REMEDIAL ACTION WORK PLAN
METROPOLIS TOWERS – SITE 156
(FORMERLY GREGORY PARK APARTMENTS)
270-280 LUIS MUNOZ MARIN BOULEVARD
JERSEY CITY, NEW JERSEY

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1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) has been prepared on behalf of PPG Industries, Inc. (PPG) for the remediation of chromium-impacted soils at the Metropolis Towers site (formerly Gregory Park Apartments). The site, identified as Site 156, is located at 270-280 Luis Munoz Marin Boulevard in Jersey City, New Jersey. This site is designated as chromate waste Site 156 in the July 19, 1990 Administrative Consent Order (ACO) between the New Jersey Department of Environmental Protection (NJDEP) and PPG. The site's NJDEP program interest (PI) number is G000008770.

This RAWP presents a brief discussion of the site's prior and current use and its regulatory history leading up to the preparation of this RAWP. Then summaries of the environmental investigations performed are presented followed by a description of the proposed remedial action.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

This site encompasses the Metropolis Towers property consisting of Buildings I and II and including the area formerly occupied by a Central Building that included a pool and commons area, which was previously demolished. The complex includes multi-unit residential uses with outside parking on approximately 8.6 acres of land located in Jersey City as shown on Figure 1. The property is covered with buildings (used for residential housing), parking, and some green space. The property is bordered by Christopher Columbus Drive, Warren Street, Montgomery Street, and Luis Munoz Marin Boulevard.

The complex was constructed between 1961 and 1967 with the aid of Federal funds granted by the Housing and Urban Redevelopment Authority (HUD). At the time of construction, the complex was called the Gregory Park Apartments. Buildings I and II are 21 stories with approximately 20 apartments per floor for a total of 752 units. Each building is a reinforced concrete structure supported by driven piles. The Central Building between Buildings I and II contained a single story commons building and commercials space with a second story containing a swimming pool located on the north side of the building. Design drawings from John Hans Graham and Associates show the Central Building foundation to consist of pile foundations with grade beams supporting the building floor slab.

In 2006, the Central Building between Buildings I and II was demolished to the floor slab. Fencing was installed around the remaining floor slab to restrict access to the area.

2.2 SITE HISTORY

Prior to the properties current configuration, the site was comprised of numerous individual lots and was zoned as mixed commercial/residential. The “Sanborn Company Map of 1906 (updated 1949)” indicated the following industries occupied portions of the site sometime between the late 1800’s and 1950: National Iron Works, Filling station, Painting Contractor, Chemical Warehouse, Auto Truck Parking, Motor Freight Station, Machine Shop, and Furniture Manufacturer. Aerial photographs from 1951 show numerous commercial, light industrial, and

row-style housing buildings on site. A small surface water impoundment also existed in the vicinity of the pool and commons area. The aerial photo also shows street through the property (i.e., Van Vorst Street, Gregory Street, Coopers Place, and Newark Avenue) that have since been abandoned.

Since the construction of the current buildings in 1961 to 1967 the site's use has been residential. Prior to 1961, numerous businesses were present, some of which were potential sources of hazardous waste discharges. However, details of the specific site operations and discharges are unavailable, and there are no records to indicate if any environmental permits were applied for, or issued.

As noted in prior reports for this site, in 1990 the NJDEP informed PPG that they had received a statement from Mr. Claude Perretti indicating that approximately 9,000 cubic yards of chromate chemical processing waste (CCPW) was used as backfill at the site in 1961. How that material was used and where it was placed is not known.

Also noted in prior reports for this site, a former excavating company employee reported to NJDEP that approximately 350-400 loads of material, 15-17 cubic yards each, were removed from the north and south parking lots of Building I in 1976 or 1977. It is not known why this material was removed and there is no allegation to indicate that this was a remedial action undertaken to remove CCPW from the site. The employee recalled each excavation to be 200-feet by 75-feet and five to seven feet deep. These dimensions equate to a volume removed in the range of approximately 5,600 to 10,400 cubic yards. The actual size of the excavations is probably on the lower end of the estimate, since 350 to 400 loads of 15-17 cubic yards totals 5,200 to 6,800 cubic yards of material, and groundwater should have been encountered at a depth of four to six feet below ground surface.

Several other soil removals took place at the site (as noted in prior site reports), unrelated to the CCPW fill. An above ground heating oil tank located at the northeast corner of Building I leaked in 1986-1987, with product flowing into the streets. An unknown volume of surface soils were removed in response to the leak. Also, the 1987 remodeling of the Port Authority Trans Hudson (PATH) ventilation duct involved the removal of an unknown volume of soil (Jenkins, personal communication, 1991).

2.3 SURROUNDING LAND USE

The surrounding land use is a mix of residential and commercial properties. Located west of the apartment complex and across Luis Munoz Marin Boulevard is the City Hall of Jersey City. Nearby are several office towers, as well as several public schools and churches. The PATH Grove Street Station is located across Christopher Columbus Drive (formerly Railroad Avenue) and a PATH subway tunnel runs beneath Christopher Columbus Drive along the northern edge of the site. A ventilator shaft for the PATH tunnel lies adjacent to the site at the corner of Christopher Columbus Drive and Warren Street. Presently the land is zoned for commercial and residential use. The Jersey City Master Plan Review (Buckhurst et al., 1984) envisions future land use of the area as residential.

2.4 GEOLOGY AND HYDROGEOLOGY

2.4.1 Geology

Regional Geology: The site lies within the physiographic province of the Piedmont Plain, characterized by low ridges trending in a northeasterly direction. The area is underlain by formations of Recent, Pleistocene and Triassic ages.

Triassic Newark Basin: The bedrock underlying the site is part of the Newark Basin which is the most northerly of the three basins known as the Newark Supergroup. These rocks are of Upper Triassic and Jurassic ages and lie on an arcuate belt stretching from southern New York to central Virginia.

The site is underlain by the Stockton Formation; however, a gradational contract and/or interfingering with the Lockatong Formation may exist close to the site. The Stockton Formation is a gray to reddish brown sandstone, interbedded with conglomerate, siltstone, and shale. The siltstone may be gray, green or purple and fossiliferrous. This formation may be found at depths greater than 40 feet and has a thickness of approximately 850 feet (Lyttle and Epstein, 1987) beneath the site. The Stockton dips gently to the west. The Lockatong Formation is a fossil-rich gray to black siltstone and shale, which is thinly laminated to thick bedded. West of the site, within Jersey City, a diabase sill of Lower Jurassic Age intrudes the Lockatong Formation.

Pleistocene Glacial Deposits: The sediments overlying the Newark Supergroup in this area are usually Pleistocene glacial drift deposits (Killam, 1988). The Pleistocene glacial drift deposits exist as stratified and unstratified sediments ranging from silty clay to sands and gravels. In the eastern part of Newark, a buried valley has been identified with depth to bedrock ranging from 125 to 300 feet. The axis of this valley runs roughly southwest-northeast, suggesting that the valley passes north of Jersey City, but portions could exist in western Jersey City. Preglacial Lakes Hackensack and Hudson, which existed to the north of the site, may have contributed outwash deposits to this area as drainage of these lakes occurred. The terminal moraine stretches to south of Jersey City, across Perth Amboy, New Jersey; Staten Island, New York; and western Long Island.

Recent Deposits: Recent alluvial deposits consist of unconsolidated mud and silt, with peat and other organic material, and occasional sand and gravel lenses. Streams have deposited alluvial sediments either directly on the Stockton Formation or on top of the Pleistocene age glacial sediments. These deposits have resulted in the creation of the meadowlands tidal marshes (Special Report No. 10, 1951). A peat layer called "meadow mat" is frequently associated with the tidal marsh deposits of silty clay. These marsh areas have been dewatered and backfilled in many areas of Jersey City resulting in a surface layer of fill material overlying the meadow mat unit (first natural deposit).

2.4.2 Hydrogeology

Regional Hydrogeology: In the vicinity of the sites, groundwater occurs in the Stockton and Lockatong Formations, the unconsolidated Pleistocene sand and gravel, and the recent deposits of alluvium and fill.

Stockton and Lockatong Formations: These formations are part of a major regional aquifer serving most of the industrialized sections of northern New Jersey. Hydrogeologic properties of the Stockton and Lockatong are not well documented; however, they are expected to be similar to the Passaic Formation (formerly referred to as the Brunswick Formation), which is well documented. The aquifer's hydraulic properties (i.e. storage capacity and transmissivity) are primarily controlled by secondary permeability. The thickness of water-bearing zones is small, with estimates ranging from a few inches to 20 feet. Groundwater occurrence and flow is

controlled either by the numerous vertical or near-vertical fractures (Special Report No. 10, 1951), or by major bedding partings and/or intensely fractured seams (Michalski, 1990). These formations exhibit an anisotropic flow pattern, with preferential flow along the strike of the beds. Well yields range from several gallons to several hundred gallons per minute, with yields generally decreasing with depth. Groundwater in these formations occurs under both unconfined and confined conditions.

Groundwater in Glacial Deposits: The Pleistocene age glacial deposits of sand and gravel can yield groundwater at volumes of 175 to 600 gallons per minute (gpm) (Special Report No. 10, 1951). Geraghty (1959) reports a well yielding 1,500 gpm. These glacial deposits are widespread northeast of Jersey City where they formerly served as water supplies.

Groundwater in Recent Deposits: The ground surface area at the site is fairly level with an elevation of 6 to 7 feet above mean sea level (ft-msl). Water level measurements from geotechnical borings performed in 1960 indicate the water table was between 4 and 6 feet below grade. Recent water table level measurements during the RAWP Investigation indicate a water level ranging from 0.5 to 3.7 ft-msl. From the general perspective of the site location, groundwater flow within the recent deposit is anticipated to be towards the Hudson River which is east and southeast of the site.

Surface Water: Major water bodies in the vicinity of the site include the Hudson River, Located approximately 2,000 feet to the east and the Morris Canal Basin of the Upper New York Bay located approximately 2,000 feet south. There are no open water bodies existing onsite and site drainage is by flow over paved areas into the city combined storm sewer system. During precipitation periods, some runoff water may seep into the ground via infiltration through the limited unvegetated areas and pavement cracks.

2.5 BASELINE ECOLOGICAL EVALUATION (BEE)

The baseline ecological evaluation (BEE) for Site 156 has been prepared in accordance with the NJDEP requirements in N.J.A.C. 7:26E-3.11 and is limited to the areas contaminated with or by chromate waste. The BEE is qualitative in nature and is used to determine whether further ecological investigation is required based on the co-occurrence of the following conditions:

- Contaminants of Ecological Concern Exist on-site;

- An environmentally sensitive area (defined in N.J.A.C. 7:26E-1.8) exists on or immediately adjacent to the site; and

- Potential contaminant migration pathways to an environmentally sensitive area exist, or an impact to an environmentally sensitive area is indicated based on visual observation

Contaminants of Ecological Concern: Contaminants of ecological concern associated with chromate waste at Site 156 can include hexavalent chromium, other metals, and elevated pH. Further discussion of these contaminants is not provided because the other two conditions do not apply to this site as discussed below.

Environmentally Sensitive Areas: Environmental sensitive areas as defined in N.J.A.C. 7:26E-1.8 and N.J.A.C. 7:1-1.8(a) do not exist on or immediately adjacent to this site, except for ground water. Ground-water data are discussed in Section 3.1 of this report and in the RAWP Investigation presented in RAWP Appendix D.

Contaminant Migration Pathways: Contaminant migration pathways to an environmentally sensitive area do not exist based on visual observations of the site, except for migration of chromate waste contaminants to ground water. Ground-water data are discussed in Section 3.1 of this report and in the RAWP Investigation presented in RAWP Appendix D.

Conclusions: Because all three conditions have not been met as required in N.J.A.C. 7:26E-3.11(a)4, no further ecological investigations are needed for Site 156.

3.0 SUMMARY OF SITE INVESTIGATIONS

Both PPG and Metrovest have performed environmental investigations at the site. This information is summarized by PPG remedial investigation (RI) reports, a Metrovest Supplemental Investigation, and a PPG RAWP Investigation.

3.1 DRAFT PPG REMEDIAL INVESTIGATION REPORT

The first RI report was by ICF Kaiser Engineers titled " Draft Remedial Investigation Report, Group 1 – Site 156, Gregory Park Apartments Site" dated September 29, 1993, and the second RI report was by IT Corporation titled "Draft Remedial Investigation Report, Group 1 – Site 156 Gregory Park Apartments site" dated June 6, 2001. The IT report revises and supersedes the ICF Kaiser Engineers report and the following discusses this report in more detail. Both reports were submitted to the NJDEP.

The draft RI Report was prepared in accordance with Paragraph 41c of the ACO to document the investigations conducted at the Group 1 site. Group 1 includes the site designated as Site 156 – Gregory Park Apartments which was at one time called Metrovest Towers, and is now called Metropolis Towers. The remedial investigation performed by PPG involved the collection of soil samples from 68 test borings and from 5 borings advanced for the installation of monitoring wells. The groundwater investigation included the installation of 5 monitoring wells, permeability testing, and performance of two rounds of groundwater sampling. Because surface water and sediment are not present at the site, these media were not addressed. Boring locations from the PPG remedial investigation are shown on Figure 2

The primary objective of the RI was to delineate the horizontal and vertical extent of chromium contamination in the soils related to CCPW within the Site 156 area. Groundwater quality data was collected to determine whether the groundwater beneath the site has been impacted by CCPW.

Results from the laboratory analyses of chromium in soils are presented in Appendix A. Contaminated soils generally lie within an 8-foot thick interval in the surface fill layer at depths between 4 to 12 feet below the floor level of the Central Building. The main contaminated zone

is located primarily between Buildings I and II and extends to the south toward Luis Munoz Marin Boulevard. A few outlying areas to the north and west of Building I were also identified. RI data showed that the Central Building floor slab and asphalt pavement covered the contaminated area. It was estimated that hexavalent chromium concentrations greater than 20 milligrams per kilogram (mg/kg) were covered by a minimum of 1.6 feet and an average of 3.6 feet of fill containing lower concentrations of hexavalent chromium.

Results from the laboratory analyses for chromium in ground water are presented in Appendix A. These results showed PPG well MW-5 to contain total and hexavalent chromium at concentrations of 1,630 micrograms per liter (µg/l) and 476 µg/l, respectively. PPG MW-5 was completed in the main CCPW area underlying the Central Building. All other monitoring wells on the site contained chromium concentrations below the New Jersey Ground Water Quality Standard (GWQS) for chromium.

3.2 LANGAN SUPPLEMENTAL INVESTIGATION

Supplemental site data is included in a RAWP by Langan Engineering & Environmental Services (Langan) titled “Remedial Action Workplan, Metropolis Towers Site, 270-280 Luis Munoz Marin Boulevard, Jersey City, New Jersey” dated June 28, 2004. The supplemental data was collected from 29 soil borings performed by Langan on behalf of Metrovest between August 2001 and July 2002. The Langan RAWP is superseded by this PPG RAWP.

As reported in the Langan June 28, 2004 RAWP:

- From August 2001 through July 2002 Langan, on behalf of Metrovest, completed 29 additional soil borings at the site. The borings (LB-1 through LB-25 and DB-1 through DB-4) were completed to obtain geotechnical engineering data for the proposed building foundations as well as supplemental environmental data to further delineate chromium impacts. Boring locations from the Langan investigation are shown on Figure 3.

- The supplemental investigations were completed in accordance with the requirements of NJAC 7:26E and the NJDEP Field Sampling Procedures Manual dated May 1992. All

drilling services were provided by a New Jersey-licensed well driller, and all analytical laboratory services were provided by a NJDEP-certified laboratory.

- Approximately 65 soil samples were collected from the borings and analyzed for total and hexavalent chromium. All of the samples were collected at depths ranging from approximately 1.5 feet to 26.5 feet below grade. The samples contained total chromium at concentrations ranging from non-detect to 10,500 mg/kg, with no samples exceeding the NJDEP Residential Soil Remediation Standards (RSRS) of 120,000 mg/kg. Hexavalent chromium concentrations ranged from non-detect to 1,930 mg/kg, with seven samples exceeding the RSRS of 20 mg/kg. The soil boring chromium data are summarized in Appendix B.

- Langan also collected and analyzed 22 soil samples for volatile organics, semi-volatile organics, polychlorinated biphenyls (PCBs), metals, and/or total petroleum hydrocarbons (TPH). Elevated levels of semi-volatile organics, lead, mercury, and TPH were found within fill material in several areas of the site. The contaminants appear to be representative of historic fill. The non-chromium sample results are summarized in Appendix C.

3.3 RAWP INVESTIGATION (PRE-DEMOLITION)

As an initial RAWP activity, PPG performed an additional investigation to supplement the previous PPG and Metrovest investigations, further define the extent of contamination, and provide information for defining remedial actions. The additional investigation was undertaken as part of this RAWP in accordance with a February 20, 2006 Sampling and Analysis Plan (SAP) submitted to Mr. Steve Urbanick of the NJDEP. Analytical results from this RAWP Investigation are presented in Appendix D. Figure 4 shows the RAWP investigation sampling locations. The RAWP Investigation forms the basis of this RAWP along with the other investigations performed.

3.3.1 Monitoring Well Sampling

Sampling of the five monitoring wells on-site indicated an average ground water surface elevations consistent with those from the remedial investigation report.

Only PPG1-MW2 (127 ug/l) contained total chromium above the NJ Ground Water Quality Criteria (GWQC); all other wells contained chromium at level below the total chromium detection limit of 10 ug/l. None of the five wells, including MW2, contained hexavalent chromium above the detection limit of 50 ug/l. MW2 also exceeded the GWQC for arsenic (30.6 ug/l).

All five wells exceeded the GWQS for iron and sodium. Four of the five wells exceeded the GWQC for manganese. Two wells exceeded the GWQC for chloride. None of the five wells exceeded the GWQC for any other TAL metals. Concentrations of TPH were below the detection limit of 0.51 to 0.63 mg/l in all well samples.

Analytical data from the sampling is provided in Appendix D along with the low-flow groundwater collection records associated with the sampling.

3.3.2 Concrete Core and Sub-slab Soil Samples

Twenty-six concrete cores were obtained from the former building floor slab located between Building 1 and Building 2. Of these samples, 6 slabs (I-9, I-15, I-22, slab between I-22 and I-23, I-23, and I-24) were identified as being or assumed to be visually stained or contain CCPW. None of the remaining 18 concrete cores contained hexavalent chromium above 20 mg/kg or contained TAL metals above the RSCC concentrations. Based on these results, about 724 CY of the estimated 963 CY of concrete in the floor slab would meet the RSRS for CCPW-related metals. Concrete sample analysis results are presented in Appendix D. A figure is also presented in Appendix D showing the location of each core and an indication of whether the area represented by the core was visually stained or contained hexavalent chromium above RSRS. Photographs of the cores obtained are also presented in Appendix D.

Sub-slab soil was sampled at 26 locations. 102 total samples were analyzed for TAL metals and hexavalent chromium. Samples from borings that did not have concrete staining were also

analyzed for semi-volatile organic compounds, volatile organic compounds, pesticides and PCBs. During this sampling event, hexavalent chromium was not detected above 20 mg/kg at I-4, I-13, I-16, I-19, I-25, and I-26. At the remaining 20 locations, 40 soil sample intervals contained > 20 mg/kg hexavalent chromium. Nine additional soil sample interval analyses exceeded allowable RSRS concentrations for Nickel and Vanadium (1), Lead (4) or Polynuclear Aromatic Hydrocarbons (PAH) (4). The soil intervals with sample analyses below the RSRS represent about 3,000 CY of soil underlying the building slab. Results from the sampling and analysis are consolidated in the tables provided in Appendix D. These results were also used in delineating material with hexavalent chromium at concentrations greater than 20 mg/kg at the site.

3.3.3 Pre-Excavation Borings

Over 47 pre-excavation borings were performed in remedial areas A, B, C, D, and F with the objective of achieving post-excavation sampling requirements in soil/fill materials located below the water table.

Sampling objectives were achieved in remedial areas A, B, and D. Sampling objectives were primarily achieved in Area C with the exceptions of the east and west ends of the corridor and the eastern central building wall. Sampling objectives were primarily achieved in Area F with the exception of the eastern edge of the perimeter. These objectives could not be achieved due to limitations in the ability of the geoprobe sampling probe in penetrating to the required depths. Additional sampling using larger drilling equipment was performed in these areas following demolition of the central building. Results from the sampling and analysis are consolidated in the tables provided in Appendix D.

3.3.4 Wall Borings

A visual survey and sampling of masonry wall materials was performed in the central building and corridor prior to demolition. The visual survey did not indicate any visual evidence of chromium-affected masonry. Masonry wall materials were sampled near the junction of the wall with the floor slab at eleven locations. Masonry wall materials were penetrated from the inside and from the outside to obtain two samples per location around the building and corridor

perimeter walls. All masonry wall sample results were less than 20 mg/kg hexavalent chromium. Since the wall material has been removed from the site, sample locations and analytical results are not provided in this report.

3.3.5 Site-Specific Sampling

Samples were obtained from three test pits for use in the development of site-specific impact to ground water and allergic contact dermatitis standards. None of the materials sampled contained hexavalent chromium in the concentration range required for performance of the evaluations, all concentrations were below the required range. Since the concentrations were below those required for further analysis, the sample locations and analytical results are not provided in this report.

3.4 2006-2007 PPG SUPPLEMENTAL INVESTIGATION

The RAWP Addendum presents the results of investigations performed by PPG Industries, Inc. after the submission of the RAWP to NJDEP in July of 2006. The investigation results from the RAWP Addendum were incorporated into the RAWP.

Following demolition of the building connecting the two residential towers by the owner of the building in October 2006, PPG performed a series of supplemental soil investigations. These investigations focused on completing the delineation of hexavalent chromium and target analyte list (TAL) metals in specific areas to reduce the need for post-excavation sampling following excavation. The investigations also addressed verbal comments received from NJDEP during a presentation of the draft RAWP to NJDEP following submittal.

Reducing the need for post-excavation sampling would reduce backfilling delays resulting from sampling and analysis and reduce the duration of excavation activities. The information collected also provides data to further define the excavation plans and increase the accuracy of excavation volume estimates.

Demolition of the connecting building removed prior ceiling height limitations that restricted the methods of sampling within Area C. During the RAWP investigation, ceiling height prevented

the use of drill rigs and limited the depth of sampling. An objective of the supplemental soil investigation in Area C was to extend the boring depth to complete the delineation. A second objective was to better define the lateral limit of the excavation along the eastern side of Area C-North. Supplemental investigations within Remedial Area C are termed the Central Area Investigation.

Supplemental investigations were also performed in Area E in Layout Area 1 based on verbal comments received from NJDEP regarding the area near RI-boring PPG1-B52 and to better define the remedial limits associated with Area E prior to remedial mobilization. Supplemental investigations within Layout Area 1 are termed the Layout 1 Supplemental Investigation.

3.4.1 Methods

The supplemental investigations were performed using the sampling and analytical methods for soil included in the Sampling and Analysis Plan for the RAWP Investigations submitted to the NJDEP on February 23, 2006.

Field sampling and site coordination activities were performed by ENSR International of Piscataway, NJ under the procedures presented in the FS-QAPP submitted by PPG to NJDEP in March 2006. Prior to initiation of work, ENSR reviewed their existing site-specific investigation Health & Safety Plan prepared for the RAWP Investigation and found it applicable to the supplemental investigations.

Laboratory analyses were performed by:

- Columbia Analytical Services, Rochester, NY – NELAC NY004, and
- Severn-Trent Laboratories, Edison, NJ - NELAC – NJ12977.

Each laboratory's analytical SOPs for hexavalent chromium had previously been reviewed by the NJDEP.

3.4.2 Central Area Supplemental Investigations

The central area supplemental investigations included two objectives:

- To extend the sampled depths in I-borings and select PE-borings within the former building foundation slab limits to define the depth at which material concentrations are below hexavalent chromium, nickel, vanadium, antimony, and thallium regulatory limits and

- To define the horizontal and vertical limits along the eastern boundary of Area C-North where material concentrations are below hexavalent chromium, nickel, vanadium, antimony, and thallium regulatory limits.

3.4.2.1 Field Activities

The first objective of the central area investigations was addressed by sampling below the depth of existing I-boring samples within the former building foundation slab limits to define the depth at which material containing concentrations below target regulatory limits is reached. Only locations where the depth below target regulatory limits had not been previously defined were addressed. (Area C-North and Area C-South). The following table summarizes the borings extended in depth during this investigation.

Remedial Area	Boring	Depth of Boring (ft-bgs)	Bottom of CR+6 Layer Defined?
C – North	I-1	5	No
C – North	I-2	7	No
C – North	I-3	7	No
C – North	I-4	4	No
C – North	I-6	7	No
C – North	I-7	7	No
C – North	I-8	7	No
C – North	I-9	6.5	No
C – North	I-11	7	No
C – North	I-14	7	No
C – North	I-15	7	No
C – North	I-16	5	No

Remedial Area	Boring	Depth of Boring (ft-bgs)	Bottom of CR+6 Layer Defined?
C – North	I-17	7	No
C – North	I-18	7	No
C – South	I-19	2.5	No
C – South	I-20	7	No
C – South	I-21	7	No
C – South	I-22	7	No
C – South	I-23	7	No
C – South	I-24	7	No
C – South	I-27	11	No
C – South	PE-15	12.5	No

Prior to sampling, previous I-boring locations pertinent to the current investigation were recovered using the survey information collected during the original RAWP Investigation. Boring location recovery and final boring location surveys were performed by Langan Engineering & Environmental Services, Elmwood Park, NJ. The vicinity of each I- and PE-boring location was cleared using utility mark-outs and surface geophysics (e.g. ground penetrating radar) to evaluate the potential for encountering subsurface utilities. Geoprobe boring locations were selected near the I-boring locations based on the boring logs and field information collected during previous investigations.

Since extension of the I- and PE-borings was intended to supplement and not replace data collected during the RAWP investigation, fill materials that had previously been sampled and analyzed were drummed for offsite disposal and not sampled or analyzed. The majority of the intervals consisted of a 1-foot depth interval (except for locations I14D-H, I23D-G, I1D-E, I17D-H). Within each 1-foot depth interval, a single 0.5-foot sample was selected for laboratory analysis based on visual examination of the materials and biased toward evidence of hexavalent chromium or CPPW. Each soil sample obtained was thoroughly mixed, placed in laboratory supplied bottles, and shipped under chain-of-custody (COC) to the laboratory where the samples were analyzed for hexavalent chromium and TAL metals.

The second objective of the central area investigations was to better define the horizontal and vertical limits exceeding target regulatory limits along the eastern boundary of Area C-North near Building II. This delineation was needed to better define the location for the installation of sheet pile in this area.

A total of six Geoprobe borings were performed along the east side of the Area C-North boundary. These locations are designated CE1 through CE6; the locations are shown on Figure 8.

CE-boring samples were obtained using direct-push methods to represent 2-foot intervals. Within each two foot depth interval, a single 0.5-foot sample was obtained for laboratory analysis. Sample selection was biased towards the visual presence of Chromate Chemical Production Waste (CCPW) or yellow or green coloration indicating the potential presence of chromium. Each soil sample obtained was thoroughly mixed, placed in laboratory supplied bottles, and shipped under chain-of-custody to the laboratory for analysis of hexavalent chromium and TAL metals.

Samples were analyzed by a New Jersey laboratory holding current approvals for hexavalent chromium SW-846 Methods 3060/7196A including supplementary analysis of pH and Eh at the laboratory on the field sample prior to sample preparation. The laboratory was required to perform the SW-846 Method through the second sample extraction and analysis process according to the method quality control (QC) requirements if initial pre and/or post digestion spike recoveries were beyond the method acceptance range. The laboratory provided preliminary hexavalent chromium sample results and results documenting pre and post-digestion spike recoveries within 48 hours of sample receipt. Each sample was also analyzed for selected TAL metals (total chromium, nickel, vanadium, antimony, and thallium). Full data packages (Level IV Data Quality) were obtained for hexavalent chromium and TAL metal analyses used for compliance documentation.

Following sampling, each boring was backfilled by filing the hole with cement-bentonite grout to the ground surface and repairing the concrete, grass, or asphalt penetrated by the boring installation. Locations and ground surface elevations of the borings installed were surveyed by Langan Engineering & Environmental Services.

Equipment decontamination followed procedures complying with appropriate sections of the FS-QAPP submitted by PPG to NJDEP in March 2006. Investigation derived waste (drill cuttings and excess sample materials) were containerized, characterized, and shipped offsite within 7 days of generation.

3.4.2.2 Findings

Data obtained during this portion of the investigation are consolidated onto the tables presented in Appendix D. The following table summarizes the findings relative to the central area investigation objectives:

Remedial Area	Boring	CR+6 Defined in RAWP?	SUPPLEMENTAL INVESTIGATION		
			Bottom of CR+6 Layer Defined?	Cr-Related Metals Defined?	Approx. Boring Total Depth (ft)
C – North	I-1	***No***	Yes	Yes	14
C – North	I-2	***No***	Yes	Yes	10
C – North	I-3	***No***	Yes	Yes	12.5
C – North	I-4	***No***	Yes	Yes	9.5
C – North	I-6	***No***	Yes	Yes	14
C – North	I-7	***No***	Yes	Yes	9
C – North	I-8	***No***	Yes	Yes	12
C – North	I-9	***No***	***No***	***No***	***9***
C – North	I-11	***No***	Yes	Yes	16
C – North	I-14	***No***	Yes	Yes	10.5
C – North	I-15	***No***	Yes	Yes	14
C – North	I-16	***No***	Yes	Yes	11
C – North	I-17	***No***	Yes	Yes	12
C – North	I-18	***No***	Yes	Yes	10
C – South	I-19	***No***	Yes	Yes	2.5
C – South	I-20	***No***	Yes	Yes	16
C – South	I-21	***No***	Yes	Yes	13
C – South	I-22	No	Yes	Yes	12
C - South	I-23	No	No	Yes	9
C – South	I-24	No	Yes	Yes	12
C – South	I-27	No	Yes	No	13
C – South	PE-15	No	Not Performed	Not Performed	12.5

Borings I-9 and I-23 did not penetrate to sufficient depth to obtain samples achieving the objectives. Boring PE-15 was not extended to greater depths because it was adjacent to both PE-15R and PE-16 where the depth to hexavalent chromium and target TAL metals below regulatory limits had been defined in previous investigations.

Analytical results for the samples obtained during the Central Area Supplemental Investigations are presented in Appendix D.

The eastern boundary of Area C-North was successfully defined by the installation and analysis of samples from borings CE1 through CE6. Samples obtained from these borings were below target regulatory limits. The last sample obtained from boring CE1 at a depth of 12 to 13 feet below ground surface (1156CE112-13G) encountered the meadow mat. This sample was highly colored following extraction and had a high moisture content (40%) resulting in analytical difficulties that resulted in a slight exceedance (20.6 mg/kg) of the Cr+6 regulatory limit of 20 mg/kg. Since all samples above this sample in CE1 were less than analytical detection limits, this analytical value is not considered representative.

Figure 8 presents a spatial interpretation of the analytical results obtained during the Central Area Supplemental Investigations. This figure presents the results of the lateral and vertical delineation in Area C and defines the remedial area lateral and vertical boundary. The figure identifies the elevation of two pertinent control elevations for each boring: the bottom of the overlying sampling interval below target regulatory limits; and the top of the underlying sampling interval below target regulatory limits. These control elevations conservatively delimit the thickness of material exceeding target regulatory limits. Figure 8 also identifies boring locations where all samples obtained from the boring achieved target regulatory limits and indicates the bottom elevation of the deepest sampling interval.

3.4.2.3 Interpretation of Findings

The field investigation results and the analytical results presented in Figure 8 were used to further define the proposed excavation plan within Layout Area 2-Area C-North and within Layout Area 3 Area C-South. These results were incorporated into the formulation of the excavation plans presented in Section 7.

3.4.3 Layout 1 Supplemental Investigation

The objectives of the Layout 1 supplemental investigation were to supplement delineation of the lateral and vertical extent of material containing hexavalent chromium, nickel, vanadium,

antimony, and thallium above RSRS near specific locations identified during the previous sampling. These investigations included:

(1) Drilling additional soil borings and performing analysis of the soil samples obtained as generally requested by the NJDEP in verbal comments regarding soil delineation in the area west of Building 1 (Layout 1). These samples would provide additional information regarding the presence, and extent of chromium contamination in the Layout 1 area.

(2) Obtaining and analyzing soil samples around remedial investigation (RI) boring PPG1-B52 to define the extent of soil contamination associated within the sample obtained at a depth of 4 to 5 feet below ground surface (BGS) analyzed to contain a hexavalent chromium concentration of 20.6 mg/kg.

3.4.3.1 Field Activities

Prior to sampling, previous RI boring locations pertinent to the current investigation were recovered using the survey information collected during the RI Investigation. Boring location recovery and final boring location surveys were performed by Borbas Surveying & Mapping LLC, Boonton, NJ. The vicinity of each new boring location area was cleared using utility markouts and surface geophysics (e.g. ground penetrating radar) to evaluate the potential for encountering subsurface utilities. Boring locations were modified in the field to avoid potential utility obstructions. Samples within four feet of ground surface were obtained manually using a bucket auger or using soft-dig methods to avoid potential disruption of unknown active utilities. Samples below four feet of ground surface were obtained using a Geoprobe rig.

A series of three investigation episodes were performed. The first episode performed during August of 2006 included the installation and sampling from 17 locations. Laboratory results from samples obtained were evaluated and another 11 boring locations were selected, installed and sampled during the second episode during January of 2007. Laboratory results from the first two episodes were obtained and evaluated and another 7 boring locations were selected, installed and sampled during the third episode during February of 2007.

Samples were obtained to represent 1-foot intervals to a depth of 6 feet BGS and 2-foot intervals beyond 6 feet BGS. Within each two foot depth interval beyond 6 feet BGS, a single 1-foot sample was obtained. The 1-foot sample was biased towards the visual presence of chromite ore processing residue or yellow or green coloration indicating the potential presence of chromium. Each soil sample obtained was mixed in the field, placed in laboratory supplied bottles, and shipped under chain-of-custody to the laboratory for analysis.

Samples from surface to 6 feet were analyzed for hexavalent chromium and selected TAL metals (total chromium, nickel, vanadium, antimony, and thallium). The samples obtained were analyzed by a New Jersey laboratory holding current approvals for hexavalent chromium SW-846 Methods 3060/7196A. Hexavalent chromium analyses included supplementary analysis of pH and Eh at the laboratory on the field sample prior to sample preparation. The laboratory was required to perform the SW-846 Method through the second sample extraction and analysis process according to the method QC requirements if initial pre and/or post digestion spike recoveries are beyond the method acceptance range. The laboratory provided preliminary hexavalent chromium sample results and results documenting pre and post-digestion spike recoveries within 48 hours of sample receipt. Full Level IV DQO data packages were obtained for hexavalent chromium and TAL metal analyses.

Samples obtained below 6 feet BGS were sent to the laboratory under chain of custody and stored but not initially analyzed. Analysis of samples obtained below 6 feet BGS was contingent upon analytical results from overlying samples. If required, the laboratory was notified to analyze specific samples within the method specified holding times.

Following sampling, each boring was backfilled by filing the hole with cement-bentonite grout to the ground surface and repairing the concrete, grass, or asphalt penetrated by the boring installation. Locations and ground surface elevations of the borings installed were surveyed by Borbas Surveying & Mapping LLC, Boonton, NJ.

Equipment decontamination followed procedures complying with appropriate sections of the FS-QAPP submitted by PPG to NJDEP in March 2006. Investigation derived waste (drill cuttings and excess sample materials) were containerized, characterized, and shipped offsite within 7 days of generation.

3.4.3.2 Findings

Based on visual observations during the installation of borings within Area E, the subsurface contains fill rubble and other materials from previously demolished structures adjacent to the abandoned Gregory Street. Materials encountered included brick and concrete rubble as well as wood. The top of this layer was typically encountered from 3 to 6 feet below ground surface. When concentrations of hexavalent chromium above the regulatory limit of 20 mg/kg were found, the samples were commonly associated with this demolition rubble zone or adjacent to utility excavations in the area.

Appendix D presents the analytical results for the samples obtained during the Layout 1 Supplemental Investigations. Data obtained during this portion of the investigation are consolidated onto the tables presented in Appendix D.

Analytical results from the Layout 1 investigations indicate areas near borings B-52SW and B-75S that contain hexavalent chromium concentrations above 75 mg/kg. Samples obtained from B-52SW were the only ones that contained some of the target TAL metals (i.e. nickel and vanadium) above regulatory limits. Samples above the hexavalent chromium regulatory limit were found in a number of other borings however concentrations were below 75 mg/kg hexavalent chromium and did not contain target TAL metals above regulatory limits.

Figure 10 presents a spatial interpretation of the analytical results obtained during the Layout 1 Supplemental Investigations. This figure presents the results of the lateral and vertical delineation in Area E and defines the remedial area lateral and vertical boundary. The figure also presents the locations of pre-excavation borings needed to be installed before excavation to confirm the lateral and vertical boundary in certain areas.

Figure 10 identifies the elevation of two pertinent control elevations for each boring: the bottom of the overlying sampling interval below target regulatory limits; and the top of the underlying sampling interval below target regulatory limits. These control elevations conservatively delimit the thickness of material exceeding target regulatory limits. Figure 10 also identifies boring locations where all samples obtained from the boring achieved target regulatory limits and indicates the bottom elevation of the deepest sampling interval.

3.4.3.3 Interpretation of Findings

The field investigation results and the analytical results presented in Figure 10 were used to define the proposed excavation plan within Layout Area 1-Area E that is presented in Section 7.

3.4.4 Data Quality Summary

Data validation was performed on the data by Environmental Validation, Inc. (EDV) of Pittsburgh, PA. EDV validated samples for TAL metals, mercury, and hexavalent chromium. All TAL metals and mercury samples were validated without rejections. Hexavalent chromium samples were validated using NJDEP SOP 5.A.16 (May 2002) that was the protocol in effect when the samples were analyzed. A total of 35 hexavalent chromium samples were rejected based on the validation protocol due to matrix spikes and post digestion spikes being outside acceptable limits. EDV attributed reducing conditions and chemical interference as reasons for the rejection. While supporting pH, ORP, iron and sulfide analysis were performed during the hexavalent chromium analysis, EDV was unable to use this information because it was not part of the May 2002 validation SOP. Packages that contained rejected samples for hexavalent chromium were R2735560 (10 samples), R2735651 (9 samples), and R2735798 (16 samples). Some sample values were estimated due to sample matrix interference or precision issues, but this did not influence the use of the data. Laboratory data reports and validation reports are presented in Appendix H.

