property configuration, one would conclude that the presence of buried storage or waste vessels would not be reasonably expected.

First, according to a Sanborn map from the 1890s, pre-industrial uses of the property included a hotel with a pavilion and amusement-type shooting gallery. Given the age of these structures, coal was the most likely heating source, such that heating oil underground storage tanks (USTs) would not be expected. The site was then developed for industrial use in 1907. The main production building (the former Blue and Red Wings) and the Power House (i.e., a boiler building) were constructed at that time, with coal as the fuel source. The railroad was also already present along the eastern site border, although not yet part of the property. Two residences and associated outbuildings remained on the property into at least the 1930s for employee housing (these buildings were evident on the 1917 Sanborn map), with later additions to the industrial facility including the gradual expansion of the Red Wing to the west, construction of storage buildings south of the Blue Wing, and construction of the warehouse in the 1950s. However, the overall configuration and use of the site did not significantly change over time.

As NYSDEC knows, Sanborn Fire Insurance maps were prepared with the express purpose of identifying sources of potential fire, particularly where liquid fuels were stored in USTs or ASTs. The absence of such tanks shown on the Sanborn maps for this site, with the exception of the former USTs described above as AOC 12, supports Sun Chemical's conclusion that tanks were not present at the site.

In light of the fully developed and active nature of site since 1907, Sun Chemical and ENVIRON conclude that there would have been no inactive areas available for any potential waste burial or disposal. Further, the footprints of all production buildings, as well as the Power House and the southern maintenance and storage buildings, have been subject to excavation, some to considerable depths, as have other areas of the site, and no buried drums, subsurface waste disposal or other unanticipated features were encountered. The only sub-grade industrial features encountered were shallow industrial sewer system piping and reactors in the former Grind & Mix Department that Sun Chemical had identified prior to removal of the building slabs. Last, contaminant concentrations and other evidence of impacts (such as soil staining) consistently and markedly decrease with depth such that there is no indication that buried source materials might be present. In consideration of the above, Sun Chemical and ENVIRON conclude that there are no site-specific features or conditions that justify completion of a geophysical survey and therefore request that NYSDEC withdraw its request for the evaluation.

7.3.12 Groundwater

After discussions with NYSDEC, the parties agreed that certain additional groundwater sampling would be completed at the site to confirm groundwater quality prior to determining whether additional wells were required. In addition, as suggested by NYSDEC, Sun Chemical agrees to install and sample several additional monitoring wells to more fully understand groundwater quality and the direction of groundwater flow. As the following detailed scope of work reflects, groundwater samples will be collected from all of the monitoring wells discussed below and analyzed for TCL VOCs to determine if any VOCs are present at concentrations above Part 703.5 standards. In addition, any VOC detections will be evaluated relative to NYSDEC's October 2006 "Strategy for Evaluating Vapor Intrusion at Remedial Sites in New York (DER-13) and the NYSDOH's October 2006 "Guidance for Evaluating Vapor Intrusion in the State of New York."

7.3.12.1 Confirmatory Groundwater Sampling

Groundwater samples were most recently collected from the existing on-site wells in October 2006. As noted above, through that sampling, Sun Chemical identified concentrations of several chlorinated VOCs above Part 703.5 groundwater quality standards primarily at wells MW-3 and MW-4 but also at MW-5D. In addition, benzene was present above the Part 703.5 standard at MW-3 and MW-4. Given the length of the time since the last sampling round, ENVIRON proposes to collect two confirmatory rounds of groundwater samples for TCL VOC analyses at least 30 days apart from all on-site monitoring wells. These data will be evaluated as noted above in Section 7.3.12.

In preparation for this sampling event, ENVIRON attempt to relocate MW-3, which was damaged during the demolition program. Given that the well could not be located, it will be re-installed in proximity to the original location and to the same depth as MW-3 (i.e., the well will be screened from 30 to 40 feet).

7.3.12.2 Investigation of Deeper Groundwater Quality

NYSDEC indicated that a deeper well is needed to evaluate vertical concentration trends, even though significant VOC concentrations had not been identified at MWs 3 and 4, and no soil source appears to be present. Sun Chemical therefore proposes installation of a deeper well for vertical delineation purposes. Consistent with the overall staged approach in completing this RI, Sun Chemical also proposes that this well would be installed only following review of analytical results from the proposed additional shallow groundwater testing, and confirmation of the groundwater flow regime to enable placement of the deeper well at the most appropriate location. Following confirmation of that location, Sun Chemical will install the well to monitor an interval 25 feet deeper than the well that is confirmed to have the highest concentrations of chlorinated VOCs. As shown on Plate 7, it is currently envisioned that this well will be completed proximate to MW-3S. However, prior to the well installation, Sun Chemical will seek NYSDEC's approval of the proposed location.

7.3.12.3 Downgradient Delineation Sampling

The Department requested that Sun Chemical ensure that groundwater impacts were delineated to the nearest downgradient receptor, namely the downgradient properties with

potential vapor intrusion concerns. Sun Chemical also understands that some level of soil vapor sampling might ultimately be completed at the Site, but NYSDEC and Sun Chemical have agreed to the deferral of such sampling pending evaluation of the proposed additional groundwater and soil sampling.

Consequently, to further evaluate the presence of VOC concentrations in shallow ground water near the southern property boundary, Sun Chemical will install four additional shallow wells, MWs 8 through 11, at the approximate locations depicted on Plate 7. Consistent with the other shallow wells on-site, these proposed wells will be constructed to monitor the first saturated zone, likely present at an approximate depth of 10 to 15 feet based on the most recent water level measurements at MW4. The wells will be drilled in accordance with NYSDEC recommendations, including its most recent Sampling Guidelines and Protocols. The wells will be drilled using hollow-stem augers and will be constructed with a 10-foot 0.010"-slotted 2-inch PVC screen and PVC casing, and fitted with a locking cap and flushmount protective cover. Following development and a minimum stabilization period of two weeks, ENVIRON will collect groundwater samples from these wells. This sampling will be completed concurrent with the confirmatory sampling proposed above in this subsection.

7.3.12.4 Groundwater Flow Evaluation

NYSDEC noted that a more complete characterization and delineation of the identified shallow groundwater impacts and flow regime is required. Sun Chemical therefore proposes to install three additional wells, MWs 12, 13 and 14, at the locations shown on Plate 7. As shown, MW-12 will be installed near the center of the site and near the highest topographic elevation. In addition to this being a location likely upgradient of MW-3, MW-12 will also assist in determining the degree to which there might be radial groundwater flow due to the site topography. MWs 13 and 14 are proposed at lower elevations west and north of MW-12 to further define the flow direction.

7.4 Health and Safety Protocols

ENVIRON has developed a Site Health and Safety Plan (HASP), provided in Appendix E, for sampling and remedial activities at the Site that meets the requirements of 29 CFR 1910.120. Based on the nature of soil contamination detected to date, and the confirmed absence of dust/particulates at levels of potential concern during the prior site work, future soil and groundwater sampling activities are projected to be completed with Level D personal protective equipment (PPE). However, the HASP also specifies PID monitoring during the sampling activities, and potential PPE upgrades based on PID readings.

As recommended in DER-10, Sun Chemical and ENVIRON evaluated whether a Community Air Monitoring Program (CAMP) would be required as a component of the proposed RIWP. As indicated above, the site has no known VOC soil contamination. Further, no elevated PID readings were recorded during the IRM program. Last, as indicated above, during the IRM program Sun Chemical completed a CAMP but identified no particulate readings on a 15-minute time weighted average basis that exceeded the NYSDOH suggested limit of 100 $\mu g/m^3$. ENVIRON also did not observe any visible dust migrating from the work areas. These data and observations therefore indicate that release of dust/soil particulates during planned RI activities is not of concern. In light of those prior air monitoring results and the limited nature of ground

disturbance planned, Sun Chemical proposes that a CAMP not be required during implementation of the RIWP. Based on prior discussions regarding this issue, the parties agreed that a CAMP is not required.

7.5 Reporting and Schedule

Sun Chemical will present the results of the RI in a *Remedial Investigation Report* (RIR) that meets the requirements of DER-10 Section 3.14. In accordance with that section, the RIR will be prepared to follow the general outline provided below.

I. Introduction
   A. Background
   B. Purpose and Scope
   C. Report Organization

II. Remedial Investigation Report
   A. Overview
   B. Data Usability
   C. Applicable Soil Cleanup Objectives
   D. Site Geology and Hydrogeology
   E. Soil Findings in Areas of Concern
      1. AOC 2
      2. AOC 9
      3. AOC 14
      4. AOC 15
      5. Secondary Production Area (Sampling Location SB-28)
      6. Red Wing Western End Piping
      7. Grind and Mix Department Tank Area
      8. Powerhouse
      9. WOL Building
   F. Storm Water Drainage System Sediments
   G. Groundwater

III. Recommendations for Additional Actions

ENVIRON has developed the following initial schedule for the RIWP activities. As noted, implementation of the proposed RI and all subsequent tasks on this schedule is based on an assumed date of NYSDEC work plan approval. The schedule will be revised, as needed, should the actual approval data materially differ from the assumed date.

Table 4: Proposed Remedial Investigation Schedule
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

Task	Projected Completion Date
Public Comment Period for RIWP	July 2, 2010
NYSDEC review and approval of RIWP, and revisions, if needed, to address public comments	August 6, 2010
Implementation of on-site soil sampling and initial	October 8, 2010

Table 4: Proposed Remedial Investigation Schedule
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

Task	Projected Completion Date
groundwater sampling round per RIWP	
Laboratory analyses of soil and initial groundwater samples	November 5, 2010
Collection of confirmatory round of groundwater samples	November 5, 2010
Laboratory analyses of confirmatory groundwater samples	December 3, 2010
Preparation of a *Remedial Investigation Report and Supplemental Remedial Investigation Work Plan OR Remedial Action Selection Report and Remedial Work Plan,* including review and interpretation of data from remedial investigation	February 11, 2011

7.6 Project Contact Information

The following personnel will be the primary contacts for the RI activities.

Table 5: Project Contact Information
Sun Chemical Corporation - 441 Tompkins Avenue, Staten Island, New York

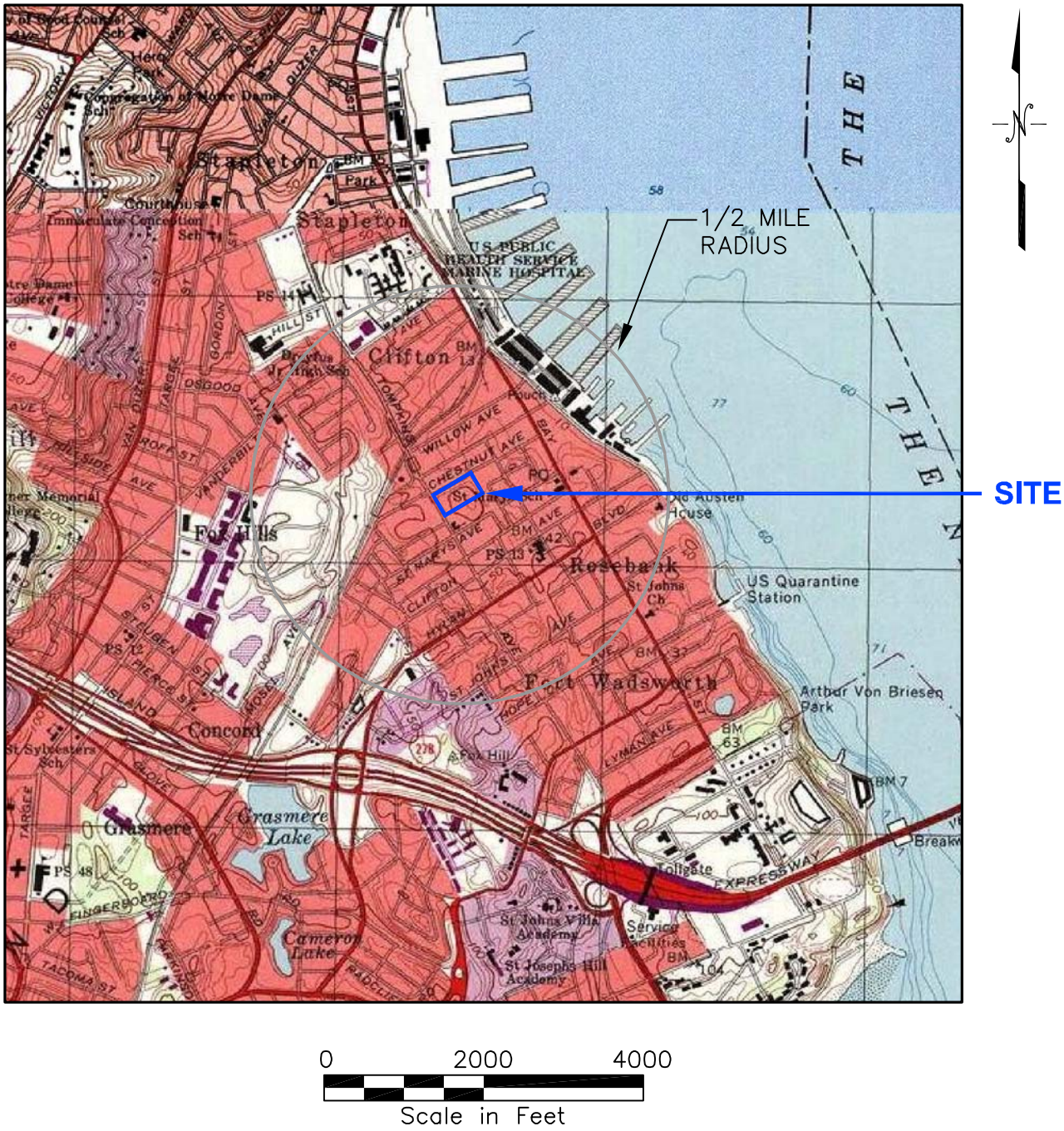
Name	Role	Contact Information
William D. Kraft, III, PG	Requestor's Consultant	ENVIRON International Corporation 214 Carnegie Center Princeton, NJ 08540 609-243-9844 bkraft@environcorp.com
Bob Garner	Requestor's Project Manager	Sun Chemical Corporation 5020 Spring Grove Avenue Cincinnati, OH 45232 (513) 681-5950 ext. 238 Bob.Garner@sunchemical.com
Warren Faure, Esq.	Requestor's Representative	SUN/DIC Acquisition Corp. 35 Waterview Blvd. Parsippany, NJ 07054-1285 (973) 404-6500 Warren.Faure@sunchemical.com
Benjamin Wolff, Esq.	Requestor's Attorney	Manatt Phelps & Phillips 7 Times Square New York, NY 10036 (212) 790-4575 twolff@manatt.com

7.7 Citizen Participation Activities

All proposed RI activities will be completed following the citizen participation requirements of the BCP and in accordance with the updated Citizen Participation (CP) Plan submitted to NYSDEC on January 26, 2010 included herein as Appendix F for reference.

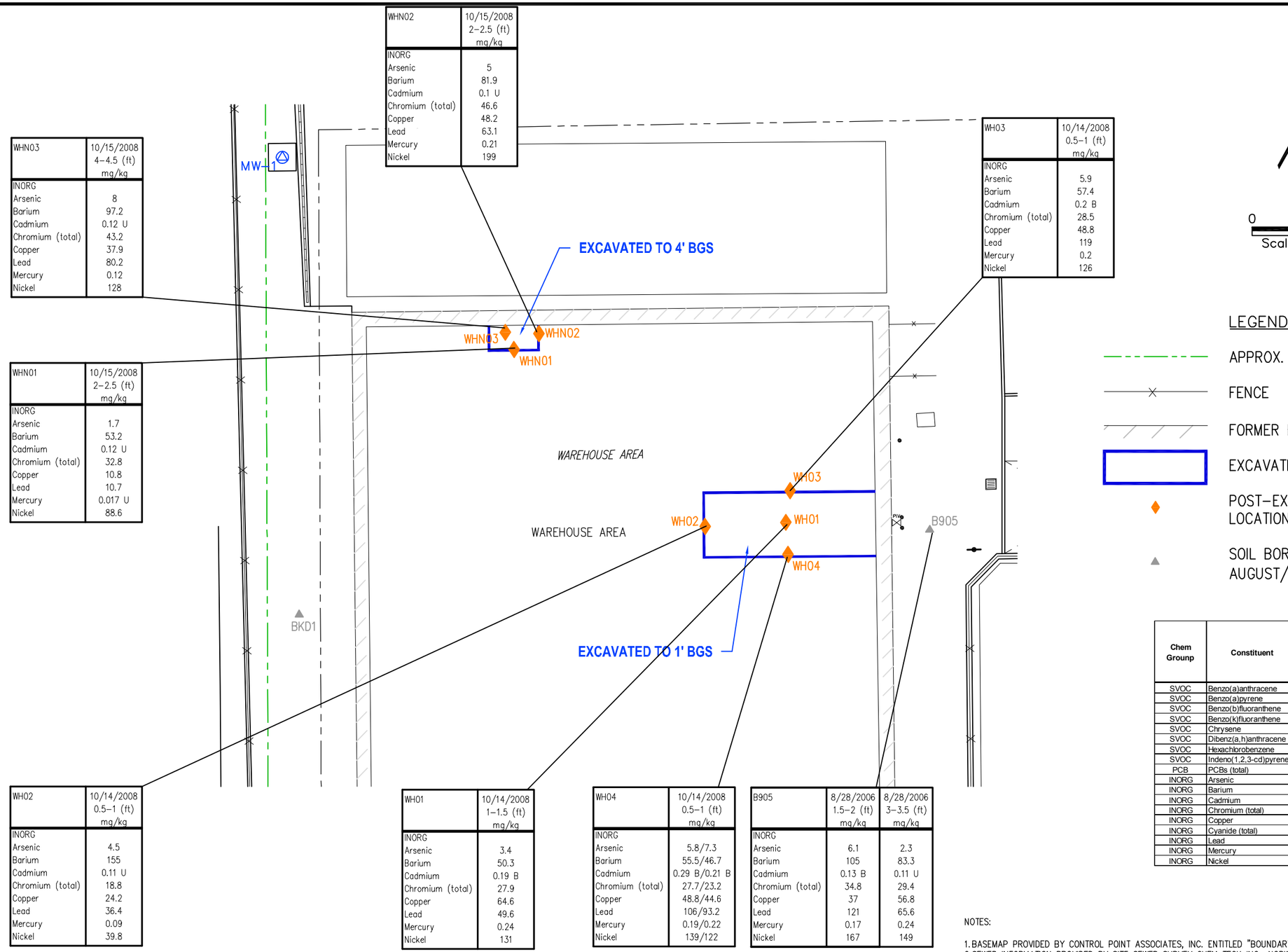
21-16433A:PRIN_WP\28850v3.Doc

Figure



SOURCE: TOPO! MAP PRINTED ON 08/29/07 FROM "NORTHEASTERN.TPO" USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, THE NARROWS, NY–NJ. MAP VERSION 1998. MAP CURRENT AS OF 1998.

