# CONSOLIDATED IRON AND METAL ORANGE COUNTY, NEW YORK

# Site Management Plan

### EPA Site Number: NY0002455756/NYSDEC Site Number: 336055 C.T. Male Project No. 11.1182

### Prepared for:

The City of Newburgh 83 Broadway Newburgh, New York 12550

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### **Revisions to Final Approved Site Management Plan:**

Revision #	Submitted Date	Summary of Revision	EPA/NYSDEC Approval Date

**JUNE 2014** 

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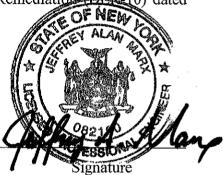
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# **CERTIFICATION**

I Jeffrey A. Marx, P.E. certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with applicable statutes and regulations and in substantive conformance with the DER Technical Guidance for Site Investigations and Remediation (DER 10) dated May 3, 2010.



082100

JUNE 26,2014

NYS Professional Engineer #

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Date

# SITE MANAGEMENT PLAN 1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

#### **1.1 INTRODUCTION**

This document is required as an element of the remedial program at the Consolidated Iron and Metal site (hereinafter referred to as the "Site"). The site is a U.S. Environmental Protection Agency (EPA) Superfund site (EPA ID#: NY0002455756) and is listed on the National Priorities List (NPL) and is also included on the NYSDEC registry of inactive hazardous waste sites (NYSDEC Site Number: 336055). As a requirement of the Consent Decree entered in the case of United States v. City of Newburgh et al. Docket 08 Civ 7378 (SDNY) ("Consent Decree") contained in Appendix A, the City of Newburgh is required to prepare a Site Management Plan that complies with the general requirements of the New York State Department of Environmental Conservation's (EPA and NYSDEC) Inactive Hazardous Waste Disposal Site Remedial Program. The site was remediated in accordance with the objectives established in the EPA issued Record of Decision (October 2006) and the remedial design plans and specifications.

#### 1.1.1 General

The EPA entered into a Consent Decree with certain Potentially Responsible Parties (PRPs) identified for the Consolidated Iron and Metal Site ("Site"). The EPA remediated the Site and a portion of the remediation costs were paid for by direct contribution from the PRP's in exchange for liability considerations as per the terms of the Consent Decree. According to Section XII of the Consent Decree, the City of Newburgh is obligated to prepare the Site Management Plan and the Declaration of Covenants, Restrictions and Environmental Easement ("Environmental Easement"). A figure showing the site location and boundaries of this approximate 8-acre Site is provided in Figure 1 in Attachment A. The boundaries of the site are more fully

described in the metes and bounds site description that is part of the Environmental Easement (Appendix B).

After completion of the remedial work, contamination was left in the subsurface at this site, which is hereafter referred to as "remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the EPA and NYSDEC or its successor agency managing environmental issues in New York State or from the EPA Region 2 Superfund Records Center. Site documents are also available for viewing at the site repository located at the Newburgh Free Library.

This SMP was prepared by C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, D.P.C. (C.T. Male Associates) on behalf of the City of Newburgh, in accordance with the requirements in EPA and NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated January, 2008, and the guidelines provided by EPA and NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

#### 1.1.2 Purpose

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. The Environmental Easement granted the NYSDEC, with third party beneficiary rights of enforcement to EPA, and recorded with the Orange County Clerk on September 11, 2012, provisions for restrictions on site use, unless in compliance with this SMP. The SMP also provides for operation, monitoring maintenance, and reporting measures to ensure compliance with all the restrictions and measures required by the Environmental Easement, as well as insurance that the Environmental Easement remains in place and is effective. This SMP specifies the methods necessary to ensure compliance with all restrictions and reporting required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the EPA and

NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the EPA and NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation, management, monitoring and certification of all Engineering and Institutional Controls (EC/ICs); (2) media monitoring; (3) operation and maintenance of containment (i.e., surface capping of the soils) system; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation, management, annual monitoring and annual certification of the ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of containment (i.e., surface capping of the soils).

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

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement and the Consent Decree;
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375, the Environmental Easement, and the Consent Decree and thereby subject to applicable penalties.

#### 1.1.3 Revisions

Revisions to this plan will be proposed in writing to the EPA and NYSDEC's project manager. In accordance with the Environmental Easement, modifications or termination of the restrictions may be provided in writing by the grantee (NYSDEC).

#### **1.2 SITE BACKGROUND**

The Consolidated Iron and Metal site is an inactive car and scrap metal junk yard located at the foot of Washington Street in the City of Newburgh, Orange County, New York. The facility operated from the mid-1950's until 1999. The facility occupies about 7 acres of land bordering the Hudson River in a mixed industrial, commercial, and residential area. The site is bounded by a boat marina and restaurant to the north, Conrail railroad tracks and South Water Street to the west, a wastewater treatment plant to the south, and the Hudson River to the east. Before EPA conducted a clearing operation at the site in 2003, the Consolidated Iron and Metal facility consisted of tire and scrap metal piles throughout the southern portion of the site; a smelter, a compactor, and a metal shear along the western portion of the site; and an office, scale, and garage located in the northern portion of the site. Scrap metal processing and storage operations took place at the site for approximately 40 years, during which time various types of scrap metal were received, including whole automobiles, automobile engines, transmissions, and batteries, keypunch machines, computer parts, white goods (appliances), and transformers. According to the former owner, the smelter operated between 1975 and 1995. The smelter was used primarily to melt aluminum transmissions to produce a reusable aluminum product. Other materials were also smelted, resulting in a lead-contaminated ash/slag by-product. Other operations included sorting ferrous and non-ferrous metal scrap for recycling, baling and shearing large pieces of metal, including whole cars, into smaller pieces for transport, and flattening of cars.

From 1997 to 1999, the NYSDEC conducted several inspections at the facility. EPA and NYSDEC observed oil and other waste liquids on the facility soils and storm water being discharged into the Hudson River from the northeast corner of the property without appropriate testing or permits. In 1999, the New York State Attorney General

filed a lawsuit against the company for environmental law violations, resulting in the company ceasing operations.

In 1998 EPA began a series of removal actions at the site that included the removal of a large ash/slag pile, the removal of a processed soil pile, the installation of an eight foot high fence, a drum removal, the construction of a runoff berm, and the removal of a number of site structures and site debris. In 2004, EPA completed a remedial investigation (RI) of the site to determine the nature and extent of contamination. Using information from the RI, EPA issued a Record of Decision in 2006. Construction at the site was completed by EPA in 2011 and a Remedial Action Report was issued in March 2012, leading to the preparation of the SMP. The allowable future use determination for the site, i.e., restricted residential, was determined jointly by EPA, NYSDEC, and NYSDOH.

#### **1.2.1** Site Location and Description

The site is located in the City of Newburgh, County of Orange, New York and is identified as Block 3 and Lot 3 on the Orange County Tax Maps. The site is an approximately eight (8)-acre area bounded by a boat marina to the north, an inactive municipal incinerator and an active wastewater treatment plant to the south, the Hudson River to the east, and Conrail railroad tracks and South Water Street to the west (see Figure 1 in Attachment A). The boundaries of the site are more fully described in Appendix B – Environmental Easement. The Metes and Bounds for the property are depicted on a pre-remediation map included in Appendix B that was prepared by Chazen Engineering, Surveying & Landscape Architecture, P.C.; entitled Topographic and Boundary Survey Prepared for Lockheed Martin REAC. Although the site topography is modified by the EPA's site activity, the boundaries have not changed.

#### 1.2.2 Site History

Scrap metal processing and storage operations took place at the site during its period of operation as a scrap yard from the mid 1950's to the late 1990's. Various types of scrap metal were received, including whole automobiles, automobile engines, transmissions, and batteries, keypunch machines, computer parts, white goods

(appliances), and transformers. A smelter was used on-site primarily to melt aluminum transmissions to produce a reusable aluminum product. Other materials were also smelted, resulting in a lead-contaminated ash/slag by-product. Other operations included sorting ferrous and non-ferrous metal scrap, which included baling and shearing large pieces of metal, including whole cars, into smaller pieces for transport, and the flattening of cars. From 1997 to 1999, NYSDEC conducted several inspections at the facility and cited the owner for a number of violations. Subsequent inspections by EPA and NYSDEC noted that the owner had failed to adequately correct the violations and in fall 1999, the New York State Attorney General shut down operations at the site for various violations, including illegal discharge to surface water without a permit.

#### **1.2.3** Geologic Conditions

According to the site's Record of Decision, the site is underlain by a stratified clay, silt and sand unit with layers of sand and gravel at the land surface and below the water table. The unconsolidated deposits are underlain by the Martinsburg Formation, which consists of shale and carbonate rocks (e.g., limestone and dolostone). The bedrock is cross-cut by faults near the site.

The unconsolidated water table aquifer, which overlies the low permeability bedrock aquifer, is comprised of fill material underlain by native sand and gravel with localized silt lenses. The water table aquifer varies in thickness across the site, averaging approximately 20 feet thick.

Based on synoptic water level measurements, groundwater flows to the east/southeast toward the Hudson River. The water table at the site is generally flat, with elevations ranging from 3.18 feet above mean sea level (msl) (14.43 feet below ground surface (bgs)) in the northwest corner of the site, to 0.44 foot above msl (11.97 feet bgs) in the southeastern part of the site.

#### **1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS**

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

• Final Remedial Investigation (RI) Report (Volumes I & II), Consolidated Iron and Metal Site, Remedial Investigation/Feasibility Study, Newburgh,

New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 5, 2006.

Generally, the RI sampling found soils at the site to be contaminated with lead and cadmium; pre-design sampling showed these levels to be above the Resource Conservation and Recovery Act (RCRA) Characteristic limits, therefore classifying most of the soils as RCRA Hazardous for lead and cadmium.

Below is a summary of site conditions when the RI was performed in 2004:

#### <u>Soil</u>

Surface and subsurface soil samples were collected site-wide and from areas in the vicinity of the process area. The term "process area" is used to describe the area of the site in which the metal shear, compactor/bailer, and smelter buildings were located. The term "site-wide area" is used to describe locations outside the process area.

Screening for the contaminants of concern in Site area as depicted by the documentational samples are included in Appendix C.

The investigation to support the site design indicated the soils at the site were contaminated with lead and cadmium above the RCRA Characteristic limits, therefore classifying most of the soils as RCRA Hazardous for lead and cadmium. A smaller area of the site was found to be contaminated with lead and cadmium at concentrations less than the RCRA Characteristic levels for classification as a hazardous waste and was separately disposed. Some of the soils in the process area were found to be contaminated with polychlorinated biphenols (PCBs). A small percentage of the soils in this area were contaminated with PCBs up to 70 ppm as total PCBs, however, most of the other soils at this site had total PCB concentrations less than 50 ppm.

#### **Sediments**

Ten (10) sediment samples were collected in the Hudson River adjacent to the site. In addition, 10 background sediment samples were collected in the Hudson River north of the site, in areas expected to be outside the tidal distribution of potential contamination from the site. Sediment screening performed as part of the RI indicated results exceeding the sediment screening criteria.

Fourteen (14) semi-volatile organic compounds, two (2) pesticides, one (1) PCB and 11 metals were detected above the sediment screening criteria. However, several of the parameters were below background values, suggesting that the contaminants may

have originated from other sources.

#### Surface Water

Surface water and background surface water samples were collected off-site from the site's east adjoining Hudson River. Iron exceeded the calculated background level and screening criteria in nine (9) of 10 surface water samples adjacent to the site. Lead exceeded its screening criteria in two samples.

#### Site-Related Groundwater

Volatile organic compounds and metals exceeded the applicable screening criteria in groundwater in certain wells at the site. Volatile organic compounds commonly found in gasoline (MTBE, benzene, toluene, ethylbenzene, and/or m, p-xylene) were detected above screening criteria in between five or six wells during the two rounds of sampling. The majority of exceedances were downgradient (east) of former underground storage tanks (USTs) located along the western border of the site. The highest levels of contaminants were adjacent to and downgradient of the former compactor/bailer and metal shear buildings. The highest concentrations were detected in a monitoring well (MW-05) approximately 250 feet downgradient of the former metal shear building.

#### Site-Related Soil Vapor Intrusion

A Vapor Intrusion Assessment was not conducted as part of the RI/FS.

#### Underground Storage Tanks

A buried underground storage tank containing residual gasoline was unearthed during the remedial action excavation. The contents of the tank were removed and transported off site for disposal. The decontaminated tank was then transported off site for recycling.

#### **1.4 SUMMARY OF REMEDIAL ACTIONS**

The site was remediated in accordance with the EPA-approved Remedial Design Report, dated October 2009, as documented by EPA in the Remedial Action Report.

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

1. Excavation of lead and cadmium-contaminated soil across the site to a depth of six (6) feet below grade or to the water table if the water table was

encountered at a depth less than six (6) feet followed by placement of a barrier demarcation layer consisting of non-woven geotextile fabric.

- 2. Select excavation of PCB and volatile organic compound contaminated soil to the water table in the vicinity of the former process area and downgradient of the former process area followed by placement of a barrier demarcation layer consisting of non-woven geotextile fabric.
- 3. Construction and maintenance of a soil cover system consisting of between approximately 3.5 and approximately 10 feet of clean fill and topsoil to prevent human exposure to remaining contaminated soil/fill remaining at the site. The depth of clean fill is depicted on Figure 1 in Attachment A (Drawing S-1, Depth of Replacement Material, prepared by Stantec Consulting Services, Inc. (Stantec)).
- 4. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.
- Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed at the site in March 2012.

#### 1.4.1 Removal of Contaminated Materials from the Site

The preliminary remediation goals (PRGs) established for remediation of soils at the site was the residential PRG of 400 parts per million (ppm) for lead and 10 ppm each for PCBs and volatile organic compounds. Because of the pervasiveness of leadcontaminated soils throughout the site, cleanup to six (6) feet below grade using the residential PRG for lead generally resulted in meeting the PRG value for all other contaminants of concern in this zone.

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

TABLE 1.4.1-1: SOIL CLEANUP OBJECTIVES & LAND USE		
	Soil Cleanup	
Parameter	Objective	Land Use
Lead	400 ppm	Restricted Residential
Volatile Organic Compounds	10 ppm total	Restricted Residential
PCBs	10 ppm total	Restricted Residential

The soil excavation was completed in two phases, Phase I and Phase II. Materials from the site were disposed of during both phases; the type of material disposed of (hazardous vs. non-hazardous) was dictated by site operations and compliance with the remediation work plan. Soil removal was initiated beginning at the southwest corner of the site in July 2009. Conventional excavation methods were used to excavate lead-contaminated soil to a depth of six feet bgs or to the water table if the water table was encountered at a depth less than six feet (which applied to the most downgradient portion of the site adjacent to the river). A summary of removal materials follows:

- Phase I: 60,000 Tons of Hazardous Soil
- Phase II: 47,500 Tons of Hazardous Soil
- Phase II: 18,500 Tons of Non-hazardous Soil

More details of the remedy can be found in the Remedial Action Report, Consolidated Iron and Metal Site, City of Newburgh, New York prepared by Stantec Consulting Services. Inc. (Stantec). Figure 1 in Attachment A depicts the final depth of excavation (Drawing S-1 - Final Depth of Excavation Plan of contaminated soils prepared by Stantec). The depth of excavation is depicted on Figure 2 in Attachment A (Drawing 7 of 8), Base Excavation Depth Plan), Figure 3 show a cross-section view of the excavation profile through the deepest portion of the excavation material (Drawing 8 of 8, Cutaway View Plan). These figures depict depth of excavation and fill thickness in plan and cross-sectional view. They have been prepared by a licensed engineer in the State of New York. Copies of the stamped drawings are attached to this Site Management Plan.

#### 1.4.2 Site-Related Treatment Systems

No treatment systems were installed as part of the site remedy.

#### 1.4.3 Remaining Contamination

Following the excavation of contaminated soils and prior to the placement of the demarcation barrier, post-excavation soil samples (documentational sampling) were taken at the base of the excavation at 50 foot grid intervals to document the contaminant composition of the soils left in place. The documentational sampling performed by the EPA during remedial activities has documented the environmental quality of the soils left in place beneath the demarcation layer. The documentational sampling is attached in Appendix C.

The EPA focused on four main constituents of concern; cadmium, lead BTEX/MTBE and PCBs.

Post-excavation soil sampling for cadmium is documented on a Figure 4 in Attachment A ((Display Figure 1 of 4 – Figure Depicting the Analytical Values for Cadmium at the Base of the Excavation) prepared by EPA. Cadmium exceeds the applicable soil cleanup guidance value beneath the barrier at numerous locations. The documentation sampling results exceeding the applicable soil cleanup values are highlighted on the Figure 4.

Documentational sampling results for lead are identified on Figure 5 in Attachment A (Display Figure 2 of 4 – Figure Depicting the Analytical Values for Lead at the Base of the Excavation). This drawing was prepared for the EPA for informational purposes by EPA. The documentation sampling results exceeding the applicable soil cleanup values are highlighted on Figure 5.

Documentational sampling results for total PCBs are identified on Figure 6 in Attachment A (Display Figure 3 of 4 - Figure Depicting the Analytical Values for total PCBs at the Base of the Excavation). This drawing was prepared for the EPA for informational purposes by EPA. The documentation sampling results exceeding the applicable soil cleanup values are highlighted on Figure 6.

Documentational sampling results for VOCS (BTEX-MTBE) are identified on Figure 7 in Attachment A (Display Figure 4 of 4 – Figure Depicting the Analytical Values for VOCs (BTEX-MTBE) at the Base of the Excavation). This drawing was prepared for the EPA for informational purposes by EPA. The documentation sampling results exceeding the applicable soil cleanup values are highlighted on Figure 7.

# 2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

### 2.1 INTRODUCTION

### 2.1.1 General

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

### 2.1.2 Purpose

This plan provides:

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

### 2.2 ENGINEERING CONTROLS

#### 2.2.1 Engineering Control Systems

#### 2.2.1.1 Soil Cover System

Exposure to remaining contamination in soil/fill at the site is prevented by a soil cover system placed over the site. This cover system is comprised of a combination of clean soil and topsoil, and stone aggregate (drainage area located in the north central portions of the site). The thickness of the soil cover system is depicted in Figure 1 in Attachment A; where the thickness of fill ranges from 6.2 feet to more than 10 feet in the central portion of the site where the deep excavation occurred. Fill thickness decreases to a minimum of 3.5 feet in the northeast corner of the site.

The soil cover system is underlain by a non-woven geotextile fabric (demarcation layer). Beneath the fabric, soils exceeding the unrestricted soil cleanup objectives (SCOs) defined by 6 NYCRR 372-6.8(a) exist virtually throughout the site. Areas of the site where lead, cadmium, BTEX/MTBE and PCBs exceeded the applicable soil cleanup guidance values are depicted respectively in Figures 4 through 7, contained in Attachment A. Breach of the demarcation layer requires compliance with the Excavation Work Plan procedures located in Appendix D.

The Excavation Work Plan outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

#### 2.2.1.2 Perimeter Fencing

An eight (8) foot high chain-link fence to prohibit trespassers from entering the site is located along the north, west and south perimeter of the site. Two (2) gates providing access to the site are located at the northwest and southwest corners of the site. The access gates are secured with a lock. The fencing can be maintained in a condition that continues to restrict access to the site or removed since there is no longer a risk of

exposure to site contamination. If it is left in place, it must be observed on an annual basis for competency.

Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses inspections that may occur in the event of extreme weather conditions or other factors that may affect controls at the site. Procedures for operating and maintaining the surface cover system and fencing are documented in the Operation and Maintenance Plan (Section 4 of this SMP).

#### 2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.5 of NYSDEC DER-10.

#### 2.2.2.1 Soil Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

#### 2.2.2.2 Sub-slab Depressurization System (SSDS)

Future building construction, should it occur, may require a sub-slab depressurization system (SSDS). Prior to any new construction, the building site must be evaluated for vapor intrusion potential. The existing barrier demarcation layer is porous and vapors from the residual VOCs remaining beneath it have the potential to migrate through it. If evaluation of site conditions indicates the potential for vapor intrusion as per the NYSDOH Guidance for Vapor Intrusion, new building construction shall require an SSDS.

The SSDS will not be discontinued unless prior written approval is granted by the EPA and NYSDEC and NYSDOH. In the event that monitoring data indicate that the SSDS is no longer required, a proposal to discontinue the SSDS will be submitted by the current property owner to the EPA and NYSDEC and NYSDOH.

#### 2.2.2.3 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the EPA and NYSDEC, until residual groundwater concentrations are

found to be consistently below EPA and NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the EPA and NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the EPA and NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

### 2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) ensure the use and development of the site consistent with the reserved rights established in paragraph 6 of the Environmental Easement, which allows Grantor any use and development not restricted in paragraph 3. Adherence to these Institutional Controls on the site is required by the Environmental Easement (Appendix B) and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering and Institutional Controls on the Site Property must be inspected at a frequency and in a manner defined in paragraph 33 (a)(vii) of the Consent Decree (Appendix A). Monitoring and maintenance of Institutional Controls shall include an inventory of any use restrictions on the Site Property, periodic certification by the Site Property owner that the institutional controls are in place and remain effective; annual inspection of the Site Property to determine if soil excavation activities below the demarcation layer have occurred; annual search of property records to ensure that institutional controls remain in place and are effective and annual notification to governmental offices to ascertain whether any filings or applications have been made regarding the site; and annual reports to the EPA and NYSDEC summarizing the findings;;

- Groundwater, soil vapor and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Site Property must be reported at the frequency and in a manner defined in this SMP;

Site restrictions and access rights identified in the Environmental Easement may not be discontinued or terminated without a modification or termination as provided in paragraph 4 of the Environmental Easement.