3.5 2011 PPG SUPPLEMENTAL INVESTIGATION

A Pre-Remedial Sampling and Analysis Plan (SAP) was prepared for the subject site in July of 2011. The objectives of the plan included:

- Replace hexavalent chromium results from the 2006-2007 PPG Supplemental Investigations that had been rejected during data validation;
- Supplement perimeter sampling to meet NJDEP distance requirements between post-excavation wall confirmation samples;
- Supplement proposed excavation floor sampling to meet NJDEP area requirements between post-excavation confirmation samples;

- Obtain samples of existing concrete for analysis of PAH and PCBs to aid in evaluation of concrete recycling; and
- Obtain a set of synoptic water levels from on-site wells.

Sampling and analysis was performed by AECOM, Inc. in the five areas: Area E [also including Area B]; Area C-North; Area C-South; Area F [also including Area D], and Area C concrete.

The analytical data for soil samples collected and analyzed during the 2011 Supplemental Investigation is presented in Appendix D, Tables 4a through 4e. Table 4a contains the "CE-Series" data, Table 4b contains the "I-Series" data, Table 4c contains the "B-Series" data, Table 4d contains the "F-Series" (e.g., excavation floor sample) data, and Table 4e Parts 1 and 2 contain the "PE-Series" (e.g., perimeter sample) data.

3.5.1 Area E Borings (including Area B Borings)

3.5.1.1 Field Activities

The sixteen (16) direct-push boring locations completed and sampled within Area E are shown on Figure 10. One (1) additional boring was also completed and sampled within adjacent Area B, and its location is shown on Figure 7. Each completed boring location was surveyed by a NJ licensed surveyor (FSQAPP Section 6.4). Details regarding the field activities are as follows:

- Proposed excavation perimeter sampling in Area E was conducted by advancing eight (8) direct-push soil borings (B89, B90, B92, B94, B95, B96, B97 and B98). Two of these borings (B92 and B94) were to confirm whether the Area E excavation could be further subdivided. Target total depths below ground surface were based on an evaluation of existing borings in the area. One (1) boring in Area E (PE-84) not proposed in the July 2011 Pre-Remedial SAP was also advanced using direct-push methods. All samples obtained from these borings were analyzed for hexavalent chromium and target TAL metals.

- Two (2) of the direct-push soil borings in Area E (B52SW and B80) were intended to produce samples that would replace rejected hexavalent chromium analyses. Specifically targeted depths for sample acquisition from the two soil borings were identified in the July 2011 Pre-Remedial SAP. Samples from these two boring locations were analyzed for hexavalent chromium only since previous TAL metals analysis met data validation criteria.

- Three (3) direct-push soil borings in Area E (FE-1, FE-2, and FE-3) were used to obtain samples from the anticipated excavation floor that could take the place of post-excavation floor samples. The floor samples were analyzed for hexavalent chromium and target TAL metals.

- Two borings (B91 and B93) were also used to obtain information on the anticipated excavation floor elevation and obtain pre-excavation floor confirmation samples. Samples obtained from these borings were analyzed for hexavalent chromium and target TAL metals.

- A floor sample from one (1) boring in Area B (FB-4) was analyzed for hexavalent chromium and target TAL metals.

3.5.1.2 Findings and Interpretations

All of the following results have been incorporated into the revised excavation plans presented in Section 7.

Area E Proposed Perimeter:

- The excavation perimeter was confirmed at boring locations B89, B96, B97, and B98 with all samples meeting RSRS for CCPW-related metals (hexavalent chromium, antimony, nickel, thallium and vanadium).
- The excavation perimeter was not defined at locations B90, B94, B95 and PE-84) due to the concentrations of hexavalent chromium above the RSCS. Samples from these

borings in the 2 to 3 ft zone below ground surface indicated hexavalent chromium below 100 mg/kg and compliance with RSRS for CCPW-related metals. In each boring the underlying sample at 5 to 6 ft below ground surface complied with all CCPW-related RSRS. The Area E excavation perimeter will be adjusted to reflect these findings.

- In B92, total chromium was below 50 mg/kg, hexavalent chromium was below 1 mg/kg and all CCPW-related metals were below RSRS with the exception of antimony. The exceedance of the antimony RSRS in B92 is not believed associated with CCPW.

Area E Proposed Excavation Floor:

- The proposed elevation of the excavation floor was confirmed by the samples obtained meeting CCPW-related RSRS in B91 at 4 ft below ground surface and at B93 at 5 ft below ground surface.
- The proposed elevation of the excavation floor was confirmed by the samples obtained meeting CCPW-related RSRS in FE-2 at 7 ft below ground surface and at FE-3 at 8 ft below ground surface.

- The proposed elevation of the excavation floor was not confirmed by the sample obtained at FE-1. The sample did not meet RSRS for hexavalent chromium. This indicates the excavation floor in this area is more than 10.5 feet below ground surface.

Area E Data Replacement:

- Samples from replacement soil borings B52SW and B80 in Area E passed the laboratory data validation requirements for hexavalent chromium and defined the excavation limits in those areas.

Area B Proposed Excavation Floor

- At FB-4, the sample at 3 feet below ground surface complied with all CCPW-related RSRS. This sample confirmed the bottom of the excavation to be 3 ft below ground surface.

3.5.2 Area C-North Borings

3.5.2.1 Field Activities

The direct-push boring locations completed and sampled within Area C-North as part of this investigation are shown on Figure 8. Each completed boring location was surveyed by a NJ licensed surveyor (FSQAPP Section 6.4). Details regarding the field activities are as follows:

- Four (4) direct-push soil borings were performed in Area C-North (PE-52NW, PE-52-NE, PE-57N, and PE-57E) near the northern area boundary to define the horizontal and vertical delineation of the CCPW-related metal antimony. Antimony had been the only CCPW-related metal above RSRS in PE-52 and PE57. The two soil borings associated with investigating PE-52 were focused specifically on antimony in the 4.0- to 4.5-feet below ground surface depth range, and the two soil borings associated with investigating PE-57 were focused specifically on antimony in the 7.5- to 8.0-feet below ground surface depth range. The required 30-foot spacing between pre-excavation borings for post-excavation sampling locations was considered when placing these four soil borings. The soil samples from these borings were analyzed for target TAL metals (e.g., antimony, total chromium, nickel, thallium, and vanadium). Although the July 2011 Pre-Remedial SAP states that these samples were to be analyzed for hexavalent chromium, that analysis was not performed.

- Three (3) borings were performed along the proposed excavation perimeter in Area C-North (PE-75 thru PE-77) to meet 30-foot spacing requirements for post-excavation sampling. These borings were not proposed in the July 2011 Pre-Remedial SAP. The samples from borings PE-75 thru PE-77 were analyzed for hexavalent chromium and target TAL metals.

- Seventeen (17) direct-push soil borings in Area C-North (FC-1 through FC-17) were used to obtain samples from the anticipated excavation floor to take the place of post-excavation floor samples. The floor samples were analyzed for hexavalent chromium and target TAL metals.

- One (1) perimeter soil boring in Area C-North (CE1) was replaced due to data rejection by advancing soil boring CE1-R to document hexavalent chromium concentrations. Samples from previously installed CE-1 had met RSRS for CCPW-related metals with the exception of hexavalent chromium. Samples from CE1-R were analyzed only for hexavalent chromium.

- Seven (7) of the direct-push soil borings in Area C-North (I-1, I-4, I-8, I-15, I-17, CE5, and CE6) in were intended to produce samples that would replace those that failed laboratory data validation requirements for hexavalent chromium and CCPW-related metals. Specifically targeted depths for sample acquisition from the two soil borings were identified in the July 2011 Pre-Remedial SAP. Samples from these borings were analyzed for hexavalent chromium and/or target TAL metals.

3.5.2.2 Findings and Interpretations

The following findings have been incorporated into the excavation plans provided in Section 7.

Area C-North Proposed Perimeter:

- The excavation perimeter was confirmed at boring locations PE-75, PE-76 and PE-77 with all samples meeting RSRS for CCPW-related metals (hexavalent chromium, antimony, nickel, thallium and vanadium).
- The excavation perimeter for antimony was confirmed at boring locations PE-52NE and PE-52NW with all samples meeting RSRS for the CCPW-related metals analyzed (antimony, nickel, thallium and vanadium).
- The excavation perimeter for antimony was confirmed at boring locations PE-57E but remained slightly above the antimony RSRS (14.5 mg/kg J) at PE-57N. All samples met RSRS for the other CCPW-related metals analyzed (nickel, thallium and vanadium).

Area C-North Proposed Excavation Floor:

- The proposed elevation of the excavation floor was confirmed by the samples obtained meeting CCPW-related RSRS in 13 of the 17 FC- borings in Area C-North.
- The proposed elevation of the excavation floor was not confirmed at locations FC-4, FC-9, FC-11 and FC-15. Location FC-4 exceeded RSRS for hexavalent chromium and antimony at greater than 8.5 ft below ground surface (<0.76 ft-msl). Location FC-9 exceeded RSRS for hexavalent chromium at greater than 9.2 ft below ground surface. Location FC-11 exceeded RSRS for hexavalent chromium at greater than 13.7 ft below ground surface. Location FC-15 exceeded RSRS for antimony at greater than 7.2 ft below ground surface.

Area C-North Data Replacement

- Hexavalent chromium was not detected at concentrations greater than the RSS in samples collected in 2011 from soil boring CE1-R.

- Replacement samples from borings I-1, I-4, I-8, I-15, I-17, CE5, and CE6 passed the laboratory data validation requirements for hexavalent chromium.

3.5.3 Area C-South Borings

3.5.3.1 Field Activities

Twenty-seven (27) direct-push boring locations were completed and sampled within Area C-South are shown on Figure 8. Each completed boring location was then surveyed by a NJ licensed surveyor (FSQAPP Section 6.4). Details regarding the field activities are as follows:

- Two (2) direct-push soil borings (PE-62 and PE-63) were advanced between PE-13 and PE-16 to verify achievement of NJDEP Soil Cleanup Standards at the locations and to meet the minimum 30-foot spacing between pre-excavation borings to be used as post-

excavation sampling locations in Area C-South. Samples from boring locations PE-62 and PE-63 were analyzed for hexavalent chromium and target TAL metals.

- Eleven (11) borings in Area C-South (PE-68 through PE-74 and PE-78 through PE-81) not proposed in the July 2011 Pre-Remedial SAP were installed to evaluate soil conditions near the intersection of the proposed excavations and the buildings. The samples from these borings were analyzed for hexavalent chromium and target TAL metals.

- Twelve (12) direct-push soil borings in Area C-South (FC-18 through FC-29) were used to obtain samples from the anticipated excavation floor to take the place of post-excavation floor samples. The floor samples were analyzed for hexavalent chromium and target TAL metals.

- Two (2) of the direct-push soil borings in Area C-South (I-22 and I-27) were intended to produce samples that would replace those that failed laboratory data validation requirements for hexavalent chromium. Samples from these soil borings were collected from specifically targeted depths and analyzed for hexavalent chromium.

3.5.3.2 Findings and Interpretations

The following findings have been incorporated into the excavation plans provided in Section 7.

Area C-South Proposed Perimeter:

- The excavation perimeter at PE-62 was not confirmed because data from six of the seven samples collected from boring PE-62 failed laboratory data validation requirements for hexavalent chromium. All other CCPW-related metals samples met RSRS in the boring.
- The excavation perimeter at PE-63 was not confirmed due to samples exceeding RSRS for hexavalent chromium and antimony.

- The excavation perimeter at PE-68 was not confirmed due to samples exceeding RSRS for hexavalent chromium (6-7 ft BGS) and antimony (8-9 ft BGS).
- The excavation perimeter was confirmed at boring locations PE-69, PE-70, PE-71, PE-72, PE-73, PE-74, PE-78, and PE-79 with all samples meeting RSRS for CCPW-related metals (hexavalent chromium, antimony, nickel, thallium and vanadium).
- The excavation perimeter at PE-80 was not confirmed due to samples exceeding RSRS for antimony (8 – 8.5 ft BGS).
- The excavation perimeter at PE-81 was not confirmed due to samples exceeding RSRS for hexavalent chromium (3 – 3.5 ft BGS) and antimony (3 – 5.5 ft BGS).

Area C-South Proposed Excavation Floor:

- The proposed elevation of the excavation floor was confirmed by the samples obtained meeting CCPW-related RSRS in FC-19, FC-20, FC-21, FC-24, FC-36, and FC-28.
- The proposed elevation of the excavation floor was not confirmed at locations FC-18, FC-22, FC-23, FC-25, FC-27 and FC-29. Location FC-18 exceeded RSRS for antimony at greater than 6 ft below ground surface. Location FC-22 exceeded RSRS for hexavalent chromium at greater than 11 ft below ground surface. Location FC-23 exceeded RSRS for hexavalent chromium and antimony at greater than 10.5 ft below ground surface. Location FC-25 exceeded RSRS for hexavalent chromium at greater than 11.5 ft below ground surface. Location FC-27 exceeded RSRS for hexavalent chromium at greater than 4.5 ft below ground surface. Location FC-29 exceeded RSRS for hexavalent chromium, antimony, nickel, thallium and vanadium at greater than 8.5 ft below ground surface.

Area C-South Data Replacement:

- Samples from replacement soil borings I-22 and I-27 passed the laboratory data validation requirements for hexavalent chromium. These data were used to update the excavation plan in the areas of these borings.

3.5.4 Area F Borings (including Area D Borings)

3.5.4.1 Field Activities

Six (6) direct-push boring locations were completed and sampled within Area F are shown on Figure 11. Two (2) additional borings were also completed and sampled within adjacent Area D, and their locations are shown on Figure 9. Each completed boring location was then surveyed by a NJ licensed surveyor (FSQAPP Section 6.4). Details regarding the field activities are as follows:

- Two (2) direct-push soil borings in Area F (PE-64 and PE-65) were advanced to verify achievement of NJDEP Soil Cleanup Standards at the locations and to meet the minimum 30-foot spacing between pre-excavation borings to be used as post-excavation sampling locations. PE-64 was advanced between PE-21 and PPG1-B12, and PE-65 was advanced between PPG1-B12 and PE-36 in response to NJDEP comments. Targeted total depths below ground surface were based on an evaluation of existing borings in the area. Samples from these two boring locations were analyzed for hexavalent chromium and the target TAL metals.

- Four (4) direct-push soil borings in Area F (FF-1 through FF-4) were intended to obtain samples from the anticipated excavation floor that would replace of post-excavation floor samples. The floor samples were analyzed for hexavalent chromium and target TAL metals.

- Two (2) borings in Area D (PE-82 and PE83) not proposed in the July 2011 Pre-Remedial SAP were installed to evaluate soil conditions near the intersection of the proposed excavations and the buildings. The samples from these borings were analyzed for hexavalent chromium and target TAL metals.

3.5.4.2 Findings and Interpretations

The following findings have been incorporated into the excavation plans provided in Section 7.

Area F Proposed Perimeter

- The excavation perimeter at PE-64 was not confirmed because data from the samples collected from the boring failed laboratory data validation requirements for hexavalent chromium. All other CCPW-related metals samples met RSRS in the boring.
- The excavation perimeter was confirmed at PE-65 with all samples meeting RSRS for CCPW-related metals (hexavalent chromium, antimony, nickel, thallium and vanadium).
- The excavation perimeter along Building I in Area D at PE-82 was not confirmed due to samples exceeding RSRS for hexavalent chromium (1 – 1.5 ft BGS). All other CCPW-related metals met RSRS.
- The excavation perimeter along Building I in Area D at PE-83 was not confirmed due to samples exceeding RSRS for antimony (1 – 1.5 ft BGS). All other CCPW-related metals met RSRS.

Area F Proposed Excavation Floor:

- The proposed elevation of the excavation floor was not confirmed at locations FF-1, FF-2, and FF-3. Location FF-1 exceeded RSRS for hexavalent chromium at greater than 10.5 ft below ground surface. Location FF-2 had all hexavalent chromium samples rejected during data validation; all samples met RSRS for CCPW-related metals. Location FF-3 had all hexavalent chromium samples rejected during data validation; antimony was above RSCC at 6.5 ft BGS.
- The proposed elevation of the excavation floor was confirmed by the samples obtained meeting CCPW-related RSRS at location in FF-4.

3.5.5 Area C (North and South) Concrete Core Sampling

3.5.5.1 Field Activities

Concrete core sampling in Areas C-North and C-South was conducted in response to the issuance of NJDEP's Guidance for Characterization of Concrete and Clean Material Certification for Recycling in 2007. The 2007 NJDEP concrete recycling guidance was issued

after the completion of in-situ concrete characterization sampling in 2006. The 2006 concrete core characterization included analysis of the chemicals of concern at the site (e.g., hexavalent chromium and TAL metals), but did not include analysis for polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), which according to the 2007 NJDEP guidance are required analyses for concrete being evaluated for potential recycling. A variance was requested for analysis of dioxins, furans, TPH, TCL organics, TCLP metals, and radionuclides because prior use of the building was as a residential commons area with a few commercial support businesses where these chemicals were not reasonably anticipated to have been used or produced.

Seventeen (17) concrete cores were collected near previously cored locations. Twelve (12) concrete cores (I-1 through I-6, 1-8, I-11, I-12, 1-14, I-17, and I-18) were located in Area C-North and five (5) concrete cores (I-19, I-20, I-21, I-25, and I-26) were located in Area C-South.

Sampling was performed using a concrete coring machine to retrieve in-situ core samples through the entire depth of the pad. Core samples were digitally photographed to document sample designation and any core coloration. Completed core locations were surveyed by a NJ licensed surveyor. The core locations were repaired using concrete mix.

Depth of coloration was noted and used as the limit of sampling, if present, but did not exceed 1-inch thickness. If coloration was not present in the coring, then 1-inch thick chip or drill hole samples were obtained from the top and bottom of the concrete core. Chip samples were collected using either a hammer and chisel or an electric hammer. Drill samples were collected using a hammer drill with various sized masonry bits to drill into the edge of a core sample, and drill cuttings were collected in a pan. Samples were crushed and/or thoroughly mixed in the field and sampling equipment was decontaminated between core locations. Discrete (e.g., grab) samples were collected and delivered under chain-of-custody to a NJ-certified analytical laboratory for analysis of PCBs and PAHs.

3.5.5.2 Findings and Interpretations

The analytical results for concrete samples collected and analyzed during the 2011 supplemental investigation were compared to the NJDEP Residential Soil Remediation Standards (RSRS) for PCBs and PAHs and the data is presented in Appendix D.

Only one of the twelve concrete cores samples in Area C-North (I-14) exceeded the RSRS evaluated for PAHs. The five concrete cores from Area C-South are not contaminated based on the analytical results.

Previous visual examination of concrete cores and analytical results for CCPW-related metals indicated that concrete in the vicinity of borings I-8, I-9, I-15, I-22, between I-22 and I-24, I-24, and I-26 had been affected. The results of this investigation add concrete in the vicinity of I-14 as being affected by PAHs.

3.5.6 Monitoring Well Water Levels

A synoptic series of water level measurements was to be obtained from five (5) existing onsite shallow monitoring wells during the 2011 supplemental investigation to update site groundwater levels.

3.5.6.1 Field Activities

The monitoring wells gauged by AECOM on March 15, 2012 were to include PPG1-series flush-mount wells identified as MW1, MW2, MW3, MW4, and MW5 shown on Figure 2; however, AECOM noted that MW-1 was not accessible at the time of gauging due to a stripped bolt. In addition, AECOM personnel could not locate MW-2 at the time of gauging. Therefore, measurements were unable to be obtained from these two monitoring wells. Water levels were measured in the three remaining monitoring wells (MW-3, MW-4, and MW-5) using electric sounding equipment and water depths were recorded relative to the top of the inside well casing.

3.5.6.2 Findings and Interpretations

Well ID	Date	Depth to Water (feet BGS)	Top of Casing (ft-msl)	Ground Water Elevation (ft-msl)
PPG1-MW-1	3/15/2012	NA *	6.46	NA *
PPG1-MW-2	3/15/2012	NA *	8.37	NA *
PPG1-MW-3	3/15/2012	5.43	5.94	0.51
PPG1-MW-4	3/15/2012	6.22	7.57	1.35
PPG1-MW-5	3/15/2012	3.45	7.20	3.75

*NA – not available

Water levels from site monitoring wells have been evaluated during three investigations, information from those measurements are indicated in the following table:

Well ID	RI 1993 (ft-msl)	RAWP Investigation 2006-2007 (ft-msl)	RAWP Supplemental Investigation 2011 (ft-msl)
PPG1-MW-1	1.61	1.68	NA
PPG1-MW-2	2.64	1.84	NA
PPG1-MW-3	1.48	0.58	0.51
PPG1-MW-4	2.01	1.27	1.35
PPG1-MW-5	3.82	3.26	3.75

The available 2006 and 2011 water levels are of comparable magnitude. The 1993 measurements were performed prior to the demolition of the Central Building and the differences between these early measurements may reflect the influence of storm drainage recharge from building roof drains.

3.5.7 Data Validation Summary

Data validation was performed on the 2011 data by Environmental Quality Associates, Inc. (EQA) of Middletown, NY. EQA validated samples for TAL metals and hexavalent chromium. All TAL metals samples were validated without rejections. A total of 13 hexavalent chromium samples out of 201 samples were rejected for hexavalent chromium validation due to matrix spikes and post digestion spikes being outside of the acceptable limits established by the validation protocol. Packages that contained rejected samples were JA87763 ((12 samples)

and JA88023 (1 sample). Some sample values were estimated due to sample matrix effects creating a low bias. Laboratory data reports and validation reports are presented in Appendix H.

4.0 REMEDIAL STANDARDS

4.1 REMEDIATION STANDARDS

The remedial actions described in this work plan will be performed in accordance with the following regulatory requirements and NJDEP guidance.

N.J.A.C. 7:26E – Technical Requirements for Site Remediation
NJDEP Field Sampling Procedures Manual, dated May 1992
NJDEP Guidance Document for the Remediation of Contaminated Soil, January 1998.
NJDEP Administrative Consent Order, dated 19 July 1990

4.2 SOIL REMEDIATION STANDARDS

Soil remediation standards for acceptance of post-excavation results for CCPW-related metals for the Metropolis Towers site is based on either the May 1999 NJDEP Soil Cleanup Criteria or the June 2008 NJDEP Soil Remediation Standards for Residential Use. In a December 12, 2011 letter, NJDEP accepted the use of the May 1999 JDEP Soil Cleanup Criteria because none of the chemicals of concern had a reduction in standard of an order of magnitude or more when compared to the June 2008 NJDEP Soil Remediation Standards for Residential Land Use. The 1999 Soil Cleanup Criteria were used only for total chromium, hexavalent chromium and vanadium while the 2008 Direct Contact Residential Soil Standards are used for all other chemicals. These criteria include the following values:

Total Chromium - 120,000 mg/kg
Hexavalent Chromium - 20 mg/kg
Antimony – 31 mg/kg
Nickel – 1,600 mg/kg
Thallium – 5 mg/kg
Vanadium – 370 mg/kg

PPG Industries, Inc is not legally responsible for any other chemicals exceeding NJ Soil Remediation Standards that may be present at the site. This RAWP addresses only chromium

and CCPW-related constituents. Other chemicals above NJ Residential Soil Remediation Standards will be managed if co-located and co-mingled with chromium and CCPW-related constituents but the RAWP will not pursue excavation of these chemicals to achieve current NJ Residential Soil Remediation Standards.

4.3 GROUNDWATER REMEDIATION STANDARDS

The RAWP will apply the New Jersey Ground Water Quality Standards (N.J.A.C. 7:9C) as of November 7, 2005 as the remediation criteria for chromium and CCPW-related metals. These criteria include the following value for chromium:

Total Chromium - 70 µg/l
Antimony – 6 µg/l
Nickel – 100 µg/l
Thallium – 2 µg/l
Vanadium – 60 µg/l

4.4 IMPACT TO GROUNDWATER (IGW) EVALUATION

4.4.1 Background

The purpose of the default IGW soil screening levels ("IGW SSL") is to prevent unacceptable risk to human health from the ingestion of contaminated ground water, caused by the leaching of contaminants from the unsaturated soil zone into the ground water. These screening levels were developed to protect against future contamination of ground water. As screening levels, they are designed to identify potential issues that need further evaluation.

The planned remediation of Site 156 by excavating soils impacted by CCPW is designed to remove soils where the concentrations of hexavalent chromium ("Cr+6"), chromium ("Cr") and CCPW related metals (antimony ["Sb"], nickel ["Ni"], thallium ["Tl"], and vanadium ["V"] exceed the NJDEP Residential Direct Contact ("RDC") Soil Remediation Standards ("SRS"). The impacted soils to be removed are present in both the unsaturated and saturated soil zones at

the Site. PPG is only responsible for remediation of Cr+6 and CCPW-related impacts at Site 156.

The IGW SSLs are generally lower than the corresponding RDC SRS. Based on the excavation plans presented in Section 7 for each remediation area of concern ("AOC"), residual CCPW-related metals detected in soil samples from the unsaturated zone at the perimeter of each AOC were identified and compared to the IGW SSLs. Based upon this comparison, additional evaluation was conducted to assess the impacts of CCPW metals within the unsaturated zone soils that will remain in-place after the remediation of Site 156.

4.4.2 Existing Soil Data Comparison

To evaluate the potential impact of soil metal concentrations remaining following remedial excavation on long-term ground water quality, TAL metals results from pre-excavation soil delineation were evaluated. The data at the perimeter of the proposed remediation excavation were sorted to identify samples within the unsaturated zone above the ground water table where the IGW SSLs were applicable. These results were then grouped by remediation AOC and summarized in Table 1. Sample results within each AOC were then averaged in accordance with the NJDEP Technical Requirements for Site Remediation ("TRSR") for compliance averaging at 7:26E-4.8(c)3.i. and NJDEP Site Remediation Program Guidance (http://www.nj.gov/dep/srp/news/1995/95spr_08.htm).

Table 1 demonstrates that many metals not related to CCPW were found in unsaturated perimeter samples above IGW SSLs in every AOC. These concentrations are likely associated with other types of urban fill identified in boring logs from exploratory borings performed on the Site.

For the CCPW-related metals Cr, Cr+6, or V there is currently no established default IGW SSL. While an IGW SSL is established for the CCPW-related metal thallium (Tl), no soil samples from the unsaturated perimeter zone exceeded the IGW SSL. Therefore, comparisons to IGW SSLs were limited to Sb and Ni. The results of this analysis include the following:

CCPW Metals Evaluated - Antimony and Nickel					
Remedial Area	Metal	IGW SSL (mg/kg)	Number of Samples Evaluated	Number of Samples above the IGW SSL	Maximum Concentration of Perimeter Samples (mg/kg)
A	Nickel	31	8	1	105
B	None	NA	9	0	NA
C	Antimony	6	46	2	27.6
C	Nickel	31	46	5	52
D	None	NA	6	0	NA
E	Antimony	6	56	2	23.9
E	Nickel	31	56	2	63
F (1)	Nickel	31	28	11	109
(1) Area F does not include Area F-1 where the excavation limits will be determined through post-excavation sampling. (2) "None" indicates that no samples from the unsaturated zone exceeded the IGW SSLs in this AOC.					

4.4.3 Conclusions

The evaluation indicates that:

- Areas C and E contain individual samples that exceed the Sb and Ni IGW SSLs;
- Areas A and F contain individual samples that exceed only the Ni IGW SSL; and
- Areas B and D have no Sb or Ni samples exceeding the IGW SSLs.

A scope of work has been prepared and submitted to NJDEP for the sampling and analysis needed to derive site-specific IGW SSLs for the chemicals identified in the evaluation. This work is currently being implemented and will be submitted to the NJDEP when completed as part of design submittals.

5.0 REMEDIAL ACTION DESCRIPTION

5.1 REMEDIAL ACTION SELECTION

The remedial action selected by PPG is excavation to achieve NJDEP Residential Soil Cleanup Standards for hexavalent chromium and CCPW target metals and off-site disposal of materials at landfills permitted to accept the excavated materials.

5.2 AREA OF CONCERN IDENTIFICATION

The investigations performed to date have been used to identify areas of concern on the Site related to CCPW. The soil analytical data have allowed the identification of seven CCPW remedial action areas (designated as A, B, C, D, E, F, and F-1). Each of these areas has been identified based on soil hexavalent chromium concentrations and were enlarged to encompass soil exceeding the NJDEP Residential Soil Cleanup Standards (RSS) for CCPW-related metals (antimony, nickel, thallium and vanadium). The locations of these remedial action areas are identified on Figure 5.

Information used in identifying the lateral extent and depth of affected soil is presented in the following sections. Data collected during the investigations performed are presented in Appendix A, B, and D. The area of concern identification process uses the analytical data to develop the location and elevation of two pertinent control points with each boring based on the samples obtained: the bottom of the overlying sampling interval achieving target RSS; and the top of the underlying sampling interval achieving target RSS. These control elevations conservatively delimit the thickness of material exceeding target RSS. Borings where all samples are within target RSS are used to identify the perimeter of the area of concern.

5.2.1 Remedial Area A

Details of the boring and analytical information used to identify Area A are summarized on Figure 6. In PPG1-B02, un-affected soil was found from ground surface to 1.8 ft BGS (5.98 ft-msl). CCPW-affected soil was encountered within boring PPG1-B02 in samples from 1.8 to 4.8 ft BGS (5.98 to 2.98 ft-msl). The PPG1-B02 CCPW-affected soil interval was bracketed by an

un-affected soil sample at 10 ft BGS (-2.22 ft-msl). Similarly in PE-4, un-affected soil was found from ground surface to 1.5 ft BGS (5.8 ft-msl). CCPW-affected soil was encountered within boring PE-4 in samples from 1.5 to 4 ft BGS (5.8 to 2.8 ft-msl). Borings PE-1, PE-2, PE-3, and PPG1-B01 indicate un-affected soil conditions in all samples and serve as the limit of the area. Along the north-west side of the excavation, existing borings do not provide adequate lateral documentation of values below RSS; additional post-excavation sampling will be required to document achievement of RSS in this area. Details of the excavation and post-excavation sampling are included in the discussion of remedial action areas presented in Section 7.

5.2.2 Remedial Area B

Details of the boring and analytical information used to identify Area B are summarized on Figure 7. In PPG1-B28, un-affected soil was found from ground surface to 4.5 ft BGS (2.15 ft-msl). CCPW-affected soil was encountered within boring PPG1-B28 in samples from 4.5 to 4.9 ft BGS (2.15 to 1.75 ft-msl). The PPG1-B28 CCPW-affected soil interval was bracketed by an un-affected soil sample at 12 ft BGS (-6.35 ft-msl). The extent of the area of concern is defined by the locations of PE5, PE6, PE7, and PE8 in which all samples are below CCPW-associate RSS. Along the north-east side of the excavation, existing borings do not provide adequate lateral documentation of clean; additional sidewall sampling and excavation floor sampling will be required to document achievement of values below RSS; additional post-excavation sampling will be required to document achievement of RSS in this area. Details of the excavation and post-excavation sampling are included in the discussion of remedial action areas presented in Section 7.

5.2.3 Remedial Area C

Details of the boring and analytical information used to identify the perimeter of Area C-North and Area C-South are summarized on Figure 8. Within Area C, asphalt or concrete in many borings was found to overlie soil un-affected by CCPW-related metals. Underlying this material, CCPW-affected soil was encountered in numerous borings and at various depths as indicated on Figure 8. Table 2 presents a summary of available information on the elevation intervals of both un-affected and CCPW-affected materials within the perimeters of Area C North and C-South.

As presented on Appendix D Figure 2, concrete cores obtained from the I-Borings were used to represent the concrete within the dashed lines. Due to the available information, post-excavation sampling will be used to identify the vertical extent of the excavation at specific locations. Details of the excavation and post-excavation sampling are included in the discussion of remedial action areas presented in Section 7.

5.2.4 Remedial Area D

Details of the boring and analytical information used to identify the perimeter of Area D are summarized on Figure 9. The perimeter of Remedial Area D is defined by borings PE-12, PE-13, PE-14, PPG1-B53, and the south-eastern corner of Building 1. The perimeter is not defined along the western side near the points shown as C and D on Figure 9 due to the presence of a sewer main through the area. Depths below ground surface to un-affected and CCPW-affected soils are highly variable within Area D. In boring PPG1-B23, unaffected soil occurs from ground surface to 9 ft BGS (-1.16 ft-msl). The affected soil interval is from 9 to 9.3 ft BGS (-1.16 to -1.46 ft-msl) and extends to an undefined depth below 9.3 ft BGS. In PPG1-B58, un-affected soil occurs from ground surface to 1.6 ft BGS (5.88 ft-msl). The CCPW-affected soil interval is from 1.6 to 1.8 ft BGS (5.88 to 5.68 ft-msl) and is bounded by an underlying un-affected sample occurring at 4 ft BGS (3.48 ft-msl). Along the southeastern corner of Building 1 and the western side of the excavation, existing sampling does not provide adequate lateral documentation of clean soils. Additional sidewall sampling and excavation floor sampling will be required to document achievement of values below RSS. Details of the excavation and post-excavation sampling are detailed in the discussion of remedial action areas presented in Section 7.

5.2.5 Remedial Area E

Details of the boring and analytical information used to identify the perimeter of Area E are summarized on Figure 10. Based on visual observations during the installation of borings within Area E, the subsurface contains fill rubble and other materials from previously demolished structures adjacent to the abandoned Gregory Street. Materials encountered included brick and concrete rubble as well as wood. The top of this layer was typically encountered from 3 to 6 feet below ground surface. When CCPW-affected materials were found they were commonly associated with this demolition rubble zone or adjacent to utility excavations in the area.

Table 2 presents a summary of available information on the elevation intervals of both un-affected and CCPW-affected materials within the perimeter of Area E.

5.2.6 Remedial Areas F and F-1

Details of the boring and analytical information used to identify the perimeter of Area F and F-1 are summarized on Figure 11. The perimeter of Area F-1 is not defined and will be defined during excavation through sidewall sampling. Within Remedial Area F, un-affected material consisting of quarry process stone or gravelly soil was encountered overlying CCPW-affected soil in all borings within the area. Two borings, PE-22 and PE-23, located within Area F did not encounter CCPW-affected soil throughout their complete depth of sampling (surface to 12.5 ft BGS). In Remedial Area F-1, un-affected soil was encountered in boring PPG1-B48 from ground surface to 4.3 ft BGS (surface to 1.73 ft-msl). A summary of the un-affected and CCPW-affected intervals in Areas F and F-1 are presented on Figure 11 (perimeter) and in Table 2.

5.3 REMEDIAL ACTION SEQUENCING

To physically separate remedial construction activities from residential complex operations, the seven remedial action areas were arranged into three remedial layouts (designated as Layout 1, 2, and 3). Each layout is designed to allow remedial action while physically separating construction from residential uses and supporting the on-going residential access and parking requirements of the complex. For these reasons, Area C was divided into Area C-North and Area C-South. Remedial construction in each layout will be performed sequentially with activities being completed in one Layout before progressing to the next layout. Only one layout will have active remedial construction at a time. At the completion of remedial action, the area will be restored to support the uses of the residential complex prior to transitioning to the next layout area. Transitions between layouts will require close coordination with the property owner to maintain effective resident safety and complex access integrity.

Remedial actions within the layout areas will be sequenced as follows:

- Layout Area 2 – Areas A and C-North.
- Layout Area 3 – Areas C-South, D, F, and F-1.
- Layout Area 1 – Areas B and E.

Since remedial action and restoration activities within each Layout Area are independent and self-contained, alternate sequences for performing remedial actions are feasible. Should an alternative remedial sequence be performed, resident parking impacts may differ from those identified in Section 7.0. Changes in resident parking impacts and required mitigation will be part of any proposed alternative remedial sequence.

6.0 SITE PREPARATION ACTIVITIES

Site preparation activities are initial actions that will be performed in conjunction with each layout mobilization. These activities involve mobilization or site preparation tasks that are required to prepare the layout prior to initiation of excavation and transport of material. Site preparation activities include implementing the resident safety plan, implementing the soil erosion and sediment control plan, implementing the project air monitoring plan, set-up and testing of the excavation dewatering treatment system, and setting up excavation dewatering piping. Specifics of the site preparation activities associated with each Layout Area are presented in Section 7 Remedial Action Areas.

6.1 IMPLEMENT RESIDENT SAFETY PLAN

A Resident Safety Plan has been included in Section 9 of this report to document the activities that will be performed to coordinate, inform, and establish a separation of the remedial construction areas from the residential operations. Prior to the initial mobilization and each subsequent change in layout, the specific requirements of the Resident Safety Plan will be implemented.

6.2 IMPLEMENT SOIL EROSION AND SEDIMENTATION CONTROL

A soil erosion and sediment control permit is required from the Hudson-Essex-Passaic (HEP) Soil Conservation Service for the remedial construction activities. This permit includes requirements for drainage control and control of soil erosion during the remedial activities. Requirements of the plan will be implemented as part of the site preparation activities. Implementation of these requirements for each layout will be performed independently as an initial site preparation activity.

Erosion and sediment control will include the following:

Drop Inlet Filters: Existing catch basins at the site will be provided with inlet protection (IP). The inlet protection consists of heavy duty geotextile bags specifically designed to prevent soil and other particulate material from entering into the inlet and the storm system. The IP bag consists

of an expansion- resistant geotextile with a frame which will be installed inside of the inlet by removing the grate, installing the IP, and then replacing the grate.

Excavation Run-On Controls: Sand bag filters/diversions will be used around the perimeter at each excavation within the layout area. Due to their depth, some excavations will be supported by steel sheet piles. In these cases, the steel sheet piles will extend above the ground surface. The sand bag filters/diversions will be installed a minimum of 5 feet outside of the limits of the excavation or the edge of the sheet pile. The sand bag filters/diversions, along with the sheet piles, will provide a barrier preventing surface water outside the excavation from flowing into the excavation. They will also contain water and sediment within their limits, minimizing the potential for sediment migration away from the excavation.

6.3 IMPLEMENT PROJECT AIR MONITORING PLAN

The RAWP includes a Project Air Monitoring Plan (PAMP) presented in Appendix E for the monitoring and control of air emissions during the excavation and loading of contaminated soil. The plan includes establishment of a site-specific meteorological station, background air sampling, and establishment of air sampling and monitoring equipment applicable to each layout. Parts of the plan applicable to each layout and the site in general will be implemented during the site preparation activities.

6.4 EXCAVATION DEWATERING TREATMENT AND CONVEYANCE SYSTEM

Excavation below the water table will require the removal and treatment of ground water that is anticipated to be contaminated with site-related chemicals. As part of site preparation activities, an on-site treatment system will be located in an area of the site and fenced to prevent access. The assembly and initial testing of the treatment system will occur as part of the site preparation activities. Discharge from the treatment system will be regulated by a permit from the Passaic Valley Sewerage Commissioners (PVSC). Each layout will require the assembly of a pipe conveyance from the excavation to the on-site treatment system. Assembly of the conveyance will occur as part of the initial site preparation activities and be relocated as part of subsequent layout site preparation activities.

6.4.1 Dewatering

Groundwater at the Site is fairly shallow; therefore the lower portions of the excavations are anticipated to encounter the water table. To facilitate soil transport and post-excavation sampling, groundwater will be removed from the excavation pit. Both the depth of the planned excavation and duration of excavation activities have been incorporated into the dewatering plan.