ENVIRON	SITE LOCATION MAP SUN CHEMICAL CORPORATION 441 TOMPKINS AVENUE STATEN ISLAND, NEW YORK	FIGURE 1
DRAFTED BY: CAD/TSP DATE: 12/4/07		21-16443AJ01



Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

ENVIRON

DRAFTED BY: TSP/KPM/KPM | DATE: 4/6/09

WAREHOUSE EXCAVATION AREAS AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE 2

2116443AS02A

BWIP01	10/21/2008 1–1.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.04 U
Benzo(a)pyrene	0.04 U
Benzo(b)fluoranthene	0.04 U
Benzo(k)fluoranthene	0.04 U
Chrysene	0.4 U
Dibenz(a,h)anthracene	0.04 U
Hexachlorobenzene	0.04 U
Indeno(1,2,3–cd)pyrene	0.04 U
INORG	
Arsenic	3.7
Barium	75.7
Cadmium	0.11 U
Chromium (total)	69.8
Copper	19.8
Lead	15
Mercury	0.02 U
Nickel	205

B801	8/28/2006 0.5–1 (ft) mg/kg	8/28/2006 2–2.5 (ft) mg/kg
INORG		
Arsenic	4.1	2.2
Barium	64.8	56.1
Cadmium	0.097 U	0.097 U
Chromium (total)	54.7	56.3
Copper	24.9	17.3
Lead	10.4	7.7
Mercury	0.02 U	0.017 U
Nickel	278	265

BWIP02	10/21/2008 1–1.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.01 J
Benzo(a)pyrene	0.011 J
Benzo(b)fluoranthene	0.0097 J
Benzo(k)fluoranthene	0.039 U
Chrysene	0.011 J
Dibenz(a,h)anthracene	0.039 U
Hexachlorobenzene	0.039 U
Indeno(1,2,3–cd)pyrene	0.039 U
INORG	
Arsenic	3.4
Barium	64.5
Cadmium	0.11 U
Chromium (total)	115
Copper	39.3
Lead	35
Mercury	0.019 U
Nickel	173

BWIP08	10/21/2008 1.5–2 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.04 U/0.041 U
Benzo(a)pyrene	0.04 U/0.041 U
Benzo(b)fluoranthene	0.04 U/0.041 U
Benzo(k)fluoranthene	0.04 U/0.041 U
Chrysene	0.4 U/0.41 U
Dibenz(a,h)anthracene	0.04 U/0.041 U
Hexachlorobenzene	0.04 U/0.041 U
Indeno(1,2,3–cd)pyrene	0.04 U/0.041 U
INORG	
Arsenic	3.7/4.4
Barium	66.2/64.5
Cadmium	0.43 B/0.42 B
Chromium (total)	81.2/84.7
Copper	19.9/21.1
Lead	12.9/13.8
Mercury	0.02 U/0.02 U
Nickel	262/284

B702	8/28/2006 0.5–1 (ft) mg/kg	8/28/2006 2–2.5 (ft) mg/kg
INORG		
Arsenic	1.6	1.5
Barium	29.9 B	27 B
Cadmium	0.089 U	0.088 U
Chromium (total)	37.3	26.3
Copper	16.1	17.4
Lead	14.3	5.2
Mercury	0.03 B	0.018 U
Nickel	181	247

BWIP07	10/21/2008 2–2.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.041 U
Benzo(a)pyrene	0.041 U
Benzo(b)fluoranthene	0.041 U
Benzo(k)fluoranthene	0.041 U
Chrysene	0.41 U
Dibenz(a,h)anthracene	0.041 U
Hexachlorobenzene	0.041 U
Indeno(1,2,3–cd)pyrene	0.041 U
INORG	
Arsenic	4.9
Barium	101
Cadmium	0.12 U
Chromium (total)	63.5
Copper	24.5
Lead	14.5
Mercury	0.02 U
Nickel	247

BWIP06	10/21/2008 1–1.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.04 U
Benzo(a)pyrene	0.04 U
Benzo(b)fluoranthene	0.04 U
Benzo(k)fluoranthene	0.04 U
Chrysene	0.4 U
Dibenz(a,h)anthracene	0.04 U
Hexachlorobenzene	0.04 U
Indeno(1,2,3–cd)pyrene	0.04 U
INORG	
Arsenic	4.6
Barium	59.3
Cadmium	0.11 U
Chromium (total)	42.9
Copper	20.7
Lead	12.8
Mercury	0.02 U
Nickel	206

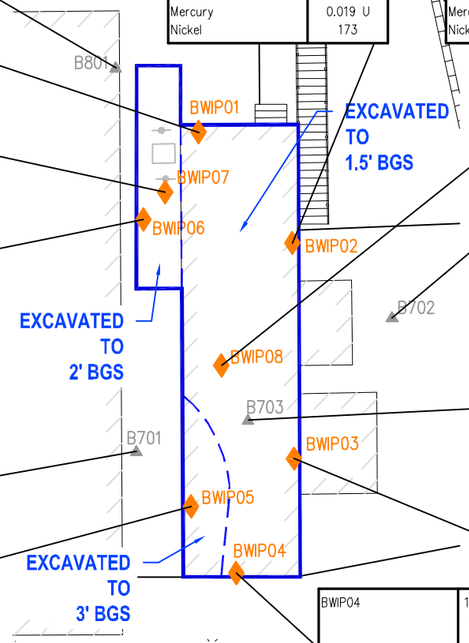
B703	10/4/2006 0.5–1 (ft) mg/kg
INORG	
Arsenic	6.7
Barium	243
Cadmium	0.45 B
Chromium (total)	62.8
Copper	105
Lead	1000
Mercury	0.37
Nickel	146

BWIP03	10/21/2008 1.5–2 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.04 U
Benzo(a)pyrene	0.04 U
Benzo(b)fluoranthene	0.04 U
Benzo(k)fluoranthene	0.04 U
Chrysene	0.4 U
Dibenz(a,h)anthracene	0.04 U
Hexachlorobenzene	0.04 U
Indeno(1,2,3–cd)pyrene	0.04 U
INORG	
Arsenic	4.2
Barium	63.2
Cadmium	0.12 U
Chromium (total)	98.3
Copper	39.9
Lead	14.5
Mercury	0.02 U
Nickel	220

B701	8/28/2006 0.5–1 (ft) mg/kg	8/28/2006 1.5–2 (ft) mg/kg
INORG		
Arsenic	7.3	6.9
Barium	**428**	164
Cadmium	0.13 B	0.27 B
Chromium (total)	45	45
Copper	94.9	124
Lead	884	139
Mercury	0.76	0.28
Nickel	75.3	203

BWIP05	10/21/2008 1–1.5 (ft) mg/kg	10/24/2008 2–2.5 (ft) mg/kg	10/29/2008 3–3.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.038 U	–	–
Benzo(a)pyrene	0.038 U	–	–
Benzo(b)fluoranthene	0.038 U	–	–
Benzo(k)fluoranthene	0.038 U	–	–
Chrysene	0.38 U	–	–
Dibenz(a,h)anthracene	0.038 U	–	–
Hexachlorobenzene	0.038 U	–	–
Indeno(1,2,3–cd)pyrene	0.038 U	–	–
INORG			
Arsenic	4.4	2.3	1.2
Barium	82.7	79.2	32.8 B
Cadmium	0.12 U	0.096 U	0.09 U
Chromium (total)	66.4	59	22.7
Copper	20.6	23	38.5
Lead	15.5	8.8	4.7
Mercury	0.016 U	0.017 U	0.019 U
Nickel	**327**	**318**	210

BWIP04	10/21/2008 1.5–2 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.04 U
Benzo(a)pyrene	0.04 U
Benzo(b)fluoranthene	0.012 J
Benzo(k)fluoranthene	0.04 U
Chrysene	0.4 U
Dibenz(a,h)anthracene	0.04 U
Hexachlorobenzene	0.04 U
Indeno(1,2,3–cd)pyrene	0.0097 J
INORG	
Arsenic	4.2
Barium	80
Cadmium	0.12 U
Chromium (total)	73.7
Copper	54.6
Lead	14.2
Mercury	0.017 U
Nickel	259



LEGEND

FORMER BUILDING WALL/FOOTER

FORMER LOCATION OF ELECTRIC UTILITY POLES AND ELECTRIC PANEL

EXCAVATION AREA

ADDITIONAL EXCAVATION AREA

POST–EXCAVATION SOIL SAMPLING LOCATION, OCTOBER 2008

SOIL BORING LOCATION, AUGUST 2006

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9–24–07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

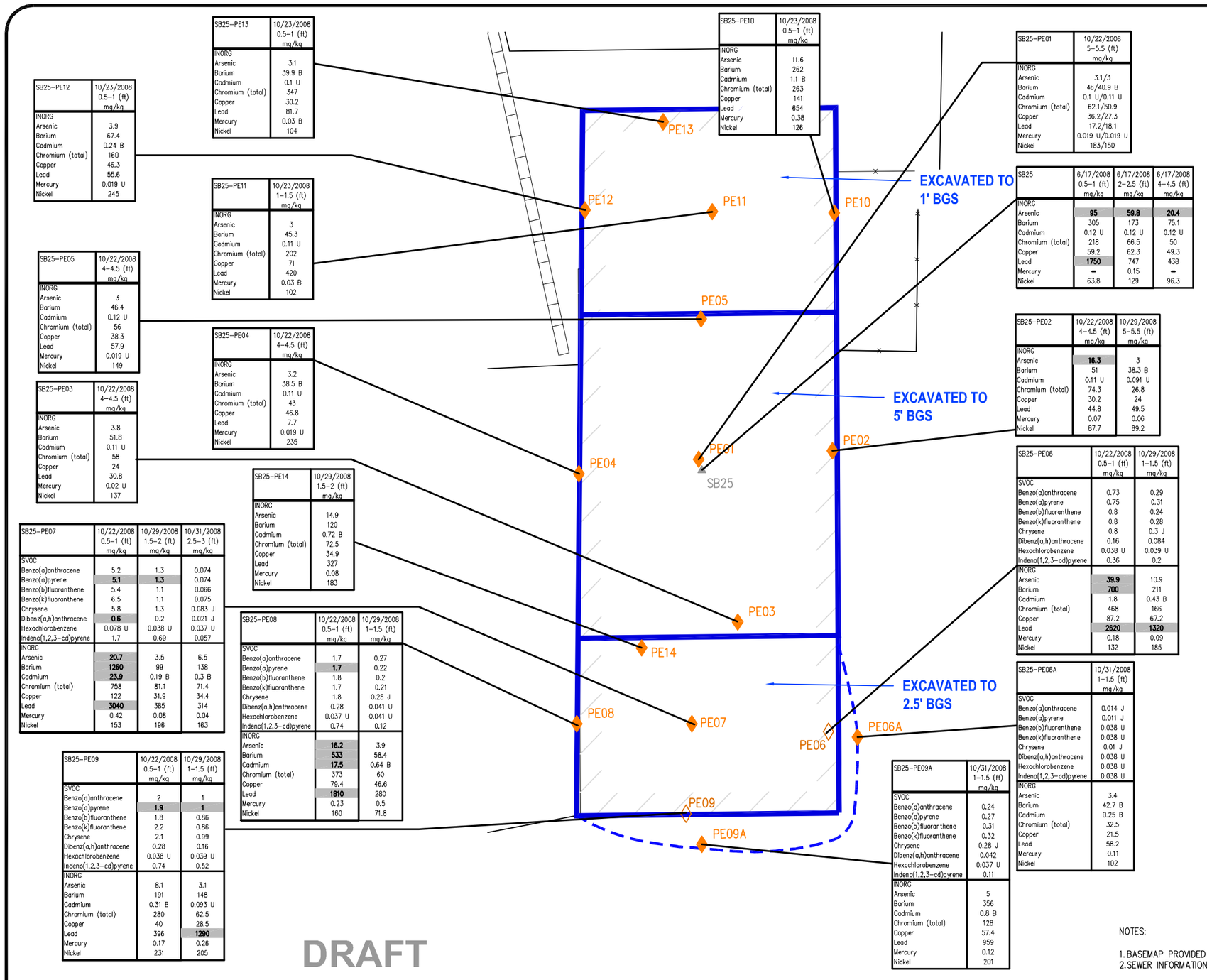
DRAFTED BY: TSP/KPM | DATE: 4/6/09

ICE PLANT EXCAVATION AREA AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE 3

2116443AS02A



SB25–PE13	10/23/2008 0.5–1 (ft) mg/kg
INORG	
Arsenic	3.1
Barium	39.9 B
Cadmium	0.1 U
Chromium (total)	347
Copper	30.2
Lead	81.7
Mercury	0.03 B
Nickel	104

SB25–PE12	10/23/2008 0.5–1 (ft) mg/kg
INORG	
Arsenic	3.9
Barium	67.4
Cadmium	0.24 B
Chromium (total)	160
Copper	46.3
Lead	55.6
Mercury	0.019 U
Nickel	245

SB25–PE11	10/23/2008 1–1.5 (ft) mg/kg
INORG	
Arsenic	3
Barium	45.3
Cadmium	0.11 U
Chromium (total)	202
Copper	71
Lead	420
Mercury	0.03 B
Nickel	102

SB25–PE10	10/23/2008 0.5–1 (ft) mg/kg
INORG	
Arsenic	11.6
Barium	262
Cadmium	1.1 B
Chromium (total)	263
Copper	141
Lead	654
Mercury	0.38
Nickel	126

SB25–PE01	10/22/2008 5–5.5 (ft) mg/kg
INORG	
Arsenic	3.1/3
Barium	46/40.9 B
Cadmium	0.1 U/0.11 U
Chromium (total)	62.1/50.9
Copper	36.2/27.3
Lead	17.2/18.1
Mercury	0.019 U/0.019 U
Nickel	183/150

SB25–PE05	10/22/2008 4–4.5 (ft) mg/kg
INORG	
Arsenic	3
Barium	46.4
Cadmium	0.12 U
Chromium (total)	56
Copper	38.3
Lead	57.9
Mercury	0.019 U
Nickel	149

SB25–PE04	10/22/2008 4–4.5 (ft) mg/kg
INORG	
Arsenic	3.2
Barium	38.5 B
Cadmium	0.11 U
Chromium (total)	43
Copper	46.8
Lead	7.7
Mercury	0.019 U
Nickel	235

SB25	6/17/2008 0.5–1 (ft) mg/kg	6/17/2008 2–2.5 (ft) mg/kg	6/17/2008 4–4.5 (ft) mg/kg
INORG			
Arsenic	**95**	**59.8**	**20.4**
Barium	305	173	75.1
Cadmium	0.12 U	0.12 U	0.12 U
Chromium (total)	218	66.5	50
Copper	59.2	62.3	49.3
Lead	**1750**	747	438
Mercury	–	0.15	–
Nickel	63.8	129	96.3

SB25–PE03	10/22/2008 4–4.5 (ft) mg/kg
INORG	
Arsenic	3.8
Barium	51.8
Cadmium	0.11 U
Chromium (total)	58
Copper	24
Lead	30.8
Mercury	0.02 U
Nickel	137

SB25–PE14	10/29/2008 1.5–2 (ft) mg/kg
INORG	
Arsenic	14.9
Barium	120
Cadmium	0.72 B
Chromium (total)	72.5
Copper	34.9
Lead	327
Mercury	0.08
Nickel	183

SB25–PE02	10/22/2008 4–4.5 (ft) mg/kg	10/29/2008 5–5.5 (ft) mg/kg
INORG		
Arsenic	**16.3**	3
Barium	51	38.3 B
Cadmium	0.11 U	0.091 U
Chromium (total)	74.3	26.8
Copper	30.2	24
Lead	44.8	49.5
Mercury	0.07	0.06
Nickel	87.7	89.2

SB25–PE07	10/22/2008 0.5–1 (ft) mg/kg	10/29/2008 1.5–2 (ft) mg/kg	10/31/2008 2.5–3 (ft) mg/kg
SVOC			
Benzo(a)anthracene	5.2	1.3	0.074
Benzo(a)pyrene	**5.1**	**1.3**	0.074
Benzo(b)fluoranthene	5.4	1.1	0.066
Benzo(k)fluoranthene	6.5	1.1	0.075
Chrysene	5.8	1.3	0.083 J
Dibenz(a,h)anthracene	**0.6**	0.2	0.021 J
Hexachlorobenzene	0.078 U	0.038 U	0.037 U
Indeno(1,2,3–cd)pyrene	1.7	0.69	0.057
INORG			
Arsenic	**20.7**	3.5	6.5
Barium	**1260**	99	138
Cadmium	**23.9**	0.19 B	0.3 B
Chromium (total)	758	81.1	71.4
Copper	122	31.9	34.4
Lead	**3040**	385	314
Mercury	0.42	0.08	0.04
Nickel	153	196	163

SB25–PE08	10/22/2008 0.5–1 (ft) mg/kg	10/29/2008 1–1.5 (ft) mg/kg
SVOC		
Benzo(a)anthracene	1.7	0.27
Benzo(a)pyrene	**1.7**	0.22
Benzo(b)fluoranthene	1.8	0.2
Benzo(k)fluoranthene	1.7	0.21
Chrysene	1.8	0.25 J
Dibenz(a,h)anthracene	0.28	0.041 U
Hexachlorobenzene	0.037 U	0.041 U
Indeno(1,2,3–cd)pyrene	0.74	0.12
INORG		
Arsenic	**16.2**	3.9
Barium	**533**	58.4
Cadmium	**17.5**	0.64 B
Chromium (total)	373	60
Copper	79.4	46.6
Lead	**1810**	280
Mercury	0.23	0.5
Nickel	160	71.8

SB25–PE06	10/22/2008 0.5–1 (ft) mg/kg	10/29/2008 1–1.5 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.73	0.29
Benzo(a)pyrene	0.75	0.31
Benzo(b)fluoranthene	0.8	0.24
Benzo(k)fluoranthene	0.8	0.28
Chrysene	0.8	0.3 J
Dibenz(a,h)anthracene	0.16	0.084
Hexachlorobenzene	0.038 U	0.039 U
Indeno(1,2,3–cd)pyrene	0.36	0.2
INORG		
Arsenic	**39.9**	10.9
Barium	**700**	211
Cadmium	1.8	0.43 B
Chromium (total)	468	166
Copper	87.2	67.2
Lead	**2620**	**1320**
Mercury	0.18	0.09
Nickel	132	185

SB25–PE09	10/22/2008 0.5–1 (ft) mg/kg	10/29/2008 1–1.5 (ft) mg/kg
SVOC		
Benzo(a)anthracene	2	1
Benzo(a)pyrene	**1.9**	**1**
Benzo(b)fluoranthene	1.8	0.86
Benzo(k)fluoranthene	2.2	0.86
Chrysene	2.1	0.99
Dibenz(a,h)anthracene	0.28	0.16
Hexachlorobenzene	0.038 U	0.039 U
Indeno(1,2,3–cd)pyrene	0.74	0.52
INORG		
Arsenic	8.1	3.1
Barium	191	148
Cadmium	0.31 B	0.093 U
Chromium (total)	280	62.5
Copper	40	28.5
Lead	396	**1290**
Mercury	0.17	0.26
Nickel	231	205

SB25–PE09A	10/31/2008 1–1.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.24
Benzo(a)pyrene	0.27
Benzo(b)fluoranthene	0.31
Benzo(k)fluoranthene	0.32
Chrysene	0.28 J
Dibenz(a,h)anthracene	0.042
Hexachlorobenzene	0.037 U
Indeno(1,2,3–cd)pyrene	0.11
INORG	
Arsenic	5
Barium	356
Cadmium	0.8 B
Chromium (total)	128
Copper	57.4
Lead	959
Mercury	0.12
Nickel	201