The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement (Appendix B). Site restrictions that apply to the Site Property are:

- The property may only be used for residential purposes defined in the Environmental Easement, commercial or industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted use without additional remediation and amendment of the Environmental Easement, as approved by the EPA and NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Use of groundwater as a source of potable or process water is prohibited until groundwater quality standards are met;
- The potential for vapor intrusion must be evaluated for any buildings developed on the site, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardening (except community gardens with notice to EPA and NYSDEC approval), raising livestock or producing animal products for human consumption on the property is prohibited;
- The site owner or remedial party will submit to EPA and NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Site Property are unchanged from the previous certification or that any changes to the controls were approved by the EPA and NYSDEC; and, (2)

nothing has occurred that impairs the ability of the controls to protect public health and the environment or that constitute a violation or failure to comply with the SMP. EPA and NYSDEC retains the right to access such Site Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that EPA and NYSDEC may allow and will be made by an expert that the EPA and NYSDEC finds acceptable.

#### 2.3.1 Excavation Work Plan

The site has been remediated for restricted residential, commercial or industrial reuse. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix D to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures identified in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) to be prepared by the contractor for the any work on the site that may have the potential to disturb material below the demarcation barrier. A HASP and CAMP have been prepared as part of the EPA's remediation of the site that could be used for reference. Any future invasive work will require the preparation of a HASP and CAMP that complies with DER-10 and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and Federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP shall be updated by future site contractors and workers and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development

activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

#### 2.3.2 Soil Vapor Intrusion Evaluation

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

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

Preliminary SVI sampling data will be forwarded to the EPA and NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. Validated SVI data will be transmitted to a third party property owner, if applicable, within 30 days of validation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

If required and/or performed, SVI sampling results and evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

#### 2.4 INSPECTIONS AND NOTIFICATIONS

#### 2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule (Section 3.4). A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will, at a minimum include those elements defined in paragraph 33 (a)(vii) of the Consent Decree (Appendix A). Monitoring and maintenance of Institutional Controls shall include an inventory of any use restrictions on the Site Property, periodic certification by the Site Property owner that the institutional controls are in place and remain effective; annual inspection of the Site Property to determine if soil excavation activities below the demarcation layer have occurred; annual search of property records to ensure that institutional controls remain in place and are effective and annual notification to governmental offices to ascertain whether any filings or applications have been made regarding the site; and annual reports to the EPA and NYSDEC summarizing the findings. It will also include the following:

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

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

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

### 2.4.2 Notifications

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

- Not less than 30 day advance notice of any proposed changes in site use that are required under the terms of the Environmental Easement
- 10 business days advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the EPA and NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

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

- At least 60 days prior to the change, the EPA and NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Environmental Easement, the Consent Decree, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

### 2.5 CONTINGENCY PLAN

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

#### 2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, D.P.C. for soliciting site related information. These emergency contact lists must be maintained in an easily accessible location at the site.

The City of Newburgh Engineering Department shall maintain an emergency contact list until such time as the Site Property is transferred to a new owner.

Medical, Fire, and Police:	911
Dig Safely New York One Call Center:	<ul><li>811 or (800) 962-7962</li><li>(at least 2 working days but no more than 10 working days notice required for utility markout, excluding holidays and weekends)</li></ul>
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
EPA and NYSDEC Spills Hotline	(800) 457-7362

 Table 2.5.1-1: Emergency Contact Numbers

The City of Newburgh 83 Broadway	(845) 569-7300*
Newburgh, New York 12550	
<ul><li>C.T. Male Associates Engineering, Surveying,</li><li>Architecture &amp; Landscape Architecture, D.P.C.</li><li>50 Century Hill Drive</li><li>Latham, New York 12110</li></ul>	(518) 786-7400
<ul><li>C.T. Male Associates Engineering, Surveying,</li><li>Architecture &amp; Landscape Architecture, D.P.C.</li><li>652 Route 299, Suite 204B</li><li>Highland, NY 12528</li></ul>	(845) 833-0964

### Table 2.5.1-2: Other Contact Numbers

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

#### 2.5.2 Map and Directions to Nearest Health Facility

Information on nearest hospital is provided below:

Site Location: East of Water Street, North of River Street and South of

Washington Street

Nearest Hospital Name: St. Luke's Cornwall Hospital

Hospital Location: 70 Dubois Street, Newburgh, NY 12550

Hospital Telephone: (845) 561-4400

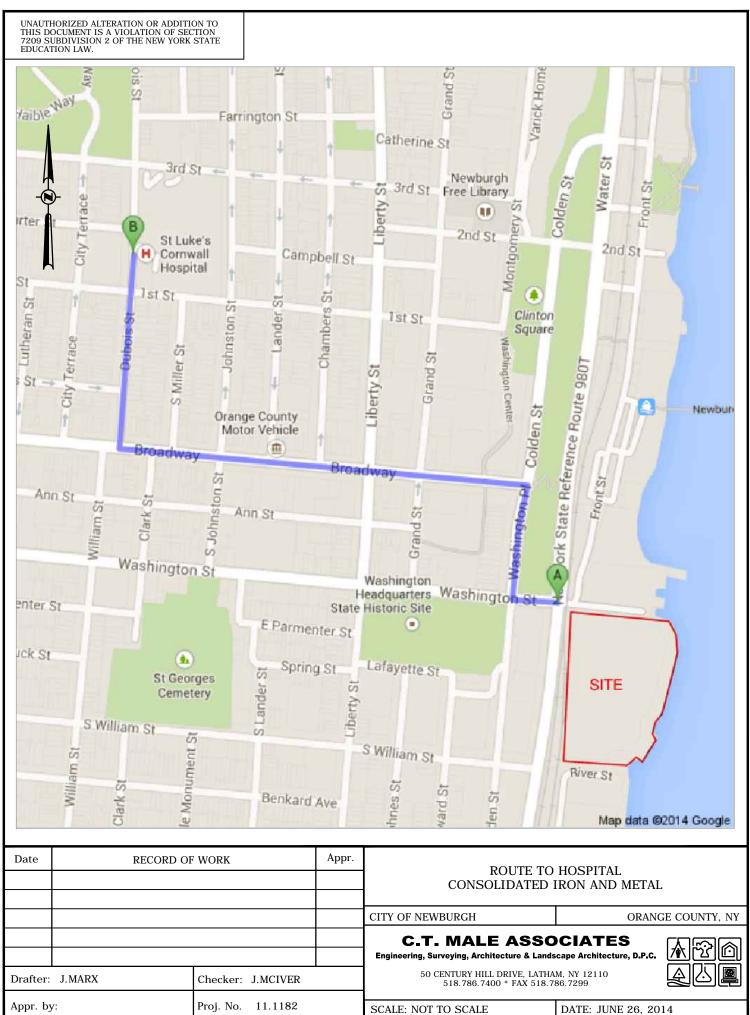
Directions to the Hospital:

- 1. Head north on Water Street toward Washington Street
- 2. Take 1<sup>st</sup> left onto Washington Street
- 3. Take 1<sup>st</sup> right onto Colden Street
- 4. Turn right onto Dubois Street
- 5. Hospital will be on the right between 1<sup>st</sup> and 3<sup>rd</sup> Streets

Total Estimated Distance: 0.9 Miles

Total Estimated Time: 4 Minutes

A map and directions to the nearest health facility is tabbed for easy access and contained at the end of Attachment A, Figures. For reference purposes, the map is presented on the following page.



#### 2.5.3 **Response Procedures**

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 2.5.1-1). The list will be maintained at the City of Newburgh Engineer's office and will also be posted prominently and made readily available to all personnel entering the site at all times.

In the event of a spill of hazardous and/or petroleum product, preliminary spill control measures should be employed. These should include:

- Preliminary assessment of the release;
- Initial control of the release source;
- Temporary containment of the released material; and
- Effective clean-up of the released material.

The site manager shall respond to an accidental release in the following manner:

- Identify the character, source, amount and area affected by the release.
- Notify the DEC Spill Hotline at 1-800-457-7362 within two hours of discovery.
- Contain the release with sorbent material such as speedi-dry, spill socks and sorbent pads.
- Mitigate the release from entering sensitive receptors (i.e., catch basins and surface water) using the sorbent material and/or sandbags.
- Coordinate cleanup of the release material and determine if additional investigatory steps (i.e., sampling and analysis) are warranted.
- Document proper handling and storage of contaminated material for disposal, and arrange for disposal of waste materials
- Provide spill cleanup information to EPA and NYSDEC for closure of the spill number.

At no time should personal health or safety be compromised or jeopardized in an attempt to control a release.

As appropriate, the fire department and other emergency response group shall be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 2.5.1-1). Petroleum spills must be reported to EPA and NYSDEC unless they meet <u>all</u> of the following criteria:

- The spill quantity is known to be less than 5 gallons; and
- The spill is contained and under the control of the spiller; and
- The spill has not and will not reach the State's water or any land; and
- The spill is cleaned up within 2 hours of discovery.

A spill is considered to have not impacted land if it occurs on a paved surface such as asphalt or concrete. A spill in a dirt or gravel parking lot is considered to have impacted land and is reportable.

### 3.0 SITE MONITORING PLAN

### 3.1 INTRODUCTION

### 3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of EPA and NYSDEC.

### 3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable EPA and NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

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

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and

• Annual inspection and periodic certification.

Annual monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first five (5) years. The frequency thereafter will be determined by EPA and NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 3.1.2 and outlined in detail in Sections 3.2 and 3.3 below.

Monitoring Program	Frequency*	Matrix	Analysis
Soil Cover	Annually	Soil	Visual Observation
Groundwater	Annually	Groundwater	Volatile Organic Compounds, PCBs and Metals
Soil Vapor	As needed**	Soil Vapor	Volatile Organic Compounds

 Table 3.1.2: Monitoring/Inspection Schedule

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

\*\* Needed if building construction is proposed for the Site

#### 3.2 SOIL COVER SYSTEM MONITORING

The soil cover system will be observed annually to determine if the condition of the surface cover system continues to be protective of human health and the environment from site contaminants.

#### 3.3 MEDIA MONITORING PROGRAM

#### 3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. No other site media are required to be monitored beyond the soil cover system monitoring.

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

- Ten (10) monitoring wells were installed at the site after completion of the remedial action in 2010. The wells are depicted as MW-01 through MW-10 on Figure 4 contained in Attachment A. The well elevations have not been established. A survey of the wells is required before the first round of groundwater samples is obtained.
- The wells were installed in the unconfined aquifer.
- The wells were installed to depths that ranged from 13 feet bgs at MW-06 located in the northeastern corner of the site to 19 feet bgs at MW-01 located in the northwestern corner of the site.
- The monitoring wells were constructed of 4-inch diameter PVC screen and riser and protected with a 6-inch diameter steel stickup enclosure.

Monitoring well construction logs are attached in Appendix E. The sampling frequency may be modified with the approval of EPA and NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by EPA and NYSDEC.

#### **3.3.1.1 Sampling Protocol**

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log. An example of a groundwater sampling log is presented in Appendix F. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network. Well sampling shall be done as follows:

Elevations have not been obtained from the groundwater monitoring wells. A survey of the wells must be conducted to obtain elevations for each groundwater monitoring well prior to the initial sampling event. Once the well elevations are established, sampling can proceed. This task needs to be performed once and the well elevations added to the monitoring well construction logs provided in Appendix E once the survey data are available.

Upon arrival at the sampling location, the well will be observed for any damage, the cover of the guard pipe or curb box will be cleared of any debris and unlocked or unbolted. Clean polyethylene sheeting will be placed adjacent to the well to protect purging and sampling equipment from contamination. The cap and top of the well casing will be wiped with a clean cloth and then the cap removed. A PID reading will be collected when the well cap is removed. Water levels for all wells will be taken and recorded before any well is purged.

Water levels will be measured in the monitoring wells using a water level indicator probe. The water levels will be measured from the surveyed reference point to the nearest 0.01 foot. Water levels will be measured progressively from upgradient monitoring wells to downgradient monitoring wells, attempting to measure water levels from the cleanest well to the dirtiest well. The water level probe shall be decontaminated between each well location during water depth measurement.

The water depth levels and reference elevations determined from the monitoring well survey will be recorded on a Water Level Record form and the water table elevations calculated. A blank copy of this form is presented in Appendix E together with the groundwater sampling log.

Prior to sampling of the groundwater, it is necessary to purge the wells. Purging of the wells allows for a representative sample to be taken from the screened interval of the well by removing stagnant water from the well. Three to five well volumes of the standing water will be removed from the well. In cases where the water recharges at a slow rate, the well will be purged dry when possible.

The wells will be purged using either a peristaltic or submersible pump and will be documented on the groundwater sampling log. Physical observations of the purge water will be noted and recorded in the groundwater sampling log. The actual quantity of purge water removed from the well will be measured by using a bucket graduated in gallons, and the volume will be recorded. Once purging is complete, the purging device will be removed from the well and placed on the clean polyethylene sheeting, adjacent to the well, until completion of the groundwater sampling.

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All of the purge water from the monitoring wells will be removed from the site. Groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site. Under certain conditions, purge water may be allowed to be discharged to ground surface; however, concurrence from the EPA and NYSDEC will be required before doing so. Discharge to ground surface would require approval from the EPA and NYSDEC on a case by case basis. and the purge water will be collected and placed in 55-gallon drums and stored at the project site until laboratory analyses results of the groundwater samples indicates the proper method of treatment or disposal.

Prior to sample collection, recovery times and water depths will be recorded on the Groundwater Services Field Log form. The wells may be sampled as soon as there is enough water in the well to collect sufficient volume for analysis. The sample will be collected using a new disposable bailer or a pre-cleaned stainless steel or Teflon bailer that was dedicated to the well for the sampling event.

The stainless steel or Teflon bailer or disposable bailer will be lowered slowly into the well to minimize the aeration of the samples. Volatile samples will be collected first, followed by field parameters and then in decreasing order of the volatility of the parameters being analyzed for. The laboratory samples will be collected without filtration.

In order to insure the integrity of samples, sample containers must be filled properly. The following sections contain general procedures for sampling and specific procedures for sampling volatile organic compounds. Care shall be taken in sampling to assure that analytical results represent the actual sample composition.

Analytical Requirements for Containers and Preservatives for Water Sampling				
PARAMETER	CONTAINER	ТОР	PRESERVATION	COMMENTS
VOCs per EPA 8260	3-40 ml vials	Septum	HCl to pH<2	NA
(Water)	(preserved)		Cool, 4°C	
Semi-VOCs (Water)	1L amber Glass	Teflon	Cool, 4°C	Store in dark
PCBs per EPA 8082	1L amber Glass	Teflon	Cool, 4°C	Store in dark

 TABLE 3.3.1.1-1

(Water)				
Pesticides Per 8081A (Water)	1L amber Glass	Teflon	Cool, 4 <sup>°</sup> C	Store in dark
Metals per EPA 6010/7000 (Water)	500 ml Plastic	Poly	HNO <sub>3</sub> to pH <2 Cool, 4 <sup>°</sup> C	NA

Sample labels will be prepared prior to sampling and affixed to the sample containers. The client, project name, site location, matrix, sample type (grab/composite), preservative and laboratory analyses to be performed will be recorded on the sample labels by the laboratory. The sample location (i.e., monitoring well ID), date, sampler's initials and time will be filled out on the sample label at the time of sampling.

#### 3.3.1.2 Monitoring Well Repairs, Replacement and Decommissioning

If bio-fouling or silt accumulation occurs in the on-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The EPA and NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of EPA and NYSDEC. Well abandonment will be performed in accordance with EPA and NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the EPA and NYSDEC.

#### **3.4 SITE-WIDE INSPECTION**

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather

conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix G). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

#### 3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the general sampling requirements outlined in the EPA and NYSDEC DER-10 and for the project Quality Assurance Project Plan (QAPP), available at the document repository. The QAPP is available for review at the Newburgh Free Library.

#### **Sampling Program:**

Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use. Containers with preservative will be tagged as such. Sample holding times will be in accordance with the EPA CLP Sampling Protocols outlined in the EPA's Quality Assurance Project Plan requirements.

Just prior to sampling and filling the sample containers, the label on the container will be completed with the required information. After filling the sample containers they will be wiped with a paper towel, and placed in a protective bubble or foam wrap to protect it during transport. The container(s) will be placed in a cooler with double bagged ice packs, to maintain a temperature of 4°C.

A Chain of Custody Record will be completed by the sampler in the field after securing analytical samples. The sampler will be responsible for retaining possession of

the samples until they are delivered to the laboratory or until they are delivered to a courier or common carrier for shipment to the laboratory. When the samples are released from the custody of the sampling personnel, the Chain of Custody Record will be signed by both parties with the date and time indicated. A copy of the form will be retained by the sampler for inclusion in the project files and the original form will accompany the shipment.

If samples are shipped, a bill of lading or an air bill will be used and retained in the project files as documentation of sample transportation. Prior to shipment, the cooler will be securely wrapped with clear tape to protect it from tampering. A separate additional Chain of Custody Record will be completed for each cooler of samples. This form will be placed in a plastic bag and taped to the underside of the cooler lid. This form will be used by the laboratory personnel as a check to verify that the containers listed on the form are present in the cooler when they are received at the laboratory. A copy of the signed Chain of Custody Record will accompany the laboratory analysis reports.

All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.

The laboratory will follow all calibration procedures and schedules as specified in EPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.

Quality control samples will be taken during the field sampling to monitor sampling technique, sampling equipment cleanliness, sample variability, sample handling and laboratory performance (analytical reproducibility). The quality control samples will include replicate samples, equipment/field blanks and transport blanks. The QC samples will be run in accordance with the protocols and frequencies specified in the EPA and NYSDEC ASP, SW-846 and EPA Methods as applicable for the analyses being performed.

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#### **3.6 MONITORING REPORTING REQUIREMENTS**

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

All monitoring results will be reported to EPA and NYSDEC and NYSDOH on a periodic basis in the Periodic Review Report. A letter report will also be prepared for the EPA and NYSDEC and NYSDOH subsequent to each sampling event. The summary will include, at a minimum:

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

Data will be reported in hard copy or digital format as determined by EPA and NYSDEC. A summary of the monitoring program deliverables are summarized in Table 3.6.1 below.

Task	Reporting Frequency*
Soil Cover Observation	Annually
Groundwater monitoring	Annually
Vapor Intrusion	Prior to construction of any occupied building
Indoor Air Quality	To be determined upon construction completion and occupation of site building(s)

#### Table 3.6-1: Schedule of Monitoring/Inspection Reports

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

### 4.0 OPERATION AND MAINTENANCE PLAN

#### 4.1 INTRODUCTION

The site remedy currently does not rely on any mechanical systems, such as subslab depressurization systems or air sparge/ soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

Any future occupied buildings constructed on the site should install a sub-slab depressurization system or perform a vapor intrusion assessment in accordance with NYSDOH guidance.

Any future construction and building approval for the site should require an amendment to this SMP documenting the methods used to address the potential vapor intrusion issue, if one exists.

The Operation and Maintenance Plan:

- Shall include the steps necessary to allow individuals unfamiliar with the site to operate and maintain the sub-slab depressurization system;
- Shall include an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the sub-slab depressurization system (when installed) is operated and maintained.

A copy of the Operation and Maintenance Plan, when prepared, along with the complete SMP, will be kept at the City Engineer's office or at the site, as applicable. The Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component of the SMP.

# 4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

There are currently no mechanical systems installed at the site and the current remedy does not include mechanical systems. If future development efforts include buildings, it is possible that an SSDS will be required, at which point in time the SMP will be modified to address the Engineering Controls to be implemented.

### 4.3 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the site will be kept on-file at the City of Newburgh Engineer's office. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and EPA and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

### 5. INSPECTIONS, REPORTING AND CERTIFICATIONS

#### 5.1 SITE INSPECTIONS

#### 5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

#### 5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system. The general site-wide inspection form will be completed during the site-wide inspection. These forms are subject to EPA and NYSDEC revision.

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

#### 5.1.3 Evaluation of Records and Reporting

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

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and Maintenance activities are being conducted properly; and, based on the above items,

• The site remedy continues to be protective of public health and the environment and is performing in accordance with the decision documents, Remedial Design and Remedial Action Report.