Excavations in Areas A, B, E, and F-1 are expected to encounter the water table in portions of the excavation. However due to the brief duration of the excavation below the water table and the limited depth of these excavations dewatering will be performed by the construction of dewatering sumps containing pumps. Pumping stations and sump pit designs consistent with the E&S Control Plan will be used for excavation dewatering.

Excavations in Areas C, D, and F are longer in duration and are greater in depth. Steel sheet pile shoring will be installed around the perimeter of these deeper areas and in certain interior portions of these excavations to support the excavation sidewalls and to reduce inflow of groundwater into the excavations. Sheet pile installation will allow for more effective dewatering in closed cells. Managing the area of the excavation that is open to ground water inflow through the construction of cells within the larger excavation area will reduce inflow volume. As the project evolves, the construction water will be removed prior to excavation and during excavation activities.

Within the steel piled areas, dewatering activities will draw down the water table by pumping water via submersible pumps from sumps installed within the excavation areas. Since the majority of the excavation will be will be terminated well above the meadow mat, water within the base of the excavation will be removed from the excavation via sumps and pumps. These sumps will be placed in strategic locations based on in the field determination. All water extracted from the Project Area's water table will be stored in tanks prior to being treated in the onsite water treatment plant.

Based on Site geology, hydrogeology, the duration of excavation below the water table, and the depth of excavation, a model was used that incorporates the effect of a perimeter sheet pile wall (when used) to restrict ground water flow into a below-ground water excavation. The model is based on a conservative average site-wide water table elevation of 2.5 ft-msl; measurements in 2011 indicate this average may be 0.5 ft high.

The dewatering model considered inflows including an initial extraction of saturation, averaged direct precipitation falling into the excavation, and the effect of perimeter inflows from the surrounding shallow aquifer and the effect of vertical inflow through a semi-confining layer at the base of the excavation. Based on the model results, the following estimates of dewatering water were obtained for each excavation area:

Remedial Area	Initial Extraction and Below GW Excavation Duration (days)	Sheet Pile Shoring Use	Estimated Dewatering Rate (gpd)	Estimated Dewatering Volume (gal.)
A	7	No	1,500	14,000
B	7	No	3,600	32,000
C-North	52	Yes	5,500	754,000
C-South	18	Yes	3,800	360,000
D	2	Partial	2,000	31,000
E	11	No	7,200	80,000
F/ F-1	10	Yes/No	5,000	118,000
			Total Volume:	1,400,000

6.4.2 Water Treatment

PPG plans to have the extracted water pre-treated and discharged to the Passaic Valley Sewer Commission treatment works ("PVSC") through an existing combined sewer manhole on Site 156. A Letter of Authorization for the water treatment discharge had been previously granted by the PVSC on 2 January 2007. A preliminary treatment plant design has been prepared and bids were previously obtained for the design, installation and operation of the water treatment facility. The preliminary design was based on a 50 gpm discharge, treatment of up to 25,000 gallons per day, storage of 60,000 gallons and unit treatment processes to achieve PVSC pre-treatment requirements. The water treatment system is anticipated to primarily operate in batch mode.

Treated water will be sampled to confirm concentrations are below PVSC discharge criteria before release. The discharged water will be conveyed through an onsite combined sewer system manhole to a 48" drainage line that feeds Jersey City's combined surface water and sewer system. The discharge will be regulated by both Jersey City Municipal Utilities Authority ("JCMUA") and PVSC.

6.4.3 Dewatering Conveyance

Heavy-duty welded HDPE piping will be used to convey water from the excavation areas to the onsite treatment plant to preclude release of sediment-containing dewatering fluids. This pipe system will be installed above ground to permit visual inspection for leakage and will be protected by truck crossings in traffic areas.

The pumps and pump station(s) will be inspected daily and after each precipitation event. The pumps shall be maintained (if needed). Conveyance pipes shall be drained when the pumping system is not working and the projected temperature is at or near 32 degrees.

The entire pipe network (including valves) will be inspected daily and after each precipitation event. The pipe network and valves should have no leakage and be in good operational condition at all times. Sediment accumulating in the pipe network that affects the ability of the pipe to operate properly will be removed and transported off-site to an approved disposal facility. Any necessary maintenance or repairs shall be made immediately.

6.5 TRUCK CLEANING STATIONS

To the extent possible, truck traffic will be routed on hard pavement within each layout area to minimize the potential for transporting sediment around the site.

All trucks will be provided with manufactured bed liners constructed on HDPE or PVC. Upon entry to the site, the truck bed liner will be inspected for holes and tears that would affect material or free-liquids generated during transport. Any truck bed liner not meeting this requirement will not be loaded until the deficiency is corrected. All trucks leaving the site will be provided with bed covers that will be closed and secured before leaving the site.

Trucks will be directly loaded at each excavation, and backfill will be directly unloaded into the excavations during backfilling; no stockpiling is anticipated. Should stockpiles be required, the stockpile will be placed on a lined surface and provided with erosion control at the perimeter. Stockpiles will be covered or stabilized to prevent wind and water erosion when materials are not being placed or removed from the stockpile. Areas surrounding the excavations will be monitored for the presence of material spilled during loading and will be returned to the excavation.

Truck wash decontamination pads will be installed at the truck construction exit in each layout area. The truck decontamination pad will provide an area to decontaminate vehicles and will minimize tracking of soil onto surrounding public roads. The truck decontamination pad will perform the function normally provided in construction areas by a truck tracking pad. All loaded trucks will be directed to a decontamination pad prior to leaving a layout area. In the wash area of the pad, every truck will be washed by scrubbing or high-pressure, low-volume spraying to remove excess soils and sediments from truck tires and truck exterior. The truck decontamination pads will be constructed to fully contain all decontamination liquids and soils and sediments washed from the loaded trucks. Each pad will be equipped with a sump that will collect the decontamination fluids. After washing, each truck will be inspected prior to proceeding to the drying pad where it will drip-dry for a short period of time where the truck will be inspected for contamination, and release of liquids from the load area. The inspection will be documented for each truck prior to exiting the pad.

Each decontamination pad will be constructed by lining a bermed area with a non-woven geotextile, a layer of 40 mil high density polyethylene (HDPE) membrane liner, another layer of non-woven geotextile, and an overlying layer of stone. The wash pad and the drying pad will each be approximately 95 feet long. Modular prefabricated truck decontamination pads may be used if equal in performance characteristics to the on-site constructed pads.

Liquids collected in each sump will periodically be transferred to the onsite water treatment plant.

At the completion of construction in each layout area, all materials in the decontamination pad, from the membrane liner and above, will be removed and disposed as a waste material.

6.6 OTHER SITE PREPARATION ACTIVITIES

Other site preparation activities are specific to the layout remedial action and include such items as abandonment of existing monitoring wells (MW-2 in Layout 3) and verifying underground utility location and deactivation status.

7.0 REMEDIAL ACTION AREAS

This section provides details on the sequence of activities to be performed within each layout area to accomplish the remedial action. The discussion is presented in layout area designation numeric order although construction sequencing will be performed in the order layout area 2, 3, and lastly 1.

7.1 LAYOUT AREA 1 (AREAS E AND B)

7.1.1 Layout Area 1 Preparation

Layout Area 1 preparation activities will involve the performance of each of the elements identified in Section 6.0 specific to this construction area. The first step in this process will to implement the resident safety plan (See Section 9) through coordinated implementation activity with the building owner and residents. Remedial work within this layout area will temporarily occupy an estimated 124 parking spaces and 4 handicap spaces that will be primarily off-set by prior restoration activities in Layout Areas 2 and 3. Prior restoration activities in Layout Areas 2 and 3 are planned to create 118 regular parking spaces and 4 handicap spaces. If required by the owner, any additional parking spaces required will be replaced in-kind at an off-site location. Key to implementation of the resident safety and security planning will be the communication of vehicular and pedestrian access restrictions and alternative routes during the construction period. This process will result in the establishment of a construction entrance and exit from Montgomery Street and the installation of temporary construction fencing and warning signage. Following physical separation of the construction area, ground surveying will be performed to locate and mark-out all utilities (gas, water, sewage, electrical, cable), locate the perimeter of each proposed excavation and establish local temporary benchmarks for vertical control. The erosion and sediment control plan elements associated with protection of storm water drop inlets will be implemented; other erosion and sediment control materials will be staged in preparation for earth disturbance. The truck wash will be installed. The air monitoring network associated with the layout area will be installed and tested. Any above-ground elements such as light standards, or parking islands within the excavation areas will be removed to ground surface.

7.1.2 Layout Area 1 Excavation Plan

Figure 16 shows the ground surface elevations (left panel) and the deepest elevation of materials overlying CCPW-affected soils within Areas E and B (right panel). Once below-grade excavation is initiated, air monitoring and response activities according to the Project Air Monitoring Plan (PAMP) (See Appendix E) will be implemented and continue throughout. In Area E these overlying materials consist of asphalt, asphalt sub-base and fill materials. In Area B these overlying materials consist of concrete sidewalk, vegetated fill and will involve the removal of existing trees from the planned excavation area. The overlying material is not affected by CCPW but may contain historic fill material and will be removed and disposed of off-site at a disposal facility permitted to accept this material.

Figure 17 (left panel) shows the floor elevations of the excavations for CCPW-affected soil removal within Areas E and B. The allowable proximity to the building or other structural foundations may vary from that shown on the drawings due to the planned performance of a geotechnical evaluation of existing soil and foundation conditions performed by a NJ Professional Engineer. The results of the geotechnical foundation evaluation and recommendations for allowable excavation proximity will be performed and submitted to, and discussed with the NJDEP prior to mobilization.

The maximum depth of Layout Area 1 excavations is approximately 8-feet below ground surface but most areas are shallower. Due to the relatively shallow depth of the excavations in these areas, sheet pile excavation support will not be used. Also due to the relatively shallow depth of excavation, ground water intrusion into the excavations is not anticipated to be problematic but should it occur, will be managed by pumping to the water treatment facility through temporary pipelines.

Area B contains a known electric line and an electrical connection to an adjacent light standard. Both of these known elements must be either deactivated and removed or protected from disturbance during excavation activities. Area E contains known electric lines and electric connections to light standards, a major sewer line, storm water collection lines, water valve and vent pipes that will either be deactivated and removed/replaced, protected from disturbance, or avoided depending on the utility type. Utility management actions will be coordinated and

performed with the knowledge and acceptance of the PSE&G or the utility owner. All materials excavated above the floor of the excavations will be managed as CCPW-affected materials through loading and transport to an out-of-state disposal facility permitted to accept the material.

7.1.3 Layout Area 1 Post-Excavation Sampling and Confirmation

Figure 17 (right panel) shows the location of pre-excavation sidewall and soil samples used in delineating the limits of excavation in Areas E and B. Post-excavation sidewall and excavation floor samples indicated on the figure will be obtained as discrete 6-inch intervals and sent to a NJ-certified laboratory under chain of custody. Post-excavation samples will be analyzed using rapid-turnaround for total chromium, hexavalent chromium, antimony, nickel, thallium, and vanadium and include parameters needed for quality control in accordance with the analytical methods. The combination of pre-excavation and post-excavation sampling is designed to meet the lateral sidewall (every 30 linear feet) and floor (one sample per 900 sq-ft of floor area) frequency requirements for confirmation sampling.

7.1.4 Layout Area 1 Backfilling and Subsurface Restoration

Backfilling of the excavations will be performed using soil from off-site sources or using on-site materials approved for re-use through a NJDEP Soil Reuse Plan. The off-site backfill will be verified as meeting NJDEP Residential Soil Cleanup Standards by laboratory analysis before being accepted for transport to the site. Backfill will be installed in lifts of no greater than 8 inches and compacted to non-movement. Soil backfill will be installed to elevations required to support the final restoration.

Backfill may include material from virgin sources, recycled soil, or other types of material. Minimal requirements for all backfill are as follows:

- The source of the backfill must be clearly established;
- Certification of the source is required;
- An initial sample for laboratory analysis will be collected;
- Subsequent laboratory analysis will be conducted at a specified frequency; and

- Visual inspections will be conducted on the material as it is received on-site at a frequency of at least one inspection per 2,000 tons.

All material must be free of trash. Stones or other material in excess of 6 inches in size is not acceptable. The upper allowable limit for root matter, brick fragments, glass and concrete is 0.5% total. Frozen lumps or other materials that would affect the performance of the fill are not allowed.

Material from a virgin source (directly mined from the open face of a quarry or sand pit, material mined from natural rock formations, where processing is limited to screening and wetting or drying) will be sampled for laboratory analysis at a frequency of one sample per 5,000 tons. Material from other sources and/or material that contain any visually apparent brick or other non-natural material will be sampled at a frequency of one sample per 2,000 tons. Following receipt of 10 consecutive acceptable results, the sampling frequency will be decreased (to one per 10,000 tons for virgin material and one per 4,000 tons for all other materials).

Initial and routine samples will be analyzed for the following:

- Volatile Organic Compound TCL - Target Compound List (SW846 8260B/5035)
- Acid / Base Neutral Extractable Compounds (SW846 8270C/3550B)
- NJDEP Extractable Petroleum Hydrocarbons (SW846 3545)
- Herbicides (SW846 8151/3550B)
- Pesticides (SW846 8081A/3545)
- Polychlorinated Biphenyls (SW846 8082/3545)
- Target Analyte List (TAL) Metals (SW846 6010B, 6020, 6020B, 7471A)
- Hexavalent Chromium (SW846 3060A/7196A)
- Redox Potential (Eh)
- Percent Solids
- pH

Final analytical data will be compared the NJDEP SRS. In addition to the SRS, analytical results will also be compared to Default Impact to Groundwater Soil Standards for Class II Groundwater

for which health-based ground water quality criterion has already been developed by the NJDEP (Ground Water Quality Standards, N.J.A.C. 7:9C). Each final data package will be sent via email to NJDEP the evaluation has been completed. A statement regarding the evaluation will be included in the transmittal. A summary spreadsheet of all analytical samples pertaining to the backfill will also be included, which will highlight exceedances of residential and impact-to groundwater remedial standards.

During the backfilling operations, reconstruction of removed subsurface storm water catch basins and collector piping will be performed. Reconstruction may either be performed concurrent with backfilling or following backfilling operations. The subsurface restoration will also include reconstruction of any light standard electrical wiring removed during the excavation activities. Any other subsurface utilities removed during the excavations will be replaced in kind. Restored underground utilities will be inspected by appropriate local jurisdictions and be approved prior to placing them back in service.

7.1.5 Layout Area 1 Restoration

Surface restoration will return the disturbed areas to the pre-excavation use subject to negotiation with the building owner. Restoration requirements will be defined through negotiation with the building owner prior to initiation of remedial activities. The intent is to replace sidewalks, paving, curbing, lighting, traffic islands, signage, parking striping, storm water drainage and existing surface vegetation including grass, shrubs, and trees in-kind unless an alternative agreement with the building owner is negotiated.

Obtaining acceptance of the surface restoration by the building owner is required to allow return of the remedial areas to use and trigger the transition to the next Layout Area or final demobilization.

7.1.6 Layout Area 1 Transition

Layout Area 1 is scheduled to be the last remedial area to undergo construction. As such, Layout Area 1 transition will also include demobilization of support areas including the water treatment system, support area trailers and materials, removal of the air monitoring system and

removal of all construction materials and debris from any of the remedial areas. Within Layout Area 1, demobilization will include removal of all construction equipment, materials and debris, removal of temporary construction fencing and replacement of the perimeter fence removed in creating the construction entrance/exit. An inspection of the property will be performed with the building owner and a punch list will be used identify final items to be resolved to gain completion acceptance.

7.2 LAYOUT AREA 2 (AREAS A AND C-NORTH)

7.2.1 Layout Area 2 Preparation

Layout Area 2 preparation activities will involve the performance of each of the elements identified in Section 6.0 specific to this construction area. The first step in this process will to implement the resident safety plan (See Section 9) through coordinated implementation activity with the building owner and residents. Remedial work within this layout area will temporarily occupy an estimated 129 parking spaces that, if required by the owner, will be replaced in-kind at an off-site location. Key to implementation of the resident safety and security planning will be the communication of vehicular and pedestrian access restrictions and alternative routes during the construction period. This process will result in the establishment of a construction entrance and exit from Christopher Columbus and the installation of temporary construction fencing and warning signage. Following physical separation of the construction area, ground surveying will be performed to locate and mark-out all utilities (gas, water, sewage, electrical, cable). The erosion and sediment control plan elements associated with protection of storm water drop inlets will be implemented; other erosion and sediment control materials will be staged in preparation for earth disturbance. The truck wash will be installed. The air monitoring network associated with the layout area will be installed and tested. Any above-ground elements such as light standards, or parking islands within the excavation areas will be removed to ground surface.

7.2.2 Layout Area 2 Excavation Plan

The Layout Area 2 excavation plan includes installation of sheet pile for excavation sidewall support and as an aid to the control of groundwater inflow into the excavation. As a pre-

construction evaluation, a subsurface engineering study will be performed by a NJ Professional Engineer to provide a design for sheet pile installation. This study will evaluate the subsurface materials to be penetrated to confirm their suitability for sheet pile installation, recommend a method of installation (e.g. driven or vibration), method for monitoring associated installation vibration, and recommend the installation depth and any tie-back requirements. The engineering study will address the sheet piling proposed for installation in Area C-North, C-South, Area D and Area F. This study will be completed prior to mobilization and will be submitted to the NJDEP.

Based on boring data collected within Remedial Area A during the Remedial Investigation, affected soil was encountered at depths that are above ground water. Therefore, a hydraulic barrier will not be proposed and shoring to support the excavation sidewall is not expected to be needed. Due to the relatively shallow depth of excavation, ground water intrusion into the excavations is not anticipated to be problematic but should it occur, will be managed by pumping to the water treatment facility through temporary pipelines.

Remedial Area C North will be subdivided and remediated in sections. Due to the planned depth of the excavation and presence of affected soil below the water table level, sheet pile shoring is proposed to support excavation sidewalls and reduce the potential for the inflow of ground water into the excavation. Sheet-pile will be installed at the locations shown on Figure 18.

Area C North will be subdivided into three areas (a South Area beneath I-Borings 3, 6, 9, 12, 15, and 18, a Middle Area beneath I-Borings 1, 2, 5, 8, 11, 14, and 17, and a North Area beneath I-Borings 1, 4, 7, 10, 13, and 16) as shown on Figure 18. Sheet-pile will be used at the perimeter of the three sections and will be installed between the subdivided areas. Following concrete removal and un-contaminated soil excavation within each of the subdivided areas, sumps and pumps will be installed as needed to lower ground water to support excavation and post-excavation sampling. Collected ground water will be treated on-site under permit by the PVSC and the treated water discharged to the combined PVSC sewer located on-site.

Figure 18 shows the ground surface elevations (left panel) and the deepest elevation of materials overlying CCPW-affected soils within Areas A and C-North (right panel). Once below-

grade excavation is initiated, air monitoring and response activities according to the Project Air Monitoring Plan (PAMP) (See Section 8.0) will be implemented and continue throughout. In Area A these overlying materials consist of asphalt, asphalt sub-base and fill materials. In Area C-North these overlying materials consist of concrete sidewalk, vegetated fill and will involve the removal of existing trees from the planned excavation area. The overlying material is not affected by CCPW but may contain historic fill material and will be removed and disposed of off-site at a disposal facility permitted to accept this material.

Figure 19 (left panel) shows the floor elevations of the excavations for CCPW-affected soil removal within Areas A and C. The allowable proximity to the building or other structural foundations may vary from that shown on the drawings due to the planned performance of a geotechnical evaluation of existing soil and foundation conditions performed by a NJ Professional Engineer. The results of the geotechnical foundation evaluation and recommendations for allowable excavation proximity will be performed, submitted to, and discussed with the NJDEP prior to mobilization.

Area A contains a known telephone line and lies adjacent to gas lines serving Building 1. Both of these known elements must be protected from disturbance during Area A excavation activities.

Area C-North contains a known electric line, electric connections to light standards, and storm water collection lines that will either be deactivated and removed/replaced, protected from disturbance, or avoided depending on the utility type. Utility management actions will be coordinated and performed with the knowledge and acceptance of the PSE&G or the utility owner. All materials within the Area C-North remedial limits in addressing utilities will be managed as CCPW-affected materials through loading and transport to an out-of-state disposal facility permitted to accept the material.

7.2.3 Layout Area 2 Post-Excavation Sampling and Confirmation

Figure 19 (right panel) shows the location of pre-excavation sidewall and soil samples used in delineating the limits of excavation in Areas A and C-North. Post-excavation sidewall and excavation floor samples indicated on the figure will be obtained as discrete 6-inch intervals and

sent to a NJ-certified laboratory under chain of custody. Post-excavation samples will be analyzed using rapid-turnaround for total chromium, hexavalent chromium, antimony, nickel, thallium, and vanadium and include parameters needed for quality control in accordance with the analytical methods. The combination of pre-excavation and post-excavation sampling is designed to meet the lateral sidewall (every 30 linear feet) and floor (one sample per 900 sq-ft of floor area) frequency requirements for confirmation sampling.

7.2.4 Layout Area 2 Backfilling and Subsurface Restoration

Backfilling of the excavations will be performed using soil from off-site sources or using on-site materials approved for re-use through a NJDEP Soil Reuse Plan. Backfill from off-site sources will be verified as meeting NJDEP Residential Soil Cleanup Standards by laboratory analysis before being accepted for transport to the site. Backfill will be installed in lifts of no greater than 8 inches and compacted to non-movement. Soil backfill will be installed to elevations required to support the final restoration.

Backfill may include material from virgin sources, recycled soil, or other types of material. Minimal requirements for all backfill are as follows:

- The source of the backfill must be clearly established;
- Certification of the source is required;
- An initial sample for laboratory analysis will be collected;
- Subsequent laboratory analysis will be conducted at a specified frequency; and
- Visual inspections will be conducted on the material as it is received on-site at a frequency of at least one inspection per 2,000 tons.

All material must be free of trash. Stones or other material in excess of 6 inches in size is not acceptable. The upper allowable limit for root matter, brick fragments, glass and concrete is 0.5% total. Frozen lumps or other materials that would affect the performance of the fill are not allowed.

Material from a virgin source (directly mined from the open face of a quarry or sand pit, material mined from natural rock formations, where processing is limited to screening and wetting or drying) will be sampled for laboratory analysis at a frequency of one sample per 5,000 tons. Material from other sources and/or material that contain any visually apparent brick or other non-natural material will be sampled at a frequency of one sample per 2,000 tons. Following receipt of 10 consecutive acceptable results, the sampling frequency will be decreased (to one per 10,000 tons for virgin material and one per 4,000 tons for all other materials).

Initial and routine samples will be analyzed for the following:

- Volatile Organic Compound TCL - Target Compound List (SW846 8260B/5035)
- Acid / Base Neutral Extractable Compounds (SW846 8270C/3550B)
- NJDEP Extractable Petroleum Hydrocarbons (SW846 3545)
- Herbicides (SW846 8151/3550B)
- Pesticides (SW846 8081A/3545)
- Polychlorinated Biphenyls (SW846 8082/3545)
- Target Analyte List (TAL) Metals (SW846 6010B, 6020, 6020B, 7471A)
- Hexavalent Chromium (SW846 3060A/7196A)
- Redox Potential (Eh)
- Percent Solids
- pH

Final analytical data will be compared the NJDEP SRS. In addition to the SRS, analytical results will also be compared to Default Impact to Groundwater Soil Standards for Class II Groundwater for which health-based ground water quality criterion has already been developed by the NJDEP (Ground Water Quality Standards, N.J.A.C. 7:9C). Each final data package will be sent via email to NJDEP the evaluation has been completed. A statement regarding the evaluation will be included in the transmittal. A summary spreadsheet of all analytical samples pertaining to the backfill will also be included, which will highlight exceedances of residential and impact-to groundwater remedial standards.

During the backfilling operations, reconstruction of removed subsurface storm water catch basins and collector piping will be performed. Reconstruction may either be performed concurrent with backfilling or following backfilling operations. The subsurface restoration will also include reconstruction of any light standard electrical wiring removed during the excavation activities. Any other subsurface utilities removed during the excavations will be replaced in kind. Restored underground utilities will be inspected by appropriate local jurisdictions and be approved prior to placing them back in service.

During backfilling, sheet pile wall removal will be concurrent with the preparation of the next sub-area in Area C-North. At the completion of backfilling in the northernmost area of C-North, all sheet pile with the exception of that which will form the northern barrier to Area C-South will be removed.

7.2.5 Layout Area 2 Restoration

Surface restoration will return the disturbed areas to the pre-excavation use subject to negotiation with the building owner. Restoration requirements will be defined through negotiation with the building owner prior to initiation of remedial activities. The intent is to replace sidewalks, paving, curbing, lighting, traffic islands, signage, parking striping, storm water drainage and existing surface vegetation including grass, shrubs, and trees in-kind unless an alternative agreement with the building owner is negotiated.

Anticipated restoration in Layout Area 2 will create approximately 102 new regular parking spaces and 4 new handicapped parking spaces above the pre-remedial levels in this area.

Obtaining acceptance of the surface restoration by the building owner is required to allow return of the remedial areas to use and trigger the transition to the next Layout Area or final demobilization.

7.2.6 Layout Area 2 Transition

Layout Area 2 transition to Layout Area 3 will involve performance of a number of items that will require close coordination with building management and communication with residents. One

item will include the sequential temporary closure of the east entrance to Building I and the west entrance to Building II to perform a focused remedial action near the entrances. The focused remedial action is designed to provide a protected pedestrian access way for residents to enter or leave each building to the north away from Layout Area 3. Remediation and temporary restoration in these areas will be performed in accordance with the Layout Area 3 excavation plan.

Additional temporary fencing will be installed around the support area for resident protection during construction in Layout Area 3. Temporary construction fencing will be reoriented to separate the restored Layout Area 2 from Layout Area 3. Once this construction fencing is in place and the focused remediation is completed, the Layout Area 2 construction entrance can be opened for resident vehicular access and access to the restored Layout Area 2.

The transition will be completed by beginning Layout Area 3 preparation activities.

7.3 LAYOUT AREA 3 (AREAS C-SOUTH, D, F, AND F-1)

7.3.1 Layout Area 3 Preparation

Layout Area 3 preparation activities will involve the performance of each of the elements identified in Section 6.0 specific to this construction area. The first step in this process will to implement the resident safety plan (See Section 9) through coordinated implementation activity with the building owner and residents. Remedial work within this layout area will temporarily occupy about 94 regular parking spaces and 4 handicapped parking spaces. Prior restoration of Layout Area 2 will result in a net increase in the number of regular parking spaces by 103 regular and 4 handicap spaces to off-set the temporary loss. If required by the owner, any parking space loss will be replaced in-kind at an off-site location. Key to implementation of the resident safety and security planning will be the communication of vehicular and pedestrian access restrictions and alternative routes during the construction period. This process will result in the conversion of the existing residential entrance from Montgomery Street into a construction entrance and the installation of temporary construction fencing and warning signage at the temporary resident entrance from Montgomery Street used during the performance of Layout Area 2 construction. Following physical separation of the construction area, ground surveying

will be performed to locate and mark-out all utilities (gas, water, sewage, electrical, cable). The erosion and sediment control plan elements associated with protection of storm water drop inlets will be implemented; other erosion and sediment control materials will be staged in preparation for earth disturbance. The truck wash will be installed. The air monitoring network associated with the layout area will be installed and tested. Any above-ground elements such as light standards, or parking islands within the excavation areas will be removed to ground surface.

7.3.2 Layout Area 3 Excavation Plan

The Layout Area 3 excavation plan includes installation of sheet pile for excavation sidewall support and as an aid to the control of groundwater inflow into the excavation. As a pre-construction evaluation, a subsurface engineering study will be performed by a NJ Professional Engineer to provide a design for sheet pile installation. This study will evaluate the subsurface materials to be penetrated to confirm their suitability for sheet pile installation, recommend a method of installation (e.g. driven or vibration), method for monitoring associated installation vibration, and recommend the installation depth and any tie-back requirements. The engineering study will address the sheet piling proposed for installation in Area C-North, C-South, Area D and Area F. This study will be completed prior to mobilization and will be submitted to the NJDEP.

Remedial Area C-South and Area D will be subdivided and remediated in sections. Due to the planned depth of the excavation and presence of affected soil below the water table level, sheet pile shoring is proposed to support excavation sidewalls and reduce the potential for the inflow of ground water into the excavation. Sheet-pile will be installed at the locations shown on Figure 20.

Area C-South will be subdivided during the planned excavation as shown on Figure 20. Sheet-pile will be used at the perimeter of the three sections (except along the building foundations) and will be installed between the subdivided areas. Following concrete removal and un-contaminated soil excavation within each of the subdivided areas, sumps and pumps will be installed as needed to lower ground water to support excavation and post-excavation sampling.

Collected ground water will be treated on-site under permit by the PVSC and the treated water discharged to the combined PVSC sewer located on-site.

Figure 20 shows the ground surface elevations (left panel) and the deepest elevation of materials overlying CCPW-affected soils within Areas C-South, D, F, and F-1 (right panel). Air monitoring and response activities will be implemented and continue throughout the remedial action according to the Project Air Monitoring Plan (PAMP) (See Section 8.0). In Area C-South these overlying materials consist of concrete sidewalk, vegetated fill and will involve the removal of existing trees from the planned excavation area. In Area F and F-1 these overlying materials consist of asphalt, asphalt sub-base and fill materials. In Area D the overlying materials consist of vegetated soil and concrete from sidewalks. Overlying material is not affected by CCPW but may contain historic fill material and will be removed and disposed of off-site at a disposal facility permitted to accept this material.

Figure 21 (left panel) shows the floor elevations of the excavations for CCPW-affected soil removal within Areas C-South, D, F, and F-1. The allowable proximity to the building or other structural foundations may vary from that shown on the drawings due to the planned performance of a geotechnical evaluation of existing soil and foundation conditions performed by a NJ Professional Engineer. The results of the geotechnical foundation evaluation and recommendations for allowable excavation proximity will be performed and submitted to, and discussed with the NJDEP prior to mobilization.

Each of the Areas contain known electric lines, electric connections to light standards, and storm water collection lines that will either be deactivated and removed/replaced, protected from disturbance, or avoided depending on the utility type. Utility management actions will be coordinated and performed with the knowledge and acceptance of the PSE&G or the utility owner. All materials removed from the remedial limits in addressing utilities will be managed as CCPW-affected materials through loading and transport to an out-of-state disposal facility permitted to accept the material.

7.3.3 Layout Area 3 Post-Excavation Sampling and Confirmation

Figure 21 (right panel) shows the location of pre-excavation sidewall and soil samples used in delineating the limits of excavation in Areas C-South, D, F, and F-1. Post-excavation sidewall and excavation floor samples indicated on the figure will be obtained as discrete 6-inch intervals and sent to a NJ-certified laboratory under chain of custody. Post-excavation samples will be analyzed using rapid-turnaround for total chromium, hexavalent chromium, antimony, nickel, thallium, and vanadium and include parameters needed for quality control in accordance with the analytical methods. The combination of pre-excavation and post-excavation sampling is designed to meet the lateral sidewall (every 30 linear feet) and floor (one sample per 900 sq-ft of floor area) frequency requirements for confirmation sampling.

7.3.4 Layout Area 3 Backfilling and Subsurface Restoration

Backfilling of the excavations will be performed using soil from off-site sources or using on-site materials approved for re-use through a NJDEP Soil Reuse Plan. Backfill from off-site sources will be verified as meeting NJDEP Residential Soil Cleanup Standards by laboratory analysis before being accepted for transport to the site. Backfill will be installed in lifts of no greater than 8 inches and compacted to non-movement. Soil backfill will be installed to elevations required to support the final restoration.

Backfill may include material from virgin sources, recycled soil, or other types of material. Minimal requirements for all backfill are as follows:

- The source of the backfill must be clearly established;
- Certification of the source is required;
- An initial sample for laboratory analysis will be collected;
- Subsequent laboratory analysis will be conducted at a specified frequency; and
- Visual inspections will be conducted on the material as it is received on-site at a frequency of at least one inspection per 2,000 tons.

All material must be free of trash. Stones or other material in excess of 6 inches in size is not acceptable. The upper allowable limit for root matter, brick fragments, glass and concrete is

0.5% total. Frozen lumps or other materials that would affect the performance of the fill are not allowed.

Material from a virgin source (directly mined from the open face of a quarry or sand pit, material mined from natural rock formations, where processing is limited to screening and wetting or drying) will be sampled for laboratory analysis at a frequency of one sample per 5,000 tons. Material from other sources and/or material that contain any visually apparent brick or other non-natural material will be sampled at a frequency of one sample per 2,000 tons. Following receipt of 10 consecutive acceptable results, the sampling frequency will be decreased (to one per 10,000 tons for virgin material and one per 4,000 tons for all other materials).

Initial and routine samples will be analyzed for the following:

- Volatile Organic Compound TCL - Target Compound List (SW846 8260B/5035)
- Acid / Base Neutral Extractable Compounds (SW846 8270C/3550B)
- NJDEP Extractable Petroleum Hydrocarbons (SW846 3545)
- Herbicides (SW846 8151/3550B)
- Pesticides (SW846 8081A/3545)
- Polychlorinated Biphenyls (SW846 8082/3545)
- Target Analyte List (TAL) Metals (SW846 6010B, 6020, 6020B, 7471A)
- Hexavalent Chromium (SW846 3060A/7196A)
- Redox Potential (Eh)
- Percent Solids
- pH

Final analytical data will be compared the NJDEP SRS. In addition to the SRS, analytical results will also be compared to Default Impact to Groundwater Soil Standards for Class II Groundwater for which health-based ground water quality criterion has already been developed by the NJDEP (Ground Water Quality Standards, N.J.A.C. 7:9C). Each final data package will be sent via email to NJDEP the evaluation has been completed. A statement regarding the evaluation will be included in the transmittal. A summary spreadsheet of all analytical samples pertaining to

the backfill will also be included, which will highlight exceedances of residential and impact-to groundwater remedial standards.

During the backfilling operations, reconstruction of removed subsurface storm water catch basins and collector piping will be performed. Reconstruction may either be performed concurrent with backfilling or following backfilling operations. The subsurface restoration will also include reconstruction of any light standard electrical wiring removed during the excavation activities. Any other subsurface utilities removed during the excavations will be replaced in kind. Restored underground utilities will be inspected by appropriate local jurisdictions and be approved prior to placing them back in service.

Sheet pile wall removal will be concurrent with the backfilling operations. At the completion of backfilling, sheet pile removal will be complete.

7.3.5 Layout Area 3 Restoration

Surface restoration will return the disturbed areas to the pre-excavation use subject to negotiation with the building owner. Restoration requirements will be defined through negotiation with the building owner prior to initiation of remedial activities. The intent is to replace sidewalks, paving, curbing, lighting, traffic islands, signage, parking striping, storm water drainage and existing surface vegetation including grass, shrubs, and trees in-kind unless an alternative agreement with the building owner is negotiated.

Proposed Layout Area 3 restoration will add approximately 15 additional regular parking spaces and maintain the 4 handicap parking spaces.

Obtaining acceptance of the surface restoration by the building owner is required to allow return of the remedial areas to use and trigger the transition to the next Layout Area or final demobilization.

7.3.6 Layout Area 3 Transition

Layout Area 3 transition to Layout Area 1 will involve performance of a number of items that will require close coordination with building management and communication with residents.

Layout Area 3 will be transitioned by restoring the Layout Area 3 construction entrance to a resident access entrance. Concurrently, the former temporary resident access to the west of Building 1 will be converted to a construction entrance with a locking gate. Temporary construction fencing will be reoriented to separate the restored Layout Area 3 from Layout Area 1 near Building 1. With these actions, the transition will continue by beginning Layout Area 1 preparation activities.

8.0 OVERVIEW OF PROJECT AIR MONITORING PLAN

Air monitoring within each Layout area and at ground level and elevated locations will be performed to protect residents and the surrounding community from unacceptable levels of airborne contaminants related to the remedial activities. PPG has established a goal of no visible dust generation during the remedial activities. A brief summary of the Project Air Monitoring Plan is presented here with the complete plan provided in Appendix E.

Air monitoring points will be positioned around each layout. The locations will be positioned according to the excavation location, wind direction, and potential on-site and off-site receptors.

Because hexavalent chromium levels in respirable dust cannot be measured directly but must be sent to an analytical laboratory for analysis, real-time monitoring of ambient respirable dust levels must be used as a surrogate to monitor real-time dust generation. The appropriateness of the real-time measurements are verified through use of air samplers that provide integrated samples of respirable dust and collect dust on filters for subsequent laboratory analysis.

Real-time monitoring of dust concentrations will be performed at ground level and at above-ground locations near the active excavations. Dust suppression actions will be implemented proactively to suppress dust generation before action levels are exceeded. Time-integrated dust samples will be obtained from each monitoring location to represent each 8-hour work day; a single 24-hour duration sample will also be collected and analyzed during each work day. The time-integrated dust samples will be analyzed for hexavalent chromium and PM_{10} dust particles. Results from the time-integrated samples will be used to verify that the real-time dust monitoring action levels are appropriate.

The wind direction and excavation activity will be documented on a diagram depicting the locations of the monitoring points and their associated identifications in relation to these parameters. Should the wind direction change, the change will be documented and the monitoring points will be modified as needed.

The Project Air Monitoring Plan includes real-time dust action levels for enhancing the level of dust suppression actions. Dust suppression actions will become increasingly more aggressive

as the level of real-time monitoring parameters increases. Ultimately, if action levels are exceeded due to site activities or weather conditions, site remedial activities will be stopped and the site will be stabilized against further dust generation until steps can be taken to reduce emission concentrations to levels below the action levels.

9.0 OVERVIEW OF RESIDENT SAFETY AND SECURITY PLAN

The Resident Safety and Security Plan describes the actions aimed at protecting the Metropolis Towers residents during the performance of remedial action. The plan components include coordination, notification, warning signs and barricades, and physical separation. The plan will be activated prior to the initial mobilization and each subsequent change in layout. The effectiveness of the plan will be continuously evaluated during the remedial action and modifications made as required to prevent accident and injury.

The Resident Safety and Security Plan proposed by PPG is part of an overall public communication process coordinated by the Site Administrator in conjunction with other Judicial Consent Order participants. The overall public communication process includes briefings, fact sheets, letters, newsletters and public meetings involving residents, community leaders, and others affected and interested parties during the planning and implementation of the remedial action.

9.1 COORDINATION WITH BUILDING MANAGEMENT

During the project planning process, PPG will meet with the Metropolis Towers' building management to explain the work to be performed on the property, the extent of the work, and the schedule for performance of work on different areas of the property. This will include the areas to be isolated from the residents during construction and the anticipated duration of construction activity in each layout area. Access needs of both building management and residents will be identified and options for providing access will be discussed. Parking modifications and plans to address the relocation of resident parking spaces will be made. A plan for providing property and resident security during the remedial construction will be discussed and actions to maintain site security will be developed. Locations where doorways, sidewalks, driveways and other pedestrian and vehicular traffic will be controlled or prohibited will be identified and the means of access control or restriction will be agreed upon. Topics for resident notification of access restriction and access modification and the timing for resident notification will be discussed. A coordination meeting will be held prior to mobilization and before each subsequent change in construction area configuration.