SB25–PE06A	10/31/2008 1–1.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.014 J
Benzo(a)pyrene	0.011 J
Benzo(b)fluoranthene	0.038 U
Benzo(k)fluoranthene	0.038 U
Chrysene	0.01 J
Dibenz(a,h)anthracene	0.038 U
Hexachlorobenzene	0.038 U
Indeno(1,2,3–cd)pyrene	0.038 U
INORG	
Arsenic	3.4
Barium	42.7 B
Cadmium	0.25 B
Chromium (total)	32.5
Copper	21.5
Lead	58.2
Mercury	0.11
Nickel	102

0 10
Scale In Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FENCE
- FORMER TRENCH
- EXCAVATION AREA
- ADDITIONAL EXCAVATION AREA
- POST–EXCAVATION SOIL SAMPLING LOCATION, OCTOBER 2008
- POST–EXCAVATION SOIL SAMPLING LOCATION REMOVED DURING SUBSEQUENT EXCAVATION
- SOIL BORING LOCATION, JUNE 2008

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9–24–07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

ENVIRON

DRAFTED BY: TSP / KPM | DATE: 4/6/09

STORAGE BUILDING EXCAVATION AREA AND SAMPLE LOCATIONS
SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
4

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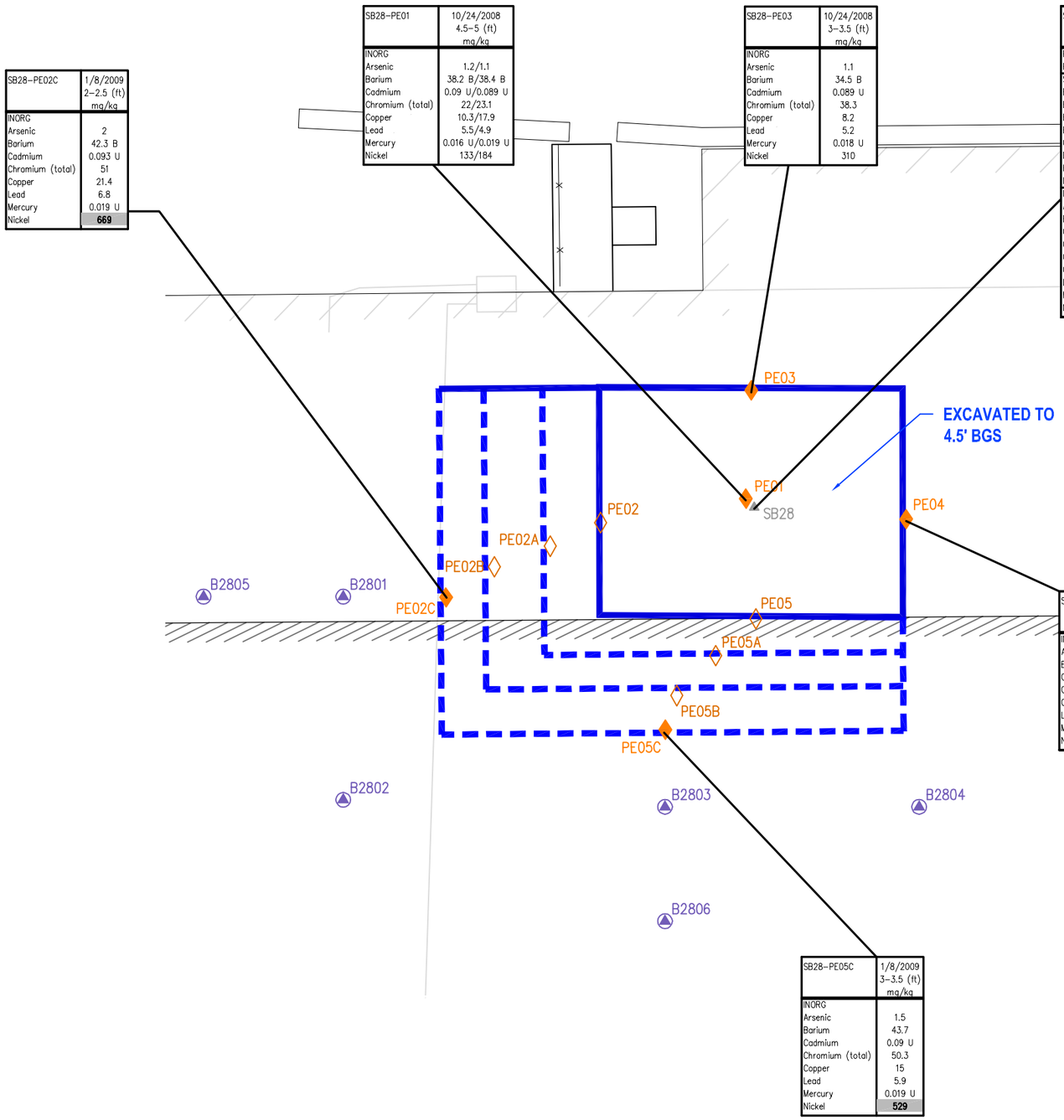


SB28-PE02C	1/8/2009 2-2.5 (ft) mg/kg
INORG	
Arsenic	2
Barium	42.3 B
Cadmium	0.093 U
Chromium (total)	51
Copper	21.4
Lead	6.8
Mercury	0.019 U
Nickel	**669**

SB28-PE01	10/24/2008 4.5-5 (ft) mg/kg
INORG	
Arsenic	1.2/1.1
Barium	38.2 B/38.4 B
Cadmium	0.09 U/0.089 U
Chromium (total)	22/23.1
Copper	10.3/17.9
Lead	5.5/4.9
Mercury	0.016 U/0.019 U
Nickel	133/184

SB28-PE03	10/24/2008 3-3.5 (ft) mg/kg
INORG	
Arsenic	1.1
Barium	34.5 B
Cadmium	0.089 U
Chromium (total)	38.3
Copper	8.2
Lead	5.2
Mercury	0.018 U
Nickel	310

SB28	6/17/2008 0.5-1 (ft) mg/kg	6/17/2008 2-2.5 (ft) mg/kg	6/17/2008 4-4.5 (ft) mg/kg
PCB			
PCBs (total)	0.075 U	-	-
SVOC			
Benzo(a)anthracene	0.037 U	-	-
Benzo(a)pyrene	0.037 U	-	-
Benzo(b)fluoranthene	0.037 U	-	-
Benzo(k)fluoranthene	0.037 U	-	-
Chrysene	0.37 U	-	-
Dibenz(a,h)anthracene	0.037 U	-	-
Hexachlorobenzene	0.037 U	-	-
Indeno(1,2,3-cd)pyrene	0.037 U	-	-
INORG			
Arsenic	2.6	2.7	2
Barium	109	63.2	71.6
Cadmium	0.47 B	0.11 U	0.11 U
Chromium (total)	52.7	46.3	50.7
Copper	30.1	15	26.9
Cyanide (total)	3.1	-	-
Lead	69.3	18.6	20.1
Mercury	-	0.04	-
Nickel	**434**	**354**	**332**

SB28-PE04	10/24/2008 0.5-1 (ft) mg/kg	10/24/2008 2-2.5 (ft) mg/kg
INORG		
Arsenic	0.81 B	1.2
Barium	34.9 B	35.4 B
Cadmium	0.088 U	0.089 U
Chromium (total)	17	18.2
Copper	12.9	12.3
Lead	5.3	5.1
Mercury	0.018 U	0.019 U
Nickel	100	128

SB28-PE05C	1/8/2009 3-3.5 (ft) mg/kg
INORG	
Arsenic	1.5
Barium	43.7
Cadmium	0.09 U
Chromium (total)	50.3
Copper	15
Lead	5.9
Mercury	0.019 U
Nickel	**529**

0 10
Scale In Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- EXCAVATION AREA
- ADDITIONAL EXCAVATION AREA
- POST-EXCAVATION SOIL SAMPLING LOCATION, OCTOBER 2008 – JANUARY 2009
- POST-EXCAVATION SOIL SAMPLING LOCATION REMOVED DURING SUBSEQUENT EXCAVATION
- SOIL BORING LOCATION, JUNE 2008
- PROPOSED DELINEATION SOIL BORING

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

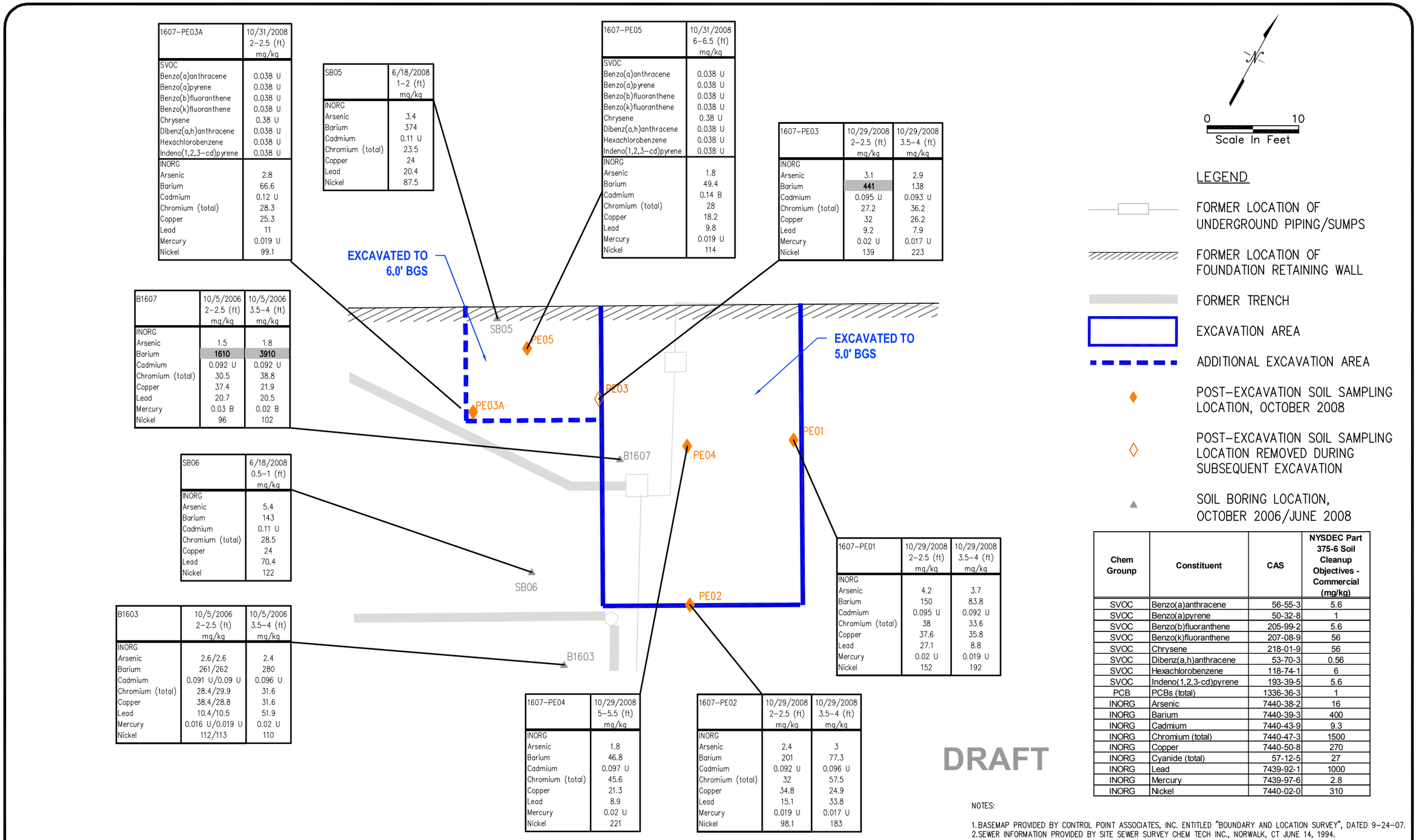
DRAFTED BY: TSP/KPM | DATE: 4/6/09

SECONDARY PRODUCTION EXCAVATION AREA AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
5

2116443AS02A



Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9–24–07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

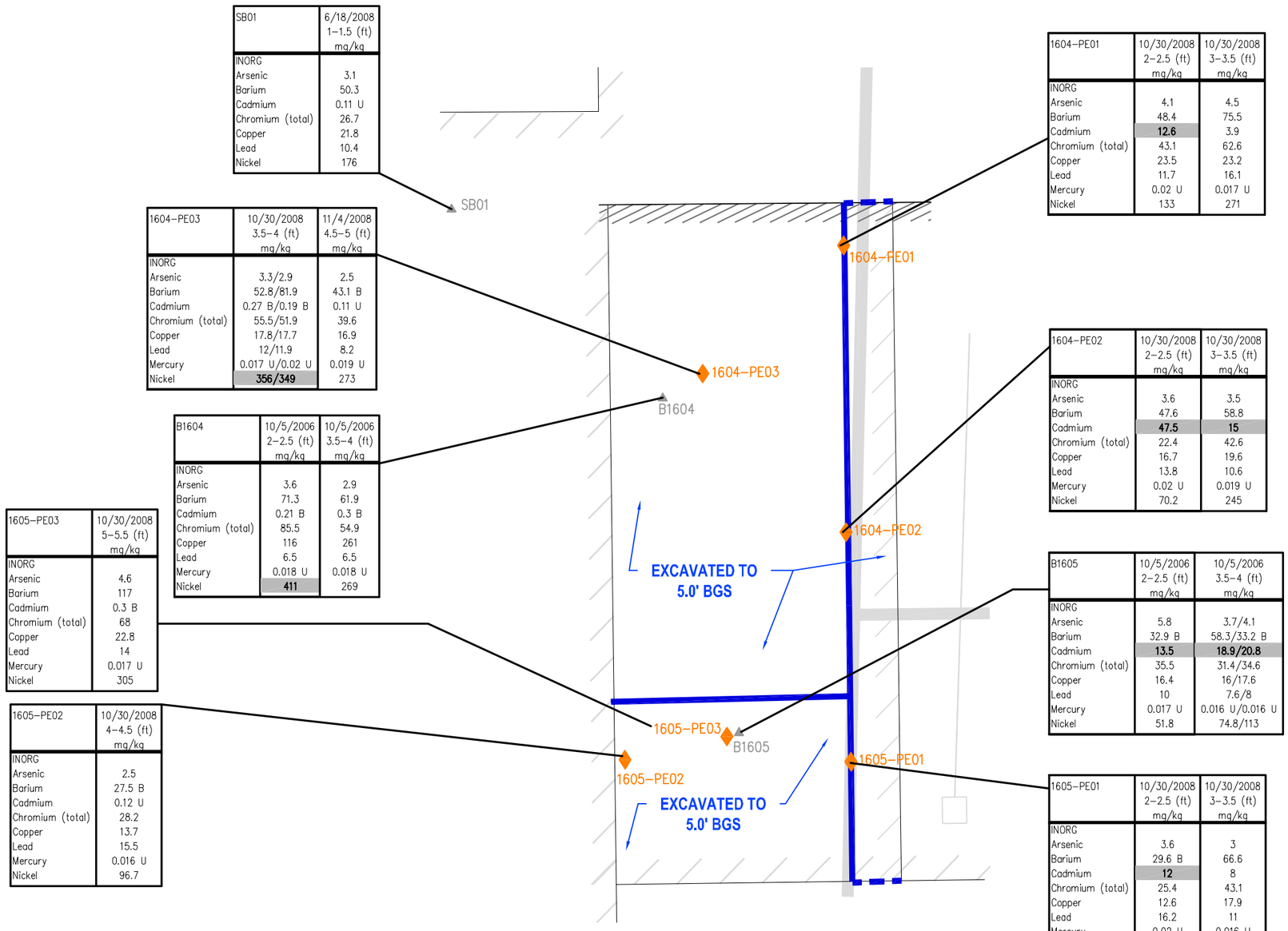
DRAFTED BY: TSP/KPM | DATE: 4/6/09

RED WING: EASTERN END OF PRODUCTION AREA EXCAVATION AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
6

2116443AS02A



SB01	6/18/2008 1-1.5 (ft) mg/kg
INORG	
Arsenic	3.1
Barium	50.3
Cadmium	0.11 U
Chromium (total)	26.7
Copper	21.8
Lead	10.4
Nickel	176

1604-PE03	10/30/2008 3.5-4 (ft) mg/kg	11/4/2008 4.5-5 (ft) mg/kg
INORG		
Arsenic	3.3/2.9	2.5
Barium	52.8/81.9	43.1 B
Cadmium	0.27 B/0.19 B	0.11 U
Chromium (total)	55.5/51.9	39.6
Copper	17.8/17.7	16.9
Lead	12/11.9	8.2
Mercury	0.017 U/0.02 U	0.019 U
Nickel	**356/349**	273

B1604	10/5/2006 2-2.5 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg
INORG		
Arsenic	3.6	2.9
Barium	71.3	61.9
Cadmium	0.21 B	0.3 B
Chromium (total)	85.5	54.9
Copper	116	261
Lead	6.5	6.5
Mercury	0.018 U	0.018 U
Nickel	**411**	269

1605-PE03	10/30/2008 5-5.5 (ft) mg/kg
INORG	
Arsenic	4.6
Barium	117
Cadmium	0.3 B
Chromium (total)	68
Copper	22.8
Lead	14
Mercury	0.017 U
Nickel	305

1605-PE02	10/30/2008 4-4.5 (ft) mg/kg
INORG	
Arsenic	2.5
Barium	27.5 B
Cadmium	0.12 U
Chromium (total)	28.2
Copper	13.7
Lead	15.5
Mercury	0.016 U
Nickel	96.7

1604-PE01	10/30/2008 2-2.5 (ft) mg/kg	10/30/2008 3-3.5 (ft) mg/kg
INORG		
Arsenic	4.1	4.5
Barium	48.4	75.5
Cadmium	**12.6**	3.9
Chromium (total)	43.1	62.6
Copper	23.5	23.2
Lead	11.7	16.1
Mercury	0.02 U	0.017 U
Nickel	133	271

1604-PE02	10/30/2008 2-2.5 (ft) mg/kg	10/30/2008 3-3.5 (ft) mg/kg
INORG		
Arsenic	3.6	3.5
Barium	47.6	58.8
Cadmium	**47.5**	**15**
Chromium (total)	22.4	42.6
Copper	16.7	19.6
Lead	13.8	10.6
Mercury	0.02 U	0.019 U
Nickel	70.2	245

B1605	10/5/2006 2-2.5 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg
INORG		
Arsenic	5.8	3.7/4.1
Barium	32.9 B	58.3/33.2 B
Cadmium	**13.5**	**18.9/20.8**
Chromium (total)	35.5	31.4/34.6
Copper	16.4	16/17.6
Lead	10	7.6/8
Mercury	0.017 U	0.016 U/0.016 U
Nickel	51.8	74.8/113

1605-PE01	10/30/2008 2-2.5 (ft) mg/kg	10/30/2008 3-3.5 (ft) mg/kg
INORG		
Arsenic	3.6	3
Barium	29.6 B	66.6
Cadmium	**12**	8
Chromium (total)	25.4	43.1
Copper	12.6	17.9
Lead	16.2	11
Mercury	0.02 U	0.016 U
Nickel	45.1	251

0 10
Scale In Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- FORMER TRENCH
- EXCAVATION AREA
- ADDITIONAL EXCAVATION AREA
- POST-EXCAVATION SOIL SAMPLING LOCATION, OCTOBER 2008
- SOIL BORING LOCATION, JUNE/OCTOBER 2006