# 5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a Qualified Environmental Professional (QEP) or a Professional Engineer licensed to practice in New York State, as defined in NYSDEC DER-10, will prepare the following certification:

- The inspections of the Site Property have occurred in accordance with the criteria identified in paragraph 33 (a)(vii) of the Consent Decree;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the EPA and NYSDEC;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the EPA and NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;

#### 5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the EPA and NYSDEC every year after completion of the SMP. In accordance with NYSDEC policy, the first report shall be due within fifteen months after approval of the SMP. Subsequent reports will be submitted annually thereafter. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that

addresses the site as described in the Consent Decree (Appendix A). The report will be prepared in accordance with NYSDEC policy requirements outlined in the Consent Decree and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the ROD;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
  - $\circ$  The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in hard-copy format, to the EPA and NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to EPA and NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

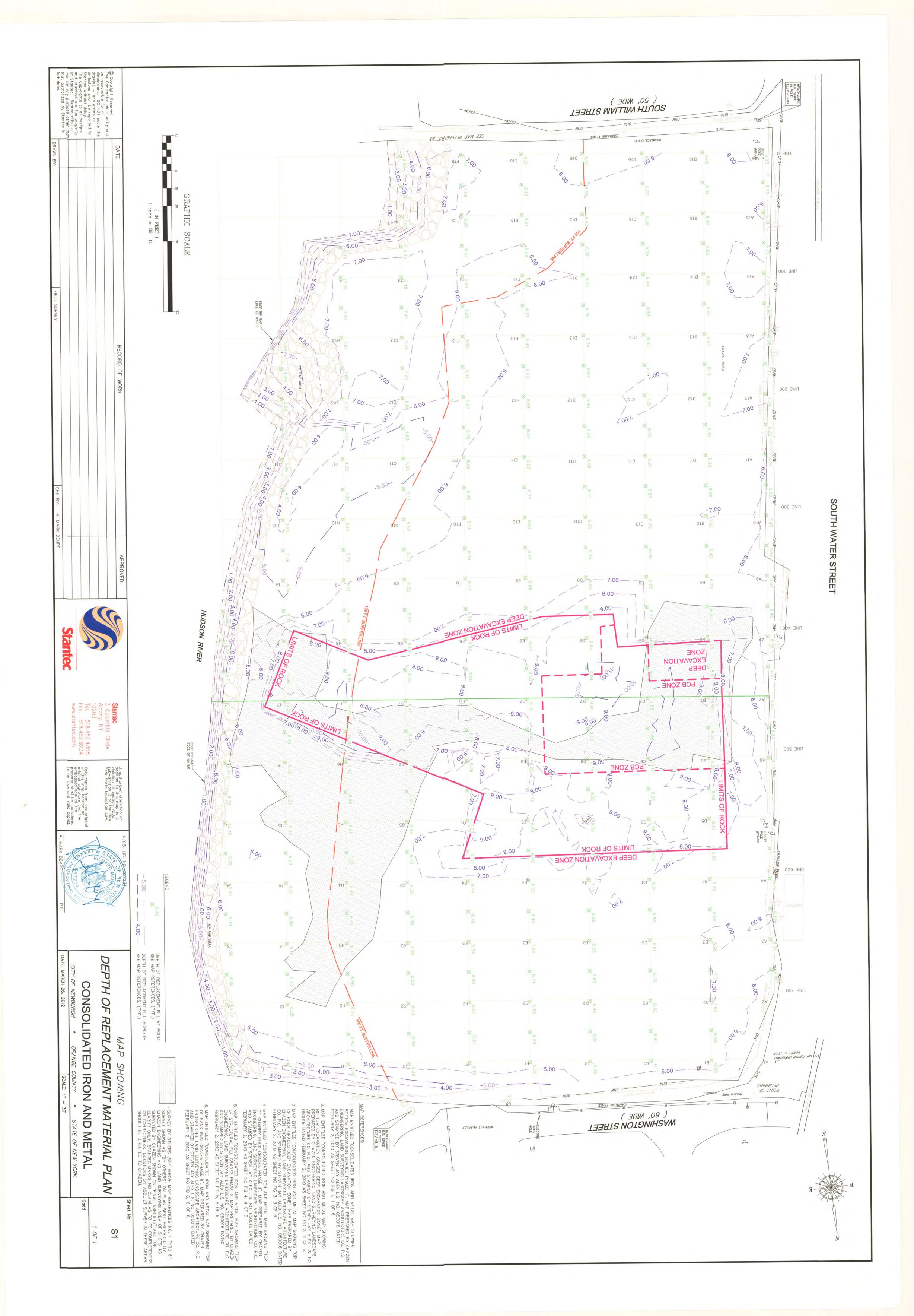
#### 5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the EPA and NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the EPA and NYSDEC.

# ATTACHMENT A FIGURES

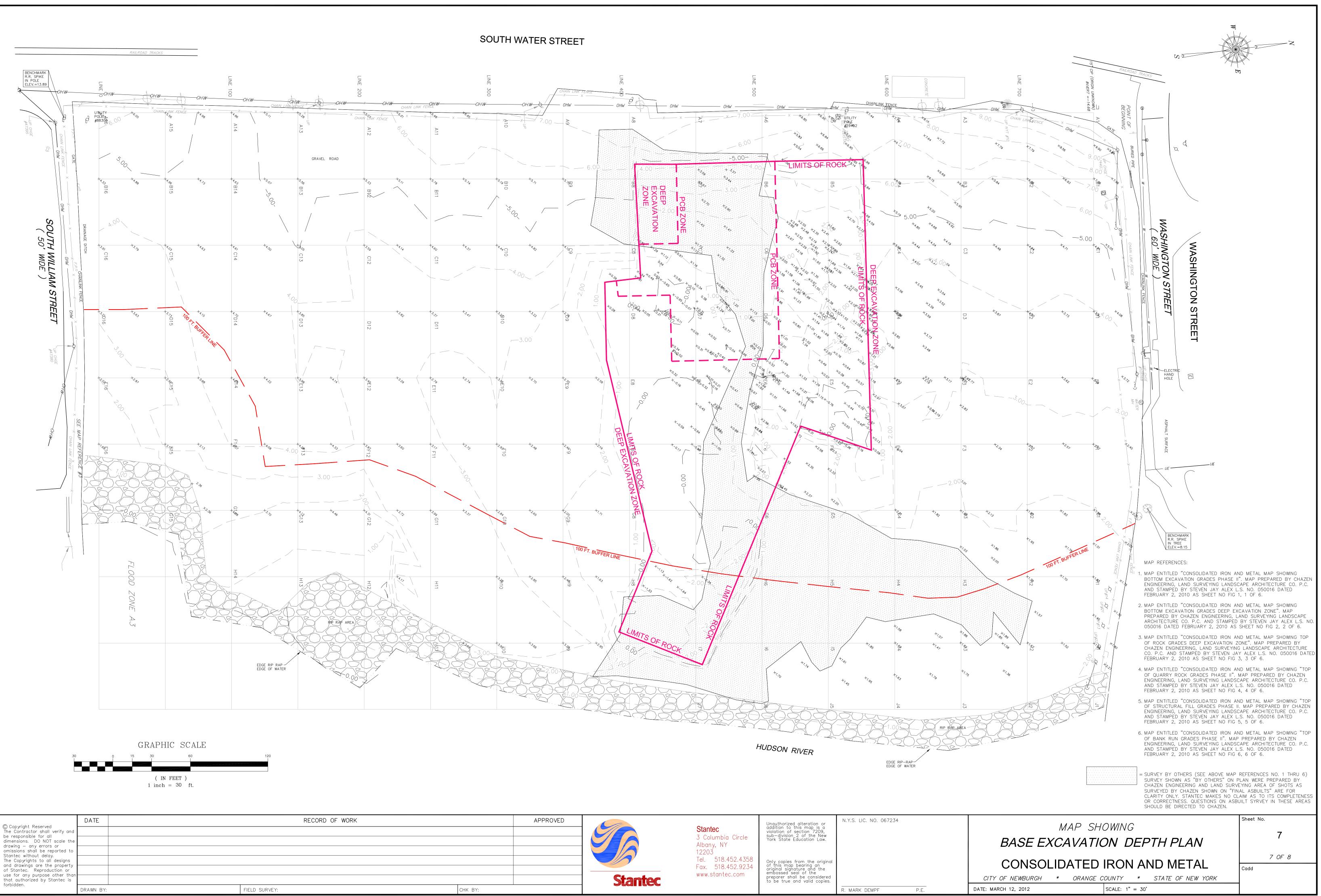
## FIGURE 1

# DRAWING S-1 - DEPTH OF REPLACEMENT MATERIAL PLAN



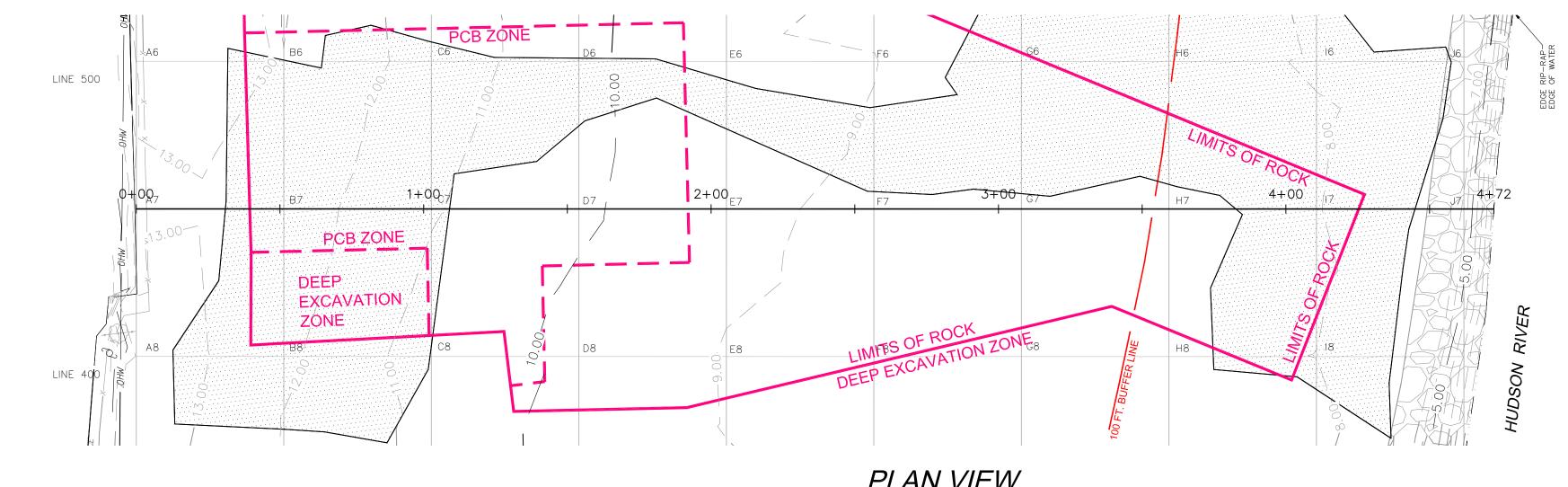
## FIGURE 2

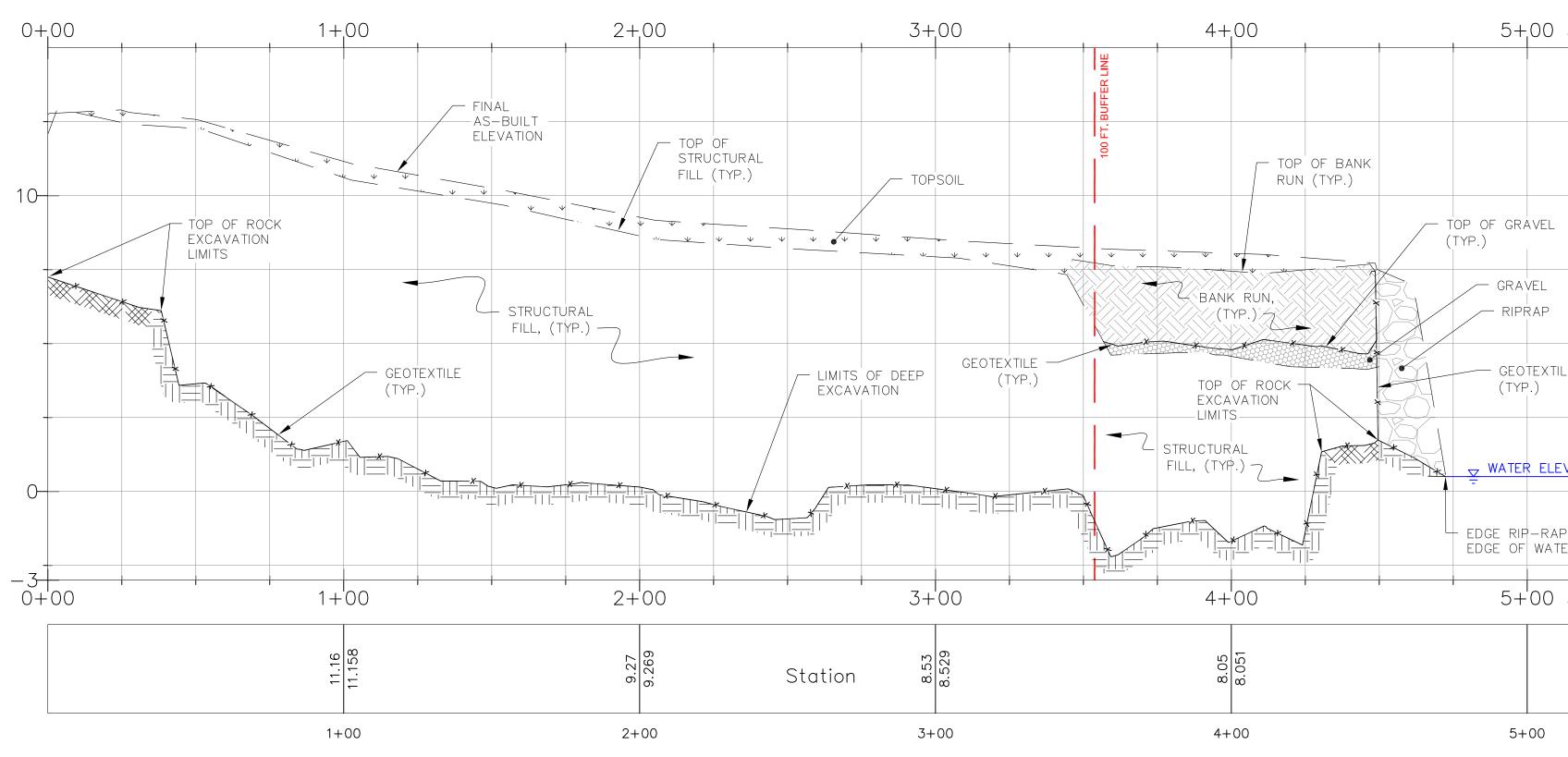
# DRAWING 7 OF 8 – BASE EXCAVATION DEPTH PLAN

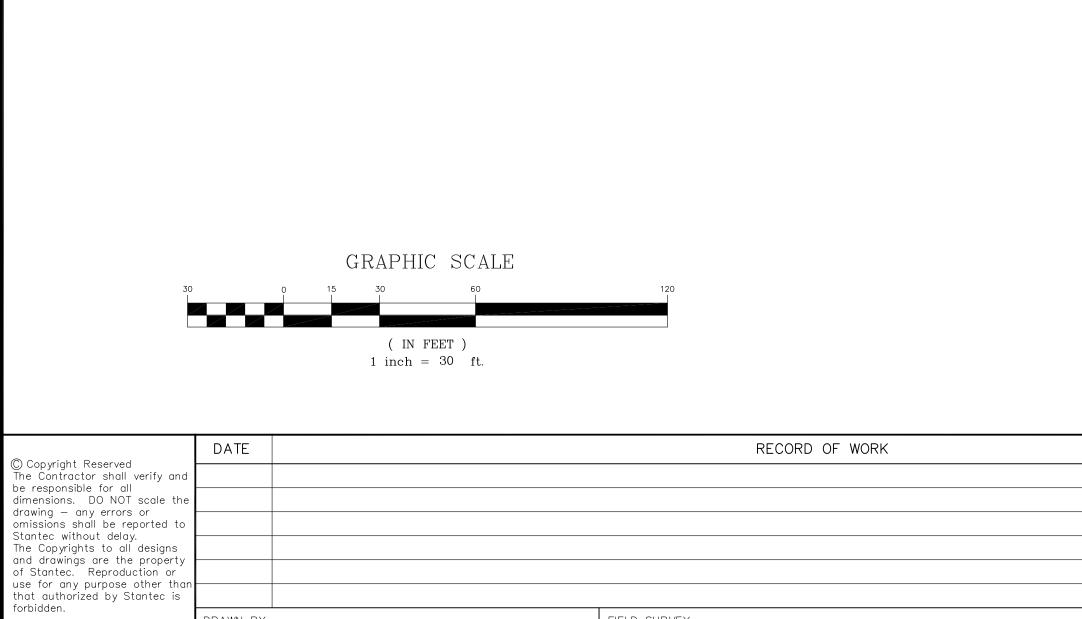


## FIGURE 3

## DRAWING 8 OF 8 – CUTAWAY VIEW PLAN







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FIELD SURVEY:

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 $\frac{CUTAWAY VIEW}{SCALE: 1 = 30'}$ 

LEGEND

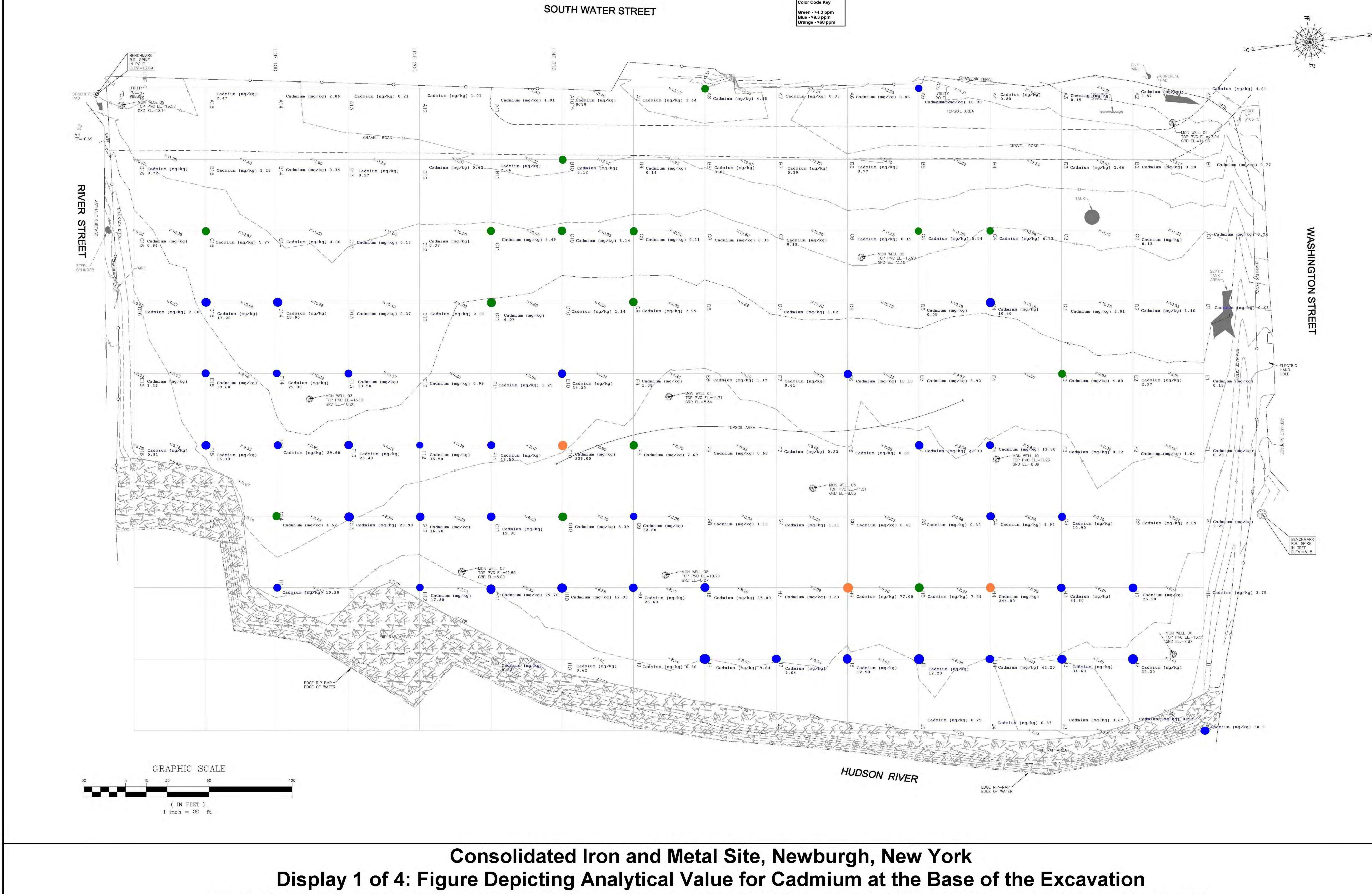
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			4. MAP ENTITLED "CONSOLIDATED IRON A OF QUARRY ROCK GRADES PHASE II". ENGINEERING, LAND SURVEYING LANDS AND STAMPED BY STEVEN JAY ALEX L FEBRUARY 2, 2010 AS SHEET NO FIG	MAP PREPARED BY CHAZEN CAPE ARCHITECTURE CO. P.C. S. NO. 050016 DATED 4, 4 OF 6.
			5. MAP ENTITLED "CONSOLIDATED IRON A OF STRUCTURAL FILL GRADES PHASE I ENGINEERING, LAND SURVEYING LANDS AND STAMPED BY STEVEN JAY ALEX L FEBRUARY 2, 2010 AS SHEET NO FIG	I. MAP PREPARED BY CHAZEN CAPE ARCHITECTURE CO. P.C. S. NO. 050016 DATED 5, 5 OF 6.
			6. MAP ENTITLED "CONSOLIDATED IRON A OF BANK RUN GRADES PHASE II". MAF ENGINEERING, LAND SURVEYING LANDS AND STAMPED BY STEVEN JAY ALEX L FEBRUARY 2, 2010 AS SHEET NO FIG	P PREPARED BY CHAZEN CAPE ARCHITECTURE CO. P.C. S. NO. 050016 DATED
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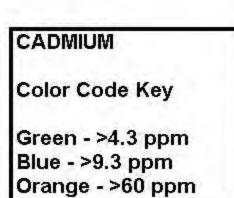
### FIGURE 4