9.2 RESIDENT NOTIFICATION

PPG will work with Metropolis Towers' building management to develop a resident notification program to inform residents of the scope of the construction activities, the types of processes to be used, equipment types, environmental protection during construction, timing of remedial construction activities and the changes in access and parking that will be associated with the remedial activities. Resident notification is anticipated to include use of the mailings of fact-sheets, meetings, and responding to the questions of individual residents. PPG will verify that the notification of residents has occurred prior to implementing initial site preparation activities and before each transition to a new construction layout.

PPG will provide a phone hot-line available on a 24-hour, 7 days per week basis for the management of resident questions and issues during the remedial construction.

9.3 BARRICADES AND WARNING SIGNS

As a site preparation activity, the access restrictions, including any needed barricades and warning signs, will be installed by PPG and verified by Metropolis Towers' building management. Barricades and warning signs will be verified as being in-place each day of construction and prior to leaving on the last work day of the week.

9.4 FENCING AND ACCESS RESTRICTION

PPG will supplement the existing property perimeter fence by constructing internal temporary chain link fence to provide a physical barrier to resident access and provide general public construction site security. The temporary fencing will include wind screens on the fence panels to reduce visibility into the construction areas and reduce wind velocities entering the site at ground level.

9.5 MONITORING

PPG will monitor the condition and presence of all fencing, barricades, and warning signs established as part of the resident safety plan once a day (including weekends) and replace or

repair any part of the control methods to maintain their effectiveness during the remedial construction activities.

10.0 PERMITS AND AUTHORIZATIONS

The permits and approvals needed for the proposed remedial action are as follows:

- A Soil Erosion and Sediment Control Permit from HEP Soil Conservation District.
- Approval from Passaic Valley Sewerage Commissioners (PVSC) to discharge treated groundwater into the combined sewer system.
- Acceptance of plans by PSE&G for the protection of subsurface utilities under their jurisdiction.
- Acceptance of plans by the Jersey City Municipal Utility Authority for the protection of subsurface utilities under their jurisdiction;
- Jersey City Temporary Construction Trailer Permit, City of Jersey City
- Jersey City Traffic Control Permit, City of Jersey City
- Electrical Service Permit, City of Jersey City
- Well abandonment, NJDEP

Necessary permits will be obtained prior to initiation of activities covered by the permit. Permit copies will be provided to the NJDEP as part of design submittals.

11.0 WORKER HEALTH & SAFETY PLAN FRAMEWORK

The remedial construction will be performed by a qualified remedial action contractor hired by PPG. Activities to be conducted during the proposed remedial actions may involve exposure to hazardous substances and physical hazards. These substances and conditions pose a hazard to the health and safety of on-site workers. As part of the scope of work, the remedial action contractor will be required to submit a Worker Health and Safety Plan that assesses and mitigates potential injuries and chemical exposures to their employees associated with the work. To facilitate preparation of this plan, a framework for the preparation of this plan is included in Appendix F. Compliance with the requirements of this framework is a minimum requirement for acceptance of the contractor's Worker Health and Safety Plan unless agreed to by PPG.

Once an excavation contractor has been selected and final construction and health and safety specifications have been determined, technical specifications and contractor health and safety information will be submitted to NJDEP as an addendum. Requirements such as training program protocols, medical surveillance program, equipment maintenance programs, personal hygiene practices, and other requirements will be detailed in the HASP. The HASP will continue to be updated as needed to reflect new information, changes in site personnel, etc. The HASP(s) developed by the excavation contractor for RA field activities will be forwarded to NJDEP as an addendum.

12.0 REMEDIAL ACTION COST ESTIMATE

In accordance with N.J.A.C. 7:26E-6.2(a)14, a summary of estimated remedial action costs are provided in Table 3.

13.0 REMEDIAL ACTION REPORT

Periodic progress reports will be submitted to NJDEP during the remedial action activities. The progress reports will summarize the remedial actions completed, actions proposed for the next reported period, and any modifications to the proposed remedial actions.

Following the completion of the remedial activities described in this RAWP, a Remedial Action (RA) Report will be prepared in accordance with the NJAC 7:26E-6.7. The RA Report will describe the remedial actions implemented at the Site and provide all necessary supporting data to show that the remedial action is complete.

14.0 PROJECT SCHEDULE

A proposed remedial construction schedule is provided in Figure 15. This proposed schedule has not been reviewed by the remedial contractor to perform the work because the remedial contractor has yet to be hired. Should the remedial contractor's schedule vary substantively from the proposed schedule, both the NJDEP and Metropolis Towers' building management will be notified to evaluate alternatives to bring the schedule back into the anticipated completion time frame. The work is projected to be initiated during December of 2012 and be completed in December of 2013.

The schedule will be periodically updated during the remedial action to evaluate progress toward completion and identify and react to items that could affect completion. Schedule revisions will be submitted to NJDEP.

15.0 REFERENCES

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TABLES

TABLE 1
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA A				
Aluminum	*3,900*	8	8	**25,600**
Antimony	6	8	0	2.5
Arsenic	19	8	0	9.2
Barium	1,300	8	0	287
Beryllium	0.50	8	7	**0.62**
Cadmium	1	8	0	0.9
Calcium	NS	8	-	55,200
Total Chromium	NS	8	-	815
Hexavalent Chromium	NS	8	-	9
Cobalt	59	8	0	31.9
Copper	7,300	8	0	55
Iron	*NS*	8	-	26,900
Lead	59	8	4	**474**
Magnesium	*NS*	8	-	8,670
Manganese	*42*	8	7	**343**
Mercury	0.10	8	3	**1.80**
Nickel	31	8	1	**105**
Potassium	NS	8	-	1,140
Selenium	7	8	0	2.5
Silver	1	8	7	**3.0**
Sodium	*NS*	8		1,420
Thallium	3	8	0	1.2
Vanadium	NS	8	-	184
Zinc	*600*	8	0	326

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 1 (continued)
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA B				
Aluminum	*3,900*	9	9	**11,400**
Antimony	6	9	0	3.6
Arsenic	19	9	1	**22.3**
Barium	1,300	9	0	1,260.00
Beryllium	0.50	9	9	**0.91**
Cadmium	1	9	2	**6.1**
Calcium	NS	9	-	71,700
Total Chromium	NS	9	-	196
Hexavalent Chromium	NS	9	-	19
Cobalt	59	9	0	9.1
Copper	7,300	9	0	206
Iron	*NS*	9	-	30,300
Lead	59	9	8	**5,130**
Magnesium	*NS*	9	-	6,420
Manganese	*42*	9	9	**265**
Mercury	0.10	9	8	**9.00**
Nickel	31	9	0	25
Potassium	NS	9	-	1,350
Selenium	7	9	1	**7.8**
Silver	1	9	9	**3.1**
Sodium	*NS*	9	-	910
Thallium	3	9	0	1.8
Vanadium	NS	9	-	38
Zinc	*600*	9	2	**3,610**

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 1 (continued)
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA C				
Aluminum	*3,900*	46	46	**18,700**
Antimony	6	46	2	**27.6**
Arsenic	19	46	1	**19.3**
Barium	1,300	46	0	647
Beryllium	0.50	46	33	**0.90**
Cadmium	1	46	2	**1.8**
Calcium	NS	46	-	31,200
Total Chromium	NS	46	-	730
Hexavalent Chromium	NS	46	-	15
Cobalt	59	46	0	21.5
Copper	7,300	46	0	1,680
Iron	*NS*	46	-	36,500
Lead	59	46	9	**2,630**
Magnesium	*NS*	46	-	12,600
Manganese	*42*	46	46	**494**
Mercury	0.10	46	12	**19.10**
Nickel	31	46	5	**52**
Potassium	NS	46	-	2,230
Selenium	7	46	0	3.6
Silver	1	46	27	**2.8**
Sodium	*NS*	46	-	1,930
Thallium	3	46	0	1.8
Vanadium	NS	46	-	104.0
Zinc	*600*	46	1	**1,200.0**

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 1 (continued)
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA D				
Aluminum	*3,900*	6	6	**14,400**
Antimony	6	6	0	2.4
Arsenic	19	6	0	6.3
Barium	1,300	6	0	123
Beryllium	0.50	6	6	**0.66**
Cadmium	1	6	0	0.6
Calcium	NS	6	-	22,500
Total Chromium	NS	6	-	91
Hexavalent Chromium	NS	6	-	5
Cobalt	59	6	0	16.9
Copper	7,300	6	0	122
Iron	*NS*	6	-	25,600
Lead	59	6	2	**175**
Magnesium	*NS*	6	-	13,200
Manganese	*42*	6	6	**366**
Mercury	0.10	6	4	**0.33**
Nickel	31	6	0	31
Potassium	NS	6	-	1,910
Selenium	7	6	0	2.4
Silver	1	6	6	**1.2**
Sodium	*NS*	6	-	1,200.0
Thallium	3	6	0	1.2
Vanadium	NS	6	-	49.0
Zinc	*600*	6	0	125

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 1 (continued)
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA E				
Aluminum	*3,900*	51	40	**14,600**
Antimony	6	51	2	**23.9**
Arsenic	19	51	5	**44.0**
Barium	1,300	51	2	**1,760**
Beryllium	0.50	51	2	**0.65**
Cadmium	1	51	6	**74.6**
Calcium	NS	51	-	52,100
Total Chromium	NS	51	-	357
Hexavalent Chromium	NS	51	-	18
Cobalt	59	51	0	19
Copper	7,300	51	-	554
Iron	*NS*	51	0	32,900
Lead	59	15	28	**4,890**
Magnesium	*NS*	51	-	8,270
Manganese	*42*	51	51	**1,080**
Mercury	0.10	51	30	**4.9**
Nickel	31	51	2	**63**
Potassium	NS	51	-	2,340
Selenium	7	51	0	3.5
Silver	1	51	1	**1.2**
Sodium	*NS*	51	-	1,380
Thallium	3	51	0	1.3
Vanadium	NS	51	-	106
Zinc	*600*	51	8	**9,270**

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 1 (continued)
PERIMETER VADOSE ZONE SAMPLE EVALUATION - IGW
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	IGW SSL (mg/kg)	Number of Vadose Zone Samples Evaluated	Number of Vadose Zone samples above IGW	Maximum Sample Concentration (mg/kg)
AREA F				
Aluminum	*3,900*	25	16	**20,100**
Antimony	6	25	0	2.4
Arsenic	19	25	0	8.7
Barium	1,300	25	0	180
Beryllium	0.50	25	15	**2.20**
Cadmium	1	25	0	0.8
Calcium	NS	25	-	38,500
Total Chromium	NS	25	-	719
Hexavalent Chromium	NS	25	-	16
Cobalt	59	25	0	33
Copper	7,300	25	0	244
Iron	*NS*	25	-	32,100
Lead	59	25	4	213
Magnesium	*NS*	25	-	13,500
Manganese	*42*	25	16	**436**
Mercury	0.10	25	5	**0.39**
Nickel	31	25	11	**109**
Potassium	NS	25	-	1,910
Selenium	7	25	0	2.4
Silver	1	25	12	1.2
Sodium	*NS*	25	-	2,180
Thallium	3	25	0	1.2
Vanadium	NS	25	-	177
Zinc	*600*	25	0	520

	- Indicates CCPW Chemicals of Concern
Bold	- Indicates value exceeds generic IGW concentration.
italics	- Indicates IGW concentration based on secondary aesthetic consideration.

TABLE 2
BORING COORDINATES AND MATERIAL TRANSITION SUMMARY
Metropolis Towers Site 156 - RAWP
Jersey City, Hudson County, New Jersey

Boring ID	Northing (ft)	Easting (ft)	Surface Elevation (ft)	Concrete Thickness (ft)	Concrete Contamination	Top of Soil Elevation	Bottom Elevation of Overlying Sample Meeting RSRS for CCPW-Related Metals [1]	Top Elevation of Underlying Sample Meeting RSRS for CCPW-Related Metals [2]	Bottom of Boring (Elevation)*	Area
PE-1	687,011.8	619,240.0	7.44			7.44			-5.06	A
PE-2	687,000.4	619,261.6	7.71			7.71			-4.79	A
PE-3	686,982.2	619,257.0	7.92			7.92			-4.58	A
PE-4	686,997.8	619,226.6	7.30			7.30	5.80	3.30		A
PPG1-B01	686,985.4	619,207.7	7.38			7.38			4.38	A
PPG1-B02	686,994.8	619,251.0	7.78			7.78	5.98	-2.22		A
PE-5	686,960.5	619,179.5	6.34			6.34			-0.16	B
PE-6	686,926.9	619,193.5	7.25			7.25			-5.25	B
PE-7	686,942.3	619,155.6	6.04			6.04			-6.46	B
PE-8	686,929.8	619,167.8	6.36			6.36			-6.14	B
PPG1-B28	686,939.7	619,178.9	6.65			6.65	2.15	-5.35		B
FB-4	686937.1891	619173.827	6.29			6.29	--	2.29		B
PE-82	686737.861	619244.257								B
PE-83	686730.838	619224.608								B
PE-9	686,863.6	619,326.7	7.71			7.71	6.21	-0.29		C
PE-9R	686,873.8	619,308.3	7.13			7.13			-5.37	C
PE-10	686,845.1	619,302.7	7.45			7.45			-5.05	C
PE-11	686,822.4	619,305.1	8.86			8.86			-3.64	C
PE-15	686,750.2	619,331.9	8.37			8.37	7.37	UD<-4.13		C
PE-15R	686,747.7	619,312.3	8.22			8.22	5.72	0.22		C
PE-25	686,724.5	619,476.2	7.92			7.92	3.42	-0.08		C
PE-25R	686,710.8	619,498.1	7.96			7.96	5.46	2.46		C
PE-26	686,792.8	619,317.5	9.32	0.83		9.32	4.82	UD<2.82		C
PE-26R	686,781.9	619,295.4	9.04	0.83		9.04	REF	REF		C
PE-26R1	686,785.9	619,290.6	9.00	0.83		9.00	REF	REF		C
PE-26R2	686,786.8	619,285.5	8.91	0.83		8.91	REF	REF		C
PE-26R3	686,788.0	619,272.0	8.79	0.83		8.79	REF	REF		C
PE-26R4	686,788.6	619,260.7	8.72	0.83		8.72	5.72	2.72		C
PE-27	686,801.8	619,410.3	9.76*	0.87		8.89	5.76	UD<3.76		C
PE-27R	686,812.7	619,431.6	9.44			9.44	NI	NI		C
PE-28	686,831.8	619,393.2	9.47*	0.96		8.51	8.51	1.47		C
PE-28R	686,850.6	619,410.7	9.13	0.96		8.17	NI	NI		C
PE-29	686,912.6	619,376.5	8.41	0.62		7.79			4.41	C
PE-35R	686,753.4	619,496.6	8.81	1.16		7.65	3.81	-3.19		C
PE-40	686,792.5	619,480.5	7.80			7.80	REF	REF		C
PE-40R	686,810.7	619,494.3	6.98			6.98			1.48	C
PE-41	686,822.3	619,482.4	6.94			6.94	2.44	-2.06		C
PE-42	686,855.6	619,486.5	6.90			6.90	-1.60	-6.60		C
PE-43	686,885.3	619,494.9	6.88			6.88	2.28	-9.62		C
PE-44	686,846.8	619,465.1	8.79			8.79	REF	REF		C
PE-45	686,940.4	619,443.5	8.18			8.18	REF	REF		C
PE-46	686,946.9	619,415.6	8.41			8.41	REF	REF		C
PE-47	686,960.7	619,382.3	8.60			8.60	REF	REF		C
PE-48	686,945.3	619,359.2	8.28			8.28	REF	REF		C
PE-49	686,916.7	619,336.4	7.05			7.05			-5.45	C
PE-50	686,948.7	619,333.6	6.58			6.58	4.08	0.58		C
PE-51	686,975.2	619,351.8	6.45			6.45			-6.05	C
PE-52	686,970.5	619,384.4	6.88			6.88			-6.62	C
PE-53	686,967.4	619,414.7	7.04			7.04			-5.46	C
PE-54	686,961.7	619,448.2	7.04			7.04			-5.46	C
PE-55	686,955.1	619,471.9	6.75			6.75			-5.75	C
PE-56	686,949.0	619,494.5	6.47			6.47			-6.03	C
PE-57	686,918.2	619,506.1	6.50			6.50			-6.50	C
CE1	686891.3	619515.8	6.15			6.15	-4.10	UD<-6.85		C
CE2	686874.6	619530.3	6.21			6.21			-8.79	C
CE3	686858.7	619522.0	6.32			6.32			-6.68	C
CE4	686841.5	619513.5	6.43			6.43			-6.57	C
CE5	686822.8	619502.3	7.00			7.00			-6.00	C
CE6	686789.3	619517.1	8.08			8.08			3.58	C
I-1	686,915.5	619,356.0	8.61	0.62	No	7.99	7.99	0.61		C
I-2	686,864.0	619,348.8	9.33*	0.87	No	8.46	6.83	0.50		C
I-3	686,811.5	619,341.4	9.33*	0.79	No	8.54	6.83	-0.09		C
I-4	686,946.0	619,381.3	8.48	0.67	No	7.81			3.48	C
I-5	686,855.9	619,372.7	9.47	0.83	No	8.64	7.97	-0.38		C
I-6	686,834.4	619,365.4	9.33	0.92	No	8.41	6.83	0.50		C
I-7	686,913.1	619,420.3	8.27			8.27	7.57	1.27		C
I-8	686,857.4	619,395.3	9.14	0.21	No	8.93	4.14	UD<-0.71		C
I-9	686,804.7	619,389.9	9.76	1.40	Yes	8.36	8.36	UD<1.00		C
I-10	686,933.5	619,429.0	7.99			7.99	4.99	1.99		C
I-11	686,886.0	619,418.7	9.05*	0.54	No	8.51	8.51	1.00		C
I-12	686,827.6	619,413.9	9.18	0.96	No	8.22	6.68	UD<2.18		C
I-13	686,907.1	619,456.5	7.17			7.17			0.17	C
I-14	686,851.0	619,441.5	8.67	0.87	Yes	7.80	6.17	0.50		C
I-15	686,798.5	619,434.1	9.21	0.83	Yes	8.38	6.71	UD<-1.80		C
I-16	686,927.9	619,468.6	8.51			8.51			-0.50	C
I-17	686,872.5	619,467.8	8.72	0.87	No	7.85	3.72	UD<-1.28		C
I-18	686,826.0	619,461.2	8.80	0.87	No	7.93	6.30	UD<-0.5		C
I-19	686,801.6	619,275.3	8.82*	0.96	No	7.86			6.32	C
I-20	686,798.5	619,295.1	8.82*	0.83	No	7.99	6.32	1.82		C
I-21	686,787.6	619,334.4	9.40*	0.83	No	8.57	6.40	-2.42		C
I-22	686,784.6	619,360.1	9.28	0.83	Yes	8.45	6.78	UD<-2.22		C
I-23	686,775.3	619,421.6	9.46	0.85	Yes	8.61	6.96	UD<0.16		C
I-24	686,765.6	619,452.3	9.50	2.83	Yes	8.67	8.67	-1.50		C
I-25	686,765.7	619,494.8	8.69*	1.16	No	7.53			1.69	C
I-26	686,762.8	619,515.6	8.69*	1.12	No	7.57			1.69	C
I-27	686783.6	619391.5	9.23	0.83		8.40	8.40	-1.77		C
PPG1-B04	686,981.0	619,349.0	6.43			6.43			-2.57	C
PPG1-B05	686,840.2	619,315.8	7.74			7.74	6.54	-5.36		C
PPG1-B06	686,847.6	619,273.4	7.15			7.15			-5.65	C
PPG1-B07	686,955.4	619,505.1	6.22			6.22			-2.98	C
PPG1-B08	686,818.5	619,488.7	7.16			7.16			-3.84	C
PPG1-B09	686,847.2	619,539.1	6.79			6.79			-8.51	C
PPG1-B10	686,729.3	619,429.2	8.24			8.24	3.44	-1.76		C
PPG1-B24	686,739.8	619,355.2	7.79			7.79	6.39	-0.21		C
PPG1-B50	686,708.8	619,517.3	8.11			8.11	3.71	0.11		C
PPG1-B56	686,894.9	619,325.4	7.26			7.26			-5.74	C
PPG1-B62	686,812.7	619,361.4	9.42			9.42			5.22	C
PPG1-B63	686,813.7	619,372.4	9.42	0.79		8.63	4.82	UD<0.42		C
PPG1-B66	686,893.7	619,368.5	9.46	0.83		8.63	6.46	1.46		C
PPG1-MW2	686,734.5	619,384.6	8.37			8.37	8.07	-3.63		C
CE1R	686893.217	619522.811	6.18			6.18			-4.32	C
CE5	686822.837	619502.258	7.01			7.01			-3.49	C
CE6	686789.334	619517.091	7.92			7.92			6.92	C
FC-1	686817.4239	619318.44	9.08			9.08	--	0.58		C
FC-2	686839.153	619340.837	9.15			9.15	--	2.15		C
FC-3	686806.3632	619365.518	9.30			9.30	--	1.30		C
FC-4	686803.722	619412.722	9.26			9.26	--	UD<0.76		C
FC-5	686822.1602	619438.999	9.04			9.04	--	1.29		C
FC-6	686794.7534	619462.837	8.80			8.80	6.30	0.80		C

TABLE 2
BORING COORDINATES AND MATERIAL TRANSITION SUMMARY
Metropolis Towers Site 156 - RAWP
Jersey City, Hudson County, New Jersey

Boring ID	Northing (ft)	Easting (ft)	Surface Elevation (ft)	Concrete Thickness (ft)	Concrete Contamination	Top of Soil Elevation	Bottom Elevation of Overlying Sample Meeting RSRS for CCPW-Related Metals [1]	Top Elevation of Underlying Sample Meeting RSRS for CCPW-Related Metals [2]	Bottom of Boring (Elevation)*	Area
FC-7	686794.164	619492.092	7.79			7.79	--	-2.21		C
FC-8	686890.1246	619347.666	8.95			8.95	--	0.95		C
FC-9	686883.0412	619396.778	8.94			8.94	--	UD<0.74		C
FC-10	686856.3131	619417.862	9.04			9.04	--	-1.16		C
FC-11	686879.8402	619442.721	8.68			8.68	--	UD<-3.99		C
FC-12	686848.3677	619470.362	8.73			8.73	--	-5.27		C
FC-13	686914.8994	619388.529	8.42			8.42	--	0.42		C
FC-14	686942.1638	619404.011	8.31			8.31	--	2.07		C
FC-15	686935.6988	619449.452	7.56			7.56	--	UD <0.38		C
FC-16	686903.5564	619479.937	8.55			8.55	--	-2.62		C
FC-17	686950.2109	619357.734	8.35			8.35	--	1.45		C
FC-18	686750.2317	619279.04	8.13			8.13	--	2.63		C
FC-19	686772.927	619289.203	8.71			8.71	--	3.71		C
FC-20	686821.2927	619263.882	8.86			8.86	--	2.86		C
FC-21	686765.5172	619342.345	8.86			8.86	--	-1.14		C
FC-22	686760.8017	619369.209	8.77			8.77	--	UD<-2.23		C
FC-23	686756.7129	619398.187	9.13			9.13	--	UD<-1.37		C
FC-24	686742.7907	619432.012	9.12			9.12	--	1.62		C
FC-25	686769.5842	619473.912	9.25			9.25	--	UD<-2.25		C
FC-26	686732.3231	619510.592	8.59			8.59	--	2.59		C
FC-27	686682.5161	619498.993	6.80			6.80	--	UD<2.30		C
FC-28	686667.2376	619512.917	7.34			7.34	--	3.84		C
FC-29	686734.6027	619462.845	8.51			8.51	--	UD<0.01		C
PE-52NE	686975.6096	619392.763	6.85			6.85			3.35	C
PE-52NW	686977.5918	619380.506	6.77			6.77			3.77	C
PE-57E	686915.5214	619513.768	6.45			6.45			-0.55	C
PE-57N	686928.2134	619508.213	6.20			6.20			-0.80	C
PE-62	686725.6275	619290.293	6.60			6.60	6.10	UD<6.10		C
PE-63	686727.0659	619310.865	6.61			6.61	6.11	-3.39		C
PE-68	686685.5989	619489.274								C
PE-69	686666.6702	619503.879								C
PE-70	686658.5058	619523.825								C
PE-71	686688.206	619528.056								C
PE-72	686717.916	619532.217								C
PE-73	686747.6062	619536.518								C
PE-74	686777.3574	619540.378								C
PE-75	686806.1967	619511.548								C
PE-76	686965.6595	619431.343								C
PE-77	686962.9548	619341.9								C
PE-78	686825.6834	619281.09								C
PE-79	686826.9814	619256.81								C
PE-80	686797.2538	619252.777								C
PE-81	686767.524	619248.759								C
PE-12	686,762.6	619,256.5	8.12			8.12			-4.38	D
PE-13	686,724.5	619,269.6	7.10			7.10			-5.40	D
PE-14	686,705.6	619,253.7	7.09			7.09			-5.41	D
PPG1-B23	686,736.4	619,250.4	7.84			7.84	-1.16	UD<-1.46		D
PPG1-B53	686,690.1	619,229.9	6.47			6.47			4.97	D
PPG1-B58	686,713.0	619,227.2	7.48			7.48	5.88	3.48		D
PE58	686787.8	619082.2	5.90			5.90			-9.60	E
PE59	686774.7	619065.2	5.67			5.67			-8.33	E
PE60	686769.1	619088.9	5.99			5.99			-8.01	E
PE61	686758.6	619079.1	5.90			5.90			-6.10	E
PPG1-B26	686,691.4	619,163.2	5.88			5.88			-3.62	E
PPG1-B29	686,616.2	619,055.9	6.83			6.83			-2.57	E
PPG1-B30	686,772.6	619,079.4	5.83			5.83	4.33	1.33		E
PPG1-B31	686,844.4	619,182.5	7.69			7.69			-8.61	E
PPG1-B46	686,822.9	619,078.9	5.51			5.51			-3.09	E
PPG1-B52	686,767.4	619,175.1	8.14			8.14	7.24	0.14		E
PPG1-B54	686,704.8	619,060.2	6.30			6.30			-2.50	E
PPG1-B57	686,890.4	619,190.8	7.75			7.75			-5.55	E
PPG1-B59	686,605.8	619,141.5	6.17			6.17			-0.43	E
PPG1-MW3	686,584.2	619,217.7	5.94			5.94				E
B52N	686770.8	619175.8	8.13			8.13			0.63	E
B52S	686763.2	619174.8	7.83			7.83	5.33	3.83		E
B52SE	686750.1	619173.4	7.59			7.59	7.59	UD<4.59		E
B52SW	686753.5	619167.3	7.31			7.31	7.31	0.31		E
B52W	686768.7	619169.2	7.63			7.63			3.13	E
B70	686900.0	619141.4	5.80			5.80			-6.20	E
B71	686892.0	619099.9	6.69			6.69			4.19	E
B72	686855.1	619133.6	6.78			6.78			4.18	E
B73	686805.4	619075.4	5.81			5.81			-3.69	E
B74	686810.6	619115.9	6.75			6.75	5.15	-7.25		E
B74E	686817.0	619127.7	6.84			6.84	2.84	UD<1.84		E
B74N	686827.2	619113.8	6.85			6.85			1.85	E
B74W	686815.9	619095.7	6.23			6.23			1.23	E
B75	686766.7	619124.4	5.86			5.86	4.36	1.76		E
B75E	686769.1	619137.8	6.18			6.18	6.18	UD<2.68		E
B75S	686747.5	619124.7	5.69			5.69	5.69	UD<2.19		E
B75W	686767.2	619111.4	5.84			5.84			2.34	E
B76	686733.5	619068.9	5.97			5.97	4.87	1.97		E
B76E	686734.0	619083.3	6.06			6.06	6.06	3.06		E
B76N	686748.2	619070.8	5.86			5.86			0.86	E
B76S	686715.1	619067.1	6.20			6.20	2.20	UD<1.20		E
B76W	686734.6	619052.4	5.94			5.94			0.94	E
B77	686729.7	619135.4	5.62			5.62			-8.38	E
B78	686650.1	619107.2	6.33			6.33			-6.67	E
B79	686647.3	619187.4	5.35			5.35			-7.15	E
B80	686736.072	619166.819	6.80			6.80	3.80	-1.20		E
B81	686755.0	619156.7	6.47			6.47	4.47	-2.53		E
B82	686822.7	619146.6	6.88			6.88	4.88	1.88		E
B83	686792.5	619150.3	6.92			6.92	4.92	0.92		E
B84	686786.7	619116.8	6.17			6.17	4.17	0.17		E
B85	619114.3	686734.2	5.76			5.76	3.76	0.76		E
B85S	686714.5	619119.9	5.45			5.45	5.45	0.45		E
B86SE	686711.1	619181.1	6.69			6.69			0.69	E
B87	686730.2	619181.0	7.19			7.19			1.19	E
B88	686700.8	619085.9	6.31			6.31			0.31	E
B89	686697.8141	619112.032	5.58			5.58			-3.42	E
B90	686694.4787	619139.198	5.53			5.53	5.53	0.53		E
B91	686714.0403	619136.858	5.54			5.54	5.04	1.54		E
B92	686727.9726	619095.95	6.11			6.11			-3.89	E
B93	686743.0705	619152.036	6.17			6.17	6.17	1.17		E
B94	686788.962	619104.181	6.21			6.21	6.21	-1.79		E
B95	686791.7649	619171.392	7.83			7.83	7.83	2.83		E
B96	686822.2582	619174.705	7.74			7.74			-2.26	E
B97	686841.8586	619150.194	6.95			6.95			-3.05	E
B98	686840.6629	619122.885	6.86			6.86			-3.14	E
FE-1	686802.1268	619128.14	6.57			6.57	--	UD<0.57		E

TABLE 2
BORING COORDINATES AND MATERIAL TRANSITION SUMMARY
Metropolis Towers Site 156 - RAWP
Jersey City, Hudson County, New Jersey

Boring ID	Northing (ft)	Easting (ft)	Surface Elevation (ft)	Concrete Thickness (ft)	Concrete Contamination	Top of Soil Elevation	Bottom Elevation of Overlying Sample Meeting RSRS for CCPW-Related Metals [1]	Top Elevation of Underlying Sample Meeting RSRS for CCPW-Related Metals [2]	Bottom of Boring (Elevation)*	Area
FE-2	686786.7067	619148.054	6.80			6.80	--	-0.20		E
FE-3	686743.8254	619115.107	5.80			5.80	--	-2.20		E
PE-84	686748.0971	619104.064								E
PE-16	686,728.9	619,337.2	6.89			6.89			-5.61	F
PE-17	686,703.7	619,344.1	5.76			5.76			-4.74	F
PE-18	686,669.6	619,351.3	5.58			5.58			-6.92	F
PE-19	686,634.8	619,354.6	5.31			5.31			-7.19	F
PE-20	686,621.8	619,378.9	5.10			5.10			-7.40	F
PE-21	686,617.8	619,409.0	4.93			4.93			-7.57	F
PE-22	686,649.4	619,415.4	5.14			5.14			-7.36	F
PE-23	686,677.6	619,424.5	5.86			5.86			-2.64	F
PE-24	686,700.1	619,447.0	6.77			6.77	2.27	0.77		F
PE-24R/R2	686,680.1	619,446.3	6.36			6.36	2.86	-1.14		F
PE-36	686,705.7	619,473.9	7.02			7.02			2.52	F
PE-37	686,659.6	619,378.2	5.61			5.61	-0.89	-4.39		F
PE-38	686,699.2	619,389.6	6.44			6.44	3.94	0.44		F
PE-39	686,712.0	619,362.1	6.34			6.34	4.84	-1.66		F
PPG1-B12	686,649.9	619,456.4	5.75			5.75			-3.65	F
PPG1-B25	686,673.2	619,289.3	5.34			5.34			-3.46	F
PPG1-B47	686,643.5	619,377.2	5.28			5.28	0.48	-7.12		F
FF-1	686703.0726	619414.628	6.81			6.81	--	UD<-3.69		F
FF-2	686686.6869	619368.219	5.96			5.96	--	R1		F
FF-3	686673.8541	619400.522	5.59			5.59	--	R1		F
FF-4	686643.8398	619436.743	5.37			5.37	--	3.37		F
PE-64	686632.0012	619430.248	5.11			5.11	R1	R1		F
PE-65	686680.5423	619465.899	6.54			6.54			-6.46	F
PPG1-B48	686,585.9	619,446.9	6.03			6.03	1.73	-0.47		F-1
PPG1-B03	686,857.8	619,923.1	4.87			4.87			-10.13	--
PPG1-B11	686,595.0	619,377.6	6.11			6.11			-2.89	--
PPG1-B13	686,713.2	619,659.2	5.72			5.72			-3.58	--
PPG1-B14	686,634.1	619,598.4	7.75			7.75			-5.45	--
PPG1-B16	686,712.8	619,877.2	5.85			5.85			-2.95	--
PPG1-B17	686,587.8	619,509.6	7.83			7.83			-2.97	--
PPG1-B20	686,891.1	619,616.6	7.84			7.84			3.54	--
PPG1-B21	686,586.5	619,215.3	5.48			5.48				--
PPG1-B22	686,607.9	619,759.8	6.90			6.90				--
PPG1-B27	686,771.5	619,708.9	6.18			6.18			1.78	--
PPG1-B42	686,783.4	619,618.6	7.20			7.20			-5.80	--
PPG1-B43	686,879.8	619,577.1	7.31			7.31			-6.09	--
PPG1-B44	686,600.3	619,861.7	6.67			6.67			-5.63	--
PPG1-B45	686,546.2	619,655.6	6.88			6.88				--
PPG1-B49	686,603.5	619,310.7	6.08			6.08			-6.92	--
PPG1-B51	686,649.7	619,517.1	7.69			7.69				--
PPG1-B55	686,916.6	619,286.0	7.19			7.19			-7.21	--
PPG1-B60	686,931.7	619,712.9	6.98			6.98			6.48	--
PPG1-B61	686,889.3	619,808.2	6.73			6.73			5.23	--
PPG1-B64	686,947.9	619,232.6	5.76			5.76			1.16	--
PPG1-B65	686,952.8	619,269.6	5.78			5.78			0.68	--
PPG1-B67	686,806.2	619,604.3	7.62			7.62			6.62	--
PPG1-B68	686,741.0	619,212.2	8.84			8.84			1.84	--
PPG1-MW1	686,980.9	619,430.6	6.46			6.46				--
PPG1-MW4	686,586.6	619,508.3	7.57			7.57				--
PPG1-MW5	686,913.8	619,293.9	7.10			7.10				--
PPG1-B15			10.18			10.18			-0.82	--
PPG1-B18			8.05			8.05			3.75	--
PPG1-B19			7.48			7.48			-1.02	--
PPG1-B32			7.48			7.48			6.28	--
PPG1-B33			11.52			11.52			-5.48	--
PPG1-B34			7.01			7.01			-2.19	--
PPG1-B35			6.96			6.96			-9.04	--
PPG1-B36			7.89			7.89			-4.51	--
PPG1-B37			7.13			7.13			-4.47	--
PPG1-B38			7.41			7.41			-3.19	--
PPG1-B39										
PPG1-B40										
PPG1-B41										
PPG1-B48										
PPG1-B51										
PPG1-B59										
PPG1-M01			7.56							
PPG1-M02			9.47							
PPG1-M03			7.05							
PPG1-M04			8.67							
PPG1-M05			8.20							

REF - Indicates that the boring did not reach completion due to encountering refusal
R1 - Indicates that the sample for this interval did not pass data validation
* - Elevation based on surrounding finished floor prior to demolition
NI - Indicates that the boring was not installed
UD< - Indicates that the deepest sample obtained from a boring exceeded Cr+6 regulatory limits, and as a result the elevation could not be determined
[1] -- Indicates that the boring was focused on evaluating the underlying sample elevation only
[2] Blank cell indicates that all samples to bottom of boring met RSRS for CCPW-related materials

TABLE 3

REMEDIAL ACTION COST ESTIMATE
Metropolis Towers Site 156 RAWP
Jersey City, Hudson County, New Jersey

	ITEM	***ESTIMATED COST***
1	Pre-Construction Engineering	$695,000
2	Treatment Plant Installation and Operation	$1,250,000
3	Air Monitoring During Construction	$315,000
4	Work Area A Remediation - N Bldg 1	$149,000
5	Work Area B Remediation - NW of Bldg 1	$128,000
6	Work Area C Remediation - Central Area.	$5,116,000
7	Work Area D Remediation - SE Corner Bldg 1	$170,000
8	Work Area E Remediation - West of Bldg 1	$1,320,000
9	Work Area F & F-1 Remediation - South of Central Area	$1,440,000
10	Engineering During Construction	$140,000
11	Remedial Action Report	$100,000
12	Post Remedial Project Closeout	$288,000
	ESTIMATED TOTAL:	$11,111,000

FIGURES

REFERENCE:
USGS 7.5 MIN. TOPOGRAPHIC QUADRANGLE
JERSEY CITY, N.J. – N.Y. DATED 1967.
PHOTOREVISED 1981.