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

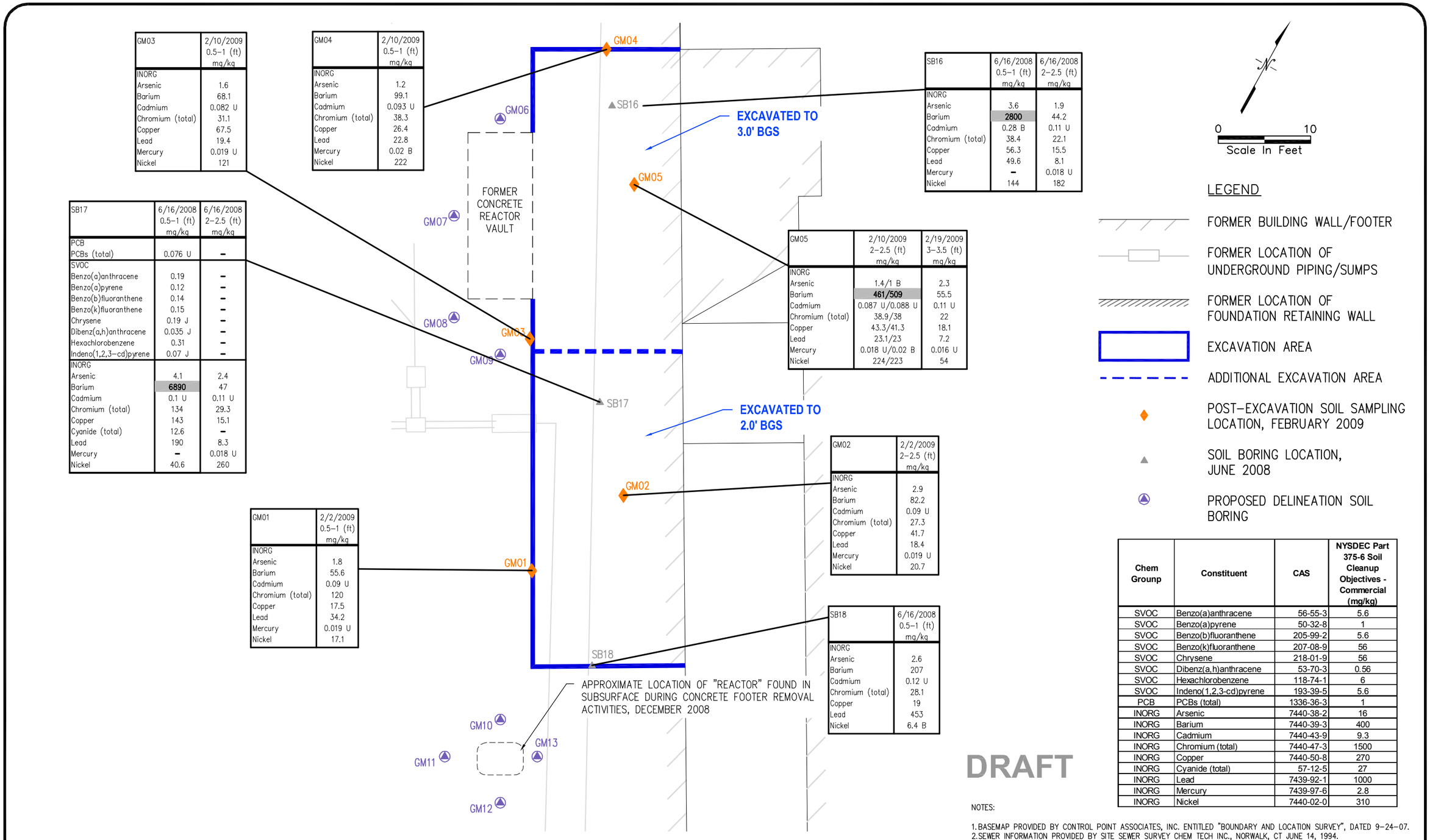
DRAFTED BY: TSP/KPM | DATE: 4/7/09

RED WING: WESTERN END PRODUCTION AREA EXCAVATIONS AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE 7

2116443AS02A



DRAFT

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9–24–07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

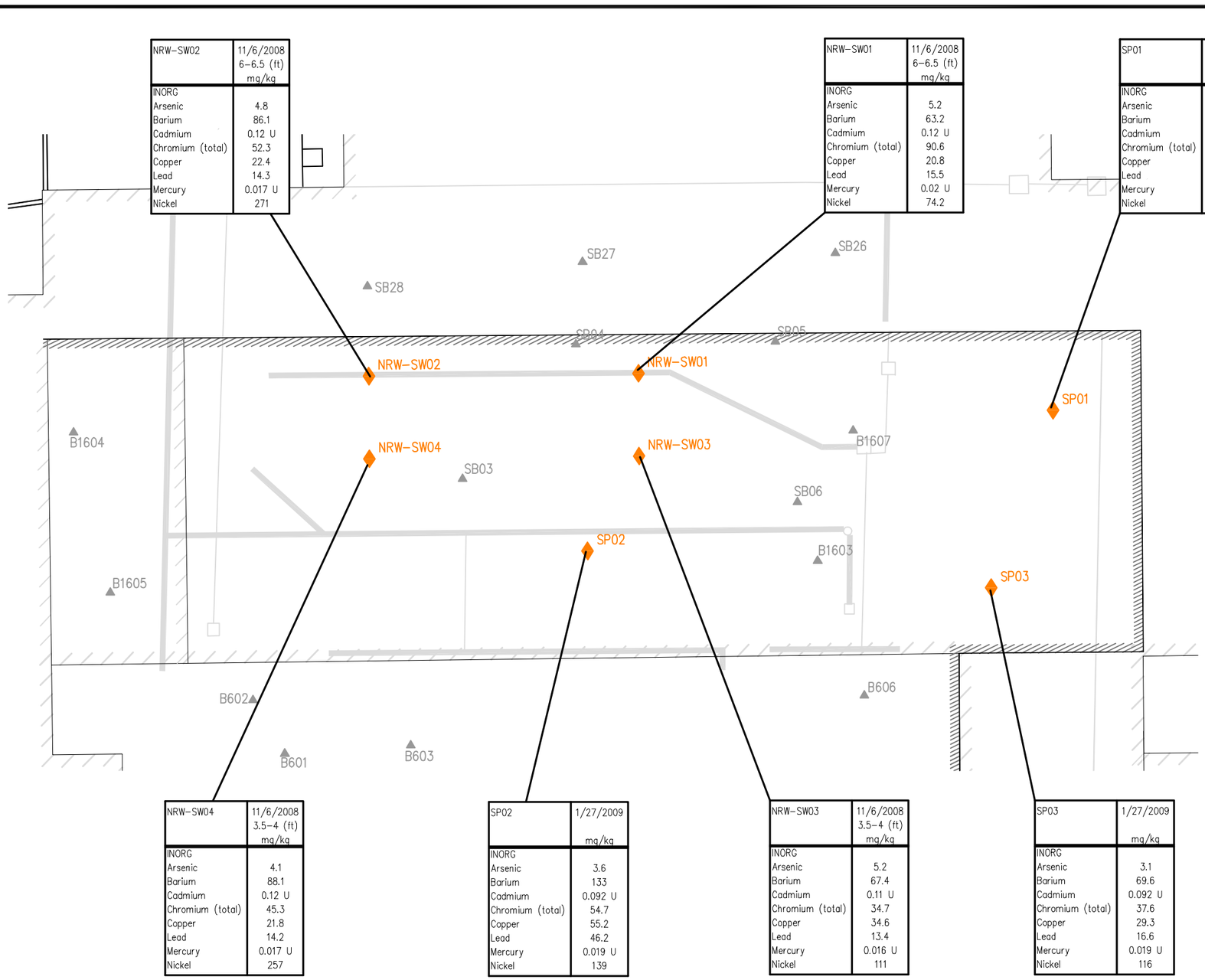
DRAFTED BY: TSP/KPM | DATE: 4/6/09

GRIND & MIX DEPARTMENT EXCAVATION AREA AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
8

2116443AS02A



NRW-SW02	11/6/2008 6-6.5 (ft) mg/kg
INORG	
Arsenic	4.8
Barium	86.1
Cadmium	0.12 U
Chromium (total)	52.3
Copper	22.4
Lead	14.3
Mercury	0.017 U
Nickel	271

NRW-SW01	11/6/2008 6-6.5 (ft) mg/kg
INORG	
Arsenic	5.2
Barium	63.2
Cadmium	0.12 U
Chromium (total)	90.6
Copper	20.8
Lead	15.5
Mercury	0.02 U
Nickel	74.2

SP01	11/6/2008 mg/kg
INORG	
Arsenic	2.8
Barium	94.2
Cadmium	0.12 U
Chromium (total)	26.7
Copper	23.4
Lead	18.3
Mercury	0.019 U
Nickel	246

NRW-SW04	11/6/2008 3.5-4 (ft) mg/kg
INORG	
Arsenic	4.1
Barium	88.1
Cadmium	0.12 U
Chromium (total)	45.3
Copper	21.8
Lead	14.2
Mercury	0.017 U
Nickel	257

SP02	1/27/2009 mg/kg
INORG	
Arsenic	3.6
Barium	133
Cadmium	0.092 U
Chromium (total)	54.7
Copper	55.2
Lead	46.2
Mercury	0.019 U
Nickel	139

NRW-SW03	11/6/2008 3.5-4 (ft) mg/kg
INORG	
Arsenic	5.2
Barium	67.4
Cadmium	0.11 U
Chromium (total)	34.7
Copper	34.6
Lead	13.4
Mercury	0.016 U
Nickel	111

SP03	1/27/2009 mg/kg
INORG	
Arsenic	3.1
Barium	69.6
Cadmium	0.092 U
Chromium (total)	37.6
Copper	29.3
Lead	16.6
Mercury	0.019 U
Nickel	116

0 20
Scale In Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER TRENCH
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- SOIL BORING LOCATION, OCTOBER 2006, JUNE 2008
- ADDITIONAL SAMPLE LOCATION

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

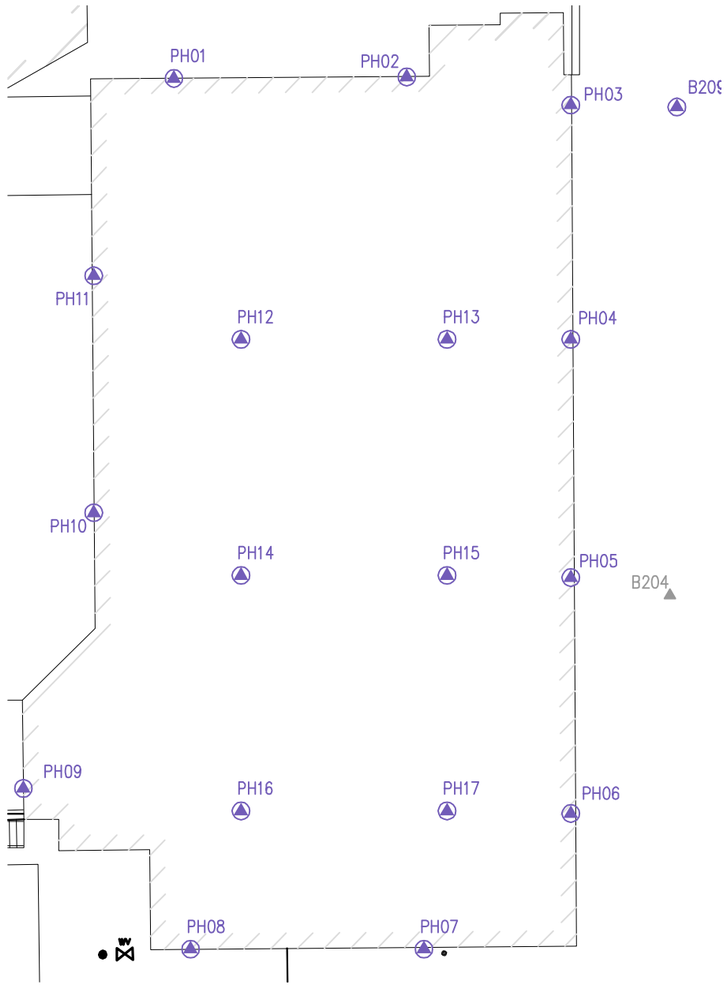
ENVIRON

DRAFTED BY: TSP / KPM | DATE: 4/7/09

ADDITIONAL RED WING SAMPLING LOCATIONS
SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
9

2116443AS02A



0 20
Scale In Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- EXCAVATION AREA
- ADDITIONAL EXCAVATION AREA
- SOIL BORING LOCATION, OCTOBER 2006
- PROPOSED DELINEATION SOIL BORING

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

ENVIRON

DRAFTED BY: TSP/KPM | DATE: 4/6/09

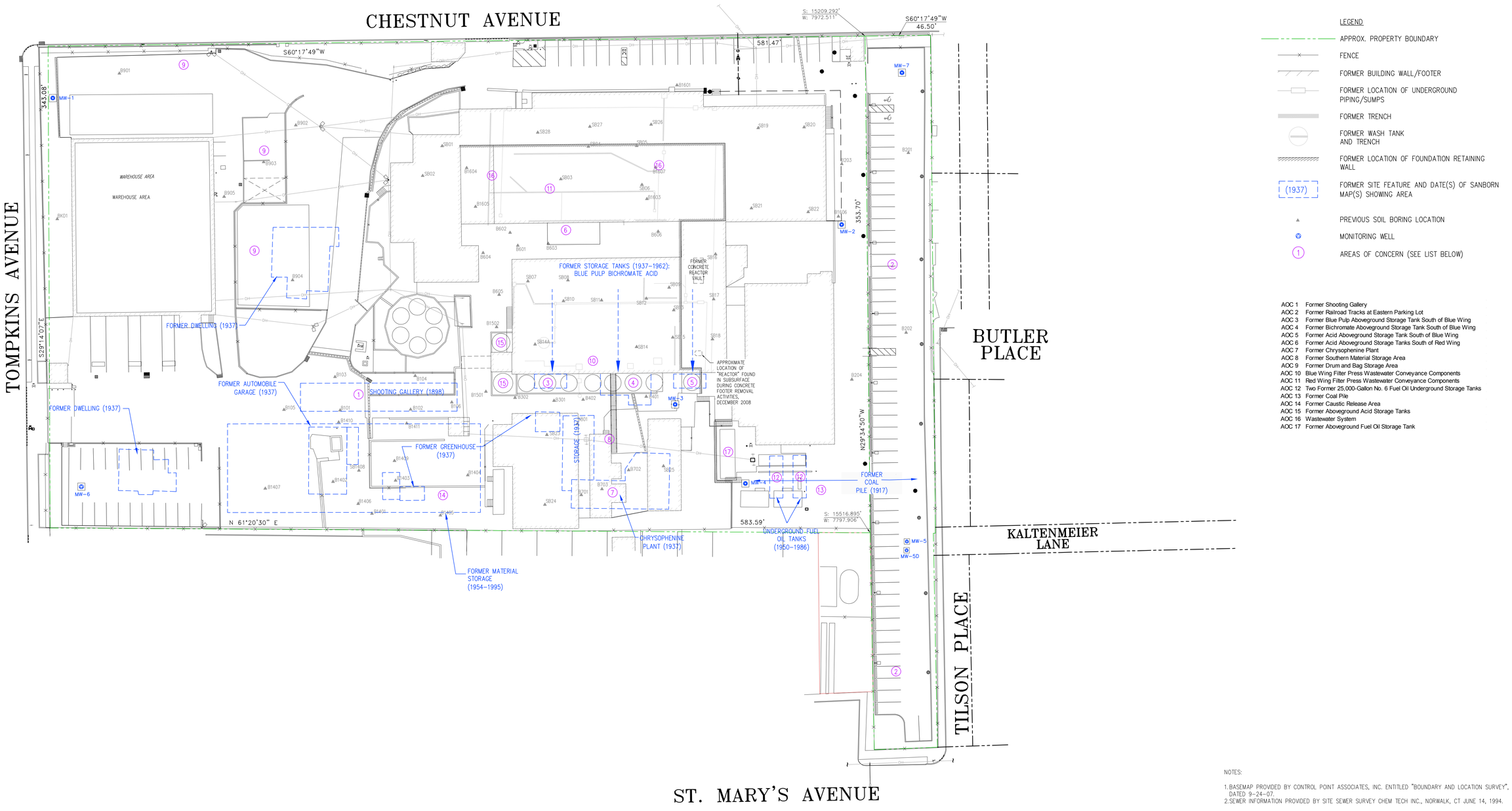
POWERHOUSE EXCAVATION AREA AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

FIGURE
10

2116443AS02A

Plates



30 0 30 60 90
Scale in Feet

LEGEND

- APPROX. PROPERTY BOUNDARY
- FENCE
- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER TRENCH
- FORMER WASH TANK AND TRENCH
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- (1937) FORMER SITE FEATURE AND DATE(S) OF SANBORN MAP(S) SHOWING AREA
- PREVIOUS SOIL BORING LOCATION
- MONITORING WELL
- (1) AREAS OF CONCERN (SEE LIST BELOW)

AOC 1 Former Shooting Gallery
AOC 2 Former Railroad Tracks at Eastern Parking Lot
AOC 3 Former Blue Pulp Aboveground Storage Tank South of Blue Wing
AOC 4 Former Bichromate Aboveground Storage Tank South of Blue Wing
AOC 5 Former Acid Aboveground Storage Tank South of Blue Wing
AOC 6 Former Acid Aboveground Storage Tanks South of Red Wing
AOC 7 Former Chrysophenine Plant
AOC 8 Former Southern Material Storage Area
AOC 9 Former Drum and Bag Storage Area
AOC 10 Blue Wing Filter Press Wastewater Conveyance Components
AOC 11 Red Wing Filter Press Wastewater Conveyance Components
AOC 12 Two Former 25,000-Gallon No. 6 Fuel Oil Underground Storage Tanks
AOC 13 Former Coal Pile
AOC 14 Former Caustic Release Area
AOC 15 Former Aboveground Acid Storage Tanks
AOC 16 Wastewater System
AOC 17 Former Aboveground Fuel Oil Storage Tank

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

DATE	DRWN	REVISIONS

SITE PLAN WITH HISTORICAL INDUSTRIAL FEATURES AND AREAS OF CONCERN

1 PLATE

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

3/17/09	AS SHOWN	2116443A801AH	4/7/09
DATE	SCALE	CADD FILE	PLOT DATE
DESIGNED BY	TSP/PRM/KPM DRAFTED BY	APPROVED BY	

B902	8/28/2006 0.2-0.7 (ft) mg/kg	8/28/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	1.2	3.6
Barium	58.6	39.1 B
Cadmium	0.11 U	0.11 U
Chromium (total)	26.4	30.4
Copper	12.8	24
Lead	9.4	8.5
Mercury	0.03 B	0.02 B
Nickel	118	234

B302	10/5/2006 1-1.5 (ft) mg/kg
INORG	
Arsenic	188
Barium	584
Cadmium	1.3
Chromium (total)	146
Copper	165
Lead	1420
Mercury	0.51
Nickel	33.5