# DISPLAY FIGURE 1 OF 4 – FIGURE DEPICTING THE ANALYTICAL VALUES FOR CADMIUM AT THE BASE OF THE EXCAVATION



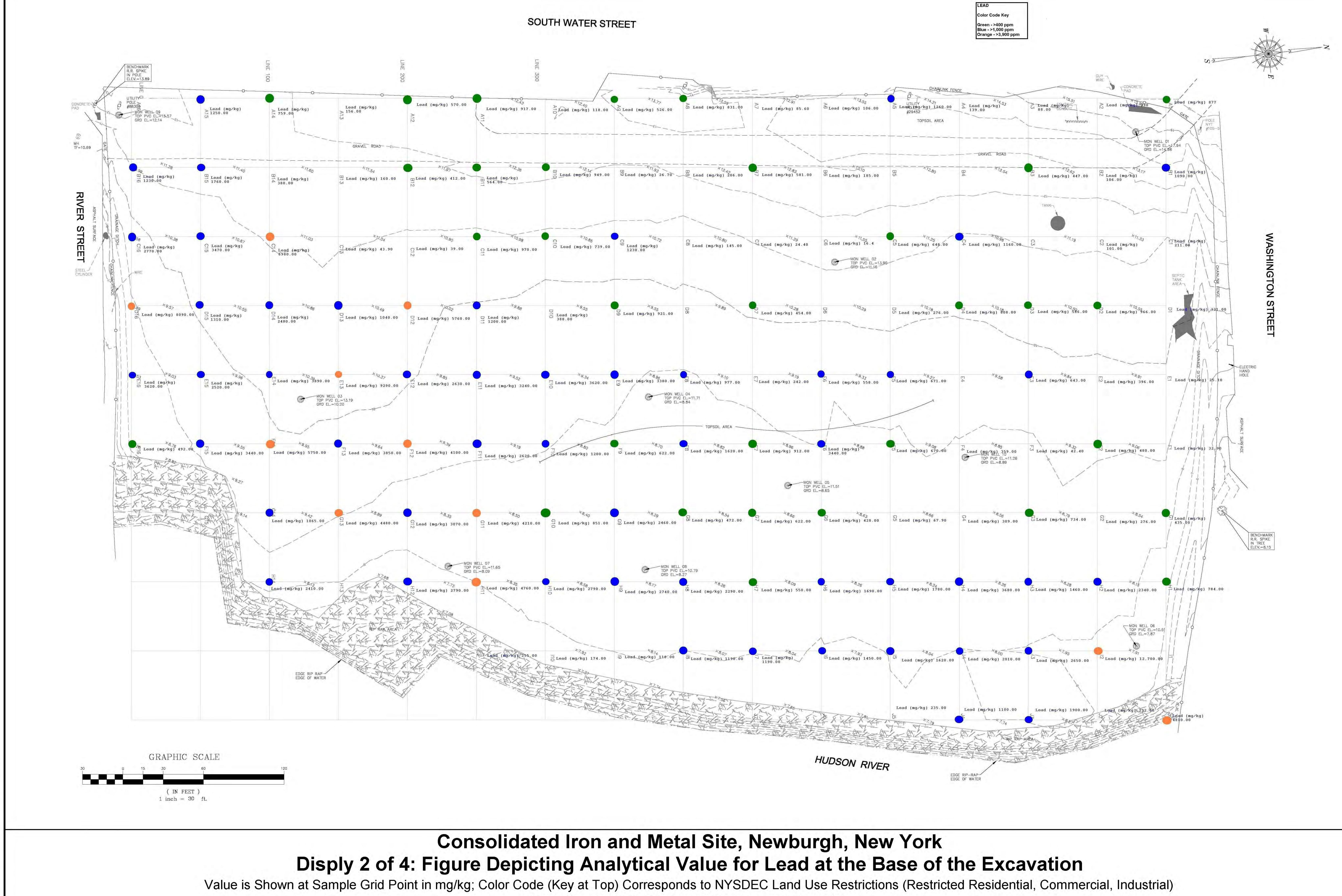
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Value is Shown at Sample Grid Point in mg/kg; Color Code (Key at Top) Corresponds to NYSDEC Land Use Restrictions (Restricted Residential, Commercial, Industrial) Display Prepared By U.S. Environmental Protection Agency, March 2012

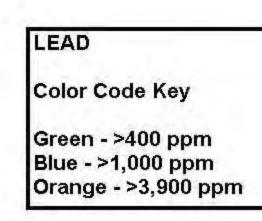


### FIGURE 5

# DISPLAY FIGURE 2 OF 4 – FIGURE DEPICTING THE ANALYTICAL VALUES FOR LEAD AT THE BASE OF THE EXCAVATION

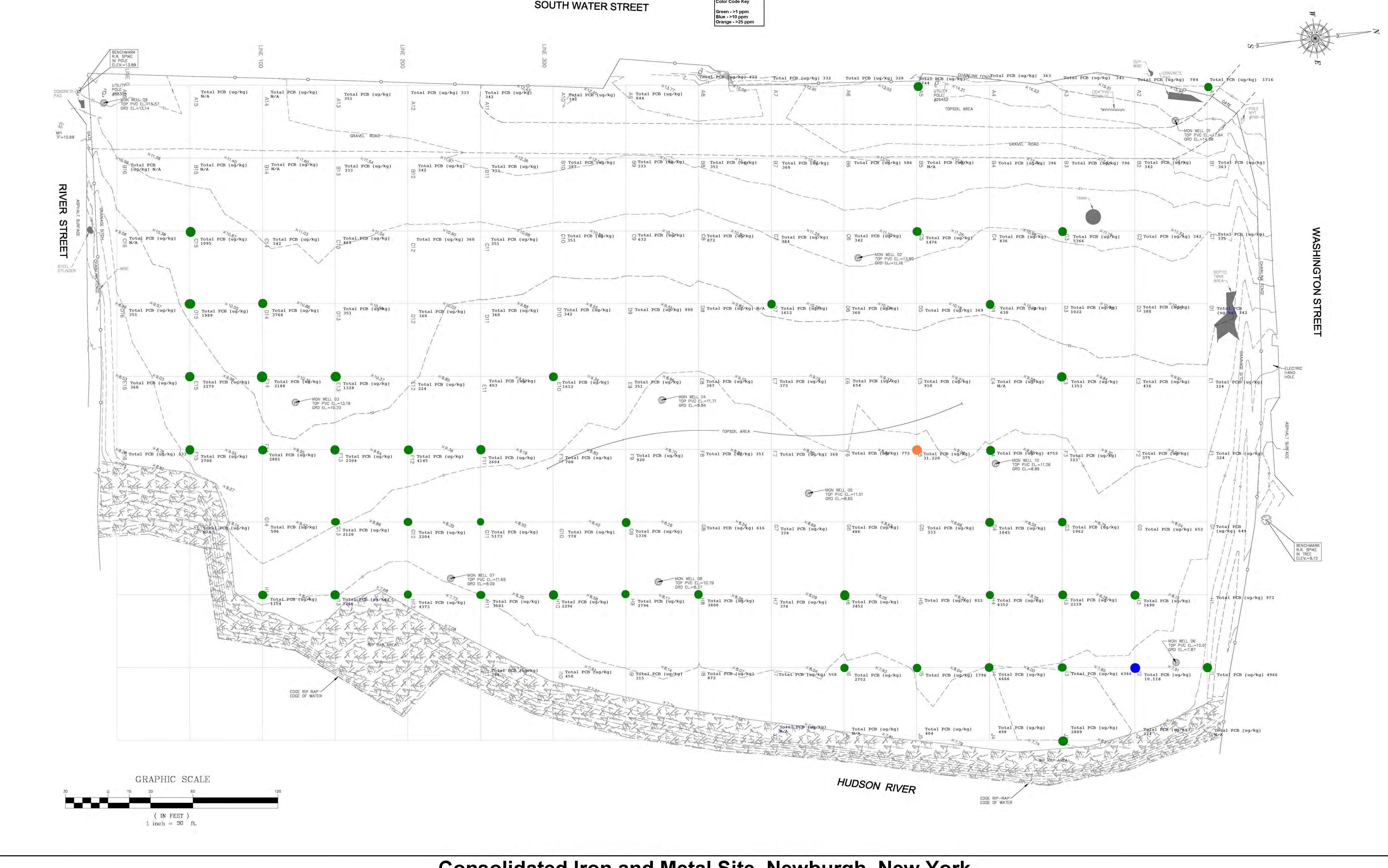


Display Prepared By U.S. Environmental Protection Agency, March 2012



## FIGURE 6

# DISPLAY FIGURE 3 OF 4 – FIGURE DEPICTING THE ANALYTICAL VALUES FOR TOTAL PCBS AT THE BASE OF THE EXCAVATION



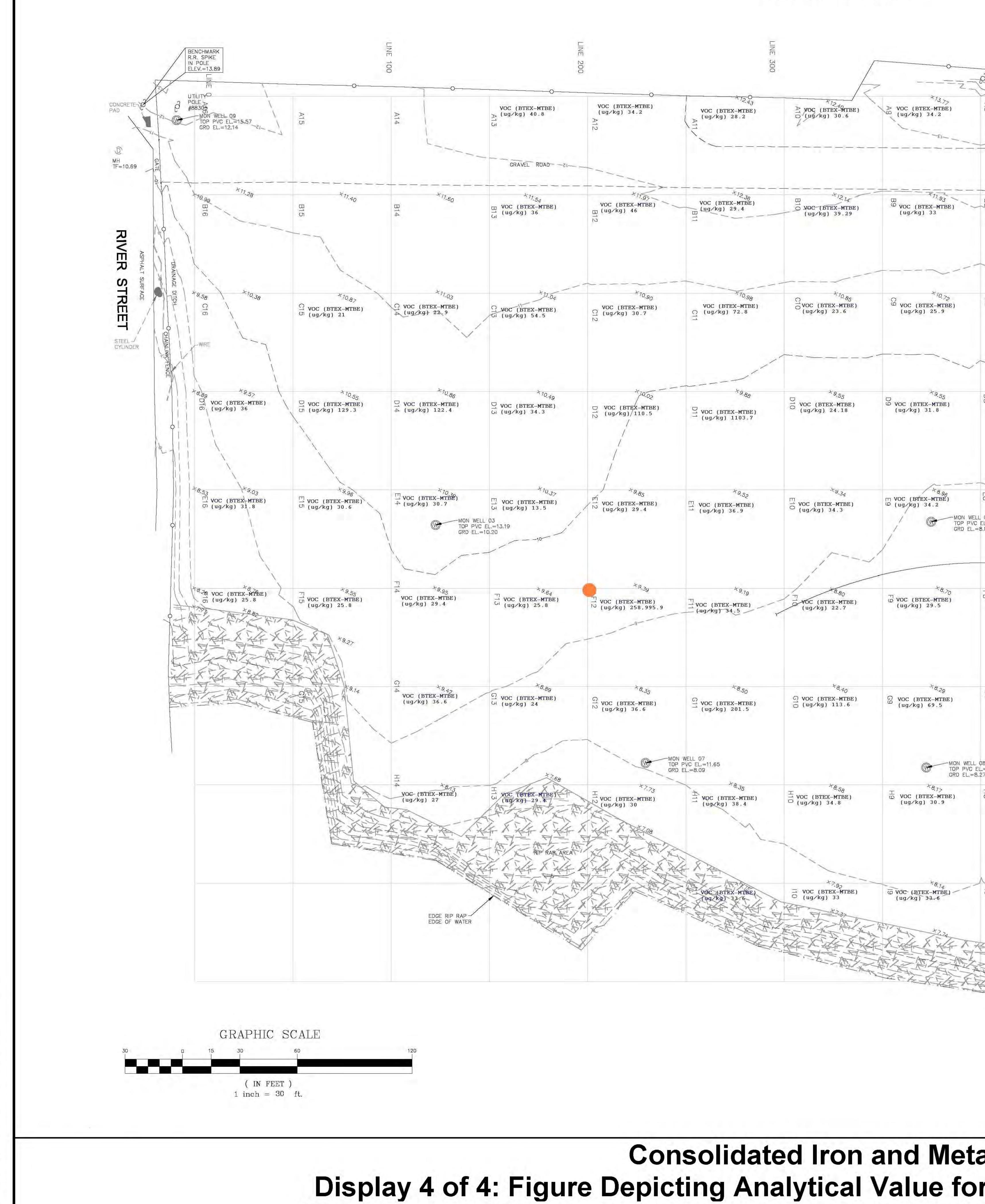
**Consolidated Iron and Metal Site, Newburgh, New York** Display 3 of 4: Figure Depicting Analytical Value for Total PCBs at the Base of the Excavation Value is Shown at Sample Grid Point in ug/kg; Color Code (Key at Top) Corresponds to NYSDEC Land Restrictions (Restricted Residential, Commercial, Industrial) Display Prepared By U.S. Environmantal Protection Agency, March 2012

SOUTH WATER STREET

PCB
Color Code Key
Green - >1 ppm
Green - >1 ppm Blue - >10 ppm Orange - >25 ppm

### FIGURE 7

# DISPLAY FIGURE 4 OF 4 – FIGURE DEPICTING THE ANALYTICAL VALUES FOR VOCS (BTEX – MTBE) AT THE BASE OF THE EXCAVATION

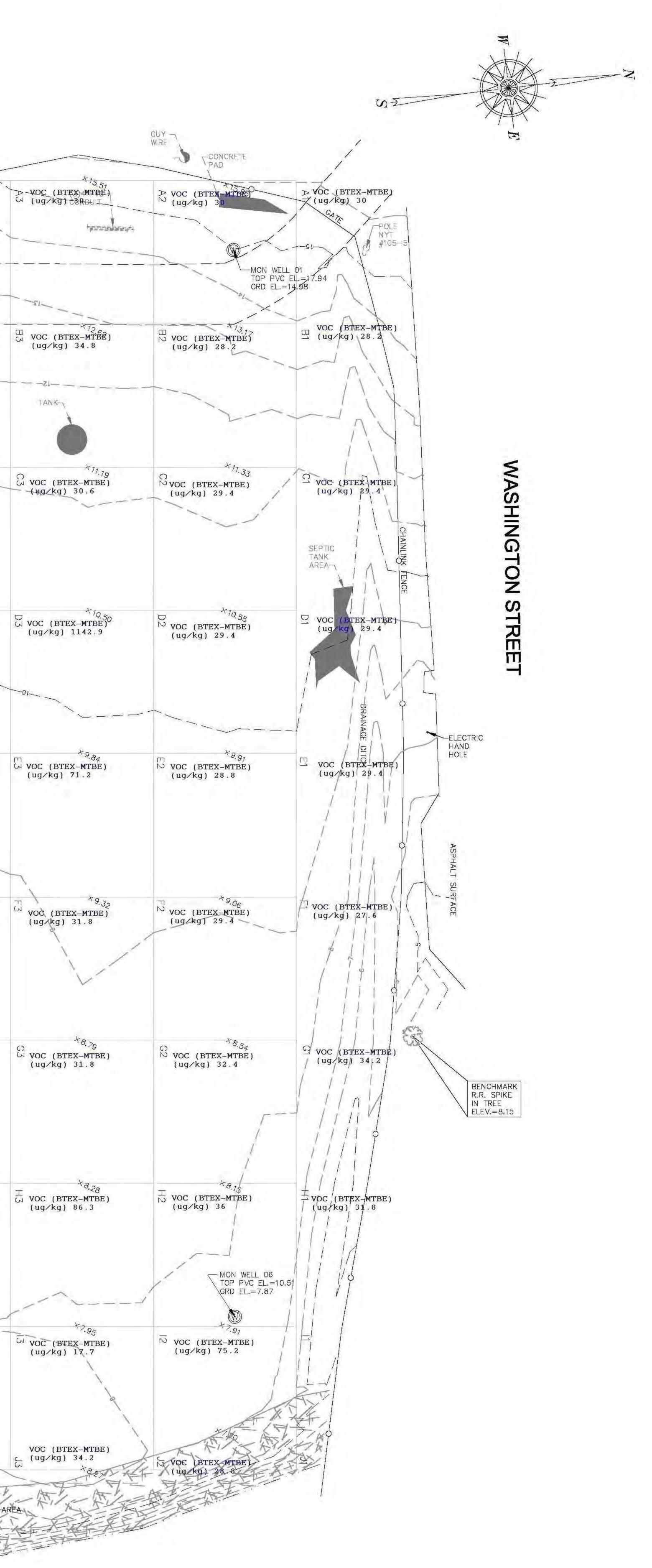


Value is Shown at Sample Grid Point in ug/kg; Color Code (Key at Top) Corresponds to NYSDEC Land Use Restrictions (Restricted Residential, Commercial, Industrial) Display Prepared By U.S. Environmental Protection Agency, March 2012

SOUTH WATER STREET

Consolidated Iron and Metal Site, Newburgh, New York Display 4 of 4: Figure Depicting Analytical Value for VOCs (BTEX - MTBE) at the Base of the Excavation

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∽⊓ <sup>★</sup> ∂.∂₂ <sup>©</sup> VOC (BTEX-MTBE)	VOC (BTEX-MTBE)	voc (btex-mtbe)	U VOC (BTEX-MTBE)	VOC (BTEX <sub>U</sub> MTBE) Ug/kg) 348.85	
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↔ <sup>A</sup> 8, <i>S</i> 4 <sup>OD</sup> VOC (BTEX-MTBE) (ug∕kg) 42.27	G ↓ VOC (BTEX-MTBE) (ug/kg) 469.1	O O VOC (BTEX-MTBE) (ug∕kg) 39.5	₩8.66 WOC (BTEX-MTBE) (ug/kg) 30.6	G ← VOC (BTEX-MTBE) (ug/kg) 33	
LL 08 C EL.=10.79 =8.27					
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# APPENDIX A CONSENT DECREE

#### IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF NEW YORK

#### UNITED STATES OF AMERICA Plaintiff,

v.

CIVIL ACTION NO.

CITY OF NEWBURGH, CITY OF POUGHKEEPSIE, CONNELL LIMITED PARTNERSHIP, INTERNATIONAL BUSINESS MACHINES CORP., NORTHROP GRUMMAN SHIP SYSTEMS, INC.,

Defendants.

#### **CONSENT DECREE**

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Х.	COVENANT NOT TO SUE BY SETTLING
	DEFENDANTS AND OTHER SETTLING PARTIES
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XX.	MODIFICATIONS TO THIS CONSENT DECREE
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XXII.	SIGNATORIES/SERVICE
XXIII.	FINAL JUDGMENT

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2

#### I. BACKGROUND

A. The United States of America, on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9606 and 9607, seeking injunctive relief and reimbursement of response costs incurred or to be incurred for response actions taken or to be taken at or in connection with the release or threat of release of hazardous substances at the Consolidated Iron and Metal Superfund Site, in the City of Newburgh, Orange County, New York (the "Site").

B. The Settling Defendants and Other Settling Parties that have entered into this Consent Decree do not admit any liability to Plaintiff arising out of the transactions or occurrences alleged in the complaint.

C. The Plaintiff, Settling Defendants, and Other Settling Parties agree, and this Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith, that settlement of this matter will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

THEREFORE, with the consent of the Parties to this Decree, it is ORDERED, ADJUDGED, AND DECREED:

#### II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331, 1345 and 1367, and 42 U.S.C. §§ 9606, 9607 and 9613(b), and also has personal jurisdiction over Settling Defendants and Other Settling Parties. Solely for the purposes of this Consent Decree and the underlying complaint, Settling Defendants and Other Settling Parties waive all objections and defenses that they may have to jurisdiction of the Court or to venue in this District. Settling Defendants and Other Settling Parties shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

#### III. PARTIES BOUND

2. This Consent Decree is binding upon the Plaintiff and upon Settling Defendants and Other Settling Parties and their heirs, successors and assigns. Any change in ownership or corporate or other legal status, including but not limited to, any transfer of assets or real or personal property, shall in no way alter the status or responsibilities of Settling Defendants and Other Settling Parties under this Consent Decree.

#### IV. <u>DEFINITIONS</u>

3. Unless otherwise expressly provided herein, terms used in this Consent Decree that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meanings assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree or in any appendix attached hereto, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601-9675.

b. "Consent Decree" shall mean this Consent Decree and any appendices attached hereto. In the event of conflict between this Consent Decree and any appendix, the Consent Decree shall control.

c. "Day" shall mean a calendar day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

d. "Development Agreement" shall mean the Development Agreement by and between the City of Newburgh and Leyland Alliance, LLC dated June 20, 2007, as executed, and attached hereto as Appendix C.

e. "DOJ" shall mean the United States Department of Justice and any successor departments, agencies or instrumentalities of the United States.

f. "EPA" shall mean the United States Environmental Protection Agency and any successor departments, agencies or instrumentalities of the United States.

g. "EPA Hazardous Substance Superfund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

h. "Fair Market Value" shall mean the price at which the Site Property would change hands between a willing buyer and a willing seller under actual market conditions, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts.

i. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

j. "NYSDEC" shall mean the New York State Department of Environmental Conservation.

k. "Owner Settling Defendant" shall mean the City of Newburgh.