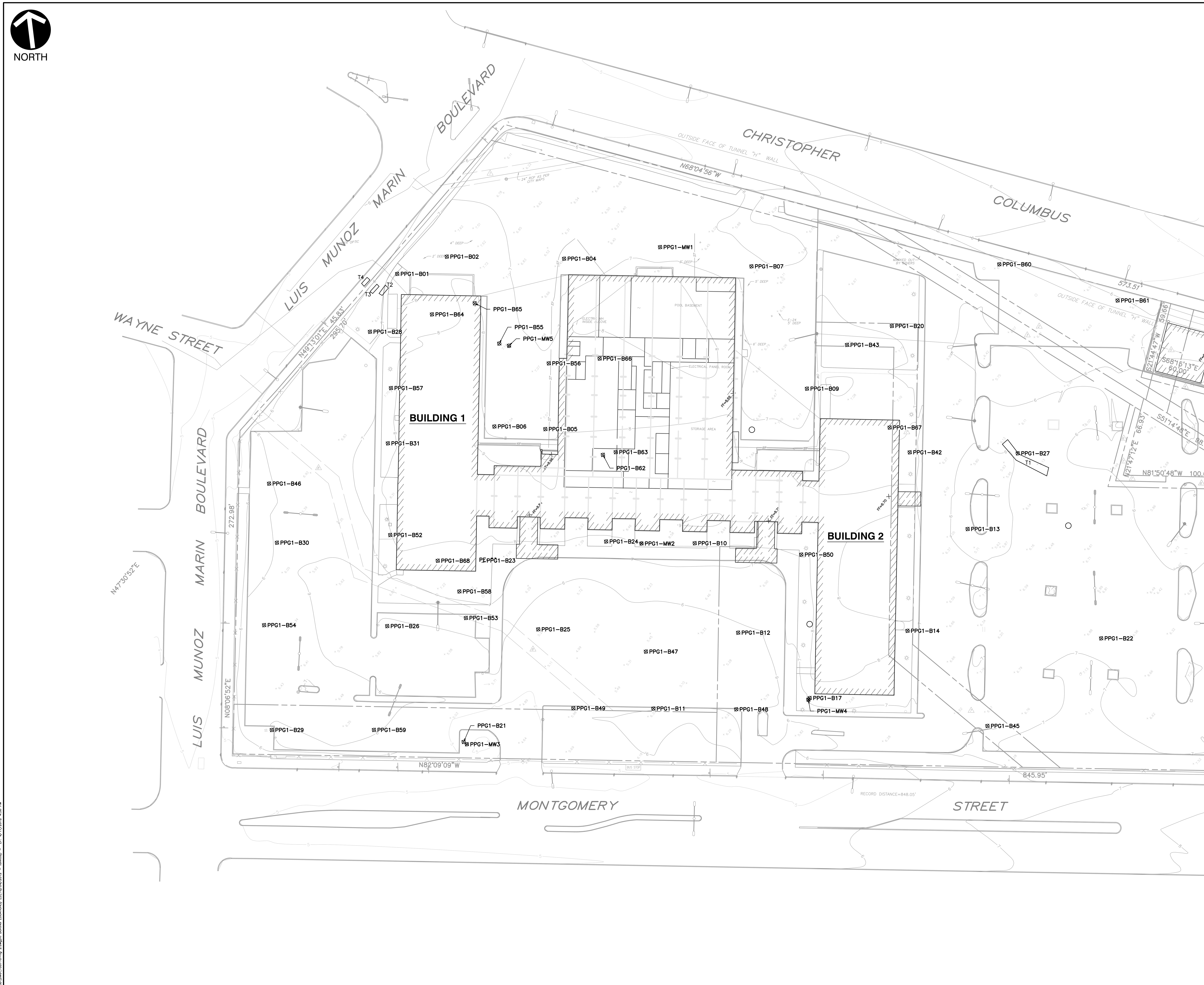
SCALE IN FEET
0 2000 4000

Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
(412)429-2324 • (800)365-2324
Chicago, IL • Cincinnati, OH • Columbus, OH • Indianapolis, IN • Nashville, TN • St. Louis, MO

SITE LOCATION MAP
PPG INDUSTRIES, INC.
METROPOLIS TOWERS
JERSEY CITY, N.J. – N.Y.

DWN. BY: KAP	SCALE:	DATE:	PROJECT NO.:	
CHKD. BY: ETM	1"=2000'	7/26/06	211603.0007	FIGURE 1

\\SVR-PITTSBURGH\PROJECTS\2010\100-710\-CADD\DWG\100710-FIG1.DWG{SITE LOCATION MAP} (LCOLAIZZI) - AUG 11, 2010 - 14:20



REVISION RECORD

DATE	DESCRIPTION

Legend

- PPG1-B01 — REMEDIAL INVESTIGATION BORING LOCATION
- PPG1-MW1 — REMEDIAL INVESTIGATION MONITORING WELL LOCATION
- T1 — TEST PIT

SCALE IN FEET
0 30 60

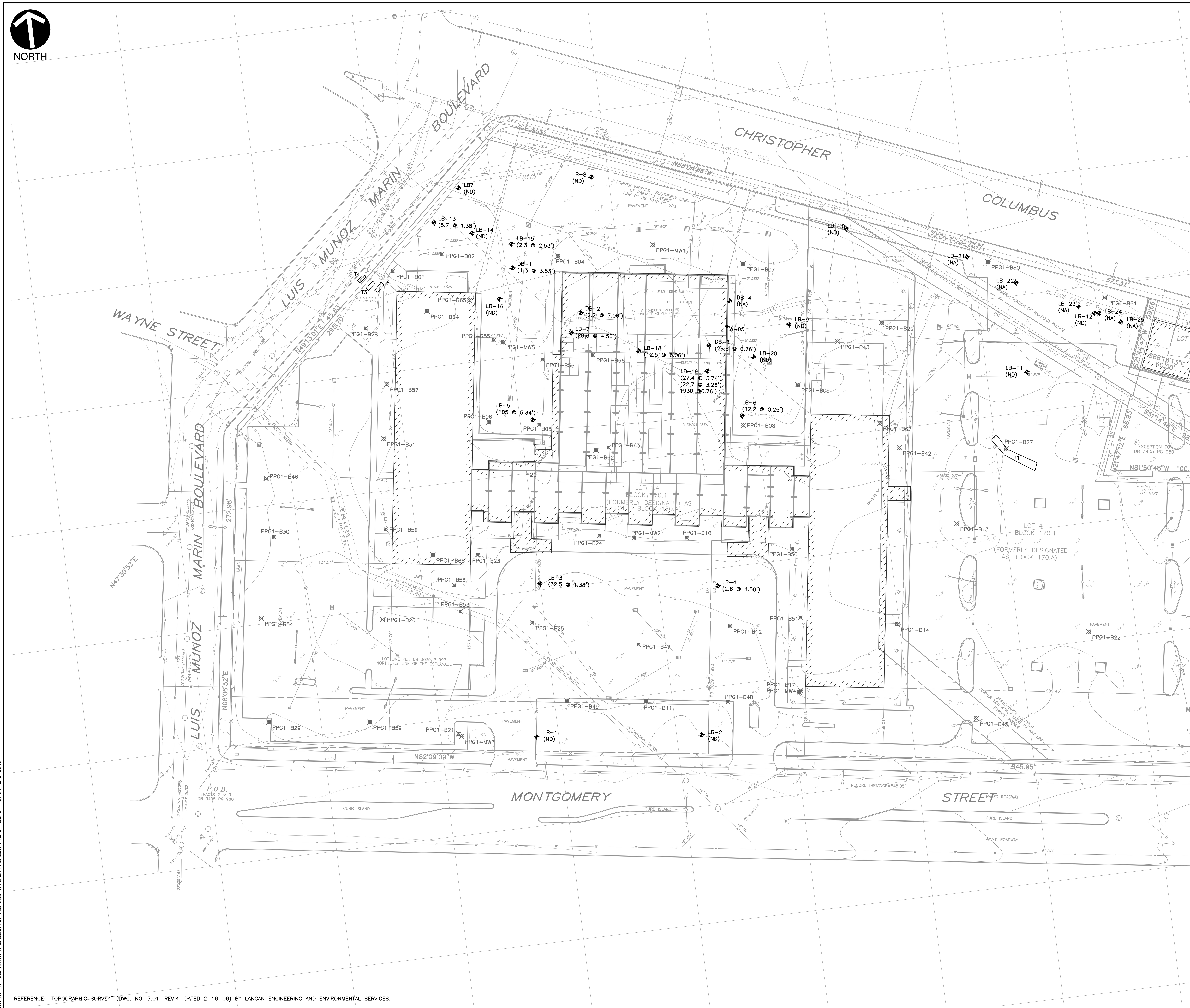
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
(412)429-2324 • (800)365-2324
Chicago, IL • Cincinnati, OH • Columbus, OH • Indianapolis, IN • Nashville, TN • St. Louis, MO

PPG INDUSTRIES, INC.
METROPOLIS TOWERS REMEDIAL INVESTIGATION
JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 05/22/06	APPROVED BY:	DWN BY: JSC
SCALE: 1"=30'	ETM	CHKD. BY: ETM
REMEDIAL INVESTIGATION BORING LOCATIONS		SHEET
		DRAWING NUMBER **FIGURE 2**

REFERENCE:
1. "TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.
2. DRAFT REMEDIAL INVESTIGATION REPORT - GREGORY PARK APARTMENTS, SITE 156 BY ICF KAISER ENGINEERS, DATED 9-29-93.

P:\2010\100-710\-CADD\DWG\100710-fig 2.dwg{RI BO



REVISION RECORD

DATE	DESCRIPTION

Legend

PPG1-B01	REMEDIAL INVESTIGATION BORING LOCATION
PPG1-MW1	REMEDIAL INVESTIGATION MONITORING WELL LOCATION
LB-12 (ND)	METROVEST SOIL BORING LOCATION (LB-1 THROUGH LB-25 & DB-1 THROUGH DB-4)
(ND)	NOT DRILLED
(NA)	NOT ANALYZED
(12.1@0.25')	HEX. CR CONCENTRATION AT FT BELOW GROUND SURFACE

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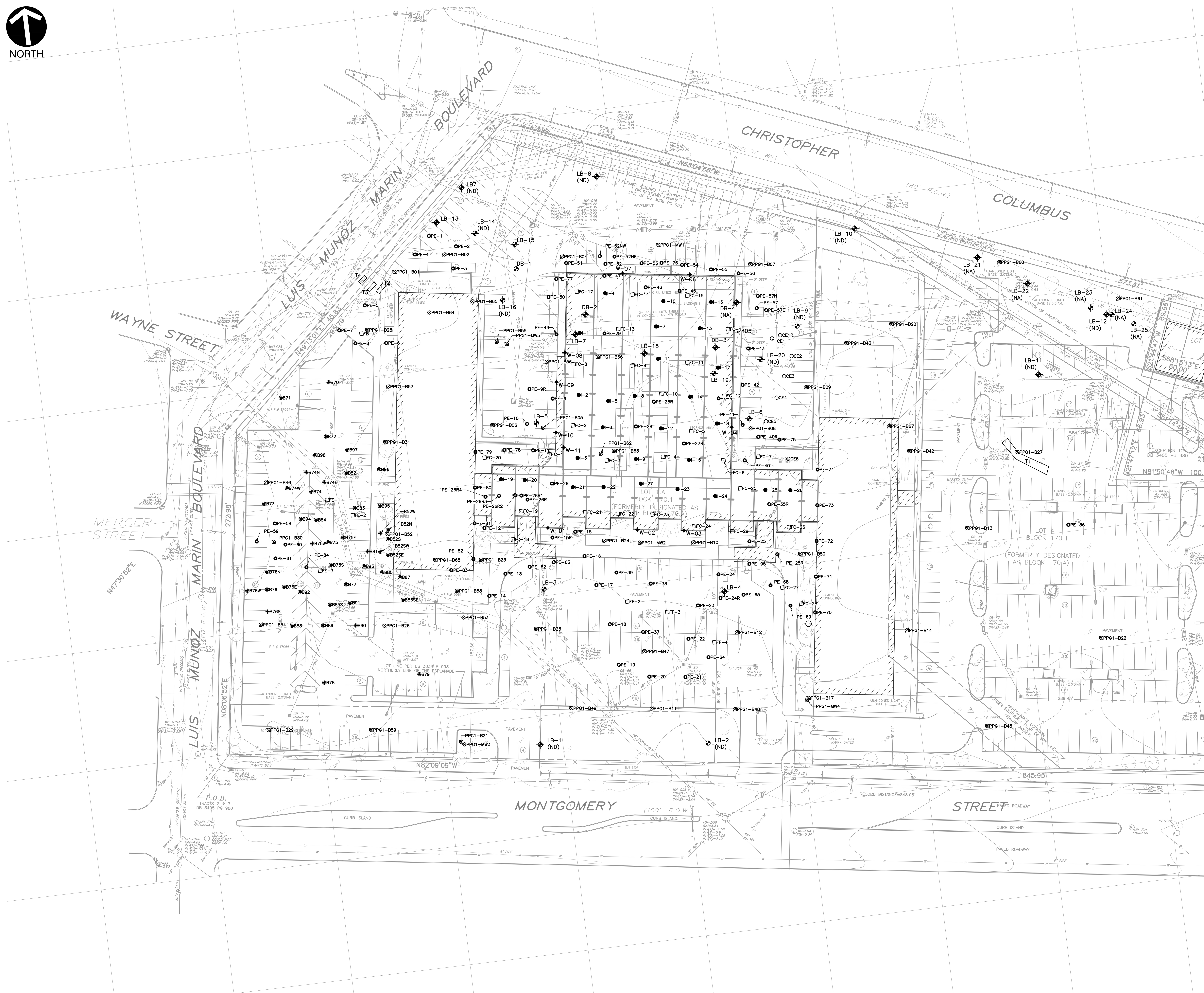
PPG INDUSTRIES, INC.
METROPOLIS TOWERS REMEDIAL INVESTIGATION
JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 05/22/06	APPROVED BY: ETM	DWN BY: JSC
SCALE: 1"=30'		CHKD. BY: ETM
LANGAN INVESTIGATION BORING LOCATIONS		SHEET / DRAWING NUMBER **FIGURE 3**

REVISION RECORD

DATE	DESCRIPTION



Legend

Symbol	Description
PPG1–B01	REMEDIAL INVESTIGATION BORING LOCATION
PPG1–MW1	REMEDIAL INVESTIGATION MONITORING WELL LOCATION
LB–12 (ND)	METROVEST SOIL BORING LOCATION (LB–1 THROUGH LB–25 & DB–1 THROUGH DB–4)
I–2	CONCRETE CORE AND OVERBURDEN BORING LOCATION
PE–1	POST–EXCAVATION DELINEATION BORING LOCATION
W–01	WALL SAMPLE LOCATION

NOTE:
PE–30 THROUGH PE–35 DESIGNATIONS FOR BORINGS WERE NOT USED.

REFERENCE: "TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2–16–06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

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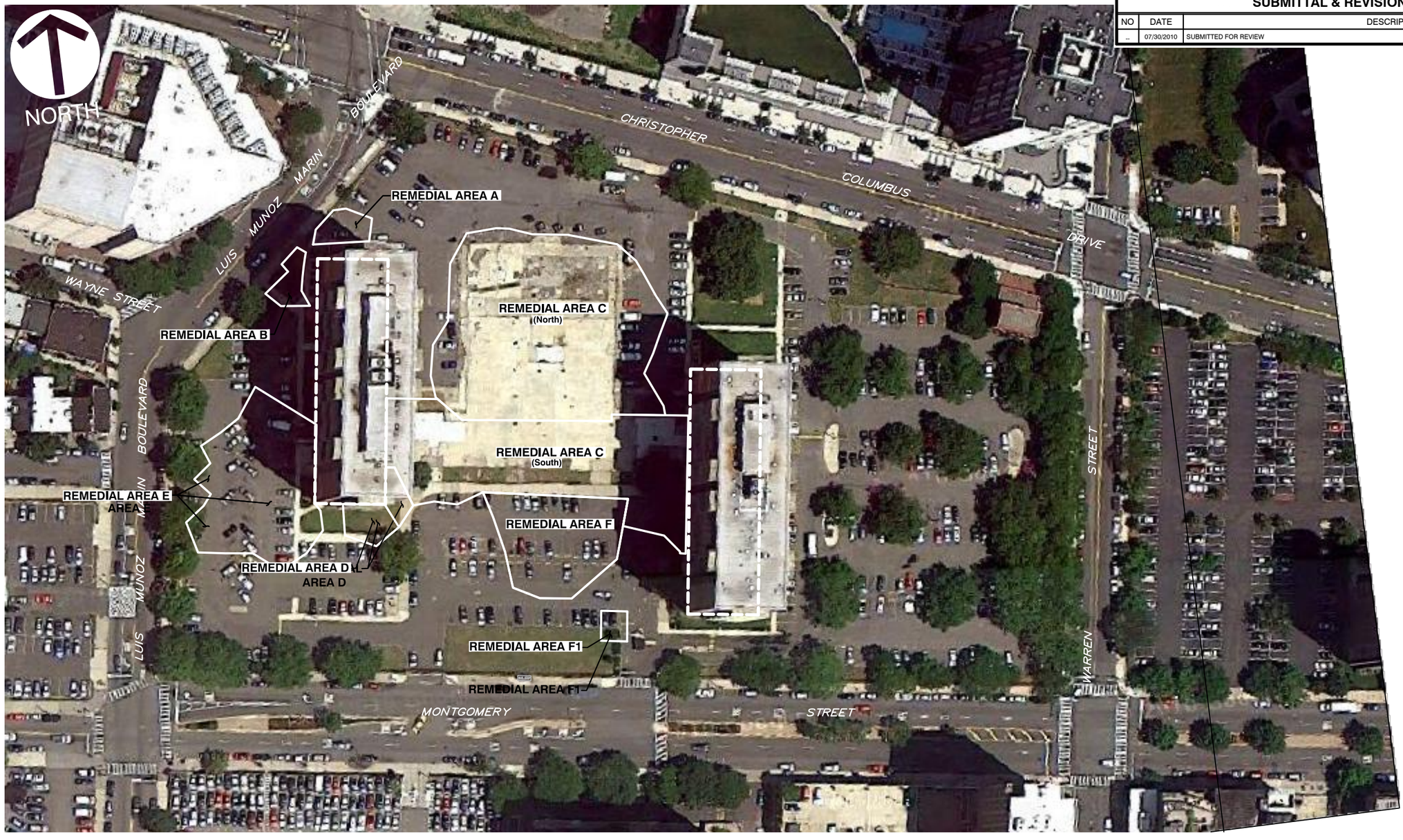
PPG INDUSTRIES, INC.
METROPOLIS TOWERS REMEDIAL INVESTIGATION
JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 05/22/06	APPROVED BY: ETM	DWN BY: JSC
SCALE: 1"=30'		CHKD. BY: ETM
PRE–REMEDIAL BORING LOCATIONS		SHEET
		DRAWING NUMBER
		FIGURE 4



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
..	07/30/2010	SUBMITTED FOR REVIEW

LEGEND

LIMIT OF REMEDIAL AREA

BASE OF BUILDING AT GROUND LEVEL

SCALE IN FEET

0 100 200

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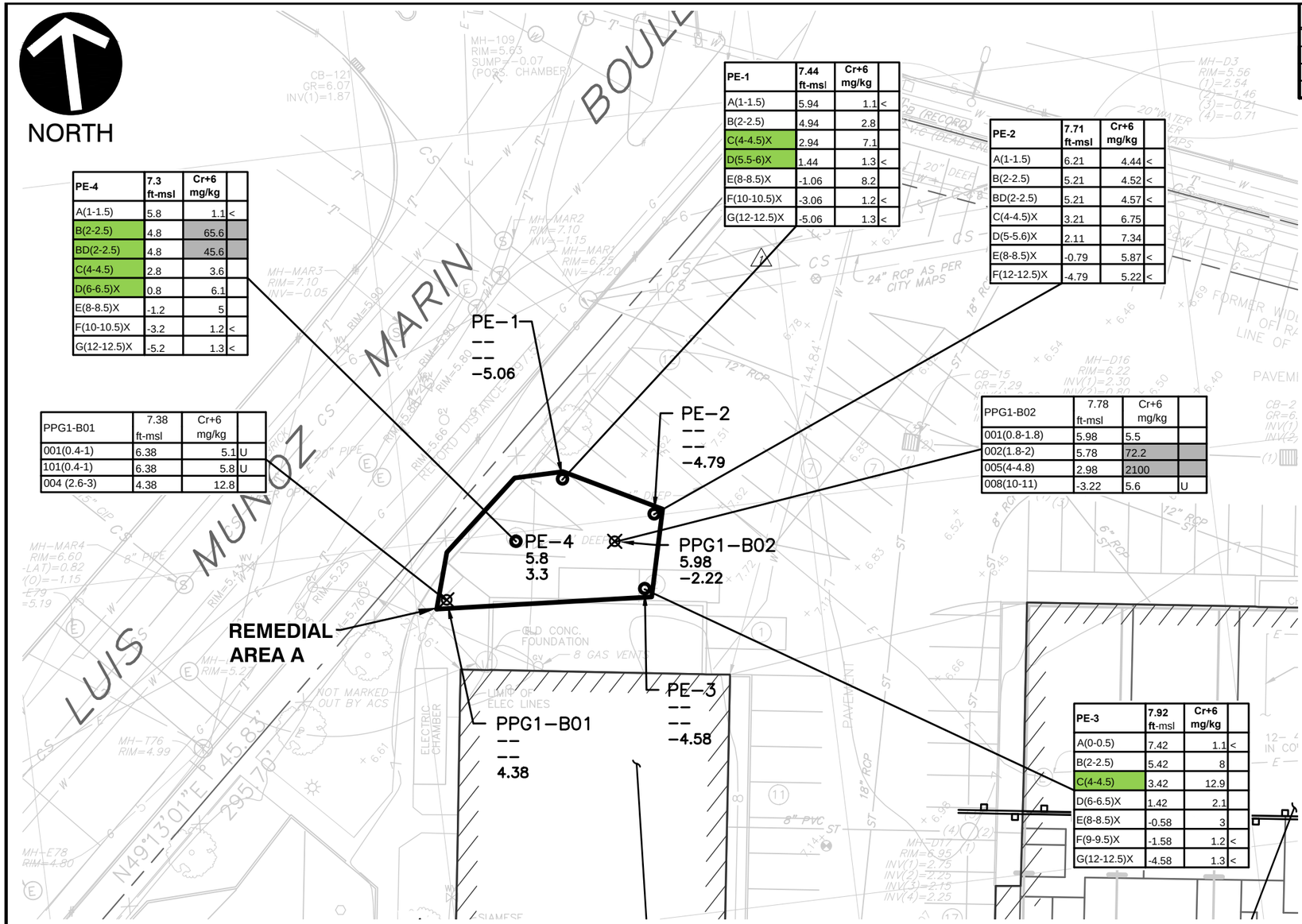
LOCATIONS OF REMEDIAL ACTION AREAS
PPG INDUSTRIES, INC.
METROPOLIS TOWERS RAWP
JERSEY CITY, HUDSON COUNTY, N.J.

DWN. BY: RLS/LKC	SCALE:	DATE:	PROJECT NO.:	DRAWING NUMBER
CHKD. BY: *ETM	1"=100'	07/30/2010	100-710	FIGURE 5

*HAND SIGNATURE ON FILE

P:\2010\100-710\-CADD\DWG\100710-fig 5.dwg[LOCATIONS OF RA AREAS] LS:(17/04/2012 - tdivittis) - LP: 4/17/2012 4:47 PM



PE-4	7.3 ft-msl	Cr+6 mg/kg	
A(1-1.5)	5.8	1.1	<
B(2-2.5)	4.8	65.6	
BD(2-2.5)	4.8	45.6	
C(4-4.5)	2.8	3.6	
D(6-6.5)X	0.8	6.1	
E(8-8.5)X	-1.2	5	
F(10-10.5)X	-3.2	1.2	<
G(12-12.5)X	-5.2	1.3	<

PE-1	7.44 ft-msl	Cr+6 mg/kg	
A(1-1.5)	5.94	1.1	<
B(2-2.5)	4.94	2.8	
C(4-4.5)X	2.94	7.1	
D(5.5-6)X	1.44	1.3	<
E(8-8.5)X	-1.06	8.2	
F(10-10.5)X	-3.06	1.2	<
G(12-12.5)X	-5.06	1.3	<

PE-2	7.71 ft-msl	Cr+6 mg/kg	
A(1-1.5)	6.21	4.44	<
B(2-2.5)	5.21	4.52	<
BD(2-2.5)	5.21	4.57	<
C(4-4.5)X	3.21	6.75	
D(5-5.6)X	2.11	7.34	
E(8-8.5)X	-0.79	5.87	<
F(12-12.5)X	-4.79	5.22	<

PPG1-B01	7.38 ft-msl	Cr+6 mg/kg	
001(0.4-1)	6.38	5.1	U
101(0.4-1)	6.38	5.8	U
004 (2.6-3)	4.38	12.8	

PPG1-B02	7.78 ft-msl	Cr+6 mg/kg	
001(0.8-1.8)	5.98	5.5	
002(1.8-2)	5.78	72.2	
005(4-4.8)	2.98	2100	
008(10-11)	-3.22	5.6	U

PE-3	7.92 ft-msl	Cr+6 mg/kg	
A(0-0.5)	7.42	1.1	<
B(2-2.5)	5.42	8	
C(4-4.5)	3.42	12.9	
D(6-6.5)X	1.42	2.1	
E(8-8.5)X	-0.58	3	
F(9-9.5)X	-1.58	1.2	<
G(12-12.5)X	-4.58	1.3	<

SCALE IN FEET

0 30 60

NOTE

1. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.
2. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 19.

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
..	07/30/2010	SUBMITTED FOR REVIEW
..	04/17/2012	REVISED PER COMMENTS
..	11/16/2012	SUBMISSION

LEGEND

LIMIT OF REMEDIAL AREA

PPG1-B01 / -- / -- / 4.38 — REMEDIAL INVESTIGATION BORING LOCATION

PE-1 / -- / -- / -5.06 — PRE-EXCAVATION DELINEATION BORING LOCATION

DEPTH LEGEND

PPG1-B02 / 5.98 / -2.22

- LOCATION SYMBOL
- LOCATION DESIGNATION
- ELEVATION (FT-MSL) AT BOTTOM OF OVERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS
- ELEVATION (FT-MSL) AT TOP OF UNDERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

PE-1 / -- / -- / -5.06

- LOCATION SYMBOL
- LOCATION DESIGNATION
- NO VALUE
- ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATIONS

CHEMICAL RESULTS LEGEND

Green Shading Indicates Exceedance of NON-CCPW Related RSRS

Boring

Approximate Surface Elevation

Gray Shading Indicates Exceedance of CCPW-Related Metal

PE-1	7.6 ft-msl	Cr+6 mg/kg	
A(1-1.5)	6.1	1.1	<

Sample(Depth Interval) "X" indicates groundwater presence

Bottom Sample Elevation

Value

Additional Data

CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

ISOCONCENTRATION MAPS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF MEASURED CONCENTRATION AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. CHEMICAL CONCENTRATIONS BETWEEN SAMPLING POINTS MAY DIFFER.

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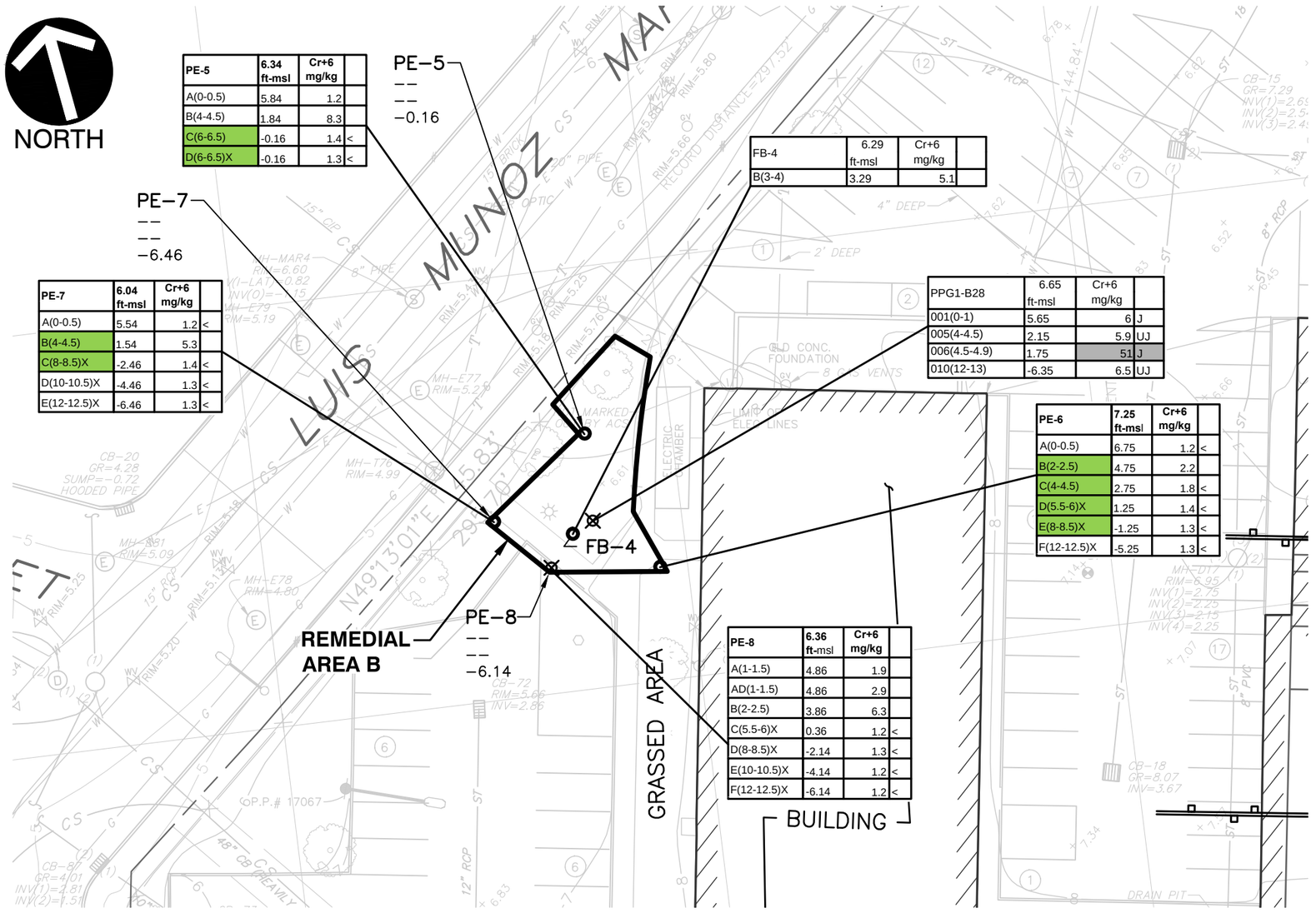
REMEDIAL AREA A DETAIL
PPG INDUSTRIES, INC.
METROPOLIS TOWERS RAWP
JERSEY CITY, HUDSON COUNTY, N.J.

DWN. BY: TCN/LKC	SCALE:	DATE:	PROJECT NO.:	
CHKD. BY: *ETM	1"=30'	07/30/2010	100-710	FIGURE 6

*HAND SIGNATURE ON FILE



PE-5	6.34 ft-msl	Cr+6 mg/kg	
A(0-0.5)	5.84	1.2	
B(4-4.5)	1.84	8.3	
C(6-6.5)	-0.16	1.4	<
D(6-6.5)X	-0.16	1.3	<

FB-4	6.29 ft-msl	Cr+6 mg/kg	
B(3-4)	3.29	5.1	

PE-7	6.04 ft-msl	Cr+6 mg/kg	
A(0-0.5)	5.54	1.2	<
B(4-4.5)	1.54	5.3	
C(8-8.5)X	-2.46	1.4	<
D(10-10.5)X	-4.46	1.3	<
E(12-12.5)X	-6.46	1.3	<

PPG1-B28	6.65 ft-msl	Cr+6 mg/kg	
001(0-1)	5.65	6	J
005(4-4.5)	2.15	5.9	UJ
006(4.5-4.9)	1.75	51	J
010(12-13)	-6.35	6.5	UJ

PE-6	7.25 ft-msl	Cr+6 mg/kg	
A(0-0.5)	6.75	1.2	<
B(2-2.5)	4.75	2.2	
C(4-4.5)	2.75	1.8	<
D(5.5-6)X	1.25	1.4	<
E(8-8.5)X	-1.25	1.3	<
F(12-12.5)X	-5.25	1.3	<

PE-8	6.36 ft-msl	Cr+6 mg/kg	
A(1-1.5)	4.86	1.9	
AD(1-1.5)	4.86	2.9	
B(2-2.5)	3.86	6.3	
C(5.5-6)X	0.36	1.2	<
D(8-8.5)X	-2.14	1.3	<
E(10-10.5)X	-4.14	1.2	<
F(12-12.5)X	-6.14	1.2	<

SCALE IN FEET

0 30 60

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

NOTE

1. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.
2. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 17.

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
..	07/30/2010	SUBMITTED FOR REVIEW
..	04/17/2012	REVISED PER COMMENTS
..	11/16/2012	SUBMISSION

LEGEND

LIMIT OF REMEDIAL AREA

PPG1-B28 — REMEDIAL INVESTIGATION BORING LOCATION
2.15
<1.75

PE-7 — PRE-EXCAVATION DELINEATION BORING LOCATION
--
--
-6.46

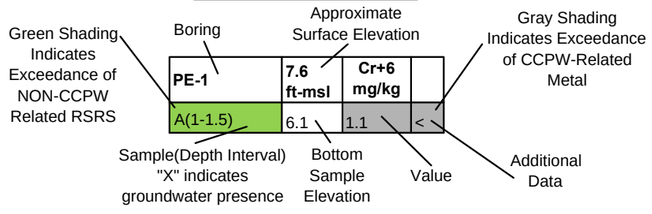
DEPTH LEGEND

PPG1-B28 — LOCATION SYMBOL
2.15 — LOCATION DESIGNATION
<1.75 — ELEVATION (FT-MSL) AT BOTTOM OF OVERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS
ELEVATION (FT-MSL) AT TOP OF UNDERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

PE-7 — LOCATION SYMBOL
-- — LOCATION DESIGNATION
-- — NO VALUE
-6.46 — ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATION

CHEMICAL RESULTS LEGEND

Chemical Results Legend



CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

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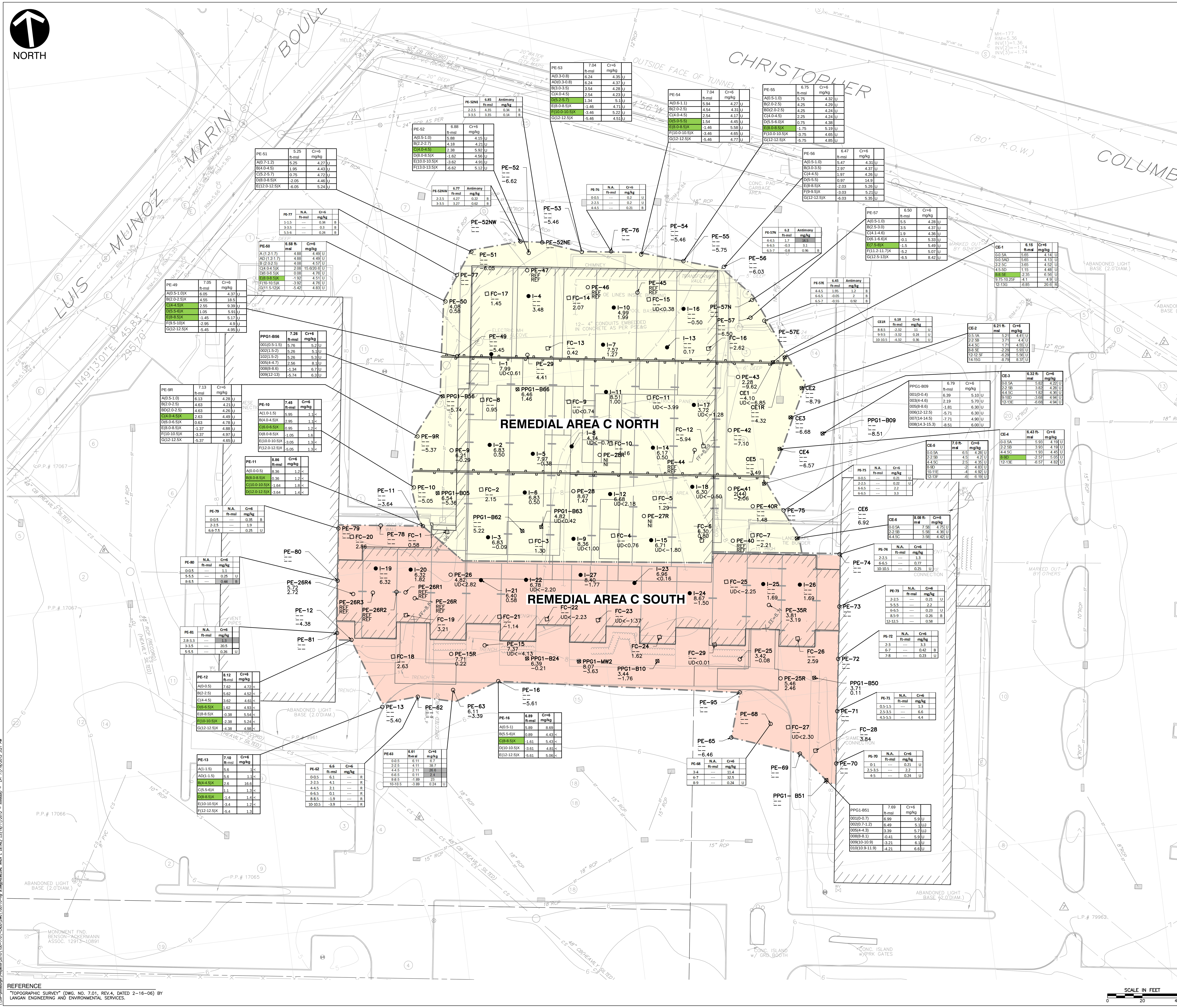
REMEDIAL AREA B DETAIL
PPG INDUSTRIES, INC.
METROPOLIS TOWERS RAWP
JERSEY CITY, HUDSON COUNTY, N.J.

DWN. BY: TCN/LKC	SCALE:	DATE:	PROJECT NO.:	
CHKD. BY: *ETM	1"=30'	07/30/2010	100-710	FIGURE 7

*HAND SIGNATURE ON FILE



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	4/17/2012	SUBMISSION
--	11/16/2012	SUBMISSION

LEGEND

- PPG1-B01 — REMEDIAL INVESTIGATION BORING LOCATION
- PPG1-MW1 — REMEDIAL INVESTIGATION MONITORING WELL LOCATION
- LB-12 (ND) — METROVEST SOIL BORING LOCATION (LB-1 THROUGH LB-25 & DB-1 THROUGH DB-4)
- I-2 — CONCRETE CORE AND OVERBURDEN BORING LOCATION
- PE-1 — PRE-EXCAVATION DELINEATION BORING LOCATION
- LIMIT OF REMEDIAL AREA
- SHEET PILE WALL LOCATION (LIMIT OF REMEDIAL AREA)
- REMEDIAL AREA C NORTH
- REMEDIAL AREA C SOUTH

DEPTH LEGEND

PE-43 / 2.28 / -9.62:
- LOCATION SYMBOL
- LOCATION DESIGNATION
- ELEVATION (FT-MSL) AT BOTTOM OF OVERLYING SOIL SAMPLE INTERVALMEETING RSRS FOR CCPW-RELATED METALS
- ELEVATION (FT-MSL) AT TOP OF UNDERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

PE-42 / -- / -7.1:
- LOCATION SYMBOL
- LOCATION DESIGNATION
- NO VALUE
- ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATION

PE-46 / REF / REF:
- LOCATION SYMBOL
- LOCATION DESIGNATION
- REFUSAL

PE-28R / NI / NI:
- LOCATION SYMBOL
- LOCATION DESIGNATION
- NOT INSTALLED

CHEMICAL RESULTS LEGEND

PE-1	7.6 ft-msl	Cr+6 mg/kg	
A(1-1.5)	6.1	1.1	<

- Boring
- Approximate Surface Elevation
- Green Shading Indicates Exceedance of NON-CCPW Related RSRS
- Gray Shading Indicates Exceedance of CCPW-Related Metal
- Sample(Depth Interval) "X" indicates groundwater presence
- Bottom Sample Elevation
- Value
- Additional Data

CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

ISOCONCENTRATION MAPS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF MEASURED CONCENTRATION AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. CHEMICAL CONCENTRATIONS BETWEEN SAMPLING POINTS MAY DIFFER.