B1502	10/5/2006 1-1.5 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg
INORG		
Arsenic	4.1	6.2
Barium	42.2 B	123
Cadmium	0.16 B	0.35 B
Chromium (total)	29.7	34.9
Copper	19.2	29.6
Lead	51.5	9.4
Mercury	0.07	0.019 U
Nickel	66.7	124

B604	10/5/2006 1.5-2 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg	10/5/2006 4.5-5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.041 U	0.041 U	0.041 U
Benzo(a)pyrene	0.041 U	0.041 U	0.041 U
Benzo(b)fluoranthene	0.041 U	0.041 U	0.041 U
Benzo(k)fluoranthene	0.041 U	0.041 U	0.041 U
Chrysene	0.41 U	0.41 U	0.41 U
Dibenz(a,h)anthracene	0.041 U	0.041 U	0.041 U
Hexachlorobenzene	0.041 U	0.041 U	0.041 U
Indeno(1,2,3-cd)pyrene	0.041 U	0.041 U	0.041 U
INORG			
Arsenic	3.8	4.5	5.2
Barium	54.2	52.9	63
Cadmium	0.13 B	0.17 B	0.56 B
Chromium (total)	25.7	25.6	47.1
Copper	13	13.1	30.8
Lead	9.5	11.3	11.9
Mercury	0.02 B	0.04	0.05
Nickel	41.6	43.4	122

B1501	10/5/2006 1-1.5 (ft) mg/kg	10/5/2006 3-3.5 (ft) mg/kg
INORG		
Arsenic	7.3	5.4
Barium	191	60.7
Cadmium	0.43 B	0.24 B
Chromium (total)	97.5	56.4
Copper	67.3	31.2
Lead	1430	11
Mercury	0.23	0.019 U
Nickel	79.4	175

B605	10/5/2006 1.5-2 (ft) mg/kg
INORG	
Arsenic	4.4
Barium	31.9 B
Cadmium	0.28 B
Chromium (total)	27.6
Copper	31.2
Lead	18.8
Mercury	0.05
Nickel	54

B602	10/5/2006 2-2.5 (ft) mg/kg
INORG	
Arsenic	5.1
Barium	1420
Cadmium	5.8
Chromium (total)	545
Copper	28.1
Lead	1490
Mercury	0.11
Nickel	94.9

B601	8/28/2006 1.8-2 (ft) mg/kg
INORG	
Arsenic	8.9
Barium	2280
Cadmium	5
Chromium (total)	329
Copper	50.5
Lead	2060
Mercury	0.6
Nickel	84.4

B603	10/5/2006 1-1.5 (ft) mg/kg
INORG	
Arsenic	1.4
Barium	1800
Cadmium	0.6 B
Chromium (total)	15.3
Copper	34.6
Lead	191
Mercury	0.06
Nickel	10.5

B301	8/30/2006 0.3-0.8 (ft) mg/kg	8/30/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	44.4	10.4
Cadmium	1.4	0.23 B
Chromium (total)	138	74.9
Copper	101	70
Lead	1120	178
Mercury	0.89	0.24
Nickel	36.4	186

B402	10/5/2006 1-1.5 (ft) mg/kg	10/5/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	559	97.5
Barium	175	87.3
Cadmium	0.2 B	0.29 B
Chromium (total)	265	67.5
Copper	164	45.7
Lead	681	28.9
Mercury	0.08	0.02 U
Nickel	96	124

B606	10/5/2006 1.5-2 (ft) mg/kg
INORG	
Arsenic	18.3/34.8
Barium	985/1940
Cadmium	0.5 B/0.55 B
Chromium (total)	53.8/75.4
Copper	69.5/75.9
Lead	175/230
Mercury	2.8/8.9
Nickel	163/146

B1601	10/5/2006 2-2.5 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg
INORG		
Arsenic	1.7	1 B
Barium	39.1 B	37.9 B
Cadmium	0.089 U	0.081 U
Chromium (total)	29	23.7
Copper	227	16
Lead	6.3	6.6
Mercury	0.018 U	0.019 U
Nickel	215	191

B203	10/5/2006 0.5-1 (ft) mg/kg	10/5/2006 1.5-2 (ft) mg/kg
SVOC		
Benzo(a)anthracene	4.3	0.038 U
Benzo(a)pyrene	4.3	0.038 U
Benzo(b)fluoranthene	4.2	0.038 U
Benzo(k)fluoranthene	4.8	0.038 U
Chrysene	4.7	0.38 U
Dibenz(a,h)anthracene	0.19 U	0.038 U
Hexachlorobenzene	0.19 U	0.038 U
Indeno(1,2,3-cd)pyrene	1.2	0.038 U
INORG		
Arsenic	31.4	1.5
Barium	3780	41.9 B
Cadmium	3.7	0.091 U
Chromium (total)	1060	47.7
Copper	154	19.4
Lead	10300	57.2
Mercury	1.6	0.07
Nickel	57.7	157

B201	10/4/2006 0.2-0.7 (ft) mg/kg	10/4/2006 1.5-2 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.2	0.31
Benzo(a)pyrene	0.18 U	0.3
Benzo(b)fluoranthene	0.18 U	0.36
Benzo(k)fluoranthene	0.18 U	0.037 U
Chrysene	0.35 J	0.33 J
Dibenz(a,h)anthracene	0.18 U	0.037 U
Hexachlorobenzene	0.18 U	0.037 U
Indeno(1,2,3-cd)pyrene	0.18 U	0.074
INORG		
Arsenic	3.8	5.8
Cadmium	0.17 B	0.6 B
Chromium (total)	21.6	57.4
Copper	32.4	55.4
Lead	80.9	268
Mercury	0.07	0.36
Nickel	28.9	98.5

B901	8/28/2006 0.5-1 (ft) mg/kg	8/28/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	3.9	2.9
Barium	59.4	63.8
Cadmium	0.11 U	0.11 U
Chromium (total)	29.7	29.7
Copper	29.3	42.6
Lead	61.1	79.6
Mercury	0.19	0.29
Nickel	145	130

B903	8/28/2006 0.3-0.8 (ft) mg/kg	8/28/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	3	2.8
Barium	49.9	60.5
Cadmium	0.11 U	0.11 U
Chromium (total)	39.2	46.2
Copper	45.9	43.7
Lead	41.7	49.9
Mercury	0.16	0.17
Nickel	160	175

BKD1	10/5/2006 0-0.5 (ft) mg/kg	10/5/2006 1.5-2 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg	10/5/2006 6-6.5 (ft) mg/kg
INORG				
Arsenic	5.7	5.2	0.76 B/1.1 B	3.1
Barium	56.4	51.3	27.7 B/28.9 B	66
Cadmium	0.094 U	0.094 U	0.089 U/0.089 U	0.091 U
Chromium (total)	41.7	31.1	23.8/24.9	64.5
Copper	34.5	30	16.5/19.3	20.3
Lead	124	64.6	6.4/6.6	8.5
Mercury	0.15	0.13	0.018 U/0.019 U	0.019 U
Nickel	138	85.8	67.5/83.4	521

B904	8/28/2006 0.3-0.8 (ft) mg/kg	8/28/2006 2-2.5 (ft) mg/kg
INORG		
Arsenic	3.7/3.7	5.1
Barium	57.6/58.6	91.4
Cadmium	0.12 U/0.12 U	0.11 U
Chromium (total)	37.3/37.5	37.5
Copper	36.2/39.2	54
Lead	82.8/85.2	144
Mercury	0.2/0.19	0.17
Nickel	153/156	174

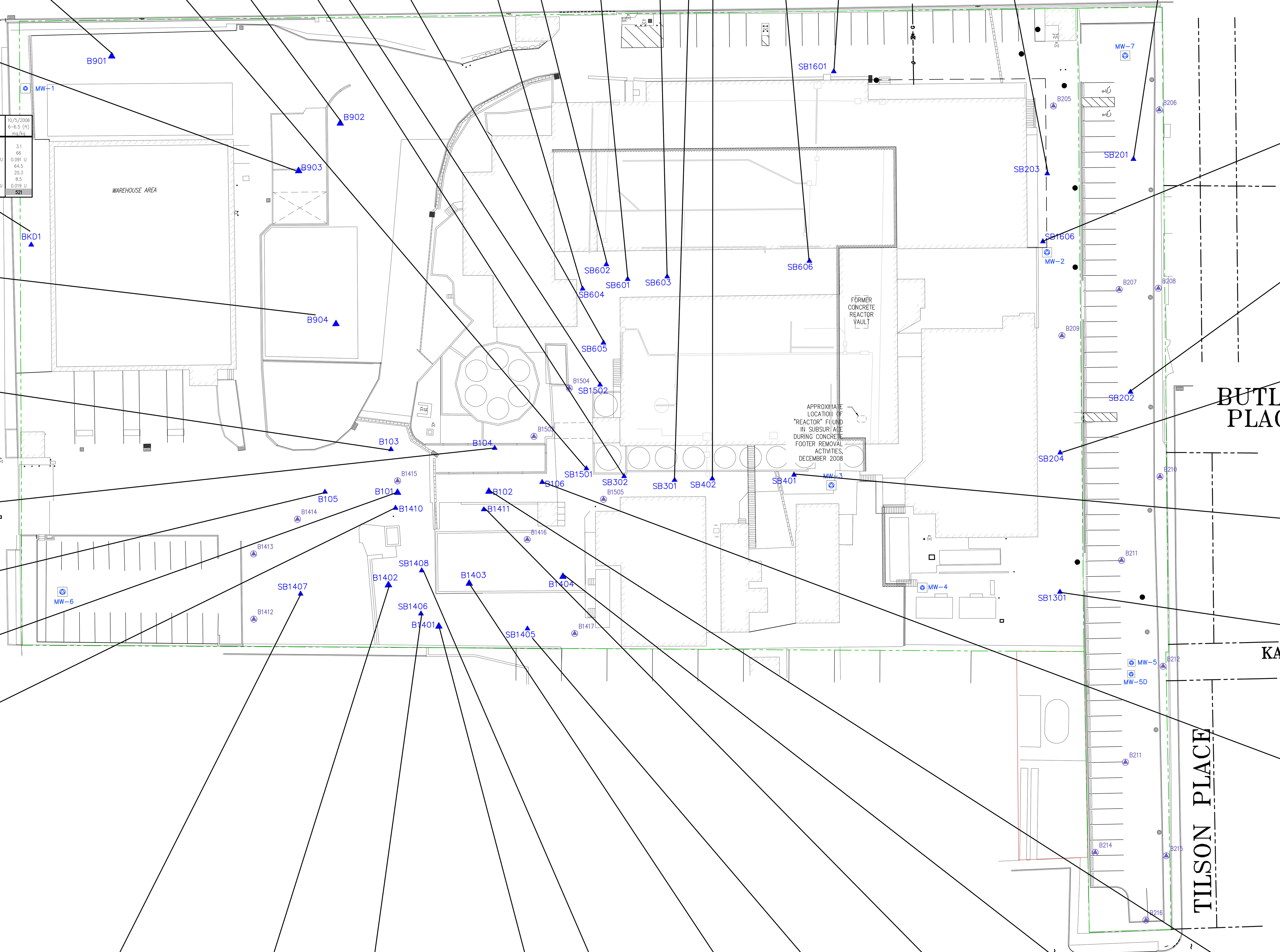
B103	10/4/2006 1.5-2 (ft) mg/kg
INORG	
Arsenic	3.5
Barium	73.2
Cadmium	0.16 B
Chromium (total)	29.8
Copper	21.8
Lead	109
Mercury	0.09
Nickel	41.1

B104	10/4/2006 3.5-4 (ft) mg/kg	10/4/2006 6-6.5 (ft) mg/kg
INORG		
Arsenic	3.9	2.7
Barium	76.2	42.7 B
Cadmium	0.16 B	0.12 U
Chromium (total)	63.7	49.6
Copper	23.9	16.2
Lead	9.5	7.1
Mercury	0.019 U	0.017 U
Nickel	226	229

B105	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 2.5-3 (ft) mg/kg
INORG		
Arsenic	7.6	5.8
Barium	177	80.4
Cadmium	1 B	0.35 B
Chromium (total)	53.1	57.5
Copper	123	47.7
Lead	244	110
Mercury	0.18	0.06
Nickel	85.1	131

B101	8/28/2006 0.5-1 (ft) mg/kg	8/28/2006 2.5-3 (ft) mg/kg	8/28/2006 3.5-4 (ft) mg/kg
INORG			
Arsenic	10.2	9.6	4.7
Barium	213	127	69.6
Cadmium	0.11 U	0.11 U	0.11 U
Chromium (total)	84	84.5	72.2
Copper	121	76.2	46.6
Lead	290	317	61.9
Mercury	0.32	0.24	0.06
Nickel	100	135	156

B1410	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	4.2	0.079 U
SVOC		
Benzo(a)anthracene	0.2	0.5
Benzo(a)pyrene	0.21	0.47
Benzo(b)fluoranthene	0.23	0.33
Benzo(k)fluoranthene	0.31	0.47
Chrysene	0.25 J	0.56
Dibenz(a,h)anthracene	0.038 U	0.061
Hexachlorobenzene	0.038 U	0.039 U
Indeno(1,2,3-cd)pyrene	0.055	0.18
INORG		
Arsenic	6	7.4
Barium	156	275
Cadmium	0.25 B	0.3 B
Chromium (total)	45.5	59.4
Copper	57.8	77.8
Lead	139	488
Mercury	0.21	0.26
Nickel	176	158



B1606	10/5/2006 2-2.5 (ft) mg/kg	10/5/2006 3.5-4 (ft) mg/kg
INORG		
Arsenic	13.4	1.6
Barium	598	38.6 B
Cadmium	1.2 B	0.081 U
Chromium (total)	449	34
Copper	172	18.8
Lead	1300	16.2
Mercury	1.2	0.019 U
Nickel	82	190

B202	8/30/2006 1.5-2 (ft) mg/kg	10/4/2006 0.2-0.7 (ft) mg/kg	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
SVOC				
Benzo(a)anthracene	–	1.5	1	–
Benzo(a)pyrene	–	1.5	1.1	–
Benzo(b)fluoranthene	–	1.1	1.8	–
Benzo(k)fluoranthene	–	1.6	2	–
Chrysene	–	1.4 J	1.5	–
Dibenz(a,h)anthracene	–	0.18 U	0.17	–
Hexachlorobenzene	–	0.18 U	0.038 U	–
Indeno(1,2,3-cd)pyrene	–	0.35	0.4	–
INORG				
Arsenic	2.8	8.2	2.2	2
Cadmium	0.081 U	0.089 U	0.09 U	0.084 U
Chromium (total)	25.9	26.1	26.3	21.2
Copper	29	61.1	24.6	21.5
Lead	9.1	130	11.3	6.8
Mercury	0.19	0.57	0.24	0.019 U
Nickel	143	80.9	121	38.9

B204	10/6/2006 1-1.5 (ft) mg/kg	10/6/2006 2-2.5 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.26/0.41	0.037 U
Benzo(a)pyrene	0.32/0.46	0.037 U
Benzo(b)fluoranthene	0.45/0.59	0.037 U
Benzo(k)fluoranthene	0.31/0.49	0.037 U
Chrysene	0.34 J/0.5	0.37 U
Dibenz(a,h)anthracene	0.038 U/0.038 U	0.037 U
Hexachlorobenzene	0.038 U/0.038 U	0.037 U
Indeno(1,2,3-cd)pyrene	0.038 U/0.038 U	0.037 U
INORG		
Arsenic	5.8/8	2.1
Barium	165/193	36.5 B
Cadmium	0.1 B/0.09 B	0.089 U
Chromium (total)	22.7/28.3	38.9
Copper	37.8/56.2	26.7
Lead	177/237	21.1
Mercury	0.2/0.38	0.03 B
Nickel	28.2/28.8	341

B401	10/4/2006 1.5-2 (ft) mg/kg
INORG	
Arsenic	30.8
Barium	1250
Cadmium	0.1 U
Chromium (total)	144
Copper	48.7
Lead	1460
Mercury	0.44
Nickel	49

B1301	8/30/2006 1.5-2 (ft) mg/kg	8/30/2006 3.5-4 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.47	0.038 U
Benzo(a)pyrene	0.54	0.038 U
Benzo(b)fluoranthene	0.64	0.038 U
Benzo(k)fluoranthene	0.76	0.038 U
Chrysene	0.74 J	0.38 U
Dibenz(a,h)anthracene	0.075 U	0.038 U
Hexachlorobenzene	0.075 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.25	0.038 U
INORG		
Arsenic	33.4	30.3
Cadmium	0.58 B	0.092 U
Chromium (total)	46.7	61
Copper	109	24.8
Lead	288	6.8
Mercury	0.28	0.019 U
Nickel	58.9	280

B106	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.038 U	0.039 U
Benzo(a)pyrene	0.038 U	0.039 U
Benzo(b)fluoranthene	0.01 J	0.039 U
Benzo(k)fluoranthene	0.038 U	0.039 U
Chrysene	0.38 U	0.39 U
Dibenz(a,h)anthracene	0.038 U	0.039 U
Hexachlorobenzene	0.038 U	0.039 U
Indeno(1,2,3-cd)pyrene	0.038 U	0.039 U
INORG		
Arsenic	3.4	4.3
Barium	49.4	44.2 B
Cadmium	0.15 B	0.17 B
Chromium (total)	40.5	38.5
Copper	26	29
Lead	9.1	7.7
Mercury	0.02 B	0.019 U
Nickel	134	139

B1407	10/4/2006 0.5-1 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	1.46	0.078 U
SVOC		
Benzo(a)anthracene	180 U	2.1
Benzo(a)pyrene	180 U	1.7
Benzo(b)fluoranthene	180 U	1.3
Benzo(k)fluoranthene	180 U	1.5
Chrysene	1800 U	2.8
Dibenz(a,h)anthracene	180 U	0.23
Hexachlorobenzene	180 U	0.039 U
Indeno(1,2,3-cd)pyrene	180 U	0.37
INORG		
Arsenic	5.9	2.3
Barium	637	103
Cadmium	0.46 B	0.12 U
Chromium (total)	21	26.6
Copper	99.7	40.2
Lead	113	227
Mercury	0.22	0.37
Nickel	22.7	72

B1402	8/28/2006 0.5-1 (ft) mg/kg	8/28/2006 6-6.5 (ft) mg/kg
PCB		
PCBs (total)	5.4	0.067 U
SVOC		
Benzo(a)anthracene	–	0.04 U
Benzo(a)pyrene	–	0.04 U
Benzo(b)fluoranthene	–	0.04 U
Benzo(k)fluoranthene	–	0.04 U
Chrysene	–	0.4 U
Dibenz(a,h)anthracene	–	0.04 U
Hexachlorobenzene	–	0.04 U
Indeno(1,2,3-cd)pyrene	–	0.04 U
INORG		
Arsenic	9.2	4.2
Barium	114	51.2
Cadmium	0.11 B	0.12 U
Chromium (total)	19.6	51.1
Copper	65.1	28.2
Lead	116	10.9
Mercury	0.06	0.017 U
Nickel	18.5	224