1. "Other Settling Parties" shall mean those parties, other than Settling Defendants, participating in payment of Response Costs to EPA and listed in Appendix A.

m. "Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter.

n. "Parties" shall mean the United States of America, the Settling Defendants, and Other Settling Parties.

o. "Person" shall mean an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body.

p. "Plaintiff" shall mean the United States acting on behalf of EPA

q. "Record of Decision" or "ROD" shall mean the EPA Record of Decision containing the cleanup plan for the Consolidated Iron and Metal Superfund Site, signed on October 4, 2006, by the Regional Administrator, EPA Region 2, or his/her delegate, and all attachments thereto.

r. "Remedial Action" shall mean those activities, except for Operation and Maintenance, to be undertaken by EPA and Owner Settling Defendant to implement the Record of Decision.

s. "Response Costs" shall mean all costs, including but not limited to direct and indirect costs, that EPA and DOJ on behalf of EPA have paid or will pay at or in connection with the Site, plus accrued Interest on all such costs.

t. "Section" shall mean a portion of this Consent Decree identified by a Roman numeral.

u. "Settling Defendants" shall mean the City of Newburgh, the City of Poughkeepsie, Connell Limited Partnership, International Business Machines Corporation, and Northrop Grumman Ship Systems, Inc.

v. "Site" shall mean the Consolidated Iron and Metal Superfund Site, encompassing approximately 7 acres, located at the foot of Washington Street in the City of Newburgh, Orange County, New York, and all areas to which contamination resulting from the

operations at the Site Property has migrated. The Site is depicted generally on the map attached as Appendix B.

w. "Site Management Plan" or "SMP" shall mean a plan which will be prepared by Owner Settling Defendant and reviewed and approved by EPA as part of the remedy at the Site that provides for the proper management of all Site remedy components after completion of the Remedial Action.

x. "Site Property" shall mean the property which comprises the former Consolidated Iron and Metal Co., Inc. facility, encompassing approximately 7 acres, located at the foot of Washington Street in the City of Newburgh, Orange County, New York and described on the Orange County Land and Tax Map as Section 40, Block 3, Lot 3.

y. "State" shall mean the State of New York.

z. "Transfer" shall mean sale, assignment, transfer or exchange by Owner Settling Defendant of the Site Property, where title to the Site Property is transferred, and Fair Market Value is received in consideration.

aa. "United States" shall mean the United States of America, including its departments, agencies and instrumentalities.

### V. STATEMENT OF PURPOSE

4. By entering into this Consent Decree, the mutual objective of the Parties is for Settling Defendants and Other Settling Parties to make a cash payment to address their liability for the Site as provided in the Covenant Not to Sue by Plaintiff in Section VIII, and subject to the Reservations of Rights by United States in Section IX.

## VI. PAYMENT OF RESPONSE COSTS

5. Payment of Response Costs by Settling Defendants and Other Settling Parties.

a. Within 10 days of the entry of this Consent Decree by the court or by July 30, 2008, whichever date is later, Settling Defendants and Other Settling Parties shall pay to EPA \$9,862,000.

b. On September 30, 2009, Settling Defendants shall pay to EPA \$300,000, \$112,256.28 of which shall constitute interest on the unpaid balance.

c. On January 4, 2010, Settling Defendants shall pay to EPA \$1,900,000, \$22,969.44 of which shall constitute interest on the unpaid balance.

6. Payments shall be made by FedWire Electronic Funds Transfer (EFT) to the United States Department of Justice account in accordance with current EFT procedures, referencing the USAO File Number 2002V2080, EPA - Region 2, Site Spill ID Number 02-LT, and DOJ Case Number 90-11-3-07979. Payment shall be made in accordance with instructions provided to Settling Defendants by the Financial Litigation Unit of the United States Attorney's Office in the Southern District of New York following lodging of the Decree. Any payment received by the Department of Justice after 4:00 p.m. Eastern Time shall be credited on the next business day.

7. Notice that such payments have been made shall be sent to EPA and DOJ in accordance with Section XVII (Notices and Submissions), and to:

U.S. EPA 26 W. Martin Luther King Drive Attention: FINANCE MS: NWD Cincinnati, Ohio 45268

With E-mails to: *AcctsReceivable.CINWD@epa.gov*.

Such notice shall reference EPA Region 2, the Site/Spill Identification Number 02-LT, the DOJ Case Number 90-11-3-07979, and the civil action number.

8. The total amount to be paid by Settling Defendants to the United States pursuant to Paragraph 5, \$12,062,000, shall be deposited into the Consolidated Iron and Metal Superfund Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

# VII. FAILURE TO COMPLY WITH CONSENT DECREE

9. <u>Interest on Late Payments</u>. If Settling Defendants fail to make any payment under Section VI (Payment of Response Costs) by the required due date, Interest shall continue to accrue on the unpaid balance through the date of payment.

10. <u>Stipulated Penalty</u>.

a. If any amounts due EPA by Settling Defendants under Section VI (Payment of Response Costs) are not paid by the required date, Settling Defendants shall be in violation of this Consent Decree and shall pay to EPA, as a stipulated penalty, in addition to the Interest required by Paragraph 9, the following penalty per violation per day that such payment is late:

Penalty Per violation Per day	Period of Noncompliance	
\$2,500	1st-14th Day	
\$5,000	15th-30th Day	
\$10,000	31 <sup>st</sup> Day and beyond	

b. If Owner Settling Defendant fails to timely submit, or if necessary, revise and resubmit, any plan, report or other deliverable, including but not limited to, the SMP and the easement/covenant, or fails to properly and timely implement a provision of the SMP, Owner Settling Defendant shall be in violation of this Consent Decree and shall pay to EPA as a stipulated penalty the following amounts per violation per day that such deliverable is late:

Penalty Per violation Per day	Period of Noncompliance	
\$1,000	1st-14th Day	
\$2,000	15th-30th Day	
\$4,000	31 <sup>st</sup> Day and beyond	

c. Stipulated penalties are due and payable within 30 days of the date of the demand for payment of the penalties by EPA. All payments to EPA under this Paragraph shall be identified as "stipulated penalties" and shall be made by certified or cashier's check payable to "EPA Hazardous Substance Superfund." The check, or a letter accompanying the check, shall identify the name and address of the party(ies) making payment, the Consolidated Iron and Metal Superfund Site, EPA Region 2, the Site/Spill Identification Number 02-LT, the DOJ Case Number 90-11-3-07979, and the civil action number, and shall be sent to:

U.S. Environmental Protection Agency Fines and Penalties Cincinnati Finance Center P.O. Box 979077 St. Louis, MO 63197-9000

d. On the day of each payment under Subparagraph b, above, Settling Defendants shall also send notice that payment has been made to EPA and DOJ in accordance with Section XVII (Notices and Submissions), and to:

U.S. EPA 26 W. Martin Luther King Drive Attention: FINANCE MS: NWD Cincinnati, Ohio 45268

With E-mails to: AcctsReceivable.CINWD@epa.gov.

Such notice shall reference the Consolidated Iron and Metal Superfund Site, EPA Region 2, the Site/Spill Identification Number 02-LT, EPA Enforcement Action number 02-2006-0015, DOJ Case Number 90-11-3-07979, and the civil action number.

e. Penalties shall accrue as provided in this Paragraph regardless of whether EPA has notified Settling Defendants of the violation or made a demand for payment, but need only be paid upon demand. All penalties shall begin to accrue on the day after payment is due and shall continue to accrue through the date of payment. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Decree.

11. If the United States brings an action to enforce this Consent Decree, Settling Defendants shall reimburse the United States for all costs of such action, including but not limited to costs of attorney time, provided, however, if such enforcement action relates only to the obligations of Owner Settling Defendant, then Owner Settling Defendant shall be liable solely for reimbursing the United States as provided in this Paragraph.

12. Payments made under this Section shall be in addition to any other remedies or sanctions available to the United States by virtue of Settling Defendants' failure to comply with the requirements of this Consent Decree.

13. The obligations of Settling Defendants to pay the amounts pursuant to Paragraph 5 to the United States under this Consent Decree are joint and several. In the event of the failure of any one or more Settling Defendants to make the payments required under this Consent Decree, the remaining Settling Defendants shall be responsible for the entire payment(s) required by Paragraph 5.

14. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Consent Decree. Payment of stipulated penalties shall not excuse Settling Defendants from payment as required by Section VI or from performance of any other requirements of this Consent Decree.

## VIII. <u>COVENANT NOT TO SUE BY PLAINTIFF</u>

15. Covenant Not to Sue by United States. Except as specifically provided in Section IX (Reservations of Rights by Plaintiff), the United States covenants not to sue or to take administrative action against Settling Defendants and Other Settling Parties pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), with regard to the Site. With respect to present liability, this covenant not to sue shall take effect upon the receipt by EPA of all payments by Settling Defendants and Other Settling Parties required by Section VI, and any amount due under Section VII (Failure to Comply with Consent Decree). With respect to future liability, this covenant not to sue shall take effect upon to to sue is conditioned upon the satisfactory performance by Settling Defendants and Other Settling Parties of their

obligations under this Consent Decree. This covenant not to sue extends only to the Settling Defendants and Other Settling Parties and does not extend to any other person.

#### IX. RESERVATION OF RIGHTS BY PLAINTIFF

16. The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling Defendants and Other Settling Parties with respect to all matters not expressly included within the Covenant Not to Sue by Plaintiff in Section VIII. Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against Settling Defendants with respect to subparagraphs a. through e. below and Other Settling Parties with respect to subparagraphs b. through e. below, as follows:

a. liability for failure of Settling Defendants to meet a requirement of this Consent Decree;

b. criminal liability;

c. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

d. liability of Settling Defendants and Other Settling Parties, based upon their ownership or operation of the Site or their transportation, treatment, storage, or disposal, or arrangement for the transportation, treatment, storage, or disposal, of a hazardous substance, pollutant, contaminant or solid waste at or in connection with the Site, after signature of this Consent Decree; and

e. liability arising from the past, present, or future disposal, discharge, release or threat of release of a hazardous substance, pollutant, contaminant or solid waste outside the Site.

17. <u>United States Pre-Certification Reservations</u>. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Defendants either to perform further response actions relating to the Site or to reimburse the United States for additional costs of response if, (a) prior to Certification of Completion of the Remedial Action, (i) conditions at the Site, previously unknown to EPA, are discovered, or (ii) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

18. <u>United States Post-Certification Reservations</u>. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Defendants either to perform further response actions relating to

the Site or to reimburse the United States for additional costs of response if, (a) subsequent to Certification of Completion of the Remedial Action, (i) conditions at the Site, previously unknown to EPA, are discovered, or (ii) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or this information together with other relevant information indicate that the Remedial Action is not protective of human health or the environment.

19. For purposes of Paragraph 17, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date the Record of Decision for the Remedial Action was signed and set forth in the Record of Decision and the administrative record supporting the Record of Decision. For purposes of Paragraph 18, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date of Certification of Completion of the Remedial Action and set forth in the Record of Decision, the administrative record supporting the Record of Decision, the post-Record of Decision administrative record, or in any information received by EPA pursuant to the requirements of this Consent Decree prior to Certification of Completion of the Remedial Action.

20. <u>Certification of Completion of the Remedial Action</u>. As soon as reasonably practicable after EPA completes the Remedial Action for the Site, EPA will certify in writing that the Remedial Action has been performed fully and that the performance standards have been attained. This certification shall constitute the Certification of Completion of the Remedial Action for purposes of Paragraphs 15, 17, 18 and 19 above. Upon request of Settling Defendants, EPA will provide periodic updates on the progress of the Remedial Action to the Settling Defendants.

21. Nothing in this Consent Decree is intended to be nor shall it be construed as a release, covenant not to sue, or compromise of any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the United States may have against any person, firm, corporation or other entity not a signatory to this Consent Decree.

# X. <u>COVENANT NOT TO SUE BY SETTLING DEFENDANTS AND OTHER</u> <u>SETTLING PARTIES</u>

22. Settling Defendants and Other Settling Parties covenant not to sue and agree not to assert any claims or causes of action against the United States or their contractors or employees, with respect to the Site, including but not limited to:

a. any direct or indirect claim for reimbursement from or against the Hazardous Substance Superfund, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim against the United States arising out of response actions at or in

connection with the Site, including any claim under the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Site.

23. Nothing in this Consent Decree shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. 300.700(d).

24. Settling Defendants and Other Settling Parties agree not to assert any claims and to waive all claims or causes of action that they may have for all matters relating to the Site, including but not limited to, claims or causes of action under Sections 107(a)(4)(b) and 113(f) of CERCLA, against any person where the person's liability to Settling Defendants and Other Settling Parties with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if:

a. materials containing hazardous substances contributed by such person to the Site did not exceed 5,000 pounds.

b. This waiver shall not apply to any claim or cause of action against any person meeting the above criteria if EPA has determined that the materials contributed to the Site by such person contributed or could contribute significantly to the costs of response at the Site. This waiver also shall not apply with respect to any defense, claim, or cause of action that Settling Defendants and Other Settling Parties may have against any person if such person asserts a claim or cause of action relating to the Site against Settling Defendants and Other Settling Parties.

25. Settling Defendants and Other Settling Parties agree not to assert any claims and to waive all claims or causes of action that they may have for all matters relating to the Site, including but not limited to, claims or causes of action under Sections 107(a)(4)(b) and 113(f) of CERCLA, against any person that has entered into a final CERCLA § 122(g) de minimis settlement or a final settlement based on limited ability to pay with EPA with respect to the Site, or the Town of Rhinebeck, provided, however, that the Town of Rhinebeck enters into a de minimis settlement within one year of the date of entry of this Consent Decree. This waiver shall not apply with respect to any defense, claim, or cause of action that Settling Defendants and Other Settling Parties may have against any person if such person asserts a claim or cause of action relating to the Site against Settling Defendants and Other Settling Parties.

### XI. EFFECT OF SETTLEMENT/CONTRIBUTION PROTECTION

26. Except as provided in Paragraphs 24 and 25 above, nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party

to this Consent Decree. Except as provided in Paragraphs 24 and 25, the Parties expressly reserve any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action that they may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto.

27. The Parties agree, and by entering this Consent Decree this Court finds, that Settling Defendants and Other Settling Parties are entitled, as of the date of entry of this Consent Decree, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), for "matters addressed" in this Consent Decree. The "matters addressed" in this Consent Decree are: all response actions taken or to be taken; and all response costs incurred or to be incurred, at or in connection with the Site, by the United States, or any other person. The "matters addressed" in this Consent Decree do not include those natural resources damages, response costs, or response actions as to which the Plaintiff has reserved its rights under this Consent Decree (except for claims for failure to comply with this Consent Decree), in the event that the Plaintiff asserts rights against Settling Defendants or Other Settling Parties coming within the scope of such reservations.

28. Settling Defendants and Other Settling Parties agree that, with respect to any suit or claim for contribution brought by them for matters related to this Consent Decree, prior to entry of the Consent Decree, they will notify EPA and DOJ in writing within 60 days of the initiation of such suit or claim, except to the extent that such claim or suit was brought by Settling Defendants before lodging of this Consent Decree, in which case Settling Defendants shall provide notice to EPA and DOJ within 10 days of the lodging of this Consent Decree. After the entry of this Consent Decree, Settling Defendants and Other Settling Parties agree that, with respect to any suit or claim for contribution brought by them for matters related to this Consent Decree they will notify EPA and DOJ in writing no later than 60 days prior to the initiation of such suit or claim. Each Settling Defendant and Other Settling Party also agrees that, with respect to any suit or claim for contribution brought against it for matters related to this Consent Decree, it will notify EPA and DOJ in writing within 10 days of service of the complaint or claim upon it. In addition, each Settling Defendant or Other Settling Party shall notify EPA and DOJ within 10 days of service or receipt of any Motion for Summary Judgment, and within 10 days of receipt of any order from a court setting a case for trial, for matters related to this Consent Decree.

29. In any subsequent administrative or judicial proceeding initiated by the United States, or EPA for injunctive relief, recovery of response costs, or other relief relating to the Site, Settling Defendants or Other Settling Parties shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, *res judicata*, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or EPA in the subsequent proceeding were or should have been brought in the instant case; *provided*, however, that nothing in this Paragraph affects the enforceability of the Covenant by Plaintiff set forth in Section VIII.

# XII. ACCESS, INSTITUTIONAL CONTROLS, AND SITE MANAGEMENT PLAN

30. Owner Settling Defendant shall:

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a. commencing on the date of lodging of this Consent Decree, provide the United States, the State, and their representatives, including EPA and its contractors, with access at all reasonable times to the Site Property, or such other property it controls, for the purpose of conducting any activity related to this Consent Decree including, but not limited to, the following activities:

- (1) Performing and/or monitoring response actions at the Site;
- (2) Verifying any data or information submitted to the United States;
- (3) Conducting investigations relating to contamination at or near the Site;
- (4) Obtaining samples;
- (5) Assessing the need for, planning, or implementing additional response actions at or near the Site;
- (6) Assessing Owner Settling Defendant's compliance with this Consent Decree;
- (7) Determining whether the Site or other property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by or pursuant to this Consent Decree; and
- (8) Inspecting and copying records or other documents maintained or generated by Owner Settling Defendant or its agents, consistent with Paragraph 36 below;

b. commencing on the date of lodging of this Consent Decree, refrain from using the Site Property, or such other property it controls, in any manner that would interfere with or adversely affect the implementation, integrity, or protectiveness of the remedial measures to be performed at the Site pursuant to this Consent Decree. Such use restrictions include, but are not limited to:

- i. prohibition of any excavation six feet below the ground surface unless the excavation activities are in compliance with the Site Management Plan as provided in the ROD and are approved by EPA in writing in advance;
- ii. prohibition of any new construction at the Site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with the Site Management Plan as provided in the ROD, and is approved by EPA in writing in advance; and
- iii. prohibition of the use of groundwater at the Site as a source of potable or process water until groundwater quality standards are met at the Site; and

c. upon EPA's request, execute and record in the Orange County Clerk's Office, State of New York, an easement/covenant, running with the land, that (i) grants a right of access for the purpose of conducting any activity related to the Site Property including, but not limited to, those

activities listed in Paragraph 30 a. of this Consent Decree, and (ii) grants the right to enforce the land/water use restrictions listed in Paragraph 30.b. of this Consent Decree, or other restrictions that EPA determines are necessary to implement, ensure non-interference with, or ensure the protectiveness of the remedial measures to be performed at the Site Property. Owner Settling Defendant shall grant the access rights and the rights to enforce the land/water use restrictions to one or more of the following persons: (i) the State and its representatives, (ii) the other Settling Defendants and their representatives, and/or (iii) other appropriate grantees, as determined by EPA. EPA will provide prior notice to Owner Settling Defendant of the identity of the grantee(s). Owner Settling Defendant shall, within 45 days of entry of EPA's request, submit to EPA for review and approval with respect to the Site Property:

- i. A draft easement/covenant, in substantially the form attached hereto as Appendix D, that is enforceable under the laws of the State of New York, and
- a current title insurance commitment or some other evidence of title acceptable to EPA, which shows title to the land described in the easement/covenant to be free and clear of all prior liens and encumbrances (except when those liens or encumbrances are approved by EPA or when, despite best efforts, Owner Settling Defendant is unable to obtain release or subordination of such prior liens or encumbrances).

Within 15 days of EPA's approval and acceptance of the easement/covenant and the title evidence, Owner Settling Defendant shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment to affect the title adversely, record the easement/covenant with the Orange County Clerk's Office. Within 30 days of recording the easement/covenant, Owner Settling Defendant shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded easement/covenant showing the clerk's recording stamps. Any agreement to Transfer the Site Property pursuant to Paragraph 48 or 49, below, must contain an agreement that the transferee will be bound by the access and institutional controls provisions of this Paragraph. Owner Settling Defendant shall reference such access and institutional controls provisions in any deed transferring the Site Property.