GENERAL NOTES

1. SEE FIGURES 13, 18 AND 19 FOR ADDITIONAL AREA C NORTH LAYOUT 2 DETAILS.
2. SEE FIGURES 14, 20 AND 21 FOR ADDITIONAL AREA C SOUTH LAYOUT 3 DETAILS.
3. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 19.
4. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

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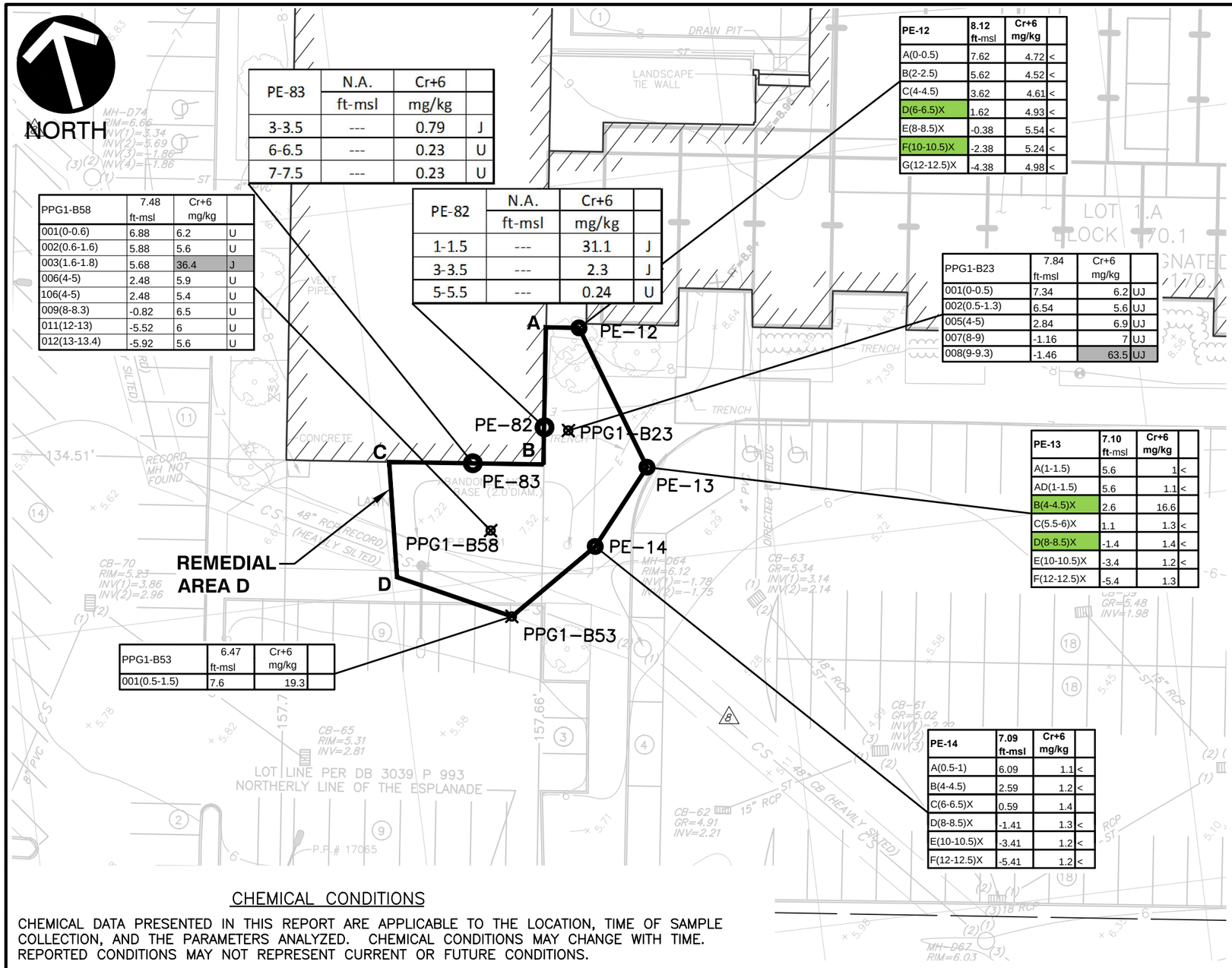
PPG INDUSTRIES, INC.
METROPOLIS TOWERS RAWP
JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 07/20/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: JSC/LKC
SCALE: 1"=20'		CHKD. BY: ETM
REMEDIAL AREA C DETAIL		SHEET 1 OF 1
		DRAWING NUMBER **FIGURE 8**



CHEMICAL CONDITIONS

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NOTE

1. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.
2. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 21.

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
..	04/17/2012	REVISED PER COMMENTS
..	11/16/2012	SUBMISSION

Legend

PPG1-B01 — REMEDIAL INVESTIGATION BORING LOCATION

PE-1 — PRE-EXCAVATION DELINEATION BORING LOCATION

REMEDIAL BOUNDARY AREA

DEPTH LEGEND

PPG1-B28 — LOCATION SYMBOL AND LOCATION DESIGNATION

2.15 — ELEVATION (FT-MSL) AT BOTTOM OF OVERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

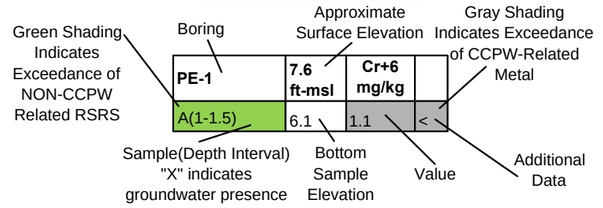
<1.75 — ELEVATION (FT-MSL) AT TOP OF UNDERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

PE-7 — LOCATION SYMBOL AND LOCATION DESIGNATION

-- / -- — NO VALUE

-6.46 — ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATION

Chemical Results Legend



NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SCALE IN FEET

0 30 60

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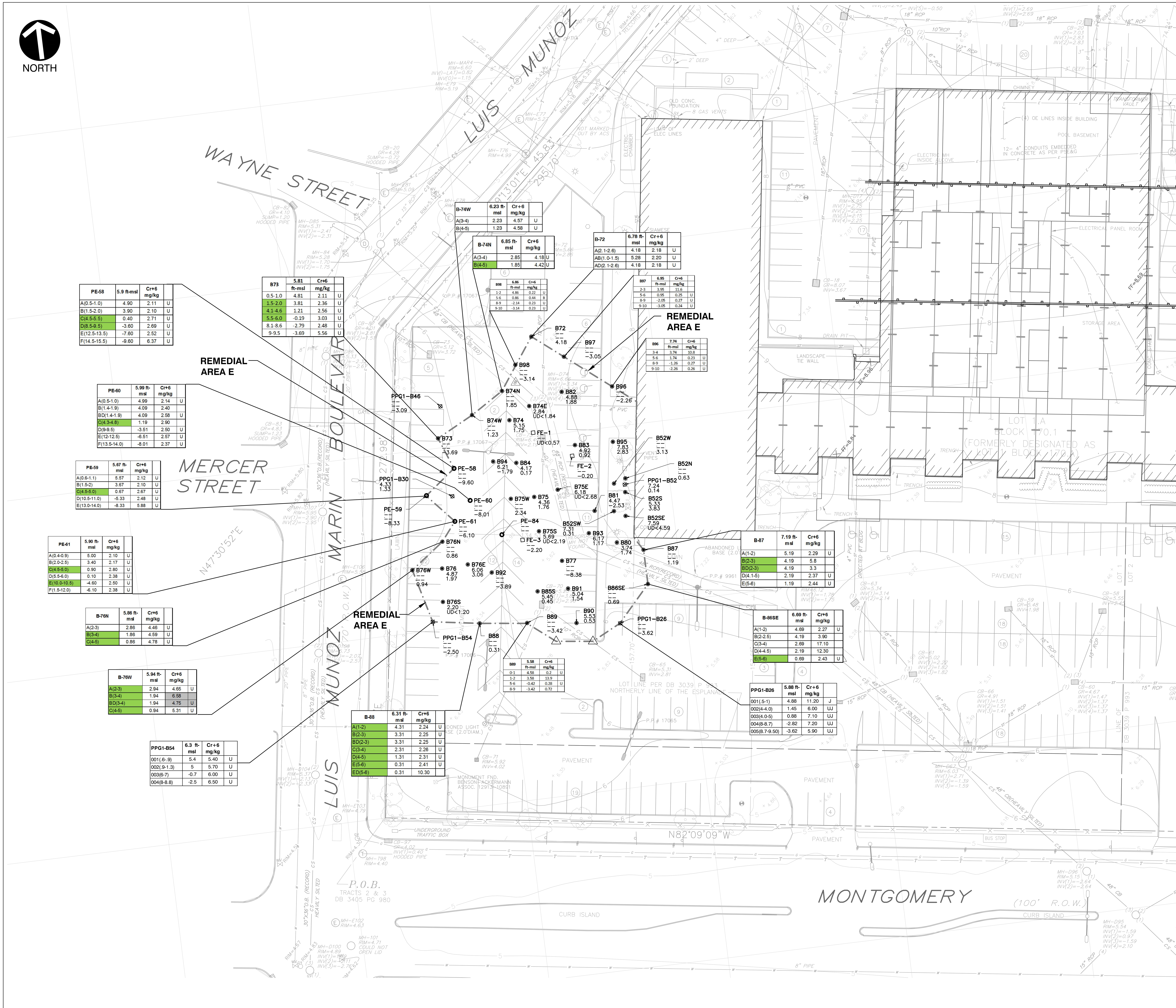
DWN. BY:	SCALE:	DATE:	PROJECT NO.:	
TCN	1"=30'	07/30/2010	100-710	FIGURE 9
CHKD. BY: *ETM				

REMEDIAL AREA D DETAIL
PPG INDUSTRIES, INC.
METROPOLIS TOWERS RAWP
JERSEY CITY, HUDSON COUNTY, N.J.

*HAND SIGNATURE ON FILE



PE-58	5.9 ft-msl	Cr+6 mg/kg	
A(0.5-1.0)	4.90	2.11	U
B(1.5-2.0)	3.90	2.10	U
C(4.5-5.5)	0.40	2.71	U
D(8.5-9.5)	-3.60	2.69	U
E(12.5-13.5)	-7.60	2.52	U
F(14.5-15.5)	-9.60	6.37	U

B73	5.81 ft-msl	Cr+6 mg/kg	
0.5-1.0	4.81	2.11	U
1.5-2.0	3.81	2.36	U
4.1-4.6	1.21	2.56	U
5.5-6.0	-0.19	3.03	U
8.1-8.6	-2.79	2.48	U
9-9.5	-3.69	5.56	U

PE-60	5.99 ft-msl	Cr+6 mg/kg	
A(0.5-1.0)	4.99	2.14	U
B(1.4-1.9)	4.09	2.40	
BD(1.4-1.9)	4.09	2.58	U
C(4.3-4.8)	1.19	2.90	
D(9-9.5)	-3.51	2.50	U
E(12-12.5)	-6.51	2.57	U
F(13.5-14.0)	-8.01	2.37	U

PE-59	5.67 ft-msl	Cr+6 mg/kg	
A(0.6-1.1)	5.57	2.12	U
B(1.5-2)	3.67	2.10	U
C(4.5-5.0)	0.67	2.67	U
D(10.5-11.0)	-5.33	2.48	U
E(13.0-14.0)	-8.33	5.88	U

PE-61	5.90 ft-msl	Cr+6 mg/kg	
A(0.4-0.9)	5.00	2.10	U
B(2.0-2.5)	3.40	2.17	U
C(4.5-5.0)	0.90	2.80	U
D(5.5-6.0)	0.10	2.38	U
E(10.0-10.5)	-4.60	2.50	U
F(1.5-12.0)	-6.10	2.38	U

B-76N	5.86 ft-msl	Cr+6 mg/kg	
A(2-3)	2.86	4.46	U
B(3-4)	1.86	4.59	U
C(4-5)	0.86	4.78	U

B-76W	5.94 ft-msl	Cr+6 mg/kg	
A(2-3)	2.94	4.65	U
B(3-4)	1.94	6.58	
BD(3-4)	1.94	4.75	U
C(4-5)	0.94	5.31	U

PPG1-B54	6.3 ft-msl	Cr+6 mg/kg	
001(.6-.9)	5.4	5.40	U
002(.9-1.3)	5	5.70	U
003(6-7)	-0.7	6.00	U
004(8-8.8)	-2.5	6.50	U

B-74W	6.23 ft-msl	Cr+6 mg/kg	
A(3-4)	2.23	4.57	U
B(4-5)	1.23	4.58	U

B-74N	6.85 ft-msl	Cr+6 mg/kg	
A(3-4)	2.85	4.18	U
B(4-5)	1.85	4.42	U

B98	6.86 ft-msl	Cr+6 mg/kg	
1-2	4.86	0.22	U
5-6	0.86	0.44	B
8-9	-2.14	0.23	U
9-10	-3.14	0.23	U

B-72	6.78 ft-msl	Cr+6 mg/kg	
A(2.1-2.6)	4.18	2.18	U
AB(1.0-1.5)	5.28	2.20	U
AD(2.1-2.6)	4.18	2.18	U

B97	6.95 ft-msl	Cr+6 mg/kg	
2-3	3.95	11.6	
5-6	0.95	0.25	U
8-9	-2.05	0.27	U
9-10	-3.05	0.24	U

B96	7.74 ft-msl	Cr+6 mg/kg	
3-4	3.74	10.8	
5-6	1.74	0.23	U
8-9	-1.26	0.27	U
9-10	-2.26	0.26	U

B-87	7.19 ft-msl	Cr+6 mg/kg	
A(1-2)	5.19	2.29	U
B(2-3)	4.19	5.8	
BD(2-3)	4.19	3.3	
D(4.1-5)	2.19	2.37	U
E(5-6)	1.19	2.44	U

B-86SE	6.69 ft-msl	Cr+6 mg/kg	
A(1-2)	4.69	2.27	U
B(2-2.5)	4.19	3.90	
C(3-4)	2.69	17.10	
D(4-4.5)	2.19	12.30	
E(5-6)	0.69	2.43	U

B89	5.58 ft-msl	Cr+6 mg/kg	
0-1	4.58	0.2	U
1-2	3.58	13.9	
5-6	-0.42	0.28	U
8-9	-3.42	0.72	

PPG1-B26	5.88 ft-msl	Cr+6 mg/kg	
001(.5-1)	4.88	11.20	J
002(4-4.0)	1.45	6.00	UJ
003(4.0-5)	0.88	7.10	UJ
004(8-8.7)	-2.82	7.20	UJ
005(8.7-9.50)	-3.62	5.90	UJ

B-88	6.31 ft-msl	Cr+6 mg/kg	
A(1-2)	4.31	2.24	U
B(2-3)	3.31	2.25	U
BD(2-3)	3.31	2.25	U
C(3-4)	2.31	2.26	U
D(4-5)	1.31	2.31	U
E(5-6)	0.31	2.41	U
ED(5-6)	0.31	10.30	

REFERENCE
"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	4/12/2012	SUBMISSION
--	11/16/2012	SUBMISSION

LEGEND

PPG1-B26	REMEDIAL INVESTIGATION BORING LOCATION
PPG1-MW3	REMEDIAL INVESTIGATION MONITORING WELL LOCATION
PE-59	POST-EXCAVATION DELINEATION BORING LOCATION
B75	RAWP INVESTIGATION BORING LOCATION
△	PRE-EXCAVATION SAMPLES TO BE INSTALLED PRIOR TO INITIATING WORK
□	EXCAVATION FLOOR SAMPLE LOCATION

DEPTH LEGEND

B83 / 4.92 / 0.92
- LOCATION SYMBOL
- LOCATION DESIGNATION
- ELEVATION (FT-MSL) AT BOTTOM OF OVERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS
- ELEVATION (FT-MSL) AT TOP OF UNDERLYING SOIL SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

PE-60 / -- / -- / -8.01
- LOCATION SYMBOL
- LOCATION DESIGNATION
- NO VALUE
- ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATION

CHEMICAL RESULTS LEGEND

PE-1	7.6 ft-msl	Cr+6 mg/kg	
A(1-1.5)	6.1	1.1	<

Green Shading Indicates Exceedance of NON-CCPW Related RSRS; Boring; Approximate Surface Elevation; Gray Shading Indicates Exceedance of CCPW-Related Metals; Sample(Depth Interval) "X" indicates groundwater presence; Bottom Sample Elevation; Value; Additional Data

CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

ISOCONCENTRATION MAPS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF MEASURED CONCENTRATION AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. CHEMICAL CONCENTRATIONS BETWEEN SAMPLING POINTS MAY DIFFER.

GENERAL NOTES

1. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 17.
2. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SCALE IN FEET
0 20 40

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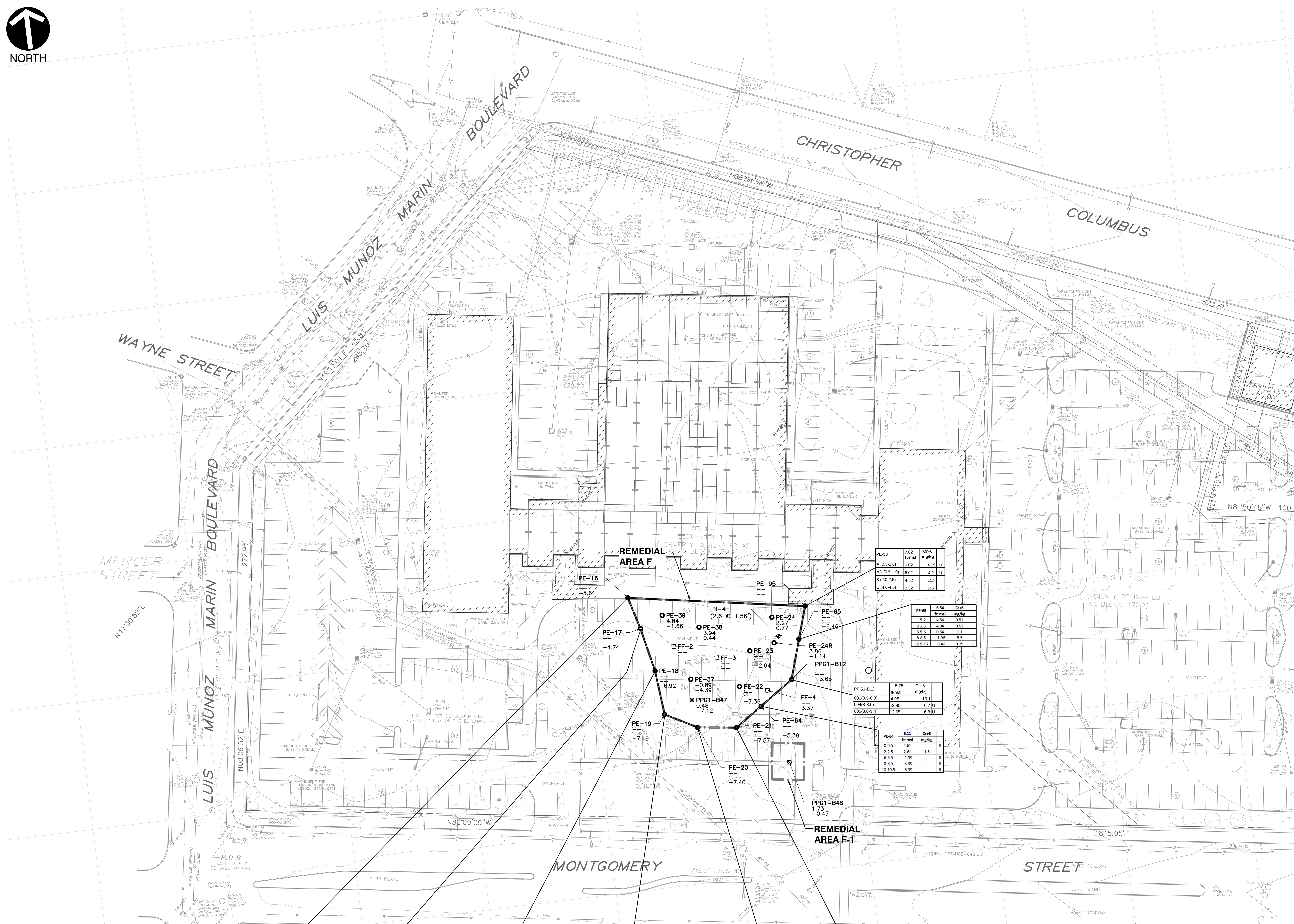
HUDSON COUNTY, NEW JERSEY

DATE: 07/30/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: TCN/LKC
SCALE: 1"=20'		CHKD. BY: ETM
REMEDIAL AREA E DETAIL		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 10



PE-36	7.02 ft-msl	Cr+6 mg/kg	
A (0.5-1.0)	6.02	4.19	U
AD (0.5-1.0)	6.02	4.21	U
B (2.0-2.5)	4.52	11.8	
C (4.0-4.5)	2.52	16.4	

PE-65	6.54 ft-msl	Cr+6 mg/kg	
1.5-2	4.54	0.51	
2-2.5	4.04	0.52	
5.5-6	0.54	1.1	
8-8.5	-1.96	5.5	
12.5-13	-6.46	0.25	U

PPG1-B12	5.75 ft-msl	Cr+6 mg/kg	
001(0.5-0.8)	4.95	10.1	
004(8-8.6)	-2.85	6.7	U
005(8.6-9.4)	-3.65	6.8	U

PE-64	5.11 ft-msl	Cr+6 mg/kg	
0-0.5	4.61	---	R
2-2.5	2.61	1.5	
6-6.5	-1.39	---	R
8-8.5	-3.39	---	R
10-10.5	-5.39	---	R

PE-16	6.89 ft-msl	Cr+6 mg/kg	
A(0.5-1)	5.89	8.69	
B(5.5-6)X	0.89	4.43	<
C(8-8.5)X	-1.61	5.43	<
D(10-10.5)X	-3.61	4.81	<
E(12-12.5)X	-5.61	5.06	<

PE-17	5.76 ft-msl	Cr+6 mg/kg	
A(0.5-1)	4.76	4.31	<
B(4-4.5)X	1.26	4.53	<
C(6-6.5)X	-0.74	4.99	<
D(8-8.5)X	-2.74	4.52	<
ED(10-10.5)X	-4.74	4.74	<
E(10-10.5)X	-4.74	4.78	<

PE-18	5.58 ft-msl	Cr+6 mg/kg	
A(0.6-1.1)	4.48	1.1	<
B(4-4.5)X	1.08	10.5	J
C(5.5-6)X	-0.42	1.3	<
D(8-8.5)X	-2.92	3.7	J
DD(8-8.5)X	-2.92	5.7	J
E(10-10.5)X	-4.92	7.6	J
F(12-12.5)X	-6.92	8.8	J

PE-19	5.31 ft-msl	Cr+6 mg/kg	
A(0.6-1.1)	4.21	1.1	J
B(5.5-6)X	-0.69	1.9	J
C(8-8.5)X	-3.19	19.7	J
D(10-10.5)X	-5.19	1.2	<
E(12-12.5)X	-7.19	1.3	<

PE-20	5.10 ft-msl	Cr+6 mg/kg	
A(1-1.5)	3.6	1.1	<
B(5-5.5)X	-0.4	1.4	<
C(8-8.5)X	-3.4	1.7	J
D(10-10.5)X	-5.4	1.1	<
E(12-12.5)X	-7.4	1.2	<

PE-21	4.93 ft-msl	Cr+6 mg/kg	
A(1-1.5)X	3.43	4.25	<
B(5.5-6)X	-1.07	5.76	<
BD(5.5-6)X	-1.07	5.19	<
C(8-8.5)X	-3.57	5.04	<
D(10-10.5)X	-5.57	4.78	<
E(12-12.5)X	-7.57	4.85	<

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

REVISION RECORD	
DATE	DESCRIPTION
4/17/2012	SUBMISSION

LEGEND

- LB-12 (ND) — METROVEST SOIL BORING LOCATION (LB-1 THROUGH LB-25 & DB-1 THROUGH DB-4)
- PPG1-B01 — REMEDIAL INVESTIGATION BORING LOCATION
- PPG1-MW1 — REMEDIAL INVESTIGATION MONITORING WELL LOCATION
- I-2 — CONCRETE CORE AND OVERBURDEN BORING LOCATION
- PE-1 — POST-EXCAVATION DELINEATION BORING LOCATION
- LIMIT OF REMEDIAL AREA
- SHEET PILE WALL LOCATION (LIMIT OF REMEDIAL AREA)
- EXCAVATION FLOOR SAMPLE LOCATION

DEPTH LEGEND

PE-39 / 4.84 / 0.34

- LOCATION SYMBOL
- LOCATION DESIGNATION
- ELEVATION (FT-MSL) OF BOTTOM OF OVERLYING SOIL MEETING RSRS FOR CCPW-RELATED METALS
- ELEVATION (FT-MSL) OF UNDERLYING SOIL MEETING RSRS FOR CCPW-RELATED METALS

PE-16 / -- / -- / -5.61

- LOCATION SYMBOL
- LOCATION DESIGNATION
- NO VALUE
- ALL SOIL SAMPLES MEETING RSRS FOR CCPW-RELATED METALS TO THE INDICATED ELEVATION

CHEMICAL RESULTS LEGEND

PE-1	7.6 ft-msl	Cr+6 mg/kg	
A(1-1.5)	6.1	1.1	<

Green Shading Indicates Exceedance of CCPW Related RSRS; Boring; Approximate Surface Elevation; Gray Shading Indicates Exceedance of CCPW-Related Metals; Sample(Depth Interval) "X" indicates groundwater presence; Bottom Sample Elevation; Value; Additional Data

CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

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GENERAL NOTES

1. PROPOSED SIDEWALL AND FLOOR POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURE 21.
2. THE PROPOSED EXCAVATION LIMITS ARE BASED ON LAST OVERLYING AND FIRST UNDERLYING SAMPLES WITH HEXAVALENT CHROMIUM CONCENTRATIONS LESS THAN 20mg/kg, AND ANTIMONY, NICKEL, VANADIUM, AND THALLIUM CONCENTRATIONS BELOW REGULATORY LIMITS.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SCALE IN FEET: 0 30 60

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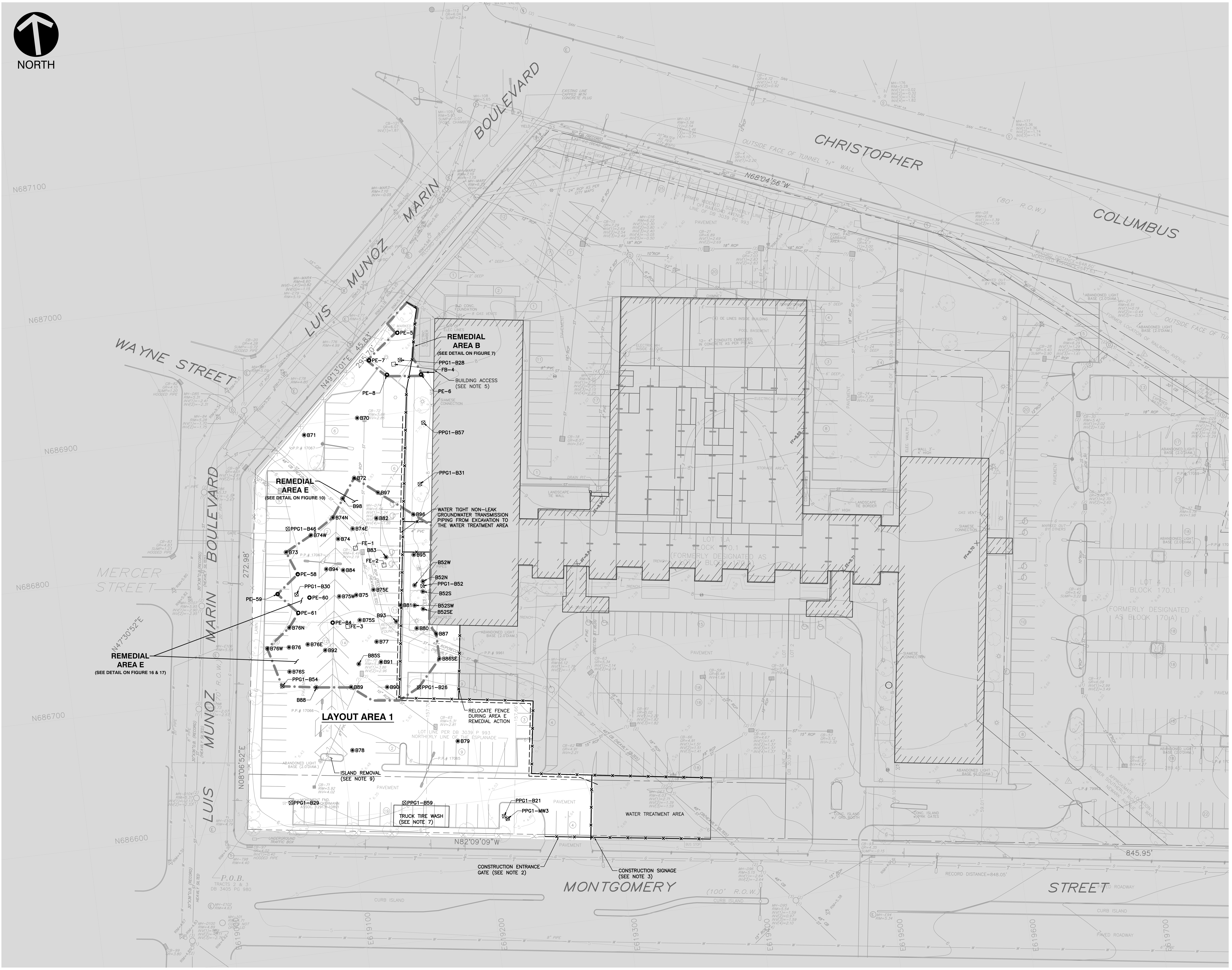
HUDSON COUNTY, NEW JERSEY

DATE: 07/26/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: JSC/LKC
SCALE: 1"=30'		CHKD. BY: ETM
REMEDIAL AREA F & F1 DETAIL		SHEET
		DRAWING NUMBER FIGURE 11



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	4/17/2012	SUBMISSION

LEGEND

- HYDRANT
- STREET LIGHT
- SIGNAL POLE
- MANHOLE
- WATER VALVE
- GAS VALVE
- CATCH BASIN
- CLEAN OUT
- TREE
- BM-1 BENCH MARK
- SIGN
- UTILITY POLE
- STORM DRAIN
- SANITARY LINE
- GAS LINE
- WATER LINE
- ELECTRIC UNDERGROUND
- ELECTRIC OVERHEAD
- 8' HIGH TEMPORARY CHAIN LINK FENCE
- LIMIT OF REMEDIAL AREA
- SHEET PILE
- GROUNDWATER TRANSMISSION PIPING
- PPG1-B01 REMEDIAL INVESTIGATION BORING LOCATION
- PPG1-MW1 REMEDIAL INVESTIGATION MONITORING WELL LOCATION
- LB-12 (ND) METROVEST SOIL BORING LOCATION (LB-1 THROUGH LB-25 & DB-1 THROUGH DB-4)
- I-2 CONCRETE CORE AND OVERBURDEN BORING LOCATION
- PE-1 POST-EXCAVATION DELINEATION BORING LOCATION
- W-01 WALL SAMPLE LOCATION

GENERAL NOTES

1. REMEDIAL ACTIVITY WILL BE PERFORMED WITHIN REMEDIAL AREA B THEN AREA E. PAVING ACROSS REMEDIAL AREA E SHALL BE PRESERVED SUCH THAT PAVED ACCESS IS MAINTAINED TO AREA B UNTIL AREA B HAS BEEN BACKFILLED.
2. A GATE SHALL BE INSTALLED AT THE LOCATION SHOWN TO CONTROL SITE ACCESS.
3. A SIGN SHALL BE POSTED AT THE GATE NOTING THE FOLLOWING: "RESTRICTED CONSTRUCTION AREA, AUTHORIZED PERSONNEL AND VEHICLES ONLY."
4. EMERGENCY FIRE ACCESS SHALL BE MAINTAINED AROUND REMEDIAL AREA B PERIMETER BY FENCING..
5. THE EXCAVATION LIMIT LINE IS PROJECTED BASED ON REMEDIAL INVESTIGATION DATA. THE FINAL LIMIT OF CONSTRUCTION WILL BE BASED ON POST EXCAVATION SAMPLING.
6. UTILITIES WITHIN THE WORK AREA SHALL BE IDENTIFIED AND PROTECTED. UTILITIES WITHIN THE EXCAVATION SHALL BE SUPPORTED DURING THE EXCAVATION TO MAINTAIN SERVICE.
7. PARKING LOT ISLANDS WILL BE REMOVED AS NEEDED FOR SITE ACCESS. FOLLOWING REMEDIAL ACTIVITY, ISLANDS WILL BE REPLACED DURING REMEDIAL AREA RESTORATION.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SCALE IN FEET
0 30 60

REFERENCE
"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

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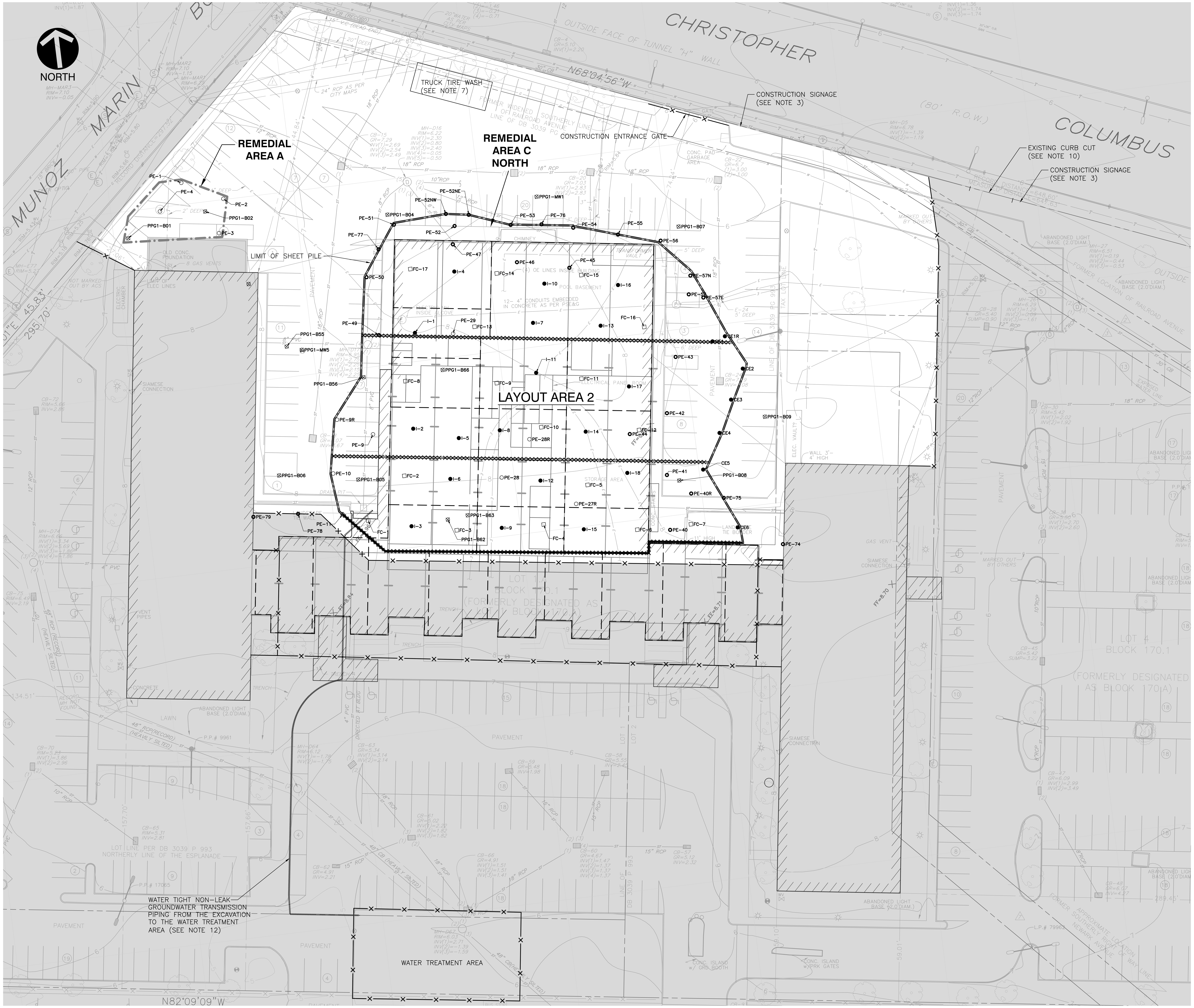
DATE: 07/30/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: RLS/LKC
SCALE: 1"=30'		CHKD. BY: GDT
LAYOUT AREA 1		SHEET 1 OF 1
		DRAWING NUMBER **FIGURE 12**



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	4/12/2012	SUBMISSION

LEGEND

- HYDRANT
- STREET LIGHT
- SIGNAL POLE
- MANHOLE
- WATER VALVE
- GAS VALVE
- CATCH BASIN
- CLEAN OUT
- TREE
- BM-1 BENCH MARK
- SIGN
- UTILITY POLE
- STORM DRAIN
- SANITARY LINE
- GAS LINE
- WATER LINE
- ELECTRIC UNDERGROUND
- ELECTRIC OVERHEAD
- 8' HIGH TEMPORARY CHAIN LINK FENCE
- LIMIT OF REMEDIAL AREA
- SHEET PILE
- SHEET PILE SIDEWALL EXCAVATED THROUGH DURING NEXT EXCAVATION PHASE
- GROUNDWATER TRANSMISSION PIPING
- PPG1-B01 REMEDIAL INVESTIGATION BORING LOCATION
- PPG1-MW1 REMEDIAL INVESTIGATION MONITORING WELL LOCATION
- LB-12 (ND) METROVEST SOIL BORING LOCATION (LB-1 THROUGH LB-25 & DB-1 THROUGH DB-4)
- I-2 CONCRETE CORE AND OVERBURDEN BORING LOCATION
- PE-1 POST-EXCAVATION DELINEATION BORING LOCATION