B1406	10/4/2006 0.5-1 (ft) mg/kg	10/4/2006 2.5-3 (ft) mg/kg
PCB		
PCBs (total)	0.48	10.6
SVOC		
Benzo(a)anthracene	0.11	0.29
Benzo(a)pyrene	0.12	0.34
Benzo(b)fluoranthene	0.15	0.34
Benzo(k)fluoranthene	0.16	0.47
Chrysene	0.13 J	0.38 J
Dibenz(a,h)anthracene	0.038 U	0.081 U
Hexachlorobenzene	0.038 U	0.087
Indeno(1,2,3-cd)pyrene	0.038 U	0.11
INORG		
Arsenic	3.5	3.5
Barium	155	1060
Cadmium	0.39 B	0.25 B
Chromium (total)	26.1	45.7
Copper	40.2	1010
Lead	111	268
Mercury	0.24	0.7
Nickel	75	64.2

B1401	8/28/2006 0.5-1 (ft) mg/kg	8/28/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	3.3	0.067 U
SVOC		
Benzo(a)anthracene	0.23	0.57
Benzo(a)pyrene	0.18	0.54
Benzo(b)fluoranthene	0.16	0.39
Benzo(k)fluoranthene	0.15	0.46
Chrysene	0.22 J	0.52
Dibenz(a,h)anthracene	0.038 U	0.04 U
Hexachlorobenzene	0.038 U	0.04 U
Indeno(1,2,3-cd)pyrene	0.063	0.17
INORG		
Arsenic	70.4	4.1
Barium	81.8	48.4
Cadmium	0.1 U	0.12 U
Chromium (total)	49.7	27.3
Copper	46.7	20
Lead	172	59
Mercury	0.14	0.28
Nickel	81.2	57

B1408	10/4/2006 1-1.5 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	9.9	0.08 U/0.16
SVOC		
Benzo(a)anthracene	93	0.12/0.11
Benzo(a)pyrene	74	0.14/0.1
Benzo(b)fluoranthene	60	0.04 U/0.096
Benzo(k)fluoranthene	89	0.04 U/0.11
Chrysene	83	0.15 J/0.14 J
Dibenz(a,h)anthracene	13	0.04 U/0.017 J
Hexachlorobenzene	2 U	0.04 U/0.04 U
Indeno(1,2,3-cd)pyrene	29	0.061/0.064
INORG		
Arsenic	20.7	5.9/4
Barium	280	157/158
Cadmium	1.2	0.44 B/0.49 B
Chromium (total)	52.3	36.3/33.6
Copper	131	43.8/42.1
Lead	552	175/175
Mercury	0.33	0.18/0.26
Nickel	99.8	98.6/86.8

B1403	8/28/2006 1.5-2 (ft) mg/kg
PCB	
PCBs (total)	14
SVOC	
Benzo(a)anthracene	0.38 U
Benzo(a)pyrene	0.38 U
Benzo(b)fluoranthene	0.38 U
Benzo(k)fluoranthene	0.38 U
Chrysene	3.8 U
Dibenz(a,h)anthracene	0.38 U
Hexachlorobenzene	0.38 U
Indeno(1,2,3-cd)pyrene	0.38 U
INORG	
Arsenic	12.5
Barium	139
Cadmium	0.62 B
Chromium (total)	72.4
Copper	159
Lead	305
Mercury	0.65
Nickel	87.3

B1405	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	0.074 U	0.074 U
SVOC		
Benzo(a)anthracene	1.1	0.037 U
Benzo(a)pyrene	0.58	0.037 U
Benzo(b)fluoranthene	0.57	0.037 U
Benzo(k)fluoranthene	0.62	0.037 U
Chrysene	0.52	0.37 U
Dibenz(a,h)anthracene	0.079	0.037 U
Hexachlorobenzene	0.037 U	0.037 U
Indeno(1,2,3-cd)pyrene	0.19	0.037 U
INORG		
Arsenic	67.4	7.5
Barium	210	39.4 B
Cadmium	0.68 B	0.11 B
Chromium (total)	43.3	35.9
Copper	98.6	28.8
Lead	411	20
Mercury	0.74	0.018 U
Nickel	83.2	197

B1411	10/4/2006 1.5-2 (ft) mg/kg	10/4/2006 3.5-4 (ft) mg/kg
PCB		
PCBs (total)	0.074 U	0.077 U
SVOC		
Benzo(a)anthracene	0.036 U	0.038 U
Benzo(a)pyrene	0.036 U	0.038 U
Benzo(b)fluoranthene	0.0097 J	0.038 U
Benzo(k)fluoranthene	0.036 U	0.038 U
Chrysene	0.36 U	0.38 U
Dibenz(a,h)anthracene	0.036 U	0.038 U
Hexachlorobenzene	0.036 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.036 U	0.038 U
INORG		
Arsenic	3.1	2.2
Barium	39.1 B	31.3 B
Cadmium	0.11 U	0.12 U
Chromium (total)	41.1	51.7
Copper	32.6	32.2
Lead	9	6.6
Mercury	0.018 U	0.016 U
Nickel	116	117

B1404	8/28/2006 1.5-2 (ft) mg/kg	8/28/2006 6-6.5 (ft) mg/kg
PCB		
PCBs (total)	0.067 U	0.067 U
SVOC		
Benzo(a)anthracene	0.37 U	0.04 U
Benzo(a)pyrene	0.37 U	0.04 U
Benzo(b)fluoranthene	0.37 U	0.04 U
Benzo(k)fluoranthene	0.37 U	0.04 U
Chrysene	3.7 U	0.4 U
Dibenz(a,h)anthracene	0.37 U	0.04 U
Hexachlorobenzene	0.37 U	0.04 U
Indeno(1,2,3-cd)pyrene	0.37 U	0.04 U
INORG		
Arsenic	2.3	2.9
Barium	35.8 B	71.1
Cadmium	0.089 U	0.096 U
Chromium (total)	24.6	67
Copper	7.7	20.4
Lead	3.3	7.9
Mercury	0.018 U	0.02 U
Nickel	12.8	273

B102	8/28/2006 0.5-1 (ft) mg/kg	8/28/2006 1.5-2 (ft) mg/kg	8/28/2006 3.5-4 (ft) mg/kg
INORG			
Arsenic	5.4	2.2	6.5
Barium	153	46.2	48.6
Cadmium	0.11 U	0.091 U	1.8
Chromium (total)	70.9	40.1	511
Copper	55.5	23.8	41.6
Lead	126	22.8	182
Mercury	0.26	0.08	0.14
Nickel	116	162	173

30 0 30 60 90
Scale in Feet

LEGEND

- APPROX. PROPERTY BOUNDARY
- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- FENCE
- SOIL BORING (2006)
- EXISTING MONITORING WELL
- PROPOSED DELINEATION SOIL BORING

Chem Groupp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DATE	DRWN	REVISIONS

2 PLATE

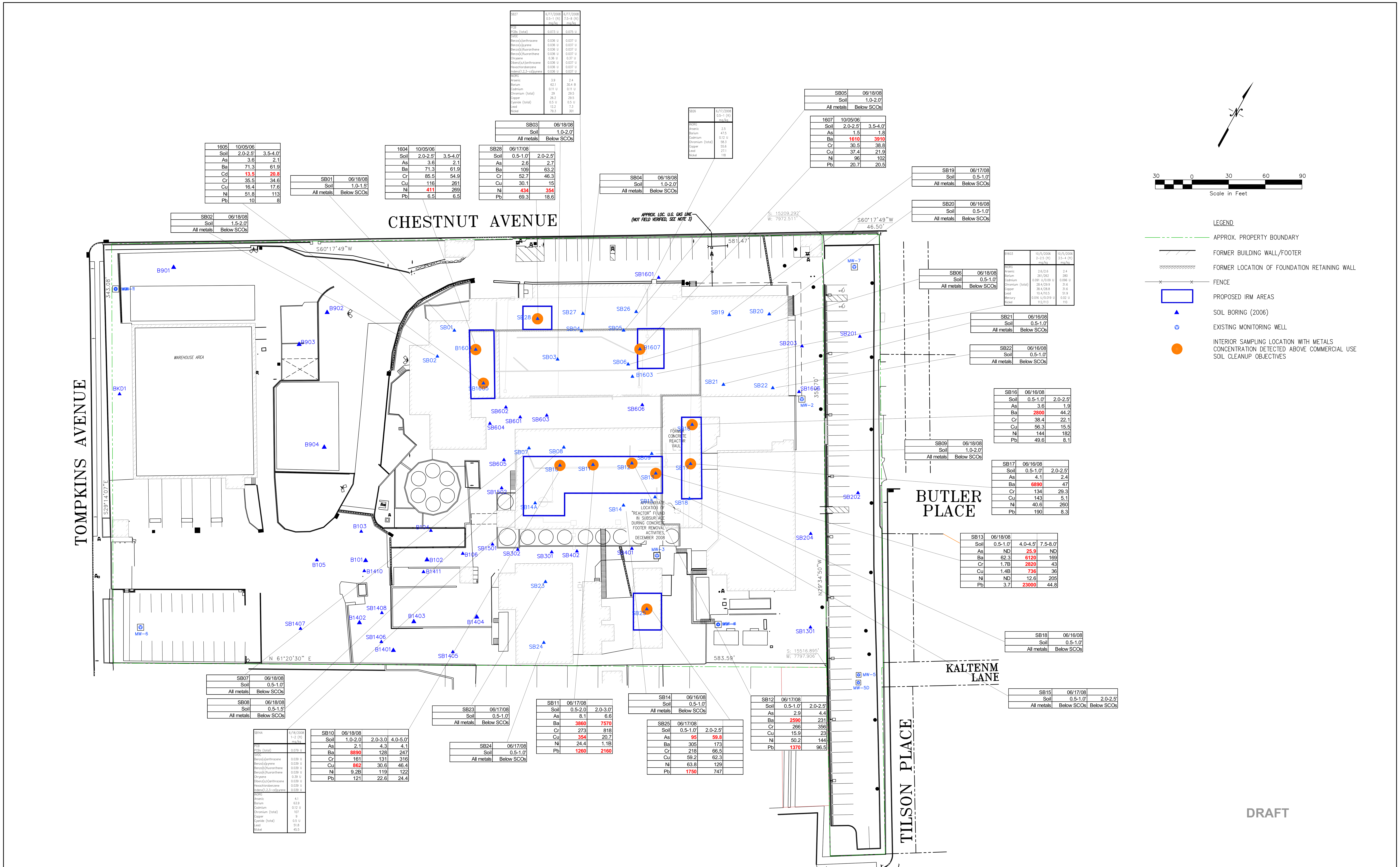
SUMMARIZED EXTERIOR SOIL SAMPLING RESULTS FOR 2006 REMEDIAL INVESTIGATION ACTIVITIES AND PROPOSED SAMPLING IN AOCs 2, 14 AND 15

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

DATE	SCALE	CADD FILE	PLOT DATE
3/27/09	AS SHOWN	2116443AS02AH	4/7/09

DESIGNED BY	DRAFTED BY	APPROVED BY
	TSP/PRM/KPM	



NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DATE	DRWN	REVISIONS

SUMMARIZED INTERIOR SOIL SAMPLING RESULTS FOR OCTOBER AND JUNE 2008 SAMPLING PROGRAMS AND PROPOSED IRM WORK PLAN

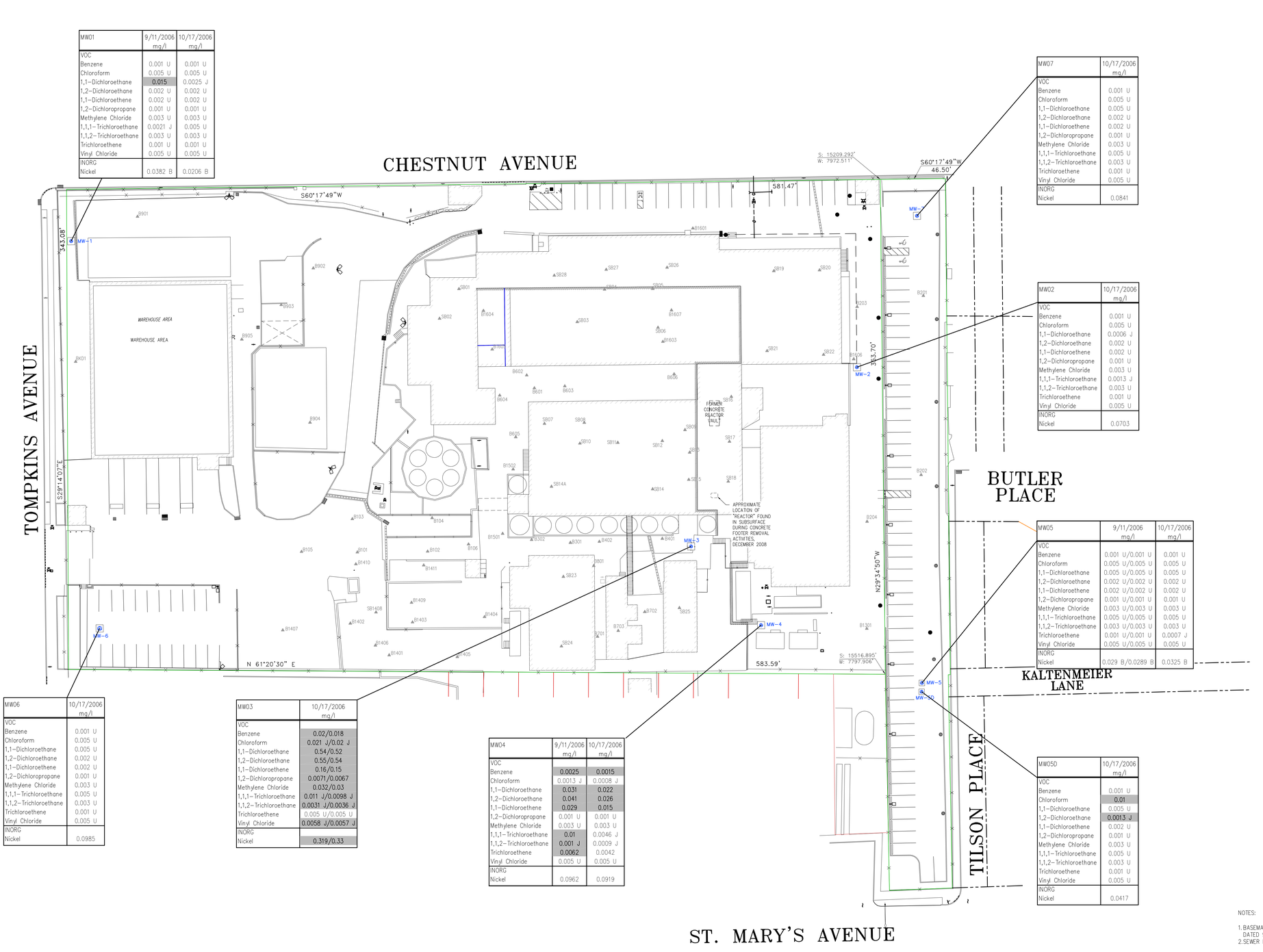
PLATE 3

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

DATE	SCALE	CADD FILE	PLOT DATE
4/7/09	AS SHOWN	2116443AS01AH	4/7/09

DESIGNED BY	DRAFTED BY	APPROVED BY
	TSP/PRM/KPM	



MW01	9/11/2006 mg/l	10/17/2006 mg/l
VOC		
Benzene	0.001 U	0.001 U
Chloroform	0.005 U	0.005 U
1,1-Dichloroethane	0.015	0.0025 J
1,2-Dichloroethane	0.002 U	0.002 U
1,1-Dichloroethene	0.002 U	0.002 U
1,2-Dichloropropane	0.001 U	0.001 U
Methylene Chloride	0.003 U	0.003 U
1,1,1-Trichloroethane	0.0021 J	0.005 U
1,1,2-Trichloroethane	0.003 U	0.003 U
Trichloroethene	0.001 U	0.001 U
Vinyl Chloride	0.005 U	0.005 U
INORG		
Nickel	0.0382 B	0.0206 B

MW07	10/17/2006 mg/l
VOC	
Benzene	0.001 U
Chloroform	0.005 U
1,1-Dichloroethane	0.005 U
1,2-Dichloroethane	0.002 U
1,1-Dichloroethene	0.002 U
1,2-Dichloropropane	0.001 U
Methylene Chloride	0.003 U
1,1,1-Trichloroethane	0.005 U
1,1,2-Trichloroethane	0.003 U
Trichloroethene	0.001 U
Vinyl Chloride	0.005 U
INORG	
Nickel	0.0841

MW02	10/17/2006 mg/l
VOC	
Benzene	0.001 U
Chloroform	0.005 U
1,1-Dichloroethane	0.0006 J
1,2-Dichloroethane	0.002 U
1,1-Dichloroethene	0.002 U
1,2-Dichloropropane	0.001 U
Methylene Chloride	0.003 U
1,1,1-Trichloroethane	0.0013 J
1,1,2-Trichloroethane	0.003 U
Trichloroethene	0.001 U
Vinyl Chloride	0.005 U
INORG	
Nickel	0.0703

MW05	9/11/2006 mg/l	10/17/2006 mg/l
VOC		
Benzene	0.001 U/0.001 U	0.001 U
Chloroform	0.005 U/0.005 U	0.005 U
1,1-Dichloroethane	0.005 U/0.005 U	0.005 U
1,2-Dichloroethane	0.002 U/0.002 U	0.002 U
1,1-Dichloroethene	0.002 U/0.002 U	0.002 U
1,2-Dichloropropane	0.001 U/0.001 U	0.001 U
Methylene Chloride	0.003 U/0.003 U	0.003 U
1,1,1-Trichloroethane	0.005 U/0.005 U	0.005 U
1,1,2-Trichloroethane	0.003 U/0.003 U	0.003 U
Trichloroethene	0.001 U/0.001 U	0.0007 J
Vinyl Chloride	0.005 U/0.005 U	0.005 U
INORG		
Nickel	0.029 B/0.0289 B	0.0325 B

MW06	10/17/2006 mg/l
VOC	
Benzene	0.001 U
Chloroform	0.005 U
1,1-Dichloroethane	0.005 U
1,2-Dichloroethane	0.002 U
1,1-Dichloroethene	0.002 U
1,2-Dichloropropane	0.001 U
Methylene Chloride	0.003 U
1,1,1-Trichloroethane	0.005 U
1,1,2-Trichloroethane	0.003 U
Trichloroethene	0.001 U
Vinyl Chloride	0.005 U
INORG	
Nickel	0.0985

MW03	10/17/2006 mg/l
VOC	
Benzene	0.02/0.018
Chloroform	0.021 J/0.02 J
1,1-Dichloroethane	0.54/0.52
1,2-Dichloroethane	0.55/0.54
1,1-Dichloroethene	0.16/0.15
1,2-Dichloropropane	0.0071/0.0067
Methylene Chloride	0.032/0.03
1,1,1-Trichloroethane	0.011 J/0.0098 J
1,1,2-Trichloroethane	0.0031 J/0.0036 J
Trichloroethene	0.005 U/0.005 U
Vinyl Chloride	0.0058 J/0.0057 J
INORG	
Nickel	0.319/0.33

MW04	9/11/2006 mg/l	10/17/2006 mg/l
VOC		
Benzene	0.0025	0.0015
Chloroform	0.0013 J	0.0008 J
1,1-Dichloroethane	0.031	0.022
1,2-Dichloroethane	0.041	0.026
1,1-Dichloroethene	0.029	0.015
1,2-Dichloropropane	0.001 U	0.001 U
Methylene Chloride	0.003 U	0.003 U
1,1,1-Trichloroethane	0.01	0.0046 J
1,1,2-Trichloroethane	0.001 J	0.0009 J
Trichloroethene	0.0062	0.0042
Vinyl Chloride	0.005 U	0.005 U
INORG		
Nickel	0.0962	0.0919