31. If EPA so requests, if any other property where access and/or land/water use restrictions are needed to implement the Record of Decision, is owned or controlled by persons other than Owner Settling Defendant, Owner Settling Defendant shall use best efforts to secure from such persons:

a. an agreement to provide access thereto for the United States on behalf of EPA and its representatives (including contractors), for the purpose of conducting any activity related to this Consent Decree including, but not limited to, those activities listed in Paragraph 30.a. of this Consent Decree;

b. an agreement, enforceable by Owner Settling Defendants and the United States, to

refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the implementation, integrity, or protectiveness of the remedial measures to be performed pursuant to this Consent Decree; and

c. upon EPA's request, execute and record in the Orange County Clerk's Office, State of New York, an easement/covenant, running with the land, that (i) grants a right of access for the purpose of conducting any activity related to response actions at the Site Property including, but not limited to, those activities listed in Paragraph 30 a. of this Consent Decree, and (ii) grants the right to enforce the land/water use restrictions listed in Paragraph 31.b. of this Consent Decree, or other restrictions that EPA determines are necessary to implement, ensure non-interference with, or ensure the protectiveness of the remedial measures to be performed at the Site Property. Owner Settling Defendant shall grant the access rights and the rights to enforce the land/water use restrictions to one or more of the following persons: (i) the State and its representatives, (ii) Settling Defendants and their representatives, and/or (iii) other appropriate grantees, as determined by EPA. EPA will provide prior notice to Owner Settling Defendant of the identity of the grantee(s). Owner Settling Defendant shall, within 45 days of EPA's request, submit to EPA for review and approval with respect to the Site Property:

- i. A draft easement/covenant, in substantially the form attached hereto as Appendix D, that is enforceable under the laws of the State of New York, and
- a current title insurance commitment or some other evidence of title acceptable to EPA, which shows title to the land described in the easement/covenant to be free and clear of all prior liens and encumbrances (except when those liens or encumbrances are approved by EPA or when, despite best efforts, Settling Defendants are unable to obtain release or subordination of such prior liens or encumbrances).

Within 15 days of EPA's approval and acceptance of the easement/covenant and the title evidence, Owner Settling Defendant shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment to affect the title adversely, record the easement/covenant with the Orange County Clerk's Office. Within 30 days of recording the easement/covenant, Owner Settling Defendant shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded easement/covenant showing the clerk's recording stamps.

32. For purposes of Paragraphs 30 and 31 of this Consent Decree, "best efforts" includes the payment of reasonable sums of money in consideration of access, access easements/covenants, land/water use restrictions, restrictive easements/covenants, and/or an agreement to release or subordinate a prior lien or encumbrance. If (a) any access or land/water use restriction agreements required by Paragraphs 30.a or 30.b of this Consent Decree are not obtained within 45 days of the date of completion of the remedial action, (b) or any access easements/covenants or restrictive easements/covenants required by Paragraph 30.c of this Consent Decree are not submitted to EPA in draft form within 45 days of the date of EPA's

request, or (c) Owner Settling Defendant is unable to obtain an agreement pursuant to Paragraph 31.c.(1) from the holder of a prior lien or encumbrance to release or subordinate such lien or encumbrance to the easement/covenant being created pursuant to this Consent Decree within 45 days of the date of EPA's request, Owner Settling Defendant shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that Owner Settling Defendant has taken to attempt to comply with Paragraph 30 or 31 of this Consent Decree. The United States may, as it deems appropriate, assist Owner Settling Defendant in obtaining access or land/water use restrictions, either in the form of contractual agreements or in the form of easements/covenants running with the land, or in obtaining the release or subordination of a prior lien or encumbrance. Settling Defendants shall reimburse the United States in accordance with the procedures in Section VI (Payments for Response Costs), for all costs incurred, direct or indirect, by the United States in obtaining such access, land/water use restrictions, and/or the release/subordination of prior liens or encumbrances including, but not limited to, the cost of attorney time and the amount of monetary consideration paid or just compensation.

#### 33. Site Management Plan.

a. Within 45 days of EPA's request, Owner Settling Defendant shall submit to EPA for review and approval four (4) copies of a Site Management Plan ("SMP"). The SMP shall provide for:

(i) the proper sampling, handling and treatment and/or disposal of soils excavated below the soil cover's demarcation layer after the Remedial Action is completed;

(ii) measures that will be taken for the protection of on-Site workers, the public and the environment in the event of future subsurface soil disturbance;

(iii) for any new construction at the Site, procedures for evaluation of the potential for vapor intrusion, and, if necessary, mitigation of vapor intrusion after the Remedial Action is completed;

(iv) procedures to confirm that the engineering controls remain in place and remain protective;

(v) provision for any operation and maintenance required of the components of the remedy;

(vi) the requirement that the Site Property owner submit periodic certifications that the institutional and engineering controls are in place;

(vii) monitoring and maintenance of institutional controls including:

(a) an inventory of any use restrictions on the Site Property;

(b) periodic certification by the Site Property owner that the institutional controls remain in place and remain effective;

(c) annual inspection of the Site to determine if soil excavation activities below the soil demarcation layer have occurred;

(d) annual search of property records to ensure the institutional controls are in place and remain effective; and

(e) annual notification to local governmental offices, such as the building and zoning offices, of the controls on the Site and review of the records in these offices to ascertain whether any applications or other filings have been made regarding the Site; and (viii) annual reports to EPA summarizing the findings of the activities noted above in paragraph 33.a.

b. EPA will either approve the SMP or require modification of it in accordance with the procedures set forth in Section XIII (EPA Approval of SMP and Easement/Covenant) below, of this Consent Decree.

34. If EPA determines that land/water use restrictions in the form of state or local laws, regulations, ordinances or other governmental controls are needed to implement the remedy selected in the ROD, ensure the integrity and protectiveness thereof, or ensure non-interference therewith, Settling Defendants shall cooperate with EPA's efforts to secure such governmental controls.

35. Notwithstanding any provision of this Consent Decree, the United States retains all of its access authorities and rights, as well as all of its rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA and any other applicable statute or regulations.

36. Owner Settling Defendant shall provide to EPA upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Consent Decree, including, but not limited to, documents relating to the SMP or institutional controls, such as monitoring and maintenance of easements/covenants pursuant to of this Consent Decree. Owner Settling Defendant shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the Site.

# XIII. EPA APPROVAL OF SMP AND EASEMENT/COVENANT

37. After review of the SMP or easement/covenant which is required to be submitted for approval by Owner Settling Defendant pursuant to this Consent Decree, EPA, after reasonable opportunity for review and comment by the State, shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing Owner Settling Defendant modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission hereunder without first providing Owner Settling Defendant at least one notice of deficiency and an opportunity to cure within10 days, except where previous submission(s) have been disapproved due to material defects and the deficiencies in the submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

38. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Paragraph 37(a), (b), or (c), Owner Settling Defendant shall proceed to take any action required

by the plan, report, or other item, as approved or modified by EPA, subject only to its right to invoke the Dispute Resolution procedures set forth in Paragraphs 43 through 47, below. In the event that EPA modifies the submission to cure the deficiencies pursuant to Paragraph 37(c) and the submission has a material defect, EPA retains its right to seek stipulated penalties, as provided in Section VII.

### 39. <u>Resubmission of SMP or Easement/Covenant</u>.

a. Upon receipt of a notice of disapproval pursuant to Paragraph 37(d), Owner Settling Defendant shall, within 10 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the SMP or easement/covenant for approval. Any stipulated penalties applicable to the submission, as provided in Section VII, shall accrue during the 10-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Paragraphs 40 and 41.

b. Notwithstanding the receipt of a notice of disapproval pursuant to Paragraph 37(d), Owner Settling Defendant shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve Owner Settling Defendant of any liability for stipulated penalties under Section VII.

40. In the event that a resubmitted SMP or easement/covenant is disapproved by EPA, EPA may again require Owner Settling Defendant to correct the deficiencies, in accordance with the preceding Paragraphs. EPA also retains the right to modify or develop the SMP or easement/covenant. Owner Settling Defendant shall implement the SMP as modified or developed by EPA, subject only to its right to invoke the procedures set forth in Paragraphs 43 through 47, below.

41. If upon resubmission, the SMP or easement/covenant is disapproved or modified by EPA due to a material defect, Owner Settling Defendant shall be deemed to have failed to submit the SMP or easement/covenant timely and adequately unless Owner Settling Defendant invokes the dispute resolution procedures set forth in Paragraphs 43 through 47, below, and EPA's action is overturned pursuant to those Paragraphs. The provisions of Paragraphs 43 through 47, below and Section VII (Stipulated Penalties) shall govern the implementation of the work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section VII.

42. The SMP required to be submitted to EPA under this Consent Decree shall, upon approval or modification by EPA, be enforceable under this Consent Decree.

43. The dispute resolution procedures of Paragraphs 43 through 47 shall be the exclusive mechanism to resolve disputes arising with respect to the submission or resubmission of the SMP or any easement/covenant pursuant to this Consent Decree. However, the procedures set forth in

this Section shall not apply to actions by the United States to enforce obligations of Settling Defendants that have not been disputed in accordance with this Section.

44. Any dispute which arises under or with respect to the submission or resubmission of the SMP or any easement/covenant pursuant to this Consent Decree shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed 20 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute.

# 45. <u>Statements of Position</u>.

a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 10 days after the conclusion of the informal negotiation period, Owner Settling Defendant invokes the formal dispute resolution procedures of Paragraphs 45 and 46 by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documentation relied upon by Owner Settling Defendant.

b. Within 14 days after receipt of Owner Settling Defendant's Statement of Position, EPA will serve on Owner Settling Defendant its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 46. Within 14 days after receipt of EPA's Statement of Position, Owner Settling Defendant may submit a Reply.

46. Formal dispute resolution shall be conducted pursuant to the procedures set forth in this Paragraph. Nothing in this Consent Decree shall be construed to allow any dispute by Settling Defendants regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to Paragraphs 45 and 46. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director of the Emergency and Remedial Response Division, EPA Region 2, will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 46.a. This decision shall be binding upon Owner Settling Defendant, subject only to the right to seek judicial review pursuant to Paragraph 46.c. and d.

c. Any administrative decision made by EPA pursuant to Paragraph 46.b. shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by Owner Settling Defendant with the Court and served on all Parties within 10 days of receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Decree. The United States may file a response to Owner Settling Defendant's motion.

d. In proceedings on any dispute governed by this Paragraph, Owner Settling Defendant shall have the burden of demonstrating that the decision of the Emergency and Remedial Response Division Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to Paragraph 46.a.

47. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone or affect in any way any obligation of Owner Settling Defendant under this Consent Decree, not directly in dispute, unless EPA or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 46. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Decree. In the event that Owner Settling Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section VII (Stipulated Penalties).

### XIV. SALE OF SITE PROPERTY BY OWNER SETTLING DEFENDANT

48. If the Site Property is to be sold to Leyland Alliance, LLC or any affiliate thereof (hereinafter collectively referred to as "Leyland"), pursuant to an agreement drafted substantially in accordance with the Development Agreement attached hereto as Appendix C (hereinafter referred to as the "Conveyance Agreement"), then thirty (30) days or more prior to Transfer of the Site Property, Owner Settling Defendant shall provide EPA with a closing statement which includes the Conveyance Agreement and sets forth the agreed upon purchase price, adjustments, setoffs and apportionments (hereinafter, "Closing Statement"). The Closing Statement shall reflect the amount due to Owner Settling Defendant at Transfer, which shall be the purchase price plus or minus any offsets, adjustments or apportionments (hereinafter, "Net Sales Proceeds") as provided for in the Conveyance Agreement and which shall substantially conform to paragraphs 2.5, 3.7 and 5.1 of the Development Agreement. EPA will review the Closing Statement to determine if it is appropriate to release its CERCLA 107(1) lien and waive a 107(r) lien, which determination shall be made based on whether the Site Property is being transferred at Fair Market Value and the Net Sales Proceeds have been appropriately calculated. Such a determination shall be made in EPA's sole and unreviewable discretion. If EPA determines that it is appropriate to release its CERCLA 107(1) lien and waive a 107(r) lien, EPA will provide a copies of the proposed release and waiver in recordable form to Owner Settling Defendant at the time of the Transfer. If the Closing Statement demonstrates that the Net Sales Proceeds will be greater than \$1,933,000.00, then Owner Settling Defendant shall remit any amount in excess of \$1,933,000.00 to EPA at the time of Transfer. If the Net Sales Proceeds will not be greater than \$1,933,000.00,

no further payments to EPA are required under this Section.

49. If the Site Property is to be transferred to a party other than Leyland, then thirty (30) days or more prior to Transfer, Owner Settling Defendant shall provide EPA with the other Transfer Agreement ("Other Agreement") and a Closing Statement which identifies the transferee, sets forth the agreed upon purchase price, adjustments, setoffs and apportionments for the Transfer of the Site Property. The Closing Statement shall reflect the amount due at Transfer, which shall be the purchase price plus or minus any offsets, adjustments or apportionments (hereinafter, "Other Net Sales Proceeds") as provided for in the Other Agreement. EPA will review the Closing Statement to determine if it is appropriate to release its CERCLA 107(1) lien and waive a107(r) lien, which determination shall be made based on whether the Site Property is being transferred at Fair Market Value and the Other Net Sales Proceeds have been appropriately calculated. Such a determination shall be made in EPA's sole and unreviewable discretion. If EPA determines that it is appropriate to release its CERCLA 107(1) lien and waive a 107(r) lien, EPA will provide copies of the proposed release and waiver in recordable form to Owner Settling Defendant at the time of the Transfer. If the Closing Statement demonstrates that the Other Net Sales Proceeds will be greater than \$1,933,000.00, then Owner Settling Defendant shall remit any amount in excess of \$1,933,000.00 to EPA at the time of Transfer. If the Other Net Sales Proceeds will not be greater than \$1,933,000.00, no further payments to EPA are required under this Section.

#### XV. FUTURE COST RECOVERY

50. a. The United States and Settling Defendants agree that proceeds from any future cost recoveries obtained by Settling Defendants from any person which has received notification as of the date of entry of this Consent Decree from EPA that such person is considered to be a potentially responsible party ("PRP") at the Site, and which is not an Other Settling Party, shall be divided between the United States and the Settling Defendants according to the following formula. The Settling Defendants may first recover a reasonable amount, agreed upon by EPA, for attorneys fees and expenses expended in pursuing claims against other persons who are or may be liable at the Site. The remaining amount shall be referred to hereinafter as the "Net Settlement Proceeds". Fifty percent (50%) of the Net Settling Defendants. In exchange for receipt of fifty percent of the Net Settlement Proceeds, the United States may add such persons as Other Settling Parties to this Consent Decree or agree to participate in a future settlement with such persons, in the sole unreviewable discretion of the United States. In the event that the United States does not add such person(s) to this Consent Decree, or agree to participate in a future settlement with such person(s), then the proceeds sharing called for in this subparagraph shall not apply.

b. The Settling Defendants may seek to add one or more persons to this Consent Decree or a future settlement with the United States who have not received notification from EPA that such persons are considered to be PRPs at the Site. If so, Settling Defendants shall submit a written request to the United States to add such person(s) to this Consent Decree or to request the participation of the United States in a future settlement with such person(s). Such written request shall (i) state the cumulative amount of proceeds that such person(s) agree to pay in settlement and (ii) include all evidence Settling Defendants have relevant to whether such persons are PRPs under Section 107 of CERCLA, 42 U.S.C. § 9607. The United States, in its sole unreviewable discretion, may add such person(s) to this Consent Decree, or agree to participate in a future settlement with such person(s). If, after a review of the PRP evidence, the United States, in its sole unreviewable discretion, agrees to include such person(s) in this Consent Decree or a future settlement, Settling Defendants shall pay to the United States fifty percent (50%) of the Net Settlement Proceeds with respect to each such person. In the event that the United States does not add such person(s) to this Consent Decree, or agree to participate in a future settlement with such person(s), then the proceeds sharing called for in this subparagraph shall not apply.

c. Upon request by one or more of the Settling Defendants, EPA, in its sole unreviewable discretion, may issue request for information letters pursuant to Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), to parties which EPA believes may have a nexus to the Site.

d. Notwithstanding subparagraphs a. and b. above, this Consent Decree does not address a percentage distribution between the United States and Settling Defendants with respect to (1) settlements with any persons once the accumulated Net Settlement Proceeds exceed \$2,000,000 and/or (2) with respect to settlements with any persons who may be considered PRPs based on arranging for the treatment or disposal of batteries at the Site. If, after receipt of a written request to add any person(s) under this subparagraph who has expressed an interest in settling with Settling Defendants, and a review of the PRP evidence submitted by Settling Defendants, the United States, in its sole unreviewable discretion, agrees to include such person(s) in this Consent Decree or a future settlement, the Parties will then determine an appropriate percentage of Net Settlement Proceeds to be provided to the United States, based on the totality of the circumstances, provided that the Net Settlement Proceeds distributed to Settling Defendants shall in no event be less than 20%. In the event that the United States does not agree to add such person(s) in this Consent Decree or a future settlement, then the Parties are free to pursue such person(s) in this Consent Decree or a future settlement, then the Parties are free to pursue such person(s) in this Consent Decree or a future settlement, then the Parties are free to pursue such

# XVI. <u>RETENTION OF RECORDS</u>

51. Until 15 years after the entry of this Consent Decree, Settling Defendants and Other Settling Parties shall preserve and retain all records, reports, or information (hereinafter referred to as "records") now in their possession or control, or which come into their possession or control, that relate in any manner to response actions taken at the Site or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary.

52. After the conclusion of the 15-year document retention period in the preceding paragraph, Settling Defendants and Other Settling Parties shall notify EPA and DOJ at least 90 days prior to the destruction of any such records, and, upon request by EPA or DOJ, Settling Defendants shall deliver any such records to EPA. Settling Defendants and Other Settling Parties may assert that certain records are privileged under the attorney-client privilege or any other

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privilege recognized by federal law. If Settling Defendants and/or Other Settling Parties assert such a privilege, they shall provide Plaintiff with the following: 1) the title of the record; 2) the date of the record; 3) the name, title, affiliation (*e.g.*, company or firm), and address of the author of the record; 4) the name and title of each addressee and recipient; 5) a description of the subject of the record; and 6) the privilege asserted. If a claim of privilege applies only to a portion of a record, the record shall be provided to Plaintiff in redacted form to mask the privileged information only. Settling Defendants and Other Settling Parties shall retain all records that they claim to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendants' and/or Other Settling Parties' favor. However, no records created or generated pursuant to the requirements of this or any other settlement with the EPA pertaining to the Site shall be withheld on the grounds that they are privileged.

53. Each Settling Defendant and each Other Settling Party hereby certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, reports, or information relating to its potential liability regarding the Site since notification of potential liability by the United States or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6972.

### XVII. NOTICES AND SUBMISSIONS

54. Whenever, under the terms of this Consent Decree, notice is required to be given or a document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Settling Defendants in writing. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of the Consent Decree with respect to the United States, EPA, DOJ, and Settling Defendants, respectively.

#### As to the United States:

Chief, Environmental Enforcement Section Environment and Natural Resources Division United States Department of Justice (DJ # 90-11-2-1134/1) Post Office Box 7611 Washington, D.C. 20044-7611

Chief, New York/Caribbean Superfund Branch Office of Regional Counsel United States Environmental Protection Agency - Region 2 290 Broadway - 17<sup>th</sup> Floor New York, New York 10007 Attn: Consolidated Iron Site Attorney Chief, New York Remediation Branch Emergency and Remedial Response Division United States Environmental Protection Agency - Region 2 290 Broadway - 20<sup>th</sup> Floor New York, New York 10007 Attn: Consolidated Iron Site Project Manager

### As to Settling Defendants and Other Settling Parties:

Edan Dionne, Director Corporate Environmental Affairs International Business Machines Corp. 294 Route 100 Somers, NY 10589

Connell Limited Partnership John Curtin, General Counsel One International Place Boston, MA 02110

Northrop Grumman Shipbuilding ATTN: Robert J. Ariatti Law Dept (M/S 1011-09) 1000 Access Road P.O. Box 149 Pascagoula, MS 39568-0149

Northrop Grumman Corporation ATTN: Law Dept (0110/M/S C-451) 755 Colshire Drive McLean, VA 22102-7508

Honorable John C. Tkazyik, Mayor City of Poughkeepsie City Hall Municipal Building Poughkeepsie, NY 12601

Jean McGrane, City Manager City of Newburgh 83 Broadway, City Hall Newburgh, NY 12550

## XVIII. <u>RETENTION OF JURISDICTION</u>

55. This Court shall retain jurisdiction over this matter for the purpose of interpreting and enforcing the terms of this Consent Decree.

# XIX. INTEGRATION/APPENDICES

56. This Consent Decree and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Consent Decree. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Decree. The following appendices are attached to and incorporated into this Consent Decree:

"Appendix A" is the list of Other Settling Parties

"Appendix B" is the map of the Site

"Appendix C" is the Development Agreement

"Appendix D" is the draft Environmental Easement

# XX. MODIFICATIONS TO THIS CONSENT DECREE

57. a. Material modifications to this Consent Decree shall be in writing, signed by the Parties, and shall be effective upon approval by the Court. Non-material modifications to this Consent Decree shall be in writing and shall be effective when signed by the Parties.

b. Settling Defendants agree that this Consent Decree may be modified to add more parties as Other Settling Parties and hereby designate Michael Zarin of Zarin & Steinmetz to sign modifications on behalf of all Settling Defendants.

### XXI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

58. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations which indicate that this Consent Decree is inappropriate, improper, or inadequate. Settling Defendants and Other Settling Parties consent to the entry of this Consent Decree without further notice.

59. If for any reason this Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

#### XXII. SIGNATORIES/SERVICE

60. Each undersigned representative of a Settling Defendant to this Consent Decree and the Assistant Attorney General for the Environment and Natural Resources Division of the United

States Department of Justice, certifies that he or she is authorized to enter into the terms and conditions of this Consent Decree and to execute and bind legally such Party to this document.

61. Each Settling Defendant hereby agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree, or any modification pursuant to paragraph 57 thereto, unless the United States has notified Settling Defendants and Other Settling Parties in writing that they no longer support entry of the Consent Decree.