GENERAL NOTES

1. REMEDIAL ACTIVITY WILL BE PERFORMED WITHIN REMEDIAL AREA A THEN AREA C.
2. A GATE SHALL BE INSTALLED AT THE LOCATION SHOWN TO CONTROL SITE ACCESS.
3. A SIGN SHALL BE POSTED AT THE GATE NOTING THE FOLLOWING: "RESTRICTED CONSTRUCTION AREA, AUTHORIZED PERSONNEL AND VEHICLES ONLY."
4. BUILDING ACCESS SHALL BE RESTRICTED WHERE EGRESS IS INTO THE WORK AREA. THE ACCESS POINT SHALL BE BLOCKED OFF TO THE GENERAL PUBLIC.
5. THE EXCAVATION LIMIT LINE IS PROJECTED BASED ON REMEDIAL INVESTIGATION DATA. THE FINAL LIMIT OF CONSTRUCTION WILL BE BASED ON POST EXCAVATION SAMPLING.
6. UTILITIES WITHIN THE WORK AREA SHALL BE IDENTIFIED AND PROTECTED. UTILITIES WITHIN THE EXCAVATION SHALL BE SUPPORTED DURING THE EXCAVATION TO MAINTAIN SERVICE.
7. PARKING LOT ISLANDS WILL BE REMOVED AS NEEDED FOR SITE ACCESS. FOLLOWING REMEDIAL ACTIVITY, ISLANDS WILL BE REPLACED DURING REMEDIAL AREA RESTORATION.
8. THE EXISTING CURB CUT NORTH OF BUILDING II ON CHRISTOPHER COLUMBUS WILL BE REOPENED FOR CONSTRUCTION TRAFFIC. A CONSTRUCTION GATE WILL BE INSTALLED AT THIS LOCATION.
9. AT THE ENTRANCES TO THE BUILDINGS, AS SHOWN, REMEDIAL ACTIVITY WILL BE PERFORMED IN THESE AREAS PRIOR TO PROCEEDING WITH OTHER AREA C REMEDIAL ACTIVITY. ALL FENCE SHOWN ON THIS DRAWING SHALL BE INSTALLED TO CONTROL ACCESS.
10. SECTIONS OF THE GROUNDWATER TRANSMISSION PIPE WITHIN TRAFFIC AREAS SHALL BE PROTECTED, BUT STILL ALLOW TRAFFIC TO PASS.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

REFERENCE
"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

SCALE IN FEET
0 20 40

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JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 07/30/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: RLS/LKC
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 2		SHEET
		DRAWING NUMBER FIGURE 13

REVISION RECORD	
DATE	DESCRIPTION
4/17/2012	SUBMISSION

GENERAL NOTES

1. REMEDIAL ACTIVITY WILL BE PERFORMED WITHIN REMEDIAL AREA C, D F AND F1.
2. A GATE SHALL BE INSTALLED AT THE LOCATIONS SHOWN TO CONTROL SITE ACCESS.
3. A SIGN SHALL BE POSTED AT THE GATES NOTING THE FOLLOWING: "RESTRICTED CONSTRUCTION AREA, AUTHORIZED PERSONNEL AND VEHICLES ONLY."
4. BUILDING ACCESS SHALL BE RESTRICTED WHERE EGRESS IS INTO THE WORK AREA. THE ACCESS POINT SHALL BE BLOCKED OFF TO THE GENERAL PUBLIC.
5. THE EXCAVATION LIMIT LINE IS PROJECTED BASED ON REMEDIAL INVESTIGATION DATA. THE FINAL LIMIT OF CONSTRUCTION WILL BE BASED ON POST EXCAVATION SAMPLING.
6. UTILITIES WITHIN THE WORK AREA SHALL BE IDENTIFIED AND PROTECTED. UTILITIES WITHIN THE EXCAVATION SHALL BE SUPPORTED DURING THE EXCAVATION TO MAINTAIN SERVICE.
7. PARKING LOT ISLANDS WILL BE REMOVED AS NEEDED FOR SITE ACCESS. FOLLOWING REMEDIAL ACTIVITY, ISLANDS WILL BE REPLACED DURING REMEDIAL AREA RESTORATION.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2-16-06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

LEGEND

HYDRANT
STREET LIGHT
SIGNAL POLE
MANHOLE
WATER VALVE
GAS VALVE
CATCH BASIN
CLEAN OUT
TREE
BENCH MARK (BM-1)
SIGN
UTILITY POLE

STORM DRAIN
SANITARY LINE
GAS LINE
WATER LINE
ELECTRIC UNDERGROUND
ELECTRIC OVERHEAD
8' HIGH TEMPORARY CHAIN LINK FENCE

PPG1-B01 — REMEDIAL INVESTIGATION BORING LOCATION
2.80 — ELEVATION OF SAMPLE LOWER INTERVAL ABOVE CONTAMINATED ZONE (20< mg/kg Cr(UI))
-1.30 — ELEVATION SAMPLE TOP INTERVAL BELOW CONTAMINATED ZONE (<20 mg/kg Cr(UI))
PPG1-MW1 — REMEDIAL INVESTIGATION MONITORING WELL LOCATION
I-2 — CONCRETE CORE AND OVERBURDEN BORING LOCATION
PE-1 — POST-EXCAVATION DELINEATION BORING LOCATION
SHEET PILE SIDEWALL EXCAVATED THROUGH DURING NEXT EXCAVATION PHASE
SHEET PILE WALL LOCATION
SHEET PILE SIDEWALL EXCAVATED THROUGH DURING NEXT EXCAVATION PHASE
LIMIT OF INITIAL REMEDIAL EXCAVATION
GROUNDWATER TRANSMISSION PIPING

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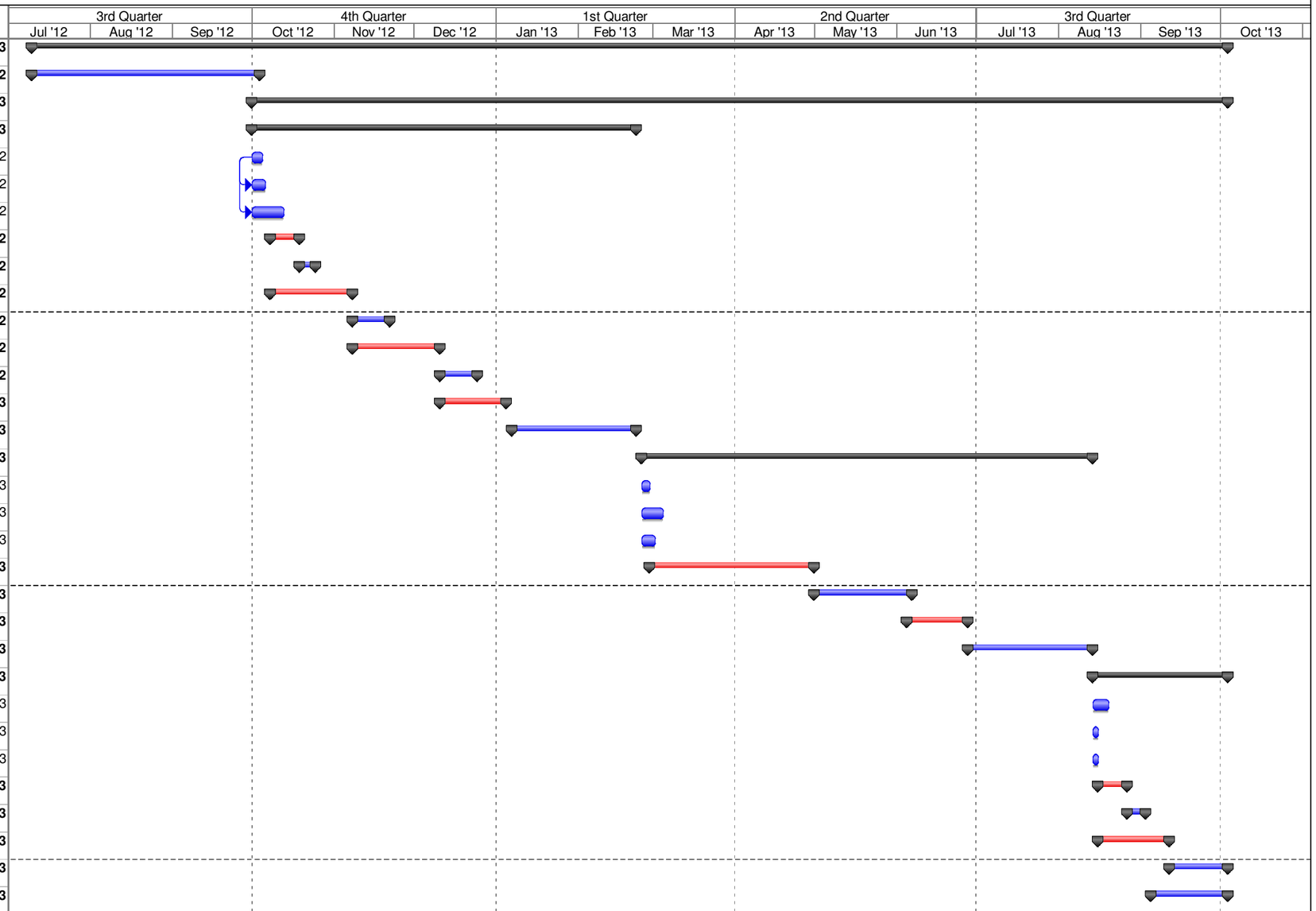
HUDSON COUNTY, NEW JERSEY

DATE: 05/22/06	APPROVED BY: ETM	DWN BY: RLS
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 3		SHEET
		DRAWING NUMBER FIGURE 14

P:\2010\100-710\-CADD\DWG\100710-fig 14.dwg{LAYOUT AREA 3} LS:(17/04/2012 - tdivittis) - LP: 4/17/2012

METROPOLIS TOWERS CONSTRUCTION SCHEDULE

ID	Task Name	Start	Finish
1	**Metropolis Towers Remedial Action**	**Tue 7/10/12**	**Thu 10/3/13**
2	**Treatment Plant (TP) Pre-Ex**	**Tue 7/10/12**	**Wed 10/3/12**
6	**Remedial Activities**	**Mon 10/1/12**	**Thu 10/3/13**
7	**LAYOUT 2 - AREAS A & C**	**Mon 10/1/12**	**Fri 2/22/13**
8	Fencing & Gates	Mon 10/1/12	Thu 10/4/12
9	Main Contractor Prep	Mon 10/1/12	Fri 10/5/12
10	Survey	Mon 10/1/12	Fri 10/12/12
11	**AREA A Intrusive**	**Mon 10/8/12**	**Thu 10/18/12**
17	**AREA A Restoration**	**Fri 10/19/12**	**Wed 10/24/12**
21	**AREA C Phase I Intrusive**	**Mon 10/8/12**	**Wed 11/7/12**
31	**AREA C Phase I Restoration**	**Thu 11/8/12**	**Wed 11/21/12**
34	**AREA C Phase II Intrusive**	**Thu 11/8/12**	**Mon 12/10/12**
42	**AREA C Phase II Restoration**	**Tue 12/11/12**	**Mon 12/24/12**
45	**AREA C Phase III Intrusive**	**Tue 12/11/12**	**Fri 1/4/13**
53	**AREA C Phase III Restoration**	**Mon 1/7/13**	**Fri 2/22/13**
58	**LAYOUT 3 - AREAS D & F**	**Mon 2/25/13**	**Tue 8/13/13**
59	Fencing & Gates	Mon 2/25/13	Wed 2/27/13
60	Main Contractor Prep	Mon 2/25/13	Mon 3/4/13
61	Survey	Mon 2/25/13	Fri 3/1/13
62	**AREA C-South / AREA D Intrusive**	**Thu 2/28/13**	**Tue 4/30/13**
69	**AREA C-South / AREA D Restoration**	**Wed 5/1/13**	**Thu 6/6/13**
72	**AREA F / AREA F-1 Intrusive**	**Wed 6/5/13**	**Thu 6/27/13**
80	**AREA F / AREA F-1 Restoration**	**Fri 6/28/13**	**Tue 8/13/13**
86	**LAYOUT 1 - AREAS B & E**	**Wed 8/14/13**	**Thu 10/3/13**
87	Fencing & Gates	Wed 8/14/13	Mon 8/19/13
88	Main Contractor Prep	Wed 8/14/13	Thu 8/15/13
89	Survey	Wed 8/14/13	Thu 8/15/13
90	**AREA B Intrusive**	**Fri 8/16/13**	**Mon 8/26/13**
94	**AREA B Restoration**	**Tue 8/27/13**	**Mon 9/2/13**
98	**AREA E intrusive**	**Fri 8/16/13**	**Wed 9/11/13**
105	**AREA E Restoration**	**Thu 9/12/13**	**Thu 10/3/13**
110	**SITE DEMOBILIZATION/ FINAL RESTORE**	**Thu 9/5/13**	**Thu 10/3/13**

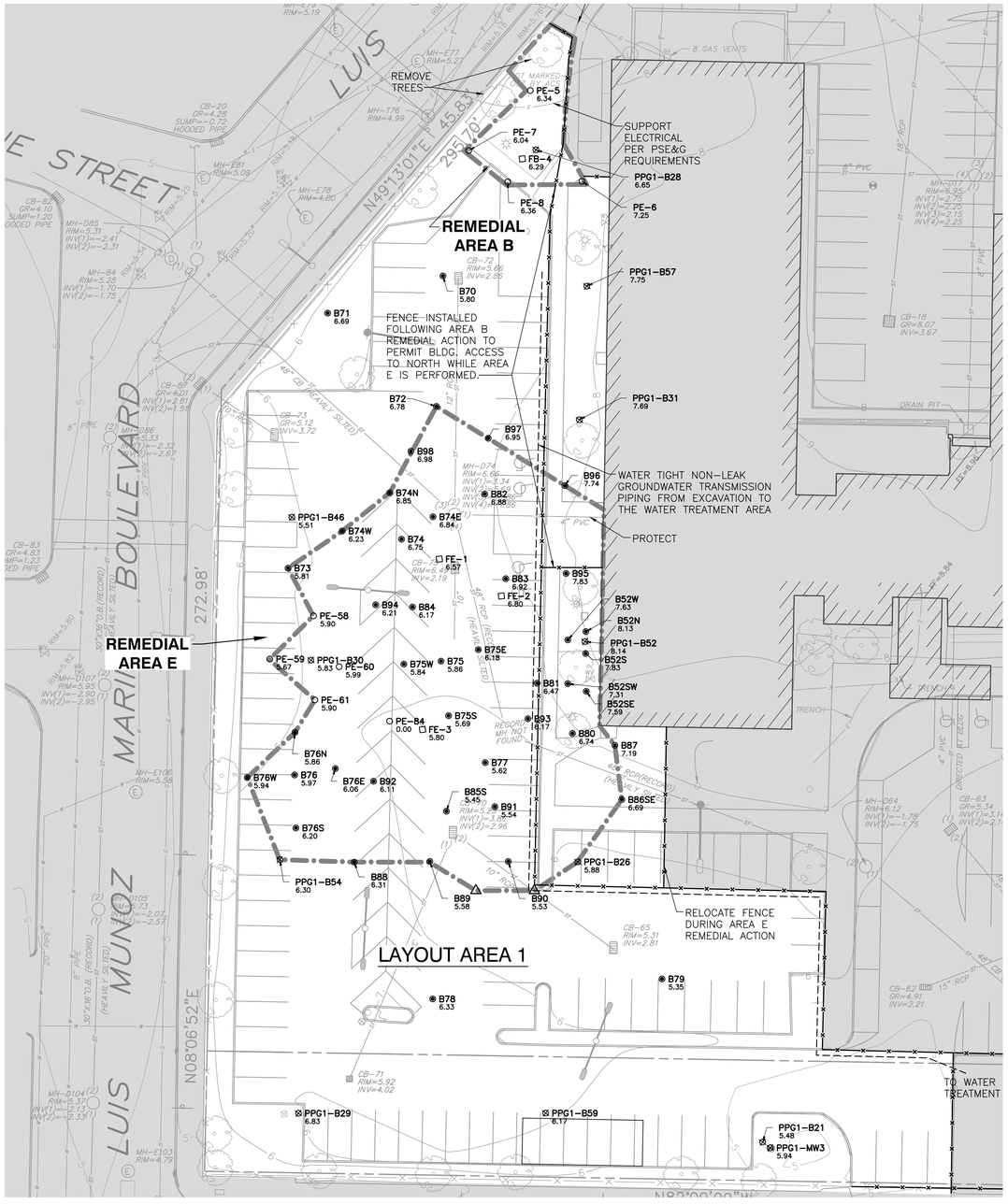


Project: CEC 100-710 MT Construction
Date: Fri 4/6/12

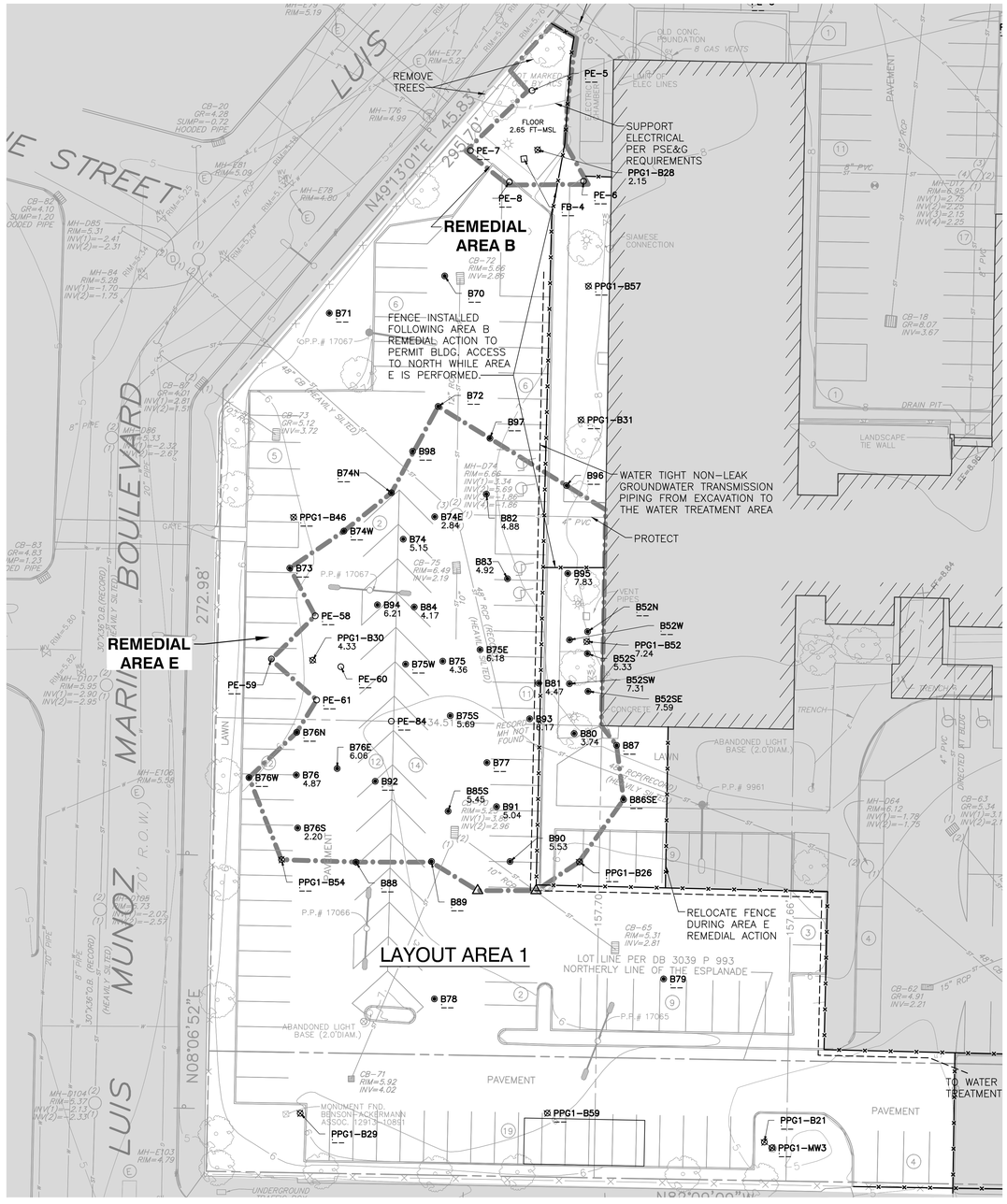
Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

FIGURE 15
Construction Schedule

NORTH



SURFACE TOPOGRAPHY SHOWING BORING LOCATIONS AND SURFACE ELEVATIONS



BOTTOM ELEVATION OF OVERLYING SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

SCALE IN FEET
0 20 40

THE ELEVATIONS PRESENTED HEREIN DEPICT AN INTERPRETATION OF THE BOTTOM ELEVATION OF SAMPLED INTERVALS ANALYZED AS MEETING RSRS FOR CCPW-RELATED METALS AT THE BORING LOCATIONS INDICATED. ACTUAL CHEMICAL CONDITIONS AND DEPTH TO SOIL BETWEEN BORING LOCATIONS MAY DIFFER.

LEGEND

- △ PRE-EXCAVATION SAMPLES TO BE INSTALLED PRIOR TO INITIATING WORK
- REMEDIAL LIMIT
- PPG1-MWX-PPG RI MONITORING WELL LOCATION
- PPG1-BX-PPG RI BORING LOCATION
- B-X-PPG RAWP INVESTIGATION BORING LOCATION
- PE-X-PPG RAWP INVESTIGATION PRE-EXCAVATION BORING LOCATION
- LB-XX LANGAN RAWP BORING
- REMEDIAL AREA BOUNDARY
- □ EXCAVATION FLOOR SAMPLE OBTAINED

NOTES

1. THE LOCATION OF ALL UNDERGROUND UTILITIES IS NOT KNOWN WITHIN THE AREA TO BE EXCAVATED.
2. PROTECT/SUPPORT ELECTRICAL LINES PER PSE&G REQUIREMENTS DURING EXCAVATION AND BACKFILLING.
3. PROTECT/SUPPORT ALL UTILITIES ENTERING THE EXCAVATION AREA.
4. REPAIR/REPLACE STORM LINES AND APPURTENANCES DISRUPTED DURING EXCAVATION AND BACKFILLING.
5. DO NOT CROSS 48" RCP WITH EQUIPMENT ONCE EXCAVATION IS INITIATED WITHOUT USE OF A CONSTRUCTED CROSSING POINT.

AREA	VOLUME FROM SURFACE TO CCPW-AFFECTED ZONE (CY)	ESTIMATED VOLUME OF CCPW-AFFECTED ZONE (CY)	TOTAL ESTIMATED VOLUME (CY)
B	110	320	430
E	700	2,500	3,200

NOTE: THE FOLLOWING BORINGS MEET RSRS FOR CCPW-RELATED METALS IN ALL SAMPLE INTERVALS ANALYZED. THE BOTTOM ELEVATION OF THE LAST SAMPLE ANALYZED IS LISTED IN THE TABLE BELOW

BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)		BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)
B52N	8.13	0.63		B88	6.31	0.31
B52W	7.63	3.13		PE5	6.34	−6.5
B70	5.8	−6.2		PE58	5.90	−9.60
B71	6.69	4.19		PE59	5.67	−8.33
B72	6.78	4.18		PE6	7.25	−12.5
B73	5.81	−3.69		PE60	5.99	−8.01
B74N	6.85	1.85		PE61	5.90	−6.10
B74W	6.23	1.23		PE7	6.04	−12.5
B75W	5.84	2.34		PE8	6.36	−12.5
B76N	5.86	0.86		PPG1-B29	6.83	−2.57
B76W	5.94	0.94		PPG1-B31	7.69	−8.61
B77	5.62	−8.38		PPG1-B46	5.51	−3.09
B78	6.33	−6.67				
B79	5.35	−7.15		PPG1-B54	6.3	−2.5
				PPG1-B57	7.75	−5.55
B86SE	6.69	0.69		PPG1-B59	6.17	−0.43
B87	7.19	1.19		PPG1-MW3	5.94	−0.56

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
—	07/30/2010	SUBMITTED FOR REVIEW
—	04/17/2012	SUBMISSION

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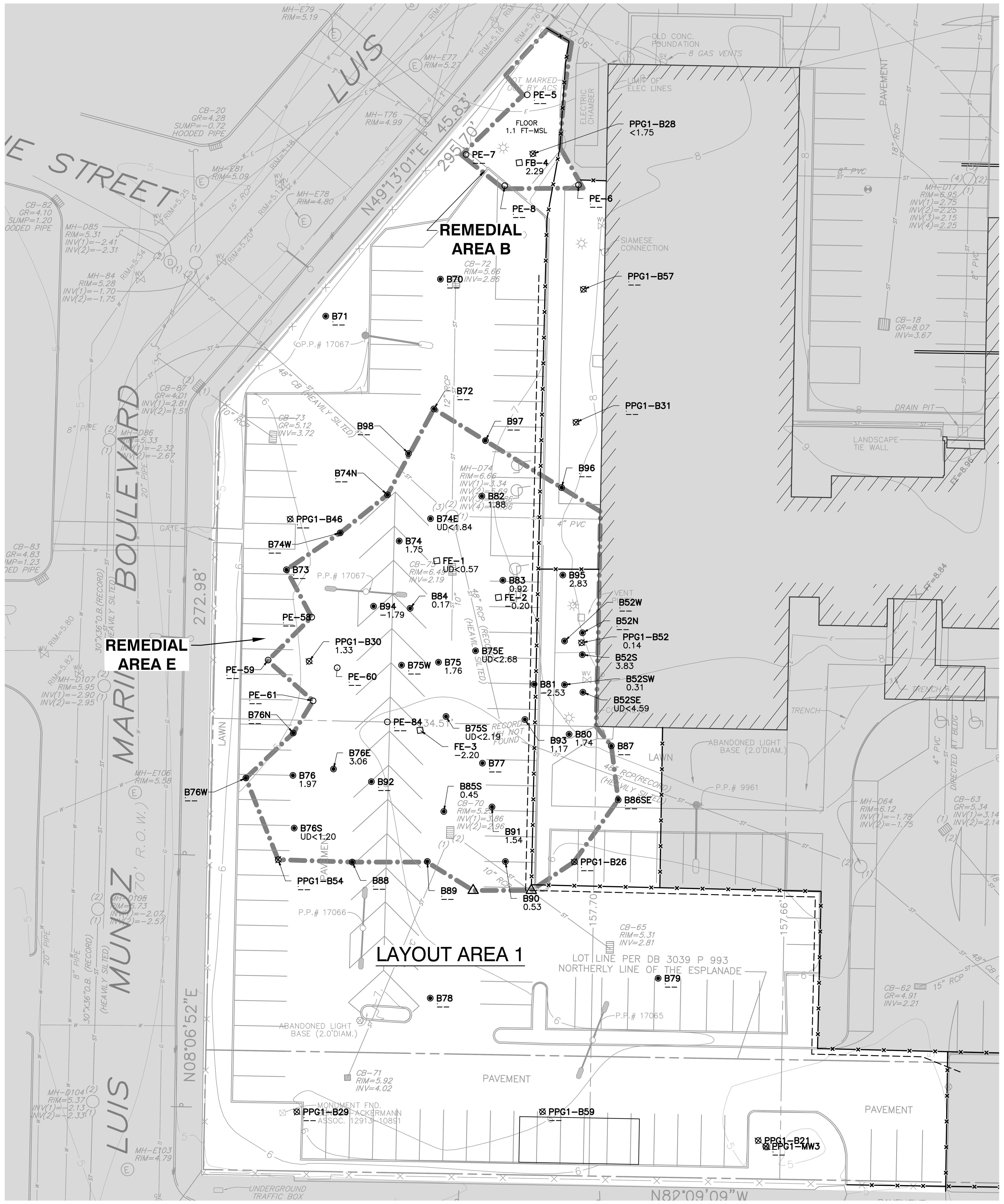
JERSEY CITY
HUDSON COUNTY, NEW JERSEY

DATE: 07/30/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: SPS/LKC
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 1 EXCAVATION PLANS SURFACE TO TOP OF CONTAMINATION		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 16

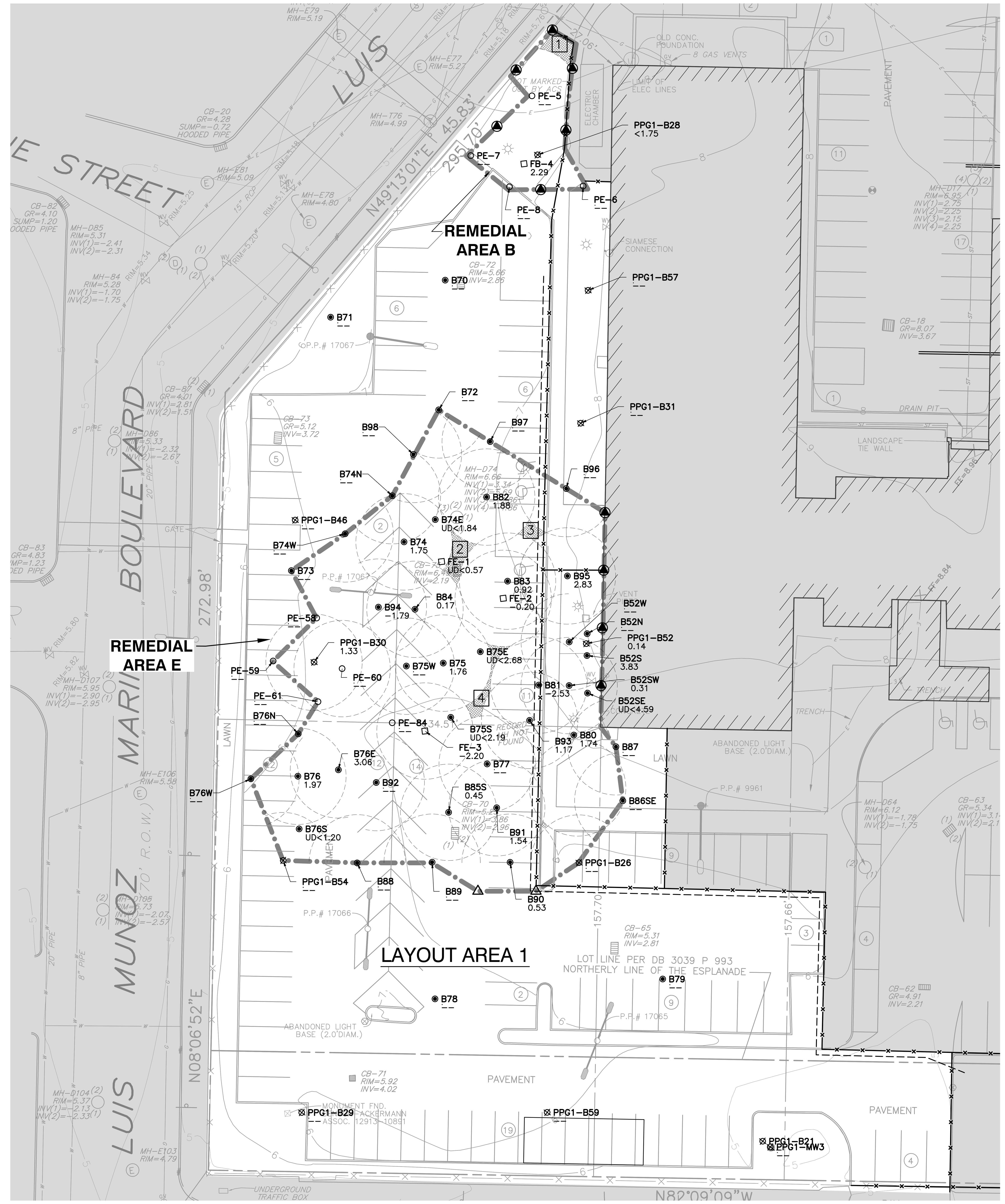
P:\30101\109-2101-CAD\DWG\30101-fig 16-17sep12 = LAYOUT AREA 1 EXCAVATION PLANS LS(17)04/2012 - tewing - LP, 4/17/2012 3:27 PM

NORTH



TOP ELEVATION OF UNDERLYING SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

THE ELEVATIONS PRESENTED HEREIN DEPICT AN INTERPRETATION OF THE BOTTOM ELEVATION OF SAMPLED INTERVALS ANALYZED AS MEETING RSRS FOR CCPW-RELATED METALS AT THE BORING LOCATIONS INDICATED. ACTUAL CHEMICAL ONDITIONS AND DEPTH TO SOIL BETWEEN BORING LOCATIONS MAY DIFFER.



POST-EXCAVATION SAMPLE LOCATIONS

SIDEWALL-10 LOCATIONS

FLOOR-4 LOCATIONS

NOTE: THE FOLLOWING BORINGS MEET RSRS FOR CCPW-RELATED METALS IN ALL SAMPLE INTERVALS ANALYZED. THE BOTTOM ELEVATION OF THE LAST SAMPLE ANALYZED IS LISTED IN THE TABLE BELOW

BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)		BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)
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B52W	7.63	3.13		PE5	6.34	-6.5
B70	5.8	-6.2		PE58	5.90	-9.60
B71	6.69	4.19		PE59	5.67	-8.33
B72	6.78	4.18		PE6	7.25	-12.5
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B74W	6.23	1.23		PE7	6.04	-12.5
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B76N	5.86	0.86		PPG1-B29	6.83	-2.57
B76W	5.94	0.94		PPG1-B31	7.69	-8.61
B77	5.62	-8.38		PPG1-B46	5.51	-3.09
B78	6.33	-6.67				
B79	5.35	-7.15		PPG1-B54	6.3	-2.5
				PPG1-B57	7.75	-5.55
B86SE	6.69	0.69		PPG1-B59	6.17	-0.43
B87	7.19	1.19		PPG1-MW3	5.94	-0.56

LEGEND

- BORING LOCATION AND ELEVATION AT TOP OF SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS
- PRE-EXCAVATION SAMPLES TO BE INSTALLED PRIOR TO INITIATING WORK
- REMEDIAL AREA BOUNDARY
- 900 SQUARE FOOT AREA AROUND KNOWN SAMPLE MEETING RSRS FOR CCPW-RELATED METALS
- AREA REQUIRING POST-EXCAVATION FLOOR SAMPLE
- 1 — POST-EXCAVATION SAMPLE GENERAL AREA
- PROPOSED SIDEWALL SAMPLE LOCATION
- PPG1-MWX-PPG — RI MONITORING WELL LOCATION
- PPG1-BX-PPG — RI BORING LOCATION
- B-X-PPG — RAWP INVESTIGATION BORING LOCATION
- PE-X-PPG — RAWP INVESTIGATION PRE-EXCAVATION BORING LOCATION
- LB-XX — LANGAN RAWP BORING
- EXCAVATION FLOOR SAMPLE OBTAINED

NOTES

1. THE LOCATION OF ALL UNDERGROUND UTILITIES IS NOT KNOWN WITHIN THE AREA TO BE EXCAVATED.
2. PROTECT/SUPPORT ELECTRICAL LINES PER PSE&G REQUIREMENTS DURING EXCAVATION AND BACKFILLING.
3. PROTECT/SUPPORT ALL UTILITIES ENTERING THE EXCAVATION AREA.
4. REPAIR/REPLACE STORM LINES AND APPURTENANCES DISRUPTED DURING EXCAVATION AND BACKFILLING.
5. DO NOT CROSS 48" RCP WITH EQUIPMENT ONCE EXCAVATION IS INITIATED WITHOUT USE OF A CONSTRUCTED CROSSING POINT.