MW05D	10/17/2006 mg/l
VOC	
Benzene	0.001 U
Chloroform	0.01
1,1-Dichloroethane	0.005 U
1,2-Dichloroethane	0.0013 J
1,1-Dichloroethene	0.002 U
1,2-Dichloropropane	0.001 U
Methylene Chloride	0.003 U
1,1,1-Trichloroethane	0.005 U
1,1,2-Trichloroethane	0.003 U
Trichloroethene	0.001 U
Vinyl Chloride	0.005 U
INORG	
Nickel	0.0417

30 0 30 60 90
Scale in Feet

LEGEND

- APPROX. PROPERTY BOUNDARY
- FENCE
- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- PREVIOUS SOIL BORING LOCATION
- MONITORING WELL

Chem Grounp	Constituent	CAS	NYSDEC Part 703.5 Standards for Class GA Ground Water (mg/L)
VOC	Benzene	71-43-2	0.001
VOC	Chloroform	67-66-3	0.007
VOC	1,1-Dichloroethane	75-34-3	0.005
VOC	1,2-Dichloroethane	107-06-2	0.0006
VOC	1,1-Dichloroethene	75-35-4	0.005
VOC	1,2-Dichloropropane	78-87-5	0.001
VOC	Methylene Chloride	75-09-2	0.005
VOC	1,1,1-Trichloroethane	71-55-6	0.005
VOC	1,1,2-Trichloroethane	79-00-5	0.001
VOC	Trichloroethene	79-01-6	0.005
VOC	Vinyl Chloride	75-01-4	0.002
INORG	Nickel	7440-02-0	0.1

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

DATE	DRWN	REVISIONS

SUMMARIZED GROUND WATER SAMPLING RESULTS

4 PLATE

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
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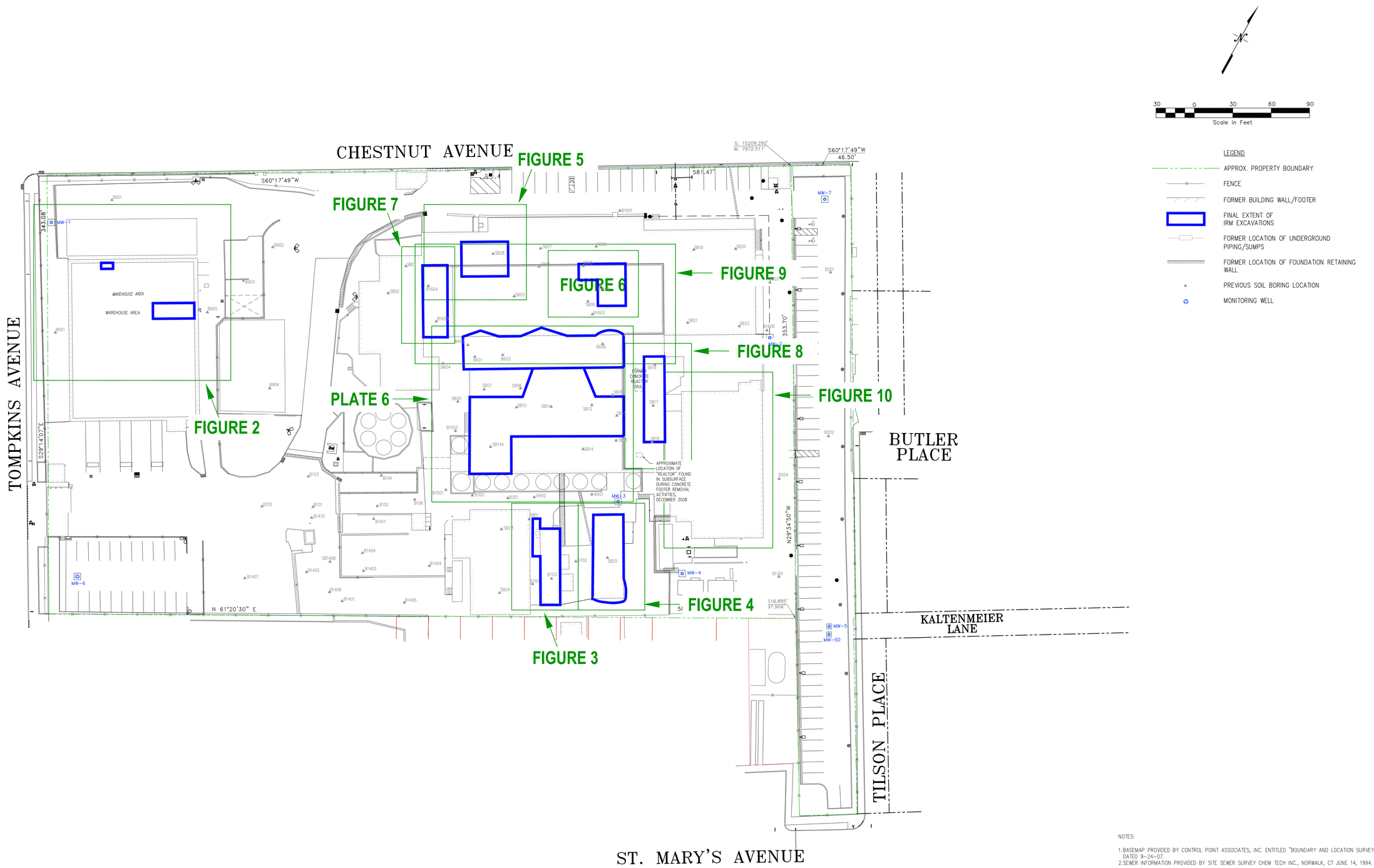
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

3/17/09	AS SHOWN	2116443AC04A	4/7/09
DATE	SCALE	CADD FILE	PLOT DATE
DESIGNED BY	TSP/PRM/KPM DRAFTED BY		APPROVED BY



30 0 30 60 90

Scale in Feet

LEGEND

- APPROX. PROPERTY BOUNDARY
- FENCE
- FORMER BUILDING WALL/FOOTER
- FINAL EXTENT OF IRM EXCAVATIONS
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- PREVIOUS SOIL BORING LOCATION
- MONITORING WELL

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

DATE	DRWN	REVISIONS

ACTUAL EXTENT OF IRM ACTIVITIES AND KEY MAP FOR POST-EXCAVATION SOIL SAMPLING DETAIL FIGURES

PLATE 5

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

DESIGNED BY	DRAFTED BY	APPROVED BY
	KPM/KPM	

DATE	SCALE	CADD FILE	PLOT DATE
3/26/09	AS SHOWN	2116443A002	4/7/09

PE09	1/14/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	3.6
Barium	64.8
Cadmium	0.12 U
Chromium (total)	35.6
Copper	15.2
Lead	23
Mercury	0.05
Nickel	38.9

B601	8/28/2006 1.8–2 (ft) mg/kg
INORG	
Arsenic	8.9
Barium	2280
Cadmium	5
Chromium (total)	329
Copper	50.5
Lead	2080
Mercury	0.6
Nickel	84.4

B602	10/5/2006 2–2.5 (ft) mg/kg
INORG	
Arsenic	5.1
Barium	1420
Cadmium	5.8
Chromium (total)	545
Copper	28.1
Lead	1490
Mercury	0.11
Nickel	94.9

PE08	1/14/2009 3–3.5 (ft) mg/kg
INORG	
Arsenic	3.2
Barium	55.6
Cadmium	0.11 U
Chromium (total)	68.9
Copper	30.6
Lead	16.9
Mercury	0.016 U
Nickel	105

PE10	1/14/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	3
Barium	100
Cadmium	0.12 U
Chromium (total)	58.4
Copper	20.3
Lead	10.1
Mercury	0.02 U
Nickel	409

B603	10/5/2006 1–1.5 (ft) mg/kg
INORG	
Arsenic	1.4
Barium	1820
Cadmium	0.8 B
Chromium (total)	15.3
Copper	34.6
Lead	191
Mercury	0.06
Nickel	10.5

BW10	2/5/2009 0.5–1 (ft) mg/kg	2/5/2009 2–2.5 (ft) mg/kg	2/5/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.038 U/0.038 U	0.038 U	0.038 U
Benzo(a)pyrene	0.038 U/0.038 U	0.038 U	0.038 U
Benzo(b)fluoranthene	0.038 U/0.038 U	0.038 U	0.038 U
Benzo(k)fluoranthene	0.038 U/0.038 U	0.038 U	0.038 U
Chrysene	0.038 U/0.038 U	0.038 U	0.038 U
Dibenz(a,h)anthracene	0.038 U/0.038 U	0.038 U	0.038 U
Hexachlorobenzene	0.038 U/0.038 U	0.038 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.038 U/0.038 U	0.038 U	0.038 U
INORG			
Arsenic	4.6/3.3	6.1	2.8
Barium	126/99.3	95.4	78.7
Cadmium	0.12 U/0.11 U	0.12 U	0.12 U
Chromium (total)	44/43.3	163	27.1
Copper	29.4/25.7	49.1	32.4
Lead	11/7.8	88.4	14.7
Mercury	0.017 U/0.019 U	0.017 U	0.017 U
Nickel	28/27.6	145	134

BW09	2/5/2009 0.5–1 (ft) mg/kg	2/5/2009 2–2.5 (ft) mg/kg	2/5/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.04 U	0.013 J	0.037 U/0.037 U
Benzo(a)pyrene	0.04 U	0.038 U	0.037 U/0.037 U
Benzo(b)fluoranthene	0.04 U	0.038 U	0.037 U/0.037 U
Benzo(k)fluoranthene	0.04 U	0.038 U	0.037 U/0.037 U
Chrysene	0.04 U	0.02 J	0.37 U/0.37 U
Dibenz(a,h)anthracene	0.04 U	0.038 U	0.037 U/0.037 U
Hexachlorobenzene	0.04 U	0.038 U	0.037 U/0.037 U
Indeno(1,2,3-cd)pyrene	0.04 U	0.038 U	0.037 U/0.037 U
INORG			
Arsenic	3.4	4	2.3/2.8
Barium	140	188	45.2/47.6
Cadmium	0.12 U	0.12 U	0.11 U/0.11 U
Chromium (total)	43.2	409	419/440
Copper	20.5	27.5	21.5/23.1
Lead	10.6	16.1	19.8/21.3
Mercury	0.02 U	0.016 U	0.098 U/0.099 U
Nickel	205	175	352/448

BW05A	7/20/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	2.3
Barium	178
Cadmium	0.12 U
Chromium (total)	30.7
Copper	25.4
Lead	15.4
Mercury	0.017 U
Nickel	180

BW02	1/12/2009 4–4.5 (ft) mg/kg
INORG	
Arsenic	8.5
Barium	148
Cadmium	0.94 B
Chromium (total)	75.4
Copper	38.7
Lead	26.9
Mercury	0.021 U
Nickel	228

B606	10/5/2006 1.5–2 (ft) mg/kg
INORG	
Arsenic	18.3/24.8
Barium	885/1940
Cadmium	0.5 B/0.55 B
Chromium (total)	53.8/75.4
Copper	69.5/75.9
Lead	175/230
Mercury	2.8/3.1
Nickel	163/146

PE05A	1/15/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	3.3
Barium	186
Cadmium	0.2 B
Chromium (total)	34.9
Copper	34.4
Lead	52.8
Mercury	0.06
Nickel	160

PE07	1/14/2009 4–4.5 (ft) mg/kg
INORG	
Arsenic	4.9
Barium	122
Cadmium	0.12 U
Chromium (total)	75.7
Copper	27.6
Lead	13.9
Mercury	0.02 U
Nickel	217

PE11	1/14/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	6.1
Barium	36.7 B
Cadmium	0.12 U
Chromium (total)	32
Copper	37.8
Lead	10.3
Mercury	0.019 U
Nickel	119

B608	6/18/2008 0.5–1.5 (ft) mg/kg	6/18/2008 2–2.5 (ft) mg/kg
INORG		
Arsenic	4.9	2.6
Barium	70	81.4
Cadmium	0.11 U	0.11 U
Chromium (total)	31	37
Copper	23.1	19.9
Lead	14.5	10
Nickel	175	297

PE05	1/13/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	3.9
Barium	2340
Cadmium	1.4
Chromium (total)	196
Copper	34.1
Lead	97.2
Mercury	0.1
Nickel	181

PE06	1/13/2009 3–3.5 (ft) mg/kg
INORG	
Arsenic	4.4
Barium	65.7
Cadmium	0.12 U
Chromium (total)	19.7
Copper	17.8
Lead	6.6
Mercury	0.02 U
Nickel	118

PE04	1/12/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	2.7
Barium	295
Cadmium	0.12 U
Chromium (total)	31.8
Copper	30.5
Lead	15.7
Mercury	0.04 B
Nickel	170

PE03	1/12/2009 1.5–2 (ft) mg/kg
INORG	
Arsenic	3.3
Barium	1220
Cadmium	0.95 B
Chromium (total)	101
Copper	49.9
Lead	484
Mercury	0.92
Nickel	227

BW04B	1/26/2009 0.5–1 (ft) mg/kg	1/26/2009 2–2.5 (ft) mg/kg	1/26/2009 4–4.5 (ft) mg/kg
INORG			
Arsenic	2	1.5	2.5
Barium	114	149	240
Cadmium	0.084 U	0.088 U	0.096 U
Chromium (total)	33	47.4	40.3
Copper	28.3	21	18.1
Lead	21	11	9
Mercury	0.02 U	0.02 U	0.02 U
Nickel	369	412	335

PE01	1/12/2009 3–3.5 (ft) mg/kg
INORG	
Arsenic	3.2
Barium	58.4
Cadmium	0.13 B
Chromium (total)	40.8
Copper	40.5
Lead	6.9
Mercury	0.02 U
Nickel	189

BW04	1/21/2009 0.5–1 (ft) mg/kg	1/21/2009 2–2.5 (ft) mg/kg	1/21/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.038 U	0.041 U	0.038 U
Benzo(a)pyrene	0.038 U	0.041 U	0.038 U
Benzo(b)fluoranthene	0.038 U	0.041 U	0.038 U
Benzo(k)fluoranthene	0.038 U	0.041 U	0.038 U
Chrysene	0.038 U	0.041 U	0.038 U
Dibenz(a,h)anthracene	0.038 U	0.041 U	0.038 U
Hexachlorobenzene	0.038 U	0.041 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.038 U	0.041 U	0.038 U
INORG			
Arsenic	2.3	2.3	2
Barium	406	86.3	72
Cadmium	0.092 U	0.098 U	0.09 U
Chromium (total)	48.5	54.2	245
Copper	24	20.6	18.6
Lead	13	10.3	131
Mercury	0.016 U	0.02 U	0.019 U
Nickel	269	308	47.7

BW04C	1/26/2009 0.5–1 (ft) mg/kg	1/26/2009 2–2.5 (ft) mg/kg	1/26/2009 4–4.5 (ft) mg/kg
INORG			
Arsenic	2.3	1.2	0.72 U
Barium	58.3	83.7	59.5
Cadmium	0.096 U	0.097 U	0.09 U
Chromium (total)	46	49.4	162
Copper	21.3	20.4	16.3
Lead	10.1	10.4	6.5
Mercury	0.02 U	0.021 U	0.019 U
Nickel	289	308	134

B609	6/18/2008 1–2 (ft) mg/kg	6/18/2008 4–4.5 (ft) mg/kg
INORG		
Arsenic	3.4	2.3
Barium	46.4	38.4 B
Cadmium	0.11 U	0.11 U
Chromium (total)	33.8	31.4
Copper	33.1	21.6
Lead	13.3	11.5
Nickel	181	198

BW01	1/15/2009 0.5–1 (ft) mg/kg	1/15/2009 2–2.5 (ft) mg/kg	1/15/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.56	0.038 U	0.039 J
Benzo(a)pyrene	0.41	0.038 U	0.037 U
Benzo(b)fluoranthene	0.38	0.038 U	0.037 U
Benzo(k)fluoranthene	0.34	0.038 U	0.037 U
Chrysene	0.54	0.38 U	0.026 J
Dibenz(a,h)anthracene	0.072	0.038 U	0.037 U
Hexachlorobenzene	0.038 U	0.038 U	0.037 U
Indeno(1,2,3-cd)pyrene	0.18	0.038 U	0.037 U
INORG			
Arsenic	6	2.9	3.2
Barium	160	363	81.3
Cadmium	0.11 U	0.11 U	0.11 U
Chromium (total)	54.1	78.3	27.3
Copper	31.8	21.2	17.3
Lead	59	7.9	98.8
Mercury	0.095 U	0.019 U	0.02 B
Nickel	210	269	254

B613	6/18/2008 0.5–1 (ft) mg/kg	6/18/2008 4–4.5 (ft) mg/kg	6/18/2008 7.5–8 (ft) mg/kg
PCB			
PCBs (total)	–	0.092 U	0.074 U
SVOC			
Benzo(a)anthracene	–	0.077	0.037 U
Benzo(a)pyrene	–	0.081	0.037 U
Benzo(b)fluoranthene	–	0.2	0.037 U
Benzo(k)fluoranthene	–	0.16	0.037 U
Chrysene	–	0.12 J	0.37 U
Dibenz(a,h)anthracene	–	0.044 J	0.037 U
Hexachlorobenzene	–	0.58	0.037 U
Indeno(1,2,3-cd)pyrene	–	0.11	0.037 U
INORG			
Arsenic	0.91 U	2.5	2.3
Barium	62.3	61.2	169
Cadmium	0.1 U	0.14 U	0.11 U
Chromium (total)	1.7 B	38.2	43
Copper	1.4 B	7.36	36
Cyanide (total)	–	45.1	8
Lead	3.7	23.2	44.8
Nickel	0.79 U	12.6	205

BW03	1/15/2009 8–8.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.037 U
Benzo(a)pyrene	0.037 U
Benzo(b)fluoranthene	0.037 U
Benzo(k)fluoranthene	0.037 U
Chrysene	0.37 U
Dibenz(a,h)anthracene	0.037 U
Hexachlorobenzene	0.037 U
Indeno(1,2,3-cd)pyrene	0.037 U
INORG	
Arsenic	4.8
Barium	81.7
Cadmium	0.11 U
Chromium (total)	354
Copper	132
Lead	72
Mercury	0.019 U
Nickel	202

BW02	1/15/2009 0.5–1 (ft) mg/kg	1/15/2009 2–2.5 (ft) mg/kg	1/15/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.056	0.037 U	0.038 U
Benzo(a)pyrene	0.038 U	0.037 U	0.038 U
Benzo(b)fluoranthene	0.022 J	0.037 U	0.038 U
Benzo(k)fluoranthene	0.04	0.037 U	0.038 U
Chrysene	0.065 J	0.37 U	0.38 U
Dibenz(a,h)anthracene	0.038 U	0.037 U	0.038 U
Hexachlorobenzene	0.038 U	0.037 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.038 U	0.037 U	0.038 U
INORG			
Arsenic	3.7	2.6	2.3
Barium	68.2	51.7	49.8
Cadmium	0.11 U	0.11 U	0.11 U
Chromium (total)	101	62	211
Copper	33	17.9	35
Lead	335	176	150
Mercury	0.019 U	0.019 U	0.096 U
Nickel	100	30.2	69.6