62. Each Settling Defendant and Other Settling Party shall identify, on the attached signature page, the name and address of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendants and Other Settling Parties hereby agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including but not limited to, service of a summons.

## XXIII. FINAL JUDGMENT

63. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute the final judgment between and among the United States, Settling Defendants and Other Settling Parties. The Court finds that there is no just reason for delay and therefore enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2008.

United States District Judge

# FOR THE UNITED STATES OF AMERICA

Date

Ronald Tenpas Assistant Attorney General Environment and Natural Resources Division U.S. Department of Justice Washington, D.C. 20530

Michael J. Garcia United States Attorney for the Southern District of New York

Date

By: Pierre Armand Assistant United States Attorney Southern District of New York U.S. Department of Justice 86 Chambers St., 3<sup>rd</sup> Floor New York, NY 10007 Tel No. 212-637-2724 FAX No. 212-637-2730

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George M. Pavlou, Acting Director

George M. Pavlou, Acting Director Emergency and Remedial Response Division U.S. Environmental Protection Agency, Region 2 290 Broadway, 19<sup>th</sup> Floor New York, New York 10007-1866

> FOR CITY OF NEWBURGH SETTLING DEFENDANT

Date: 7/8/08

Signature: Juniter o

Name (print)	Jean-Ann McGrane
Title	City Manager
Address:	83 Broadway, Newburgh, New York 12550

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: Geoffrey Chanin, Esq.

Title: Corporation Counsel, City of Newburgh

Address: 83 Broadway, Newburgh, New York 12550

Date: 6/30/08

	SETTLING DEFENDANT
Signature:	John C. Shqijk
Name (print)	John C. Tkazyik
Title	Mayor
Address:	P.O. Box 300
	Poughkeepsie, NY 12602

FOR City of Poughkeepsie

Agent Authorized to Accept Service on Behalf of Above-signed Party:

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Name: <u>G.Brian Morgan</u>, Esq. Corporation Counsel Title: <u>City of Poughkeepsie</u> P.O.Box 300 Poughkeepsie, NY 12602

		FOR <u>Connell Limited Partnership</u>		
		SETTLING DEFENDANT		
Date: <u>7/2/08</u>	Signature:	Alct		
	Name (print)	John Curtin		
	Title	General Counsel		
	Address:	One International Place		
		Boston, MA 02110		

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: <u>Patrick van der</u> Voorn

Title: <u>Counsel for Connell Limited Partnership</u>

Address: WilmerHale

60 State Street

Boston, MA 02109

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		FOR <u>IBM Corporation</u> SETTLING DEFENDANT
Date: July 7, 2008	Signature:	Glabe
	Name (print)	Edan Dionnie
	Title	Director, Comporte Environmental Affairs
	Address:	294 RTO 100, Somers, NY 10589

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Agent Authorized to Accept Service on Behalf of Above-signed Party:

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Name: Louise Novak

Title: None

Address: New Orchard Road, Armonk, NY 10504

FOR SETTLING DEFENDANT [

Date: 7 July of

[Names and address of Settling Defendant's signatories] CHRIS KASTNER UICE PRESIDENT, CONTRACTS NOATHROA GEUMMAN SHIP Systems, INC. P.O. BOX 149, PASCASOCKA, MS 39566-0199 Agent Authorized to Accept Service on Behalf of Above-signed Party:

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Name: ROBERT J ARIATTI

Title: Scular Courses

Address: Nor TITROP Grumman Strip SysTEMS, Inc Lean Dept. P.O. Box 149 PARCACOULI, MS 3956F-0149

. . .

> FOR OTHER SETTLING PARTY BERG'S AUTO

Date: 6-26-08

nal Name: RONALD BERG

Pres owner Title: \_\_\_ Address: <u>#838 SW LAKE GROVE</u> CIR'. Palm Gty, Fl. 34990

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Alyse Terhune, Esq. Jacobowitz & Gubits, LLP 504 Broadway Monticello, NY 12701 CONSOLIDATED RAIL CORPORATION

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- balle 2008 Date 2+ Scaque Name an Attorneu Title: Address: 500 Levoter Street, 14 th Flore Jackson ville, Fla. 32202

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Thomas J. Fucillo, Esq. Menter, Rudin & Trivelpiece, P.C. Suite 200 308 Maltbie Street Syracuse, NY 13204-1498

Date: 1 208

FOR OTHER SETTLING PARTY EISMER BROS., INC. tan 6 ITIEN Name: laala Title: ne commence lager IIISW) <u>.</u> Address: ( 12260 N

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

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Philip H. Gitlen, Esq. Whiteman Osterman & Hanna LLP One Commerce Plaza LLP Albany, NY 12260

FOR OTHER SETTLING PARTY ERIC ALLEVA AND SEVEN X MOTORS, INC.

Date: 6/29/08

ERCOLA ALLEVA Name:

Title:\_\_\_\_\_

Address: \_\_\_\_\_

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

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Lisa M. Penpraze, Esq. Segel, Goldman, Mazzotta & Siegel, P.C. 9 Washington Square Albany, NY 12205

Date: June 26, 200 8

FOR OTHER SETTLING PARTY FORD MOTOR COMPANY

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Name: Robert T. Biskup

Title: Assistant Secretary

Address: 3 Parklan Blue, Suite 1500W

Dearborn, MJ 48126

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Michael A. Burgin, Esq. Counsel Ford Motor Company Office of the General Counsel 3 Parklane Blvd. Suite 1500W Dearborn, MI 48126-2568

FOR <u>HYATT'S GARAGE</u> INC

Date: 6/29/08

Signature: Eleien Depart Name (print) <u>ELWW HYAH</u> Title <u>PRES</u> Address: 2612 PX52 HOPEWELL JCT NY 12533

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: JENN IFER COGALAN Title: SIVE, PAGETY RIESEL Address: 460 PARK AVE NG NG 10022

FOR OTHER SETTLING PARTY JOHN H. LUTJENS

Date: 6 26 2008

Name:	 	
Title <sup>.</sup>		

Address: \_\_\_\_\_

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

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Henry Christensen Norton & Christensen 60 Erie St. Goshen, NY 10924 THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of United States v. City of Newburgh, *et al.* relating to the Consolidated Iron and Metal Co. Superfund Site.

Date: 6 26 200%

KRAFT FOODS GLOBAL, INC.
Alfrey An
Name: Jeffrey Srulovitz
Title: Chief Environmental and Sately Counsel
Address: Mare Lakes Dr.
Northfield, IL 60015
'

FOR OTHER SETTLING PARTY

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Jeffrey S. Srulovitz Chief Environmental and Safety Counsel Kraft Foods Global, Inc. Three Lakes Drive Northfield, IL 60093 THE UNDERSIGNED PARTIES enter into this Consent Decree in the matter of United States v. City of Newburgh, *et al.* relating to the Consolidated Iron and Metal Co. Superfund Site.

FOR OTHER SETTLING PARTIES STEPHEN PIDALA STEVE PIDALA TRUCKING LTD. STEVE PIDALA TRUCKING LTD., d/b/a PIDALA LANDSCAPE MATERIAL AND SUPPLY

S.P. EQUIPMENT, INC.

Date: 6 - 26-08

Name: Stephen Pidula

Title: Yra

Address: 10 Box 51

NY 10510 Sprida.

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Andrew W. Gilchrist, Esq. Jonathon B. Tingley, Esq. Tuczinski, Cavalier, Gilchrist & Collura, P.C. 54 State Street, Suite 803 Albany, NY 12207

\_\_\_\_\_

\_\_\_\_

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of United States v. City of Newburgh, *et al.* relating to the Consolidated Iron and Metal Co. Superfund Site.

FOR OTHER SETTLING PARTY VILLAGE OF SLOATSURG

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Date: June 27, 2008

& Whill

Name: Carl S. Wright

Title: Mayor

Address: 96 Orange Turnpike

Sloatsburg, NY 10974

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Joel Grossbarth, Esq. Village of Sloatsburg 96 Orange Tpke Sloatsburg, NY 10974 APPENDIX A

## **OTHER SETTLING PARTIES**

Berg's Auto Consolidated Rail Corporation Eisner Brothers, Inc. Eric Alleva and Seven X Motors, Inc. Ford Motor Company Hyatt's Garage, Inc. John H. Lutjens Kraft Foods Global, Inc. Stephen Pidala Steve Pidala Trucking Ltd. Steve Pidala Ltd., d/b/a Pidala Landscape Material & Supply S.P. Equipment, Inc. Village of Sloatsburg APPENDIX B

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# APPENDIX C

Final Execution Copy June 20, 2007 (2:00 pm)

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DEVELOPMENT AGREEMENT BY AND BETWEEN CITY OF NEWBURGH AND LEYLAND ALLIANCE LLC DATED AS OF JUNE , 2007

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## LIST OF SCHEDULES

Schedule A Description of Project Area – Consolidated Iron Site, Boat Launch Property, Balance of City Property and Non-City Property

Schedule A-1 Tax Parcel Map of Project Area

Schedule B Conceptual Plan

Schedule C Escrow Agreement

A Development Agreement dated as of June , 2007, by and between the CITY OF NEWBURGH, a New York municipal corporation with offices at 83 Broadway, Newburgh, New York (the "City") and LEYLAND ALLIANCE LLC, a limited liability company organized under the laws of the State of Delaware with offices at 16 Sterling Lake Road, Tuxedo, New York (the "Developer").

WHEREAS, the City, or City agencies, are the record owners of those parcels of land located along or in proximity to the Hudson River waterfront in the City of Newburgh, County of Orange, New York, described on Schedule A as the Consolidated Iron Site, the Boat Launch Property and the Balance of City Property, said parcels also being described on Schedule A-1 by reference to the City of Newburgh Tax Map (collectively, the "City Property"); and

WHEREAS, there are certain additional parcels of land, comprising approximately nine (9) acres (with a portion of such acreage apparently under water), also located along or in proximity to the Hudson River waterfront in the City of Newburgh, County of Orange, New York, as described on Schedule A and Schedule A-1 (collectively, the "Non-City Property); and

WHEREAS, a portion of the City Property, identified as the "Boat Launch Property" on Schedule A, is owned by the City subject to a Co-operative Agreement between the City and the New York State Department of Environmental Conservation ("DEC") dated June 6, 1997 (the "Co-operative Agreement"); and

WHEREAS, the City desires to facilitate redevelopment and enhance public access to the waterfront and promote a mixture of residential, commercial, office and other appropriate uses on and in the vicinity of the City Property and Non-City Property; and

WHEREAS, the City and the Developer wish to develop and construct or facilitate development and construction of a mix of residential uses, retail space, professional office space, hospitality with meeting and event space, public open space and parking for such uses (the "Project") on and in the vicinity of the City Property and Non-City Property (collectively, the City Property and Non-City Property are sometimes referred to herein as the "Project Area," and each individual parcel within the Project Area is referred to as a "Project Parcel"); and

WHEREAS, the City and the Developer entered into an Exclusivity and Planning Agreement dated September 22, 2006 (the "Exclusivity and Planning Agreement"), to commence the planning process for the Project Area and to establish the general framework and scope of this Agreement; and

WHEREAS, the Developer, pursuant to the Exclusivity and Planning Agreement, provided an escrow deposit of \$50,000.00 to reimburse the City for outside consultant and other expenses incurred by the City in furtherance of the Project; and

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WHEREAS, the Developer, together with its consultants, undertook an extensive Charrette planning process, which involved the participation of community groups and individuals interested in redevelopment of the Project Area, as well as other areas within the City; and

WHEREAS, the Developer and its consultants issued a Final Charrette Report dated May 9, 2007, which, among other things, identifies a proposed conceptual plan for the Project; and

WHEREAS, the Developer, in conjunction with the Final Charrette Report, has prepared a comprehensive Conceptual Plan dated June 14, 2007 (the "Conceptual Plan"), attached hereto as Schedule B, outlining conceptually the uses, locations, height, scale, amenities, character and scope of potential development of the Project Area; and

WHEREAS, the City Council of the City of Newburgh (the "City Council") has reviewed the Conceptual Plan, and Final Charrette Report; and

WHEREAS, the City Council endorses the Final Charrette Report and Conceptual Plan as presenting a suitable land use planning vision for the Project and Project Area; and

WHEREAS, the Developer and the City are entering into this Agreement in order to set forth certain understandings among them with respect to: (i) the environmental review concerning the implementation of the Project, subject to the New York State Environmental Quality Review Act and the regulations promulgated thereunder by the Commissioner of the New York State Department of Environmental Conservation (collectively, "SEQRA") and (ii) the obligations of the parties to be performed prior to the approval, execution and delivery of a Land Acquisition and Development Agreement ("LADA") between the Developer and the City with respect to the Project Area; and

WHEREAS, the parties agree and acknowledge that although by this Agreement the City covenants in good faith to diligently and reasonably seek to perform its obligations hereunder, the City can not commit to any particular outcome regarding the Project, Project Area or future related proposed projects under SEQRA, or the Eminent Domain Procedure Law ("EDPL"), and the respective regulations thereof, and that the covenants, conditions and agreements set forth herein are subject to and conditioned upon compliance with each of the findings and determinations to be made thereunder; and

WHEREAS, the City and the Developer wish such development of the Project Area to take place in a timely and expeditious manner; and

WHEREAS, in furtherance of the above, the City Council has on this date approved this Agreement for execution by the City Manager on behalf of the City; and

NOW, THEREFORE, in consideration of the mutual covenants herein contained and other good and valuable consideration, the parties agree, as follows:

## <u>ARTICLE I</u>

## PROPOSED PROJECT

1.1 The Project. The Project is expected to include a mix of residential units with opportunity for neighborhood retail and live work arrangements, destination retail, hotel, office, open space and recreational and other public space, as depicted on the Conceptual Plan annexed as Schedule B. The City acknowledges that Developer may desire to make changes to the Conceptual Plan from time to time, based on additional due diligence and planning. The City's approval with respect to any such changes shall not be unreasonably withheld or delayed, subject to any and all governmental reviews hereunder, including, SEORA. The Project development program, as currently envisioned in the Conceptual Plan, includes 1170 residential units, 105,000 square feet of destination retail, 35,000 square feet of neighborhood retail, 50,000 square feet of flex retail associated with Live-Work units, 100,000 square feet of office space, 150 hotel rooms with banquet facilities, 2180 structured parking spaces, plus additional on and off street parking. In addition, the Project development program, as currently envisioned in the Conceptual Plan, includes approximately 4.5 acres of open space and public amenities, including parks, green-space, and improvements to the Broadway corridor. It is understood that the development program reflected in the Conceptual Plan is subject to change, as noted above, including, but not limited to, the development program for the Non-City Property, which plan is still undergoing further refinement and review by the parties. The parties contemplate a rezoning of the Project Area to facilitate the Project, and potential future development along the waterfront. The Developer shall include proposed rezoning of the Project Area, and may include proposed changes to the City's Zoning Code regarding certain areas outside the Project Area on the waterfront, as part of the Project to be reviewed under SEQRA hereunder.

1.2 <u>Project Phases</u>. The parties acknowledge that as of the date hereof, the plans for the phasing of the Project have not yet been formulated beyond the general planning concepts set forth in the Conceptual Plan. The Developer shall submit to the City updated phasing plans for specific phases of the Project during the SEQRA process.

1.3 <u>Municipal Objectives</u>. The parties agree that redevelopment of the Project Area as set forth herein, and in the Conceptual Plan, shall be in substantial harmony with the City's goals and visions for the redevelopment and sustainability of the Project Area, which Project goals and descriptions may be modified, from time to time, upon mutual agreement of the parties hereto. The parties further agree that the Developer shall provide customary and legally authorized financial or other assurances that it will construct and/or fund publicly dedicated Project Infrastructure and Shared Infrastructure determined to be the financial responsibility of the Developer within the Project Area to the reasonable satisfaction of the City, which may include letters of credit and/or performance bonds.

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Development\_Concepts for Contiguous Areas. Provided that the 1.4. Developer is not in default of this Agreement, the Developer shall have the right to submit to the City one or more proposed concept plans, similar in level of detail to the Conceptual Plan, with respect to redevelopment proposed to be undertaken by the Developer in any area or areas contiguous with or in proximity to the boundaries of the Project ("Contiguous Area"), to the extent that the inclusion of such area or areas is reasonably necessary or appropriate in order to support the economic feasibility, marketability, legal compliance, visual character, or vehicular or pedestrian accessibility, of the Project. Upon approval by the City Council, which approval or denial shall be granted in the City Council's reasonable discretion: (i) the Conceptual Plan shall be deemed modified to incorporate the concept plan so approved for the Contiguous Area; (ii) a description of the Contiguous Area shall be annexed to this Agreement as an additional exhibit thereto, and (iii) such proposed redevelopment and Contiguous Area shall become part of the Project and Project Area for all purposes under this Agreement without the need for any other or further act by any the parties, except as may be required for compliance with applicable requirements of SEQRA.

1.5 <u>Work Force Housing</u>. The LADA shall include provisions for the Developer to build up to ten percent (10%) of the number of residential units within the Project as "Work Force Housing." Work Force Housing shall mean residential units restricted for not less than thirty (30) years to occupancy by households whose income (at the time of lease or purchase) is less than or equal to one hundred twenty-five percent (125%) of the Orange County median income as determined by the United States Department of Housing and Urban Development. No less than five percent (5%) of such Work Force Housing shall be built within the Project Area. The other five percent (5%) may be built outside the Project Area within the City of Newburgh.

1.6 <u>Local Community Benefit Programs</u>. The City of Newburgh is privileged to have a diverse community. The City encourages all contractors and developers selected to do business with the City to make their onsite workforce and local vendors a reflection of the community. Prior to entering into a LADA, the parties shall endeavor in good faith to negotiate a local hiring and vendor program in relation to the construction and ongoing operation and maintenance of the Project.

## ARTICLE II

#### **DEVELOPMENT ACTIONS AND RESPONSIBILITIES**

2.1 <u>Project Entities; Negotiation of LADAs</u>. Upon compliance with all applicable SEQRA and other regulations, and upon the City's enactment of any required zoning changes and amendments to other legislation, including, but not limited to, the City Local Waterfront Redevelopment Plan ("LWRP"), the City and either Developer or an entity to be designated by Developer and meeting the requirements for an assignment or transfer under

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Section 12.18 of this Agreement (said entity that executes the LADA, be it Developer or an entity designated by Developer, is referred to herein as "Purchaser"), shall execute a LADA for the Project. The LADA shall be consistent with the terms and conditions of this Agreement and any relevant planning and design modifications, including, but not limited to, any modifications to the Conceptual Plan or any environmental mitigation measures resulting from the environmental review processes under SEQRA, or any other applicable governmental regulations. The LADA shall further set forth, among other provisions, (i) the final purchase price to be paid by for the respective Project Parcels, in accordance Article V below, and more definitive legal descriptions of the Project Parcels; (ii) the specific terms and conditions for the transfers and/or plan of acquisition and transfer of the respective Project Parcels to the Purchaser; and (iii) responsibility for and cost of any Infrastructure, as described below in Section 2.5, required to be provided for the Project. The Developer and the City shall use their commercially reasonable best efforts to negotiate the LADA for the Project as soon as is practicable, subject to the terms and conditions herein, provided, that no LADA may be executed until the Developer and the City comply with all applicable laws and regulations, including, but not limited to, SEQRA. The LADA shall be subject to approval by the City Council, such approval not to be unreasonably withheld or delayed.

#### 2.2 Assemblage of the Proposed Project Parcels

(a) The parties intend that fee simple title in an to the City Property shall be sold and conveyed to the Purchaser in accordance with the LADA for a purchase price determined in accordance with Section 5.1 below, subject to all conditions and limitations set forth in this Agreement. Prior to entering into the LADA, the City shall take whatever actions are necessary to ensure that fee simple title to all City Property owned by other entities shall be conveyed to Purchaser in accordance with the LADA.

(b) To the extent that the Project involves real property not owned by the City as of the date of this Agreement, acquiring said property and/or obtaining site access or site control agreements shall be the responsibility of the Developer, except that the City shall be responsible for acquiring any real property for which condemnation is necessary as provided below, but only as a last resort (<u>i.e.</u>, if Developer or Purchaser is unable, after a good faith effort, to consensually acquire same).

(c) In the event that the Developer is unable, after a good faith effort, to consensually acquire the Non-City Property identified in Schedule A, which is part of the Project Area, then, at the request of the Developer and subject to all applicable State and local laws, the City shall commence use of eminent domain, and thereafter shall diligently pursue all actions and procedures required under the New York Eminent Domain Procedure Law ("EDPL") in a good faith effort to accomplish such condemnation as expeditiously as possible. If privately owned property (in addition to the Non-City Property identified in Schedule A) is desired to be added to the Project Area by the parties, and Developer is unable, after a good faith effort, to consensually acquire said additional private property, then at the request of Developer and subject to all applicable State and local laws, the City shall consider commencing, on a case by

case basis, use of eminent domain in the same manner as is provided above for the Non-City Property. The parties agree that the Developer may obtain or assist the City to obtain Public Funding (as herein below defined) to defray, or reimburse the Developer for Condemnation Costs incurred by the Developer hereunder, and the City will support such efforts to obtain Public Funding for such purpose.