AREA	VOLUME FROM SURFACE TO CCPW-AFFECTED ZONE (CY)	ESTIMATED VOLUME OF CCPW-AFFECTED ZONE (CY)	TOTAL ESTIMATED VOLUME (CY)
B	110	320	430
E	700	2,500	3,200

POST EXCAVATION SAMPLES WILL BE ANALYZED FOR:	
TOTAL CHROMIUM	HEXAVALENT CHROMIUM
ANTIMONY	NICKEL
VANADIUM	THALLIUM

SCALE IN FEET
0 20 40

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	04/17/2012	SUBMISSION

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HUDSON COUNTY, NEW JERSEY

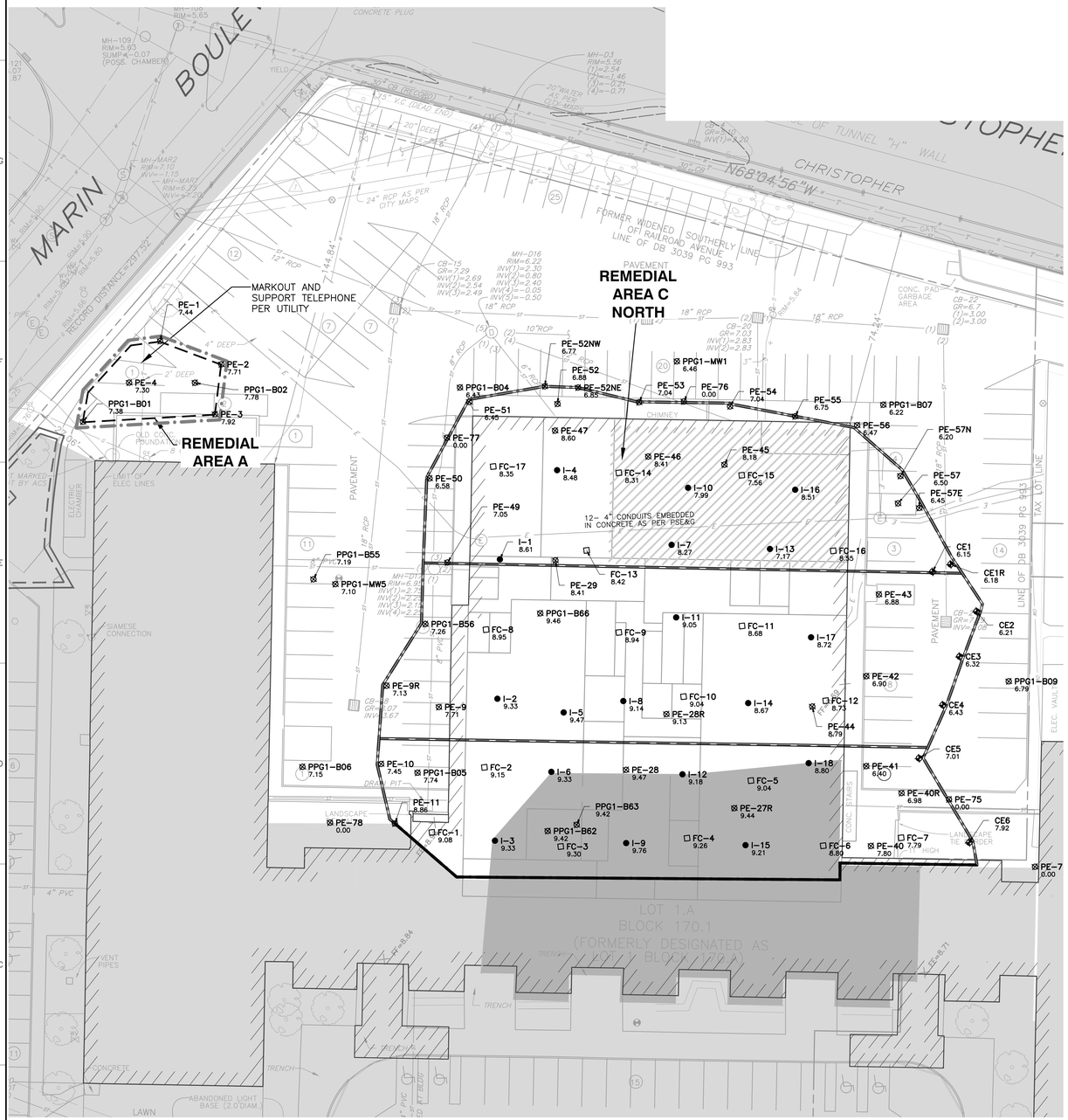
DATE: 07/30/2010
SCALE: 1"=20'
APPROVED BY: *ETM
*HAND SIGNATURE ON FILE
DWN BY: SPS/LKC
CHKD. BY: ETM
SHEET 1 OF 1

LAYOUT AREA 1
EXCAVATION PLANS
BOTTOM OF EXCAVATION AND SAMPLING

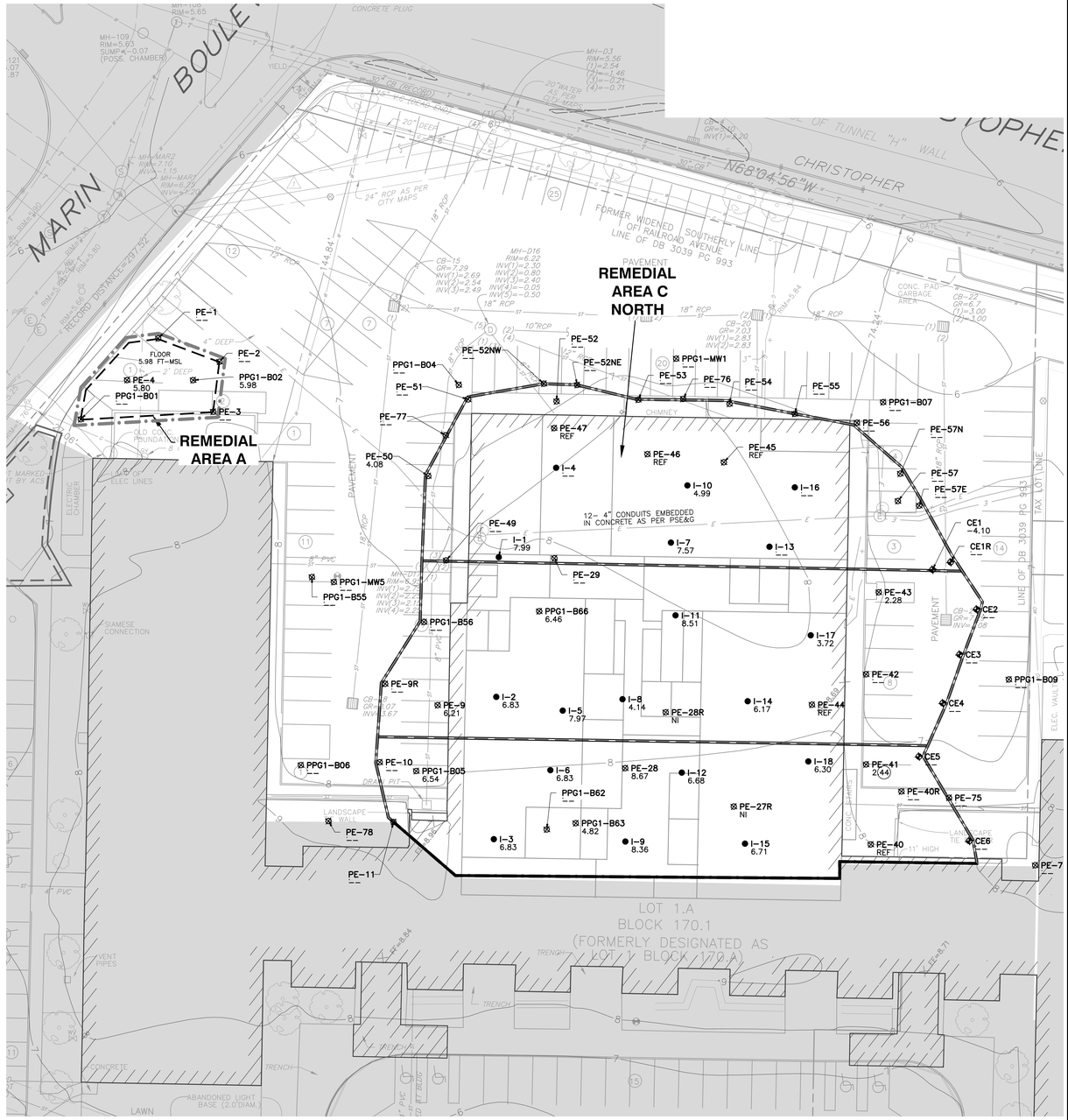
DRAWING NUMBER
FIGURE 17

NORTH

SUBMITTAL & REVISION RECORD		
NO	DATE	DESCRIPTION
2	07/30/2010	SUBMITTED FOR REVIEW
1	04/12/2012	SUBMISSION



SURFACE TOPOGRAPHY SHOWING I–BORING LOCATIONS AND SURFACE ELEVATIONS



BOTTOM ELEVATION OF OVERLYING SAMPLE INTERVAL MEETING RSRS FOR CCPW–RELATED METALS

THE ELEVATIONS PRESENTED HEREIN DEPICT AN INTERPRETATION OF THE BOTTOM ELEVATION OF SAMPLED INTERVALS ANALYZED AS MEETING RSRS FOR CCPW–RELATED METALS AT THE BORING LOCATIONS INDICATED. ACTUAL CHEMICAL ONDITIONS AND DEPTH TO SOIL BETWEEN BORING LOCATIONS MAY DIFFER.

SCALE IN FEET
0 20 40

NOTES

1. PROTECT/SUPPORT 12–4" CONDUITS EMBEDDED IN CONCRETE PER PSE&G REQUIREMENTS DURING EXCAVATION AND BACKFILLING.

LEGEND

- SIDEWALL SAMPLE LOCATION
- I-19 CONCRETE CORE LOCATIONS AND SURFACE ELEVATIONS
- * CONCRETE SURFACE ELEVATION BASED ON PRE–DEMOLITION SURROUNDING FINISHED FLOOR
- CONCRETE STAINED OR >20 mg/kg Cr(VI) EXTENDED TO NEXT CONCRETE CORE <20mg/kg Cr(VI) TO BE REMOVED AS HAZARDOUS WASTE
- SLAB AREA REPRESENTED BY CONCRETE CORE
- NO CONCRETE IN THIS AREA
- REMEDIAL LIMIT IN ABSENCE OF SHEET PILE INSTALLATION
- INTERNAL SHEET PILE WALL (REMOVED FOLLOWING BACKFILLING ON BOTH SIDES OF WALL)
- SHEET PILE WALL AND PHYSICAL EXCAVATION LIMIT
- PPG1–MWX–PPG RI MONITORING WELL LOCATION
- PPG1–BX–PPG RI BORING LOCATION
- I–X–PPG RAWP INVESTIGATION CONCRETE CORE LOCATION
- PE–X–PPG RAWP INVESTIGATION PRE–EXCAVATION BORING LOCATION
- CEX–PPG RAWP INVESTIGATION CENTRAL AREA BORING LOCATION
- LB–XX LANGAN RAWP BORING
- DB–X LANGAN RAWP BORING

AREA	ESTIMATED VOLUME FROM SURFACE TO CCPW-AFFECTED ZONE	ESTIMATED VOLUME OF CCPW-AFFECTED ZONE (CY)	TOTAL ESTIMATED VOLUME (CY)
A	190	50	240
C-NORTH	4,000	7,800	11,800

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.
ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.
iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.
iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.
v. POST–EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

NOTE: THE FOLLOWING BORINGS MEET RSRS FOR CCPW–RELATED METALS IN ALL SAMPLE INTERVALS ANALYZED. THE BOTTOM ELEVATION OF THE LAST SAMPLE ANALYZED IS LISTED IN THE TABLE BELOW

BORING	SURFACE ELEV. (ft–msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft–msl)		BORING	SURFACE ELEV. (ft–msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft–msl)
PE11	8.86	–3.64		PE57	6.50	–6.50
PE10	7.45	–5.05		CE1	6.15	–6.85
PE9R	7.13	–5.37		CE2	6.21	–8.79
PPG1–B56	7.26	–5.74		CE3	6.32	–6.68
PE49	7.05	–5.45		CE4	6.43	–7.57
I4	8.41*	–1.00		CE5	7.00	–6.00
PE52	6.88	–6.62		CE6	8.08	1.58 (REFUSAL)
PE53	7.04	–5.46		PE1	7.44	–5.06
PE54	7.04	–5.46		PE2	7.71	–4.79
PE55	6.75	–5.75		PE3	7.92	–4.58
I16	8.51	1.00				

* SURFACE OF FALSE WOODEN FLOOR

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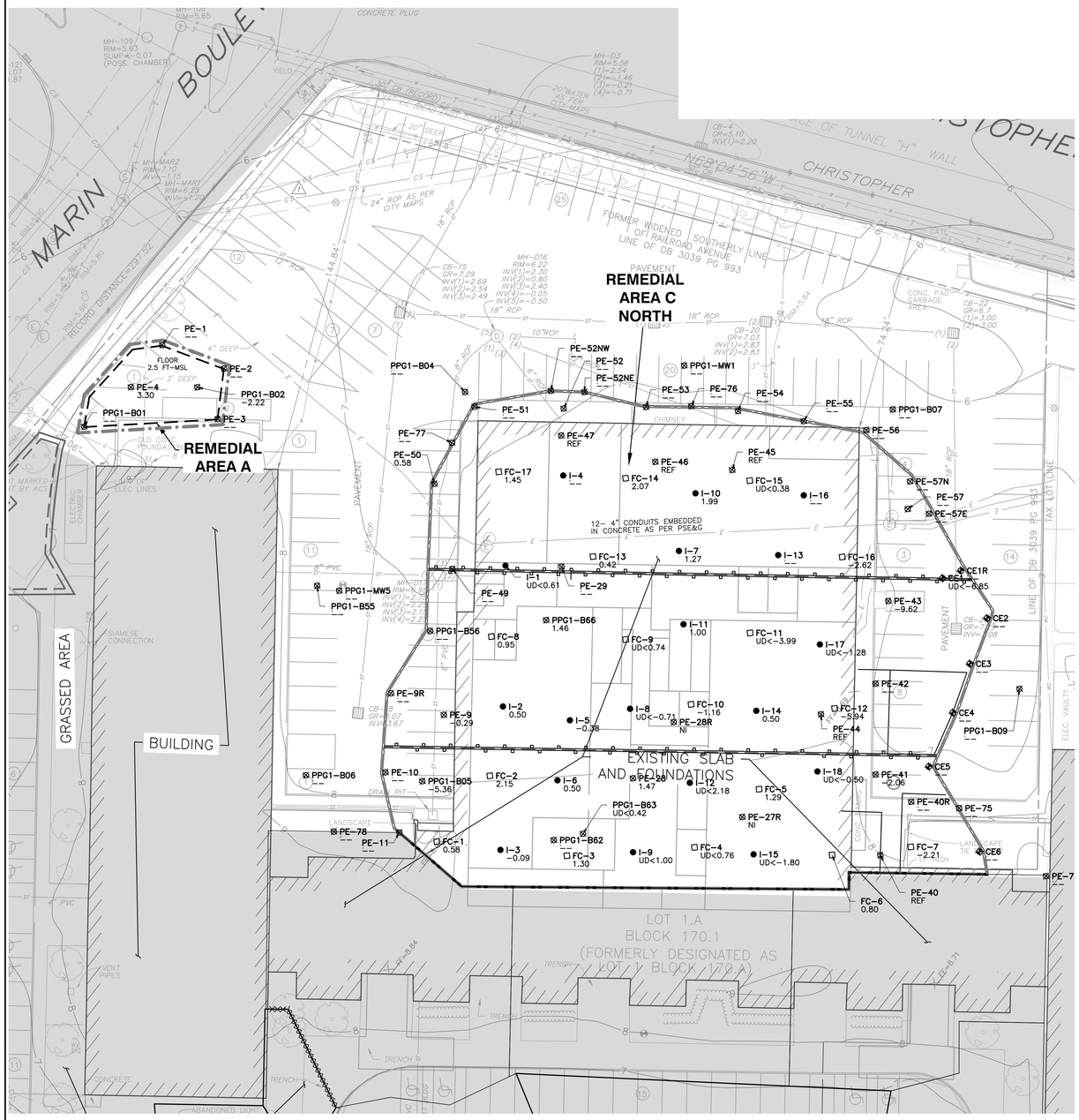
DATE: 07/30/2010	APPROVED BY: *ETM	DWN BY: SPS/LKC
SCALE: 1"=20'	*HAND SIGNATURE ON FILE	CHKD. BY: ETM
LAYOUT AREA 2 EXCAVATION PLANS SURFACE TO TOP OF CONTAMINATION		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 18

P:\2010\105-7101-CADD\DWG\105710-fig 18-19.dwg(FIG 18 - LAYOUT AREA 2 EXCAVATION PLANS) (07/29/2012 - swhite) - LP: 4/12/2012 3:34 PM

NORTH

SUBMITTAL & REVISION RECORD		
NO	DATE	DESCRIPTION
-	07/30/2010	SUBMITTED FOR REVIEW
-	04/12/2012	SUBMISSION
-	10/22/2012	SUBMISSION



TOP ELEVATION OF UNDERLYING SAMPLE INTERVAL MEETING RSRS FOR CCPW-RELATED METALS

THE ELEVATIONS PRESENTED HEREIN DEPICT AN INTERPRETATION OF THE BOTTOM ELEVATION OF SAMPLED INTERVALS ANALYZED AS MEETING RSRS FOR CCPW-RELATED METALS AT THE BORING LOCATIONS INDICATED. ACTUAL CHEMICAL ONDITIONS AND DEPTH TO SOIL BETWEEN BORING LOCATIONS MAY DIFFER.

LEGEND

- BORING LOCATION AND ELEVATION AT TOP OF SAMPLE INTERVAL <20 mg/kg Cr(VI)
- SIDEWALL SAMPLE LOCATION
- INTERNAL SHEET PILE WALL (REMOVED FOLLOWING BACKFILLING ON BOTH SIDES OF WALL)
- SHEET PILE WALL AND PHYSICAL EXCAVATION LIMIT
- TOE OF 1V: 1H SLOPE FROM BOTTOM ELEVATION OF OVERLYING SAMPLE INTERVAL <20 mg/kg Cr(VI)
- 900 SQUARE FOOT AREA AROUND KNOWN SAMPLE WITH Cr(VI) <20mg/kg
- AREA REQUIRING POST-EXCAVATION FLOOR SAMPLE
- [1] POST-EXCAVATION SAMPLE GENERAL AREA
- PPG1-MWX-PPG RI MONITORING WELL LOCATION
- PPG1-BX-PPG RI BORING LOCATION
- I-X-PPG RAWP INVESTIGATION CONCRETE CORE LOCATION
- PE-X-PPG RAWP INVESTIGATION PRE-EXCAVATION BORING LOCATION
- CEX-PPG RAWP INVESTIGATION CENTRAL AREA BORING LOCATION
- LB-XX LANGAN RAWP BORING
- DB-X LANGAN RAWP BORING

NOTES

1. PROTECT/SUPPORT 12-4" CONDUITS EMBEDDED IN CONCRETE PER PSE&G REQUIREMENTS DURING EXCAVATION AND BACKFILLING.

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST-EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

AREA	ESTIMATED VOLUME FROM SURFACE TO CCPW-AFFECTED ZONE	ESTIMATED VOLUME OF CCPW-AFFECTED ZONE (CY)	TOTAL ESTIMATED VOLUME (CY)
A	190	50	240
C-NORTH	4,000	7,800	11,800

POST EXCAVATION SAMPLES WILL BE ANALYZED FOR:	
TOTAL CHROMIUM	HEXAVALENT CHROMIUM
ANTIMONY	NICKEL
VANADIUM	THALLIUM

POST-EXCAVATION FLOOR SAMPLE LOCATIONS

- SIDEWALL-5 SAMPLES
- FLOOR-11 SAMPLES

SCALE IN FEET
0 20 40

NOTE: THE FOLLOWING BORINGS MEET RSRS FOR CCPW-RELATED METALS IN ALL SAMPLE INTERVALS ANALYZED. THE BOTTOM ELEVATION OF THE LAST SAMPLE ANALYZED IS LISTED IN THE TABLE BELOW

BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)		BORING	SURFACE ELEV. (ft-msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft-msl)
PE11	8.86	-3.64		PE57	6.50	-6.50
PE10	7.45	-5.05		CE1	6.15	-6.85
PE9R	7.13	-5.37		CE2	6.21	-8.79
PPG1-B56	7.26	-5.74		CE3	6.32	-6.68
PE49	7.05	-5.45		CE4	6.43	-7.57
I4	8.41*	-1.00		CE5	7.00	-6.00
PE52	6.88	-6.62		CE6	8.08	1.58 (REFUSAL)
PE53	7.04	-5.46		PE1	7.44	-5.06
PE54	7.04	-5.46		PE2	7.71	-4.79
PE55	6.75	-5.75		PE3	7.92	-4.58
I16	8.51	1.00				

* SURFACE OF FALSE WOODEN FLOOR

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DATE: 07/30/2010	APPROVED BY: *ETM *HAND SIGNATURE ON FILE	DWN BY: SPS/LKC
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 2 EXCAVATION PLANS BOTTOM OF EXCAVATION AND SAMPLING		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 19

P:\2010\100-710\-GADD\DWG\100710-fig 18-19.dwg[FIG 19 - LAYOUT AREA 2 EXCAVATION PLANS] LS\22/10/2012 - xxxB - LP, 10/22/2012 1:17 PM

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
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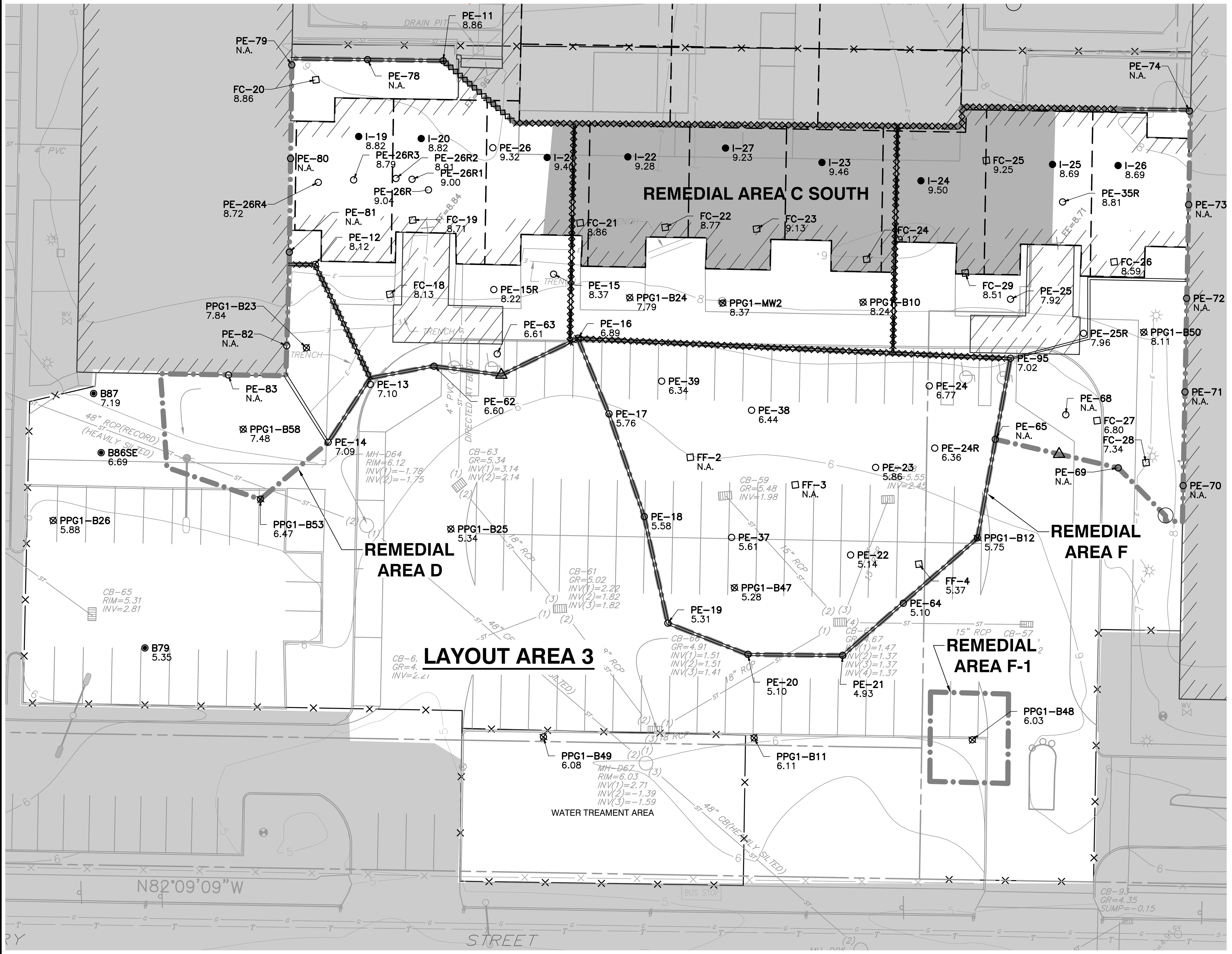
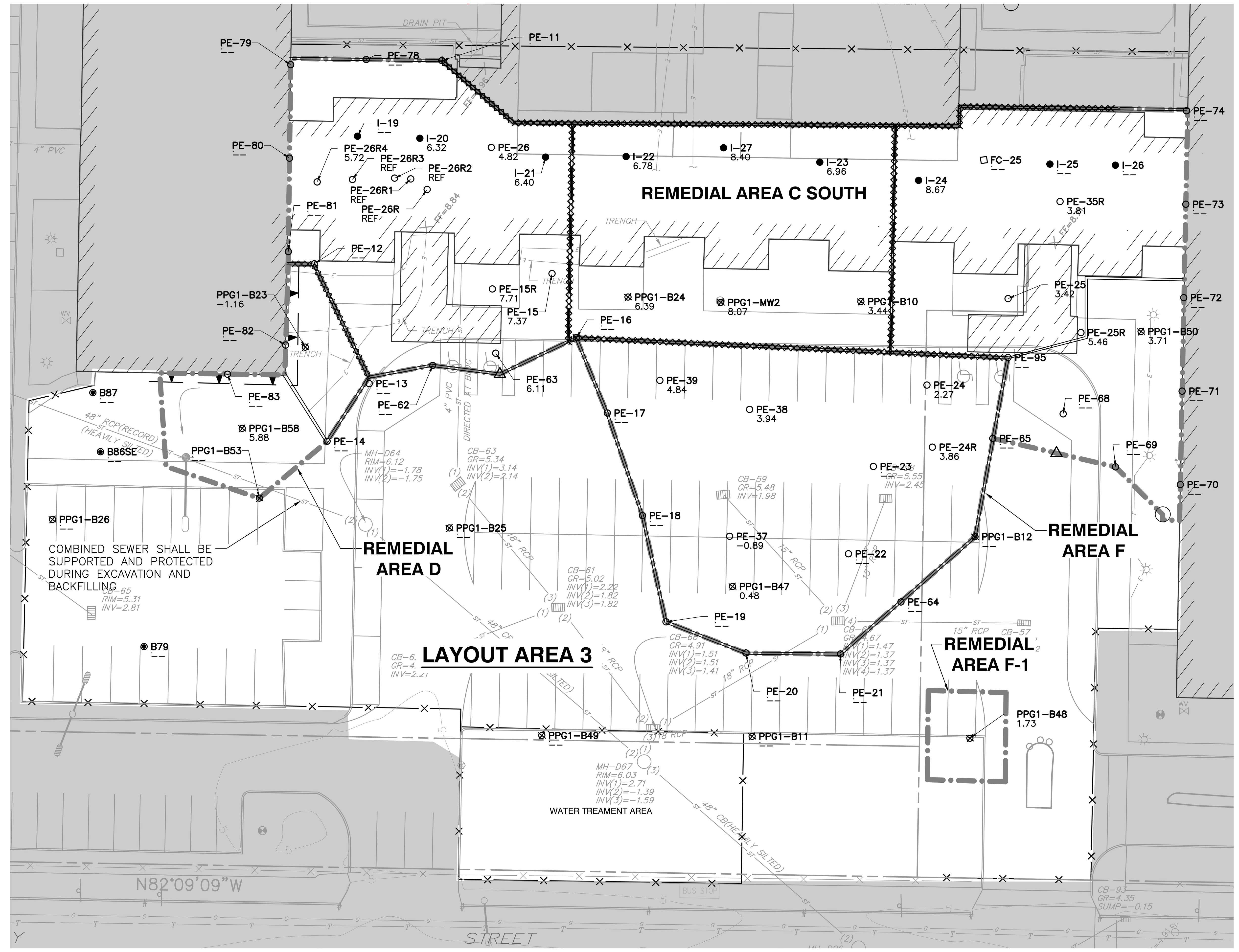
--	04/17/2012	SUBMISSION



SURFACE TOPOGRAPHY SHOWING BORING LOCATIONS AND SURFACE ELEVATIONS



BOTTOM ELEVATION OF OVERLYING SAMPLE INTERVAL MEETING RSRS FOR CCPW–RELATED METALS

THE ELEVATIONS PRESENTED HEREIN DEPICT AN INTERPRETATION OF THE BOTTOM ELEVATION OF SAMPLED INTERVALS ANALYZED AS MEETING RSRS FOR CCPW–RELATED METALS AT THE BORING LOCATIONS INDICATED. ACTUAL CHEMICAL ONDITIONS AND DEPTH TO SOIL BETWEEN BORING LOCATIONS MAY DIFFER.

LEGEND

- I-19 — CONCRETE CORE LOCATIONS AND SURFACE ELEVATIONS
- CONCRETE STAINED OR >20 mg/kg Cr(VI) EXTENDED TO NEXT CONCRETE CORE <20mg/kg Cr(VI) TO BE REMOVED AS HAZARDOUS WASTE
- SLAB AREA REPRESENTED BY CONCRETE CORE
- NO CONCRETE IN THIS AREA
- INITIAL REMEDIAL LIMIT IN ABSENCE OF SHEET PILE INSTALLATION; FINAL LIMIT BASED ON POST EX. SAMPLING
- INTERNAL SHEET PILE WALL (REMOVED FOLLOWING BACKFILLING ON BOTH SIDES OF WALL)
- SHEET PILE WALL AND PHYSICAL EXCAVATION LIMIT
- REMEDIAL AREA BOUNDARY
- PPG1–MWX–PPG — RI MONITORING WELL LOCATION
- PPG1–BX–PPG — RI BORING LOCATION
- I–X–PPG — RAWP INVESTIGATION CONCRETE CORE LOCATION
- PE–X–PPG — RAWP INVESTIGATION PRE–EXCAVATION BORING LOCATION
- CEX–PPG — RAWP INVESTIGATION CENTRAL AREA BORING LOCATION
- LB–XX — LANGAN RAWP BORING
- DB–X — LANGAN RAWP BORING
- △ — PRE–EXCAVATION SAMPLES TO BE INSTALLED PRIOR TO INITIATING WORK

REFERENCE

"TOPOGRAPHIC SURVEY" (DWG. NO. 7.01, REV.4, DATED 2–16–06) BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES.

AREA	VOLUME FROM SURFACE TO CCPW-AFFECTED ZONE (CY)	ESTIMATED VOLUME OF CCPW-AFFECTED ZONE (CY)	TOTAL ESTIMATED VOLUME (CY)
C-SOUTH	2,400	5,500	7,900
D	140	600	740
F	1,200	1,300	2,500
F-1	110	80	110

NOTE: THE FOLLOWING BORINGS MEET RSRS FOR CCPW–RELATED METALS IN ALL SAMPLE INTERVALS ANALYZED. THE BOTTOM ELEVATION OF THE LAST SAMPLE ANALYZED IS LISTED IN THE TABLE BELOW

BORING	SURFACE ELEV. (ft–msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft–msl)		BORING	SURFACE ELEV. (ft–msl)	ELEV. OF DEEPEST SAMPLED INTERVAL (ft–msl)
PE22	5.14	–7.36		PE17	5.76	–4.74
PE23	5.86	–6.64		PE18	5.58	–6.92
I26	8.69*	1.69		PE19	5.31	–7.19
PPG1–B26	5.88	–3.62		PE20	5.10	–7.40
PPG1–B53	6.47	–4.97		PE21	4.93	–7.57
PE14	7.09	–5.41		PPG1–B12	5.75	–3.65
PE13	7.10	–5.40		PE36	7.02	2.52
PE12	8.12	–4.38		PPG1–B51	7.69	–4.21
PE16	6.89	–5.61				

* SURFACE OF FALSE WOODEN FLOOR

NJAC 7:26E-6.2(a)(6) NOTATION

i. GENERAL AREAS OF CONCERN ARE SHOWN ON FIGURE 5.

ii. EXCAVATION VOLUMES ARE SHOWN ON FIGURES 16 THROUGH 21.

iii. VERTICAL AND HORIZONTAL EXCAVATION EXTENT IS SHOWN ON FIGURES 16 THOUGH 21.

iv. LOCATION, DEPTH, AND CONCENTRATIONS OF SOIL ABOVE STANDARDS ARE SHOWN ON FIGURES 6 THROUGH 11.

v. POST–EXCAVATION SAMPLES ARE SHOWN ON FIGURES 17, 19, AND 21.

SCALE IN FEET 0 20 40

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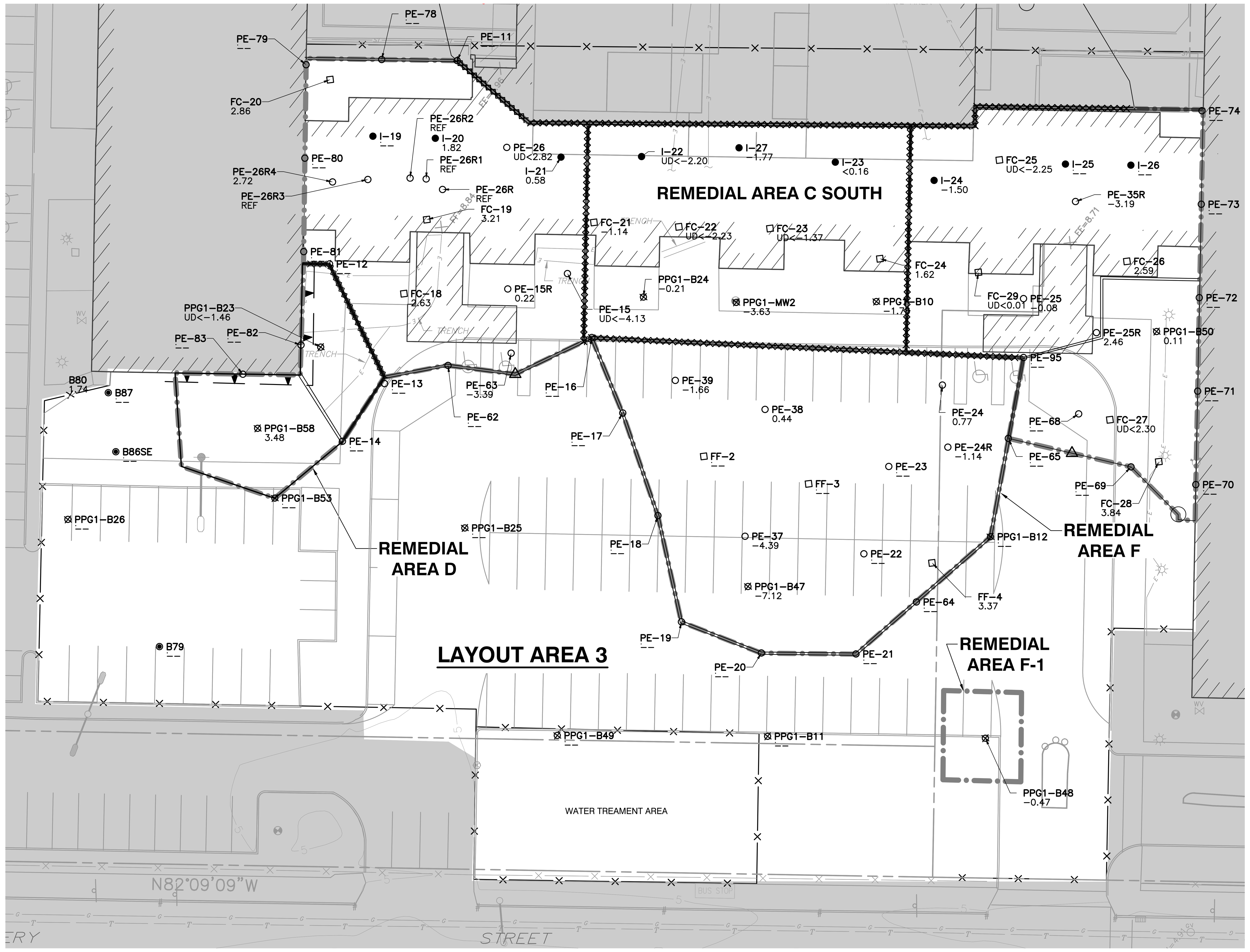
DATE: 07/30/2010	APPROVED BY: *ETM	DWN BY: SPS/LKC
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 3 EXCAVATION PLANS SURFACE TO TOP OF CONTAMINATION		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 20

DD\DWG\100710-fig 20-21.dwg{FIG 20 – LAYOUT AREA 3 EXCAVATION PLANS} LS:(17/04/2012 – tdivittis) – LP: 4/17/2012 3:45 PM

NORTH

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	07/30/2010	SUBMITTED FOR REVIEW
--	4/17/2012	SUBMISSION



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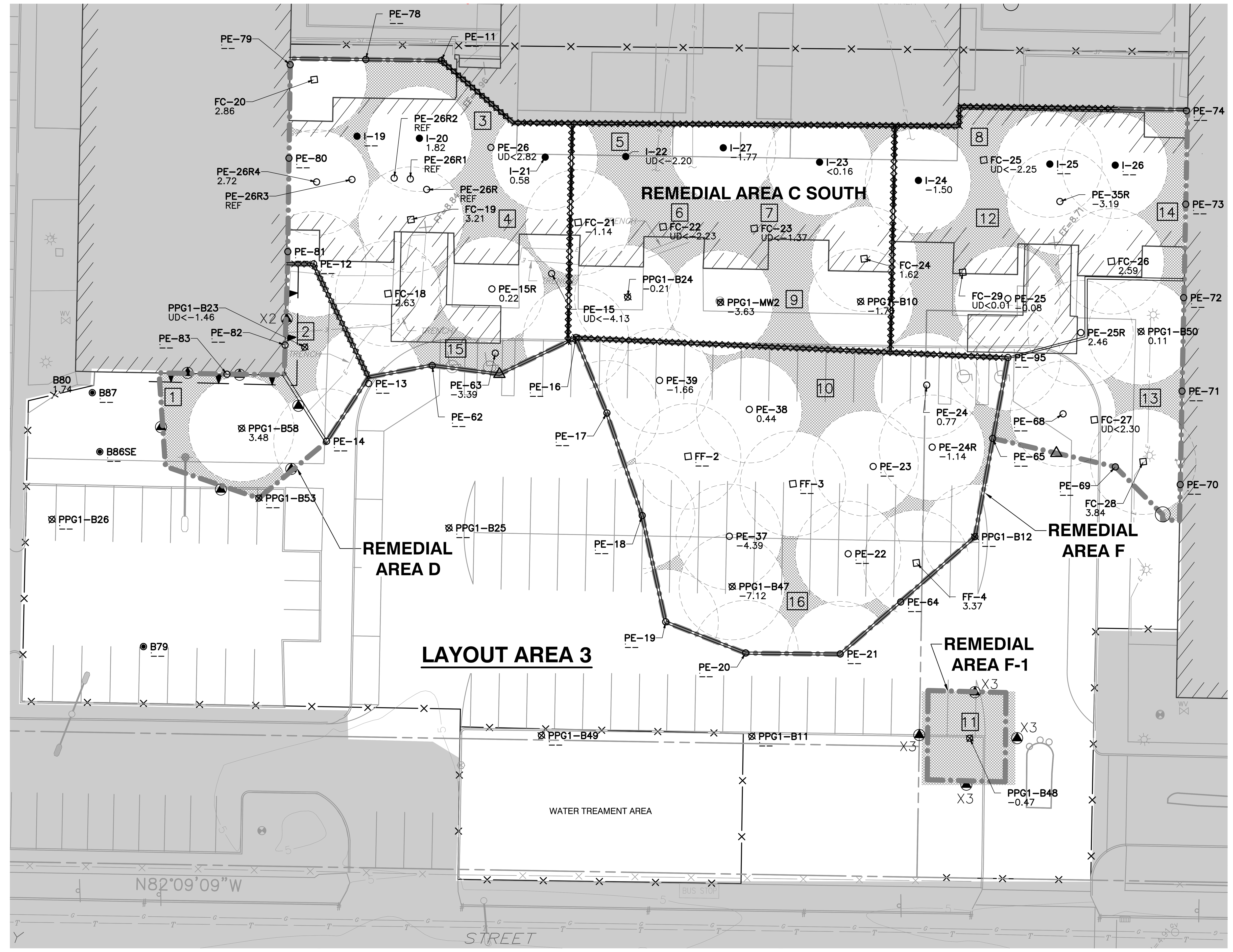

POST–EXCAVATION FLOOR SAMPLE LOCATIONS

SIDEWALL–20 SAMPLES

FLOOR–16 SAMPLES

LEGEND

- BORING LOCATION AND ELEVATION AT TOP OF SAMPLE INTERVAL
- INTERNAL SHEET PILE WALL (REMOVED FOLLOWING BACKFILLING ON BOTH SIDES OF WALL)
- SHEET PILE WALL AND PHYSICAL EXCAVATION LIMIT
- INITIAL REMEDIAL LIMIT IN ABSENCE OF SHEET PILE INSTALLATION; FINAL LIMIT BASED ON POST EX. SAMPLING
- 900 SQUARE FOOT AREA AROUND KNOWN SAMPLE WITH Cr(VI) <20mg/kg
- PROPOSED SIDEWALL SAMPLE LOCATION
- AREA REQUIRING POST–EXCAVATION FLOOR SAMPLE
- 1 — POST–EXCAVATION SAMPLE GENERAL AREA
- PPG1–MWX–PPG — RI MONITORING WELL LOCATION
- PPG1–BX–PPG — RI BORING LOCATION
- I–X–PPG — RAWP INVESTIGATION CONCRETE CORE LOCATION
- PE–X–PPG — RAWP INVESTIGATION PRE–EXCAVATION BORING LOCATION
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DATE: 07/30/2010	APPROVED BY: *ETM	DWN BY: SPS/LKC
SCALE: 1"=20'		CHKD. BY: ETM
LAYOUT AREA 3 EXCAVATION PLANS BOTTOM OF EXCAVATION AND SAMPLING		SHEET 1 OF 1
		DRAWING NUMBER FIGURE 21