BW06	1/21/2009 8–8.5 (ft) mg/kg	1/26/2009 9–9.5 (ft) mg/kg
SVOC		
Benzo(a)anthracene	0.037 U/0.037 U	–
Benzo(a)pyrene	0.037 U/0.037 U	–
Benzo(b)fluoranthene	0.037 U/0.037 U	–
Benzo(k)fluoranthene	0.037 U/0.037 U	–
Chrysene	0.37 U/0.37 U	–
Dibenz(a,h)anthracene	0.037 U/0.037 U	–
Hexachlorobenzene	0.037 U/0.037 U	–
Indeno(1,2,3-cd)pyrene	0.037 U/0.037 U	–
INORG		
Arsenic	1.7/1.9	0.71 U
Barium	29.1 B/30.4 B	44.3
Cadmium	0.09 U/0.09 U	0.089 U
Chromium (total)	84.9/101	41
Copper	51.3/75.1	63.6
Lead	7.7/7.4	10.9
Mercury	0.094 U/0.093 U	0.019 U
Nickel	288/348	238

BW14	2/19/2009 8–8.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.037 U
Benzo(a)pyrene	0.037 U
Benzo(b)fluoranthene	0.037 U
Benzo(k)fluoranthene	0.037 U
Chrysene	0.37 U
Dibenz(a,h)anthracene	0.037 U
Hexachlorobenzene	0.037 U
Indeno(1,2,3-cd)pyrene	0.037 U
INORG	
Arsenic	2.5
Barium	58.4
Cadmium	0.11 U
Chromium (total)	138
Copper	27.3
Lead	8.9
Mercury	0.019 U
Nickel	127

BW09	1/29/2009 8–8.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.037 U
Benzo(a)pyrene	0.037 U
Benzo(b)fluoranthene	0.037 U
Benzo(k)fluoranthene	0.037 U
Chrysene	0.37 U
Dibenz(a,h)anthracene	0.037 U
Hexachlorobenzene	0.037 U
Indeno(1,2,3-cd)pyrene	0.037 U
INORG	
Arsenic	1.7
Barium	38.8 B
Cadmium	0.11 U
Chromium (total)	24.6
Copper	214
Lead	5.5
Mercury	0.019 U
Nickel	205

BW12	2/5/2009 8–8.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.038 U
Benzo(a)pyrene	0.038 U
Benzo(b)fluoranthene	0.038 U
Benzo(k)fluoranthene	0.038 U
Chrysene	0.38 U
Dibenz(a,h)anthracene	0.038 U
Hexachlorobenzene	0.038 U
Indeno(1,2,3-cd)pyrene	0.038 U
INORG	
Arsenic	2.3
Barium	45.8
Cadmium	0.11 U
Chromium (total)	33.9
Copper	17.7
Lead	5.1
Mercury	0.019 U
Nickel	270

SB14A	6/18/2008 1–2 (ft) mg/kg
PCB	
PCBs (total)	0.079 U
SVOC	
Benzo(a)anthracene	0.039 U
Benzo(a)pyrene	0.039 U
Benzo(b)fluoranthene	0.039 U
Benzo(k)fluoranthene	0.039 U
Chrysene	0.39 U
Dibenz(a,h)anthracene	0.039 U
Hexachlorobenzene	0.039 U
Indeno(1,2,3-cd)pyrene	0.039 U
INORG	
Arsenic	4.1
Barium	63.9
Cadmium	0.12 U
Chromium (total)	107
Copper	9
Cyanide (total)	0.5 U
Lead	51.8
Nickel	45.5

BW11	2/5/2009 0.5–1 (ft) mg/kg	2/5/2009 2–2.5 (ft) mg/kg	2/5/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.039 U	0.039 U	0.039 U
Benzo(a)pyrene	0.039 U	0.039 U	0.039 U
Benzo(b)fluoranthene	0.039 U	0.039 U	0.039 U
Benzo(k)fluoranthene	0.039 U	0.039 U	0.039 U
Chrysene	0.39 U	0.39 U	0.39 U
Dibenz(a,h)anthracene	0.039 U	0.039 U	0.039 U
Hexachlorobenzene	0.039 U	0.039 U	0.039 U
Indeno(1,2,3-cd)pyrene	0.039 U	0.039 U	0.039 U
INORG			
Arsenic	5.4	5.5	2.8
Barium	87.7	55.8	59
Cadmium	0.12 U	0.12 U	0.12 U
Chromium (total)	35.4	27.4	43
Copper	26.4	13.2	21.4
Lead	8.6	7	6.8
Mercury	0.02 U	0.017 U	0.02 U
Nickel	232	248	100

BW15	2/19/2009 8–8.5 (ft) mg/kg
SVOC	
Benzo(a)anthracene	0.039 U
Benzo(a)pyrene	0.039 U
Benzo(b)fluoranthene	0.039 U
Benzo(k)fluoranthene	0.039 U
Chrysene	0.39 U
Dibenz(a,h)anthracene	0.039 U
Hexachlorobenzene	0.039 U
Indeno(1,2,3-cd)pyrene	0.039 U
INORG	
Arsenic	2.2
Barium	38.3 B
Cadmium	0.12 U
Chromium (total)	113
Copper	32.8
Lead	15.5
Mercury	0.019 U
Nickel	222

BW08	1/29/2009 0.5–1 (ft) mg/kg	1/29/2009 2–2.5 (ft) mg/kg	1/29/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.041 U	0.041 U	0.037 U
Benzo(a)pyrene	0.041 U	0.041 U	0.037 U
Benzo(b)fluoranthene	0.041 U	0.041 U	0.037 U
Benzo(k)fluoranthene	0.041 U	0.041 U	0.037 U
Chrysene	0.41 U	0.41 U	0.37 U
Dibenz(a,h)anthracene	0.041 U	0.041 U	0.037 U
Hexachlorobenzene	0.041 U	0.041 U	0.037 U
Indeno(1,2,3-cd)pyrene	0.041 U	0.041 U	0.037 U
INORG			
Arsenic	4.3	4.1	2.3
Barium	84	71.6	42.1 B
Cadmium	0.12 U	0.12 U	0.11 U
Chromium (total)	38.2	96.8	44.6
Copper	38.4	58.4	44
Lead	20	10.2	5.3
Mercury	0.02 U	0.017 U	0.019 U
Nickel	48.5	191	127

SB11	4/17/2008 0.5–2 (ft) mg/kg	4/17/2008 2–3 (ft) mg/kg	4/17/2008 5–5.4 (ft) mg/kg
INORG			
Arsenic	8.1	6.6	6.7
Barium	3860	7570	2060
Cadmium	1.6	0.13 U	0.43 B
Chromium (total)	213	818	695
Copper	354	20.2	90.7
Lead	1290	2160	601
Mercury	–	0.19	–
Nickel	24.4	1.1 B	85.5

BW04A	1/26/2009 0.5–1 (ft) mg/kg	1/26/2009 2–2.5 (ft) mg/kg	1/26/2009 4–4.5 (ft) mg/kg
INORG			
Arsenic	1.1 B	1.5	2
Barium	189	66.4	215
Cadmium	0.093 U	0.094 U	0.087 U
Chromium (total)	38.6	36.5	59.5
Copper	39.6	22	21.6
Lead	10.7	8.3	10.1
Mercury	0.017 U	0.02 U	0.017 U
Nickel	310	323	462

BW05	1/21/2009 0.5–1 (ft) mg/kg	1/21/2009 2–2.5 (ft) mg/kg	1/21/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.039 U	0.039 U	0.038 U
Benzo(a)pyrene	0.039 U	0.039 U	0.038 U
Benzo(b)fluoranthene	0.039 U	0.039 U	0.038 U
Benzo(k)fluoranthene	0.039 U	0.039 U	0.038 U
Chrysene	0.39 U	0.39 U	0.38 U
Dibenz(a,h)anthracene	0.039 U	0.039 U	0.038 U
Hexachlorobenzene	0.039 U	0.039 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.039 U	0.039 U	0.038 U
INORG			
Arsenic	2.9	1.5	1.7
Barium	81.9	53.7	66.8
Cadmium	0.094 U	0.093 U	0.09 U
Chromium (total)	107	25.4	65.6
Copper	54	21.3	96
Lead	11.8	6.9	8.4
Mercury	0.02 U	0.019 U	0.019 U
Nickel	210	137	206

SB15	6/17/2008 0.5–1 (ft) mg/kg	6/17/2008 2–2.5 (ft) mg/kg	6/17/2008 4–4.5 (ft) mg/kg
INORG			
Arsenic	4	2.2	3.5
Barium	50.3	39 B	47.3
Cadmium	0.11 U	0.11 U	0.12 U
Chromium (total)	141	173	188
Copper	46.4	48.9	78.4
Lead	648	99.1	368
Mercury	–	0.05	–
Nickel	122	120	150

BW02	1/15/2009 0.5–1 (ft) mg/kg	1/15/2009 2–2.5 (ft) mg/kg	1/15/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.056	0.037 U	0.038 U
Benzo(a)pyrene	0.038 U	0.037 U	0.038 U
Benzo(b)fluoranthene	0.022 J	0.037 U	0.038 U
Benzo(k)fluoranthene	0.04	0.037 U	0.038 U
Chrysene	0.065 J	0.37 U	0.38 U
Dibenz(a,h)anthracene	0.038 U	0.037 U	0.038 U
Hexachlorobenzene	0.038 U	0.037 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.038 U	0.037 U	0.038 U
INORG			
Arsenic	3.7	2.6	2.3
Barium	68.2	51.7	49.8
Cadmium	0.11 U	0.11 U	0.11 U
Chromium (total)	101	62	211
Copper	33	17.9	35
Lead	335	176	150
Mercury	0.019 U	0.019 U	0.096 U
Nickel	100	30.2	69.6

BW05	1/21/2009 0.5–1 (ft) mg/kg	1/21/2009 2–2.5 (ft) mg/kg	1/21/2009 4–4.5 (ft) mg/kg
SVOC			
Benzo(a)anthracene	0.039 U	0.039 U	0.038 U
Benzo(a)pyrene	0.039 U	0.039 U	0.038 U
Benzo(b)fluoranthene	0.039 U	0.039 U	0.038 U
Benzo(k)fluoranthene	0.039 U	0.039 U	0.038 U
Chrysene	0.39 U	0.39 U	0.38 U
Dibenz(a,h)anthracene	0.039 U	0.039 U	0.038 U
Hexachlorobenzene	0.039 U	0.039 U	0.038 U
Indeno(1,2,3-cd)pyrene	0.039 U	0.039 U	0.038 U
INORG			
Arsenic	2.9	1.5	1.7
Barium	81.9	53.7	66.8
Cadmium	0.094 U	0.093 U	0.09 U
Chromium (total)	107	25.4	65.6
Copper	54	21.3	96
Lead	11.8	6.9	8.4
Mercury	0.02 U	0.019 U	0.019 U
Nickel	210	137	206

SB14	6/18/2008 0.5–1 (ft) mg/kg
INORG	
Arsenic	3
Barium	75.5
Cadmium	0.11 U
Chromium (total)	20.1
Copper	19.9
Lead	11.4
Nickel	50.7

B1605 B602 B603 B601 B604 B1502 B1501 B302 B301 B402 B401 B606

PE10A PE10 PE11 PE05A PE05 PE04 PE03A PE03 PE09 PE08 PE07 PE06 PE02 PE01

SB07 SB08 SB09 SB01 SB02 SB03 SB04 SB05 SB06 SB10 SB11 SB12 SB13 SB14A SB15

BW13 BW14 BW07 BW04A BW04 BW04C BW10 BW04B BW09 BW12 BW06 BW03 BW11 BW08 BW05 BW02 BW15 BW01

MW-3

EXCAVATED TO 4.0' BGS

EXCAVATED TO 9.0' BGS

EXCAVATED TO 4.0' BGS

COURTYARD AREA: EXCAVATION TO 3' BGS, UNLESS OTHERWISE NOTED.

BLUE WING: EXCAVATION TO 8' BGS, UNLESS OTHERWISE NOTED.

10 0 10 20 30

Scale in Feet

LEGEND

- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- FORMER LOCATION OF UNDERGROUND PIPING/SUMPS
- FORMER WASH TANK AND TRENCH
- FENCE
- EXCAVATION AREA
- ADDITIONAL EXCAVATION AREA
- POST–EXCAVATION SOIL SAMPLING LOCATION, JANUARY/FEBRUARY 2009
- POST–EXCAVATION SOIL SAMPLING LOCATION REMOVED DURING SUBSEQUENT EXCAVATION
- SOIL BORING LOCATION, AUGUST/OCTOBER 2006, JUNE 2008
- MONITORING WELL LOCATION

Chem Grounp	Constituent	CAS	NYSDEC Part 375-6 Soil Cleanup Objectives - Commercial (mg/kg)
SVOC	Benzo(a)anthracene	56-55-3	5.6
SVOC	Benzo(a)pyrene	50-32-8	1
SVOC	Benzo(b)fluoranthene	205-99-2	5.6
SVOC	Benzo(k)fluoranthene	207-08-9	56
SVOC	Chrysene	218-01-9	56
SVOC	Dibenz(a,h)anthracene	53-70-3	0.56
SVOC	Hexachlorobenzene	118-74-1	6
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	5.6
PCB	PCBs (total)	1336-36-3	1
INORG	Arsenic	7440-38-2	16
INORG	Barium	7440-39-3	400
INORG	Cadmium	7440-43-9	9.3
INORG	Chromium (total)	7440-47-3	1500
INORG	Copper	7440-50-8	270
INORG	Cyanide (total)	57-12-5	27
INORG	Lead	7439-92-1	1000
INORG	Mercury	7439-97-6	2.8
INORG	Nickel	7440-02-0	310

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9–24–07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DRAFT

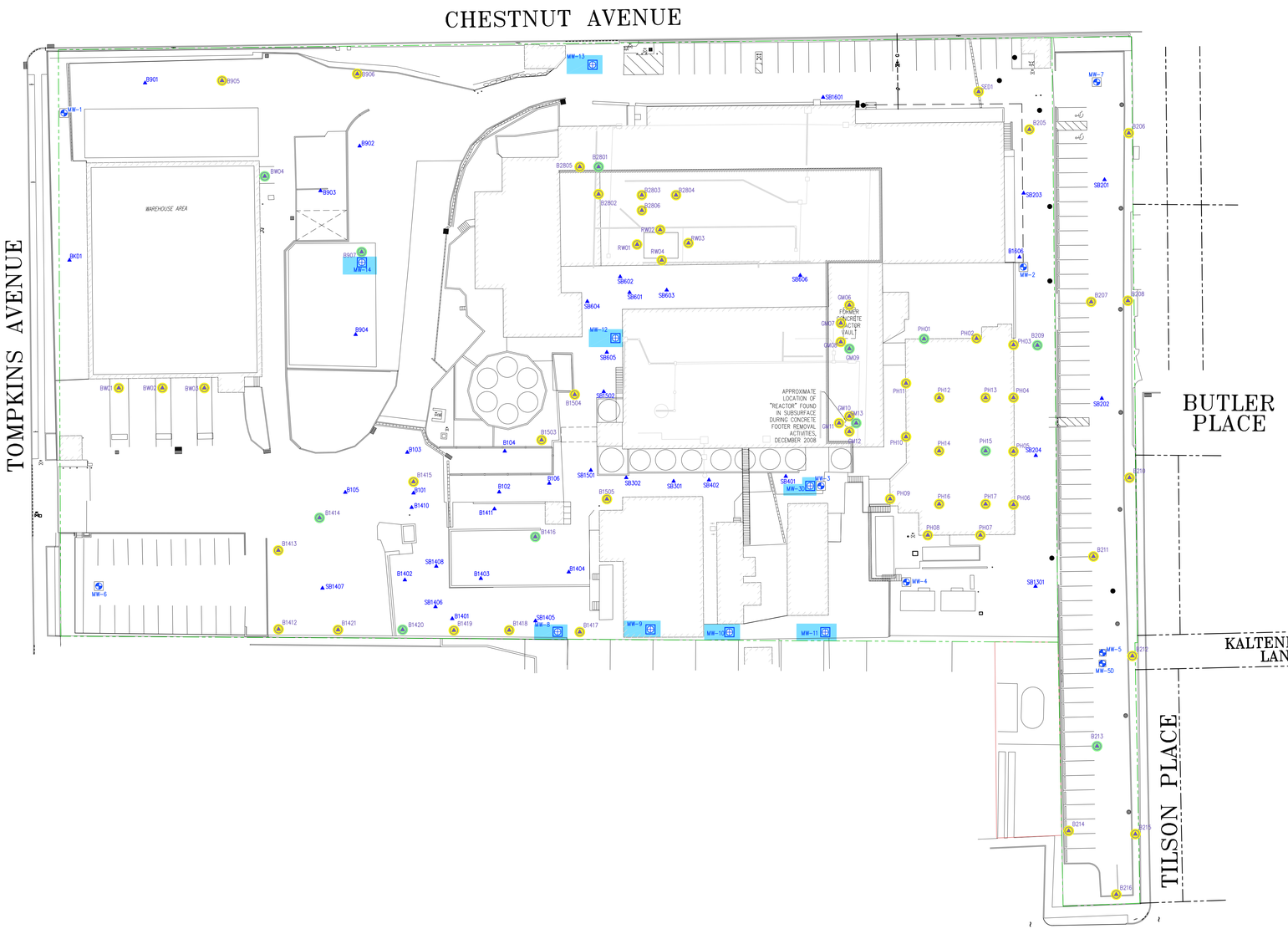
6 PLATE

COURTYARD & BLUE WING
AREA EXCAVATIONS
AND SAMPLE LOCATIONS

SUN CHEMICAL CORPORATION–ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com

3/20/09 DATE	AS SHOWN SCALE	2116443AS02A CADD FILE	4/7/09 PLOT DATE
J. SHIPLEY DESIGNED BY	TSP/PRM/KPM DRAFTED BY		B. KRAFT APPROVED BY



LEGEND

- APPROX. PROPERTY BOUNDARY
- FORMER BUILDING WALL/FOOTER
- FORMER LOCATION OF FOUNDATION RETAINING WALL
- FENCE
- SOIL BORING (2006)
- EXISTING MONITORING WELL
- PROPOSED SOIL SCREENING BORING
- PROPOSED DELINEATION SOIL BORING
- PROPOSED MONITORING WELL
- STORM WATER TRENCH DRAIN

DRAFT

NOTES:

1. BASEMAP PROVIDED BY CONTROL POINT ASSOCIATES, INC. ENTITLED "BOUNDARY AND LOCATION SURVEY", DATED 9-24-07.
2. SEWER INFORMATION PROVIDED BY SITE SEWER SURVEY CHEM TECH INC., NORWALK, CT JUNE 14, 1994.

DATE	DRWN.	REVISIONS

PROPOSED MONITORING WELLS & SOIL SAMPLING FOR REMEDIAL INVESTIGATION

PLATE 7

SUN CHEMICAL CORPORATION-ROSEBANK FACILITY
441 TOMPKINS AVE.
STATEN ISLAND, NY

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com
California, Illinois, Louisiana, Massachusetts, Missouri, Texas, Virginia, Wisconsin
Asia Pacific, Europe, United Kingdom

DATE	SCALE	CADD FILE	PLOT DATE
3/27/09	AS SHOWN	2116443AS06	2/24/10

DESIGNED BY	DRAFTED BY	APPROVED BY
	TSP/PRM/TSP	