2.3 <u>Urban Renewal Plans.</u> The City hereby agrees to amend any existing Urban Renewal Plan affecting the Project Area, as reasonably requested by Developer, to facilitate the Project and so that any such Urban Renewal Plan is not an impediment to the Project.

2.4 [intentionally blank]

2.5 <u>Infrastructure</u>.

Project Infrastructure. As used in this Agreement, the term Project (a) Infrastructure shall be deemed to refer to all infrastructure improvements directly related to or necessary for the development or enhancement of the Project (other than Public Infrastructure and Shared Infrastructure, as described below in clauses (b) and (c) of this Section 2.5), whether publicly dedicated or not, and whether or not situated within the Project Area, including, but not limited to, streets, roads, curbs, sanitary sewer hook-ups, domestic water tap-ins, storm water drainage facilities, gas, electric, communications and other utility improvements and installations, and private residential parking facilities required as part of the Project. The LADA shall provide that Purchaser (i) shall be responsible for funding and carrying out the design, engineering and construction, and obtaining financing and all approvals from other governmental entities that may be required therefor and (ii) shall oversee, or engage the services of a general contractor or construction manager who shall oversee, and shall be responsible for the construction and installation of the Project Infrastructure, subject to applicable laws and governmental procurement policies. The City shall support, assist and cooperate with the Purchaser in its performance of such responsibilities, it being the intention of the parties to this Agreement to establish a collaborative working relationship in furtherance of the Project Infrastructure development program. To the extent permitted by law, the City shall use best efforts, in consultation and cooperation with the Developer and Purchaser, to pursue all available Federal, State and other governmental and public grants and/or subsidies ("Public Funding") in connection with the construction of the Project Infrastructure. At Developer's or Purchaser's request, the City shall also use its best efforts to use municipal financing mechanisms for the Project Infrastructure, including, without limitation, the establishment of special taxing districts and the issuance of municipal bonds ("Municipal Financing"), provided, that the use of Municipal Financing for Project Infrastructure specifically, is limited to those uses that are revenue neutral for the City, meaning that such use would in no way reduce the amount of revenue to the City's general budget, and would not unduly strain the City's bonding capacity, as determined in the reasonable discretion of the City Manager.

(b) <u>Public Infrastructure</u>. As used in this Agreement, the term "Public

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Infrastructure" shall be deemed to refer to all governmental and utility improvements, perhaps related to the Project, but substantially benefiting the public or areas beyond the Project Area, or necessary to correct pre-existing capacity or other deficiencies not solely related to the Project, whether or not situated within the Project Area or Contiguous Areas. Public Infrastructure, for purposes of the Project, shall include, among others, the relocation and upgrade of the existing sewer interceptor and utilities so that they are located in rights of way adjacent to the Project Area (the "Sewer/Utility Relocation and Upgrade Cost"), construction of a landscaped median and traffic calming improvements along lower Broadway, construction of public parking facilities (which shall be deemed to include parking facilities serving retail uses within the Project), and construction of upgrades to the City sewer treatment plant, to the extent required to service the Project. The City shall be responsible for funding and financing such Public Infrastructure and all Public Infrastructure Costs (as defined hereinafter). The Developer, to the extent permitted by law and in consultation with the City and its relevant specifications and standards, and for reasonable and customary fees to be paid by the City (i) shall be responsible for carrying out the design, engineering, and construction, of the Public Infrastructure, and for obtaining all approvals from other governmental entities that may be required therefore, (ii) shall take the lead in preparing, submitting and pursuing applications for Public Funding (as herein below defined) for the Public Infrastructure, and (iii) shall oversee, or select a general contractor or construction manager who shall oversee and shall be responsible for the construction and installation of the Public Infrastructure, subject to applicable laws and governmental procurement policies. The City agrees to cooperate with Developer in obtaining any approvals for Public Infrastructure, including, but not limited to, executing permit applications to agencies with jurisdiction to approve. The activities described in clauses (i), (ii) and (iii) in the preceding sentence are sometimes herein below referred to collectively as "Public Infrastructure Work." The costs incurred or to be incurred for the design, engineering, survey, construction, construction management, permits and inspections, and related insurance costs, are collectively referred to in this Agreement as "Public Infrastructure Costs." Notwithstanding anything to the contrary set forth above in this Section 2.5(b), the Developer or Purchaser may at its sole discretion (i) elect to undertake or complete the design, engineering or construction of extraordinary improvements or repairs to Infrastructure in order to expedite such design, engineering or construction work; and/or (ii) at its further election at its sole discretion, to advance its own private funds in order to expedite such work ("Public Infrastructure Advances"). Public Infrastructure Advances shall be recouped by Developer by reimbursement from Public Funding or Municipal Financing in accordance with Section 2.5(e), and the City shall use all reasonable best efforts to reimburse Developer for such Public Infrastructure Advances as soon as possible. In the event such reimbursement can not be made, Developer shall also have the right to recoup same as an offset against the Purchase Price for the City Property to be acquired pursuant to the LADA.

(c) <u>Shared Infrastructure</u>. The parties recognize that certain infrastructure required for the Project will be shared by and benefit the public, as well as the private owners and/or tenants within the Project ("Shared Infrastructure"). Shared Infrastructure includes, but is not limited to, public open space, parks, bulkhead improvements, and parking facilities serving commercial uses such as office and hotel uses. The City and the Developer shall use their

reasonable best efforts to obtain Public Funding to pay for the Shared Infrastructure. In the event sufficient Public Funding is not available for all or a portion of the Shared Infrastructure, the costs associated with Shared Infrastructure may be funded by one or more of the following sources or a combination of such sources: Public Funding, Municipal Financing, Developer funding and/or City funding. The parties shall endeavor in good faith to arrive at a fair and reasonable allocation of responsibility for the financing of such Shared Infrastructure during the period prior to the execution of the LADA hereunder based upon the preparation by the Developer and the City's receipt and review of detailed financial pro-formas, more detailed information on such Shared Infrastructure to be produced and analyzed during the SEQRA and other governmental review processes, and other information reasonably required or produced by the parties. The parties also reserve the right, upon mutual agreement, to reduce the scope of the Shared Infrastructure, if adequate funding therefor is ultimately not available and they believe such reduction in scope is necessary in order to advance the Project. In the event that the parties cannot agree to mutually acceptable funding mechanisms for one or more elements of the Shared Infrastructure, then the parties shall submit to binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, provided, that the parties first engage in mediation to resolve any dispute, the procedures of which shall be mutually agreed to in the LADA.

Except as may be applicable under paragraph (e) below, and at the City's (d) option, the Developer shall construct any public parking lot or public parking structure included in Public Infrastructure (a "Public Parking Facility") and shall receive reasonable fees for doing so, whereas the City shall be responsible for funding and financing such Public Parking Facilities. The City shall operate any such Public Parking Facility. The Developer or Purchaser and the City shall negotiate, at the time of the execution and delivery of a LADA, responsibility for funding annually any operating deficits that may be incurred in the course of operation of any such Public Parking Facility, with the understanding that such funding may be covered by an operation deficit reserve included in the financing for such Public Parking Facility; provided, however, that in no event shall the Developer or Purchaser be responsible for funding any portion of such deficit attributable to replacement reserves or depreciation. At the time of execution and delivery of a LADA for the Project that is to be served by a particular Public Parking Facility, the Purchaser and the City shall also enter into an additional agreement or agreements containing terms and conditions, mutually acceptable to the parties thereto, pertaining to parking rates, budgeting of operating costs, standards of operation, permit parking, and other matters pertaining to the management and operation of such Public Parking Facility.

(e) At the Developer's option, and to the extent permitted by law, the Developer may propose that any Public Parking Facility be developed and constructed on a design/build basis, with participation by a local development corporation created under Section 1411 of the Not-for-Profit Corporation Law (an "LDC"), which may (i) own such Facility, or become the lessee or sublessee thereof; (ii) contract with the Developer for the latter to design, construct and operate such Facility, and (iii) receive from one or more municipal entities, and use for the payment of Public Infrastructure Costs, the following: (A) Public Funding, (B) Municipal Financing, (C) the proceeds of other bonds or notes that may be issued by the City or other

municipal entity to cover the Public Infrastructure Costs of such Facility, (D) contributions made by the City pursuant to paragraph (b) above in this Section, (E) advances that may be made by the Developer at the Developer's option, and (F) such other funds as the parties to this Agreement may provide for payment of the Public Infrastructure Costs of such Parking Facility. If the Developer shall propose to proceed on a design/build basis for any Public Parking Structure, then the City and any other participating municipal entity shall cooperate with the Developer diligently and in good faith, in accordance with applicable law, in order to implement such proposal. At the time of execution and delivery of a LADA for the Project that is to be served by a particular Public Parking Facility, the Developer and the City or other applicable municipal entity shall also enter into an additional agreement or agreements containing terms and conditions, mutually acceptable to the parties thereto, pertaining to parking rates, budgeting of operating costs, standards of operation, permit parking and other matters pertaining to the management and operation of such Public Parking Facility.

(f) The parties to this Agreement acknowledge that although funding commitments may hereafter be obtained from Federal, State or County sources of Public Funding, or from municipal entities, including the City, committing to provide Municipal Financing for elements of Public Infrastructure Work, the actual funding of such assistance may be delayed beyond the scheduled time for commencement of such Public Infrastructure Work. In such event the Developer may at its sole discretion, in order to expedite such Public Infrastructure Work, elect to advance its own funds to pay Public Infrastructure Costs of such Work, and the Developer shall be entitled to be reimbursed by the City or other appropriate municipal entity, as and to the extent permitted by law, in the amount of such advance(s), from proceeds of Public Funding or Municipal Financing subsequently received by the City (or by such other municipal entity) for the Public Infrastructure Work that was the subject of the Developer's advance.

(g) At the earliest possible date following execution of this Agreement, the Developer shall provide the City with financial pro forma information relevant to implementation and construction of the Project, which shall be sufficiently detailed for the City to make informed decisions regarding the Project, including the financing of Public, Private and Shared Infrastructure. The City reserves the right to request a reasonable level of additional financial information from the Developer in the event that it determines that additional information is necessary in order for it to make such decisions in connection with the Project.

(h) Notwithstanding anything in this Section 2.5 herein to the contrary, the application for and use of Public Funding shall be prioritized in the following order: Public Infrastructure, Shared Infrastructure and Project Infrastructure, unless the City and Developer mutually agree to change such priority order.

2.6 [intentionally blank]

2.7 <u>Seeking County, State, Federal Assistance</u>. Either party, in consultation with the other, may invite the Empire State Development Corporation and/or a subsidiary of Empire State Development Corporation ("ESDC"), as well as any other State Agencies, Federal

agencies and the County of Orange, where appropriate, to assist in the study and funding of various components of the Project.

## 2.8 [intentionally blank]

Changes to Reflect SEORA Findings. The City agrees to act reasonably 2.9 in connection with all procedures and actions taken pursuant to SEQRA hereunder. The parties acknowledge, however, that the SEORA findings to be made by the City and other municipal entities may require the Project, or portions thereof, and the Conceptual Development Plan, to be modified, reduced in scope or rejected, in whole or in part. If the Developer, in its sole judgment and discretion, determines that such modification, reduction or rejection is consistent with the Developer's continued participation in the redevelopment of the Project affected by such SEQRA findings, then all relevant documents, including, without limitation, this Agreement, the Conceptual Plan, the conceptual plan for a Contiguous Project and any LADA, shall be modified to reflect such SEQRA findings, if any. If the Developer, in its sole judgment and discretion, determines that such modification, reduction or rejection is not consistent with the Developer's continued participation in the redevelopment of any portion of the Project affected by such SEQRA findings, then the Developer shall have the right to withdraw its development proposal(s) with respect to the Project, and in the event of such withdrawal and subject to the provisions and requirements of Articles IX and X below, (i) the Developer shall promptly reimburse to the City any funds owed to it by the Developer under this Agreement, including, but not limited to, costs incurred in any condemnation proceeding; (ii) Developer shall have no claim of right to any monies that have been paid to the City; (iii) the City shall have no further obligation to the Developer, and (iv) all plans, studies and reports of any kind previously submitted to the City in connection with the Project shall remain the property of the City.

#### ARTICLE III

#### ENVIRONMENTAL REQUIREMENTS

### 3.1 Brownfield Application – Access Agreement.

(a) Subject to this Agreement being approved and executed by the City, the Developer or Purchaser may, at any time, if applicable, and if permitted by the New York State Department of Environmental Conservation ("DEC"), submit an application to the DEC to undertake environmental remediation of all or part of any parcel within the Project Area, as a "volunteer" under the New York State Brownfield Cleanup Program ("BCP"), and the City shall support any such application, including by way of partly sponsoring same. Any related environmental investigation and remediation, undertaken pursuant to the Brownfield Application shall be at the sole cost and expense of the Developer or Purchaser. If the Developer or Purchaser enters the BCP, it shall also secure an environmental insurance policy, which protects all the parties to this Agreement from future environmental liability and that qualifies for the BCP Environmental Remediation Insurance Credit. The City shall be named as an additional

insured.

Prior to Purchaser's acquisition of a parcel in the Project Area, the City **(b)** shall provide Developer with access to the Project Area during reasonable hours, to the extent permissible by law, for the purpose of facilitating the terms and conditions herein, subject to the following conditions: (i) Developer shall provide the City with reasonable notice in advance of any testing thereon; (ii) the City approves in advance any testing protocol, such approval not to be unreasonably withheld or delayed; (iii) Developer uses commercially reasonable efforts to minimize any damage to or disturbance of the Project Parcels or any ongoing operations, businesses or events related thereto; (iv) Developer uses commercially reasonable efforts to restore the Project Parcels to their prior condition; (v) Developer obtains comprehensive liability insurance, naming the City as an additional insured party; and (vi) Developer indemnifies and holds the City harmless from and against any cause of action arising out of the Developer's access and/or use of any Project Parcel or parcels within a Contiguous Area contemplated to be a Project Parcel. Developer shall provide the City with copies of all test results, reports, data, documents and like materials prepared by Developer and/or its professional consultants concerning the Project Site.

## 3.2 <u>Remedial Work Indemnification</u>.

(a) Developer and the City acknowledge that the Project Area includes the former Consolidated Iron & Metal site, which has been listed as a National Priorities List Site (referred to herein as the "NPL Project Area" or the "Consolidated Iron Site") by the United States Environmental Protection Agency ("USEPA") under CERCLA, and that the City has been identified by the USEPA as a potentially responsible party ("PRP") for response costs at the NPL Project Area. The City disputes its liability, and is seeking to settle any potential liability it may have with the USEPA. In connection with any settlement to be made by the City, the City agrees to use its best efforts to obtain successor liability and/or contribution protection in favor of the Developer, and Developer agrees to cooperate reasonably with the City so as not to hinder any settlement efforts, including, but not limited to, making such project modifications to the Concept Plan as may assist in reducing the City's potential liability, so long as such modifications do not, in the Developer's reasonable judgment, impair the quality of the Project.

(b) Neither Developer nor Purchaser shall have any liability, pre-Closing or predelisting of the NPL Project Area from the National Priorities List, of any kind in the NPL Project Area. Purchaser shall have no liability to the City for contribution, share none of the City's PRP liability, if any, and shall have no liability for remediation or removal of any existing environmental contamination in the NPL Project Area ("Remediation") until the later of (i) Purchaser takes title to the NPL Project Area and (ii) the Remediation conducted by the United States, the State and/or third party PRPs for the NPL Project Area is completed, and the Area is formally delisted from the National Priorities List ("Purchaser Liability Date"). Purchaser shall also have no liability resulting from any "re-opener provisions" set forth in any EPA order, settlement or other administrative directive. Given that Purchaser, and not Developer, will be entering into the LADA, Developer shall have no liability whatsoever to the City with respect to

the NPL Project Area or any other portion of the Project Area after the City and Purchaser enter into the LADA.

The LADA shall provide that Purchaser shall be liable for and indemnify, (c) defend by legal counsel selected and retained by the City, and hold harmless the City and their successors and assigns, each of their employees, officials, members, agents or contractors, (the "Indemnitees"), from and against any Environmental Damages ("Indemnified Claims") (i) discovered or arising on or after the date of closing of title under the LADA (the "Closing Date") related to the non-NPL Project Area (as defined below, in Section 3.2(d)), and (ii) discovered or arising Post-Purchaser Liability Date in the NPL Project Area, provided that with respect to this clause (ii), (A) such Environmental Damages are not part of a re-opener provision in a EPA consent order, settlement document or administrative directive, (B) that although the parties shall covenant not to sue one another with respect to such Environmental Damages, neither party shall indemnify the other hereunder, except as provided below, and (C) Purchaser shall have no obligation hereunder to the City with respect to any claim by a third-party against the City, whether pre- or post-Purchaser Liability Date. Developer and Purchaser shall each be liable for and indemnify, defend by legal counsel selected and retained by the City, and hold harmless the Indemnitees from and against any Indemnified Claims caused by such indemnifying party (i.e., Developer or Purchaser, as the case may be), or in connection with existing and ongoing releases that are exacerbated by such indemnifying party on either the non-NPL Project Area or NPL Project Area, prior to or after the Closing. It is understood that Developer shall have liability for Indemnified Claims caused by Developer and releases exacerbated by Developer, but shall have no liability for Indemnified Claims caused by Purchaser or releases exacerbated by Purchaser; similarly, Purchaser shall have liability for Indemnified Claims caused by Purchaser and releases exacerbated by Purchaser, but shall have no liability for Indemnified Claims caused by Developer or releases exacerbated by Developer.

(d) "Environmental Damages" means (i) all claims, judgments, damages, losses, penalties, fines, liabilities (including strict liability), encumbrances, liens, costs and expenses of investigation and defense of any claim, whether or not such claim is ultimately defeated, and of any settlement or judgment, of whatever kind or nature, contingent or otherwise, foreseeable or unforeseeable, relating to Hazardous Materials, (ii) reasonable third party out-ofpocket fees incurred for the services of attorneys, consultants, contractors, experts, and laboratories relating to Hazardous Materials, (iii) all other third party out-of-pocket costs incurred in connection with Hazardous Materials, including, without limitation, the cost of any work performed and materials furnished in order to comply with any environmental law, whether or not such cost is disclosed by any environmental report, including, without limitation, the cost of assessment, containment and/or removal of any and all Hazardous Materials, the cost of any actions taken in response to the presence, release or threat of release of any Hazardous Materials (iv) property damage (real or personal) arising out of or relating to any such Hazardous Materials, (v) damages arising from any violation of the provisions, covenants, representations or warranties hereof or of any legal requirements related to any such Hazardous Materials, and/or (vi) cleanup or remediation expenses, claims, demands, penalties, fees, fines, liabilities, settlements, damages, losses, costs or other reasonable expenses of whatever kind or nature,

known or unknown, contingent or otherwise, whether incurred or imposed within or outside the judicial process, including, without limitation, reasonable attorneys' and consultants' fees and disbursements and investigations and laboratory fees, related to any and all Hazardous Materials, but only to the extent any such matter described in the foregoing clauses (i) through (vi) arise out of (A) the presence, disposal, escape, seepage, leakage, spillage, discharge, emission, release or threat of release of any Hazardous Materials (as hereinafter defined) in, on, over, under, or affecting the NPL Project Area, or any part thereof, whether or not disclosed by any environmental report relative to the NPL Project Area, but excluding any migratory contamination from the NPL Project area in, on, or to land outside the Project Area, (B) the presence, disposal, escape, seepage, spillage, discharge, emission, release or threat of release of any Hazardous Materials on the City Property, excluding the NPL Project Area (the City Property, other than the NPL Project Area, being referred to herein as the "non-NPL Project Area"), or any part thereof whether or not disclosed by any environmental report relative to the Project Area, provided, however, as to clause (A) above and this clause (B), in the event that Developer discovers Hazardous Materials on either the non-City Property or Boat Launch Property, either pre or post-Closing, which Developer reasonably establishes migrated from the NPL Project Area, the parties agree to negotiate in good faith and include in the LADA, who is responsible for any Remedial Work (defined hereinafter) on said Properties, as well as allocation of liability for such contamination, and in failing agreement thereon, such responsibility and allocation shall be determined by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, provided that the parties first engage in mediation to resolve any dispute. Notwithstanding, the foregoing, and for avoidance of doubt. "Environmental Damages" shall not include any damages, losses, or claims of any kind related to or arising from any personal injury (including without limitation wrongful death, disease or other health condition related to or caused by, in whole or in part, by any Hazardous Materials).

"Hazardous Materials" means and includes (i) those elements, wastes, (e) materials, substances or compounds identified or regulated as hazardous or toxic pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. § 9601 et seq. and 40 CFR § 302.1 et seq.) ("CERCLA"), the Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901 et seq.), the Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq. and 40 CFR § 116.1 et seq.), the Hazardous Materials Transportation Act (49 U.S.C. § 1801 et seq.), the Clean Air Act (42 U.S.C. § 7401 et seq.), the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. § 136 et seq.), the Emergency Planning and Community Right to Know Act (42 U.S.C. § 1101 et seq.), the Occupational Safety and Health Act (29 U.S.C. § 651 et seq.), the Residential Lead Based Paint Hazard Reduction Act (42 U.S.C. § 4851 et seq.), the New York State Navigation Law, all applicable or analogous state laws, any amendments thereto, and the regulations promulgated pursuant to said laws, all as amended from time to time, relating to or affecting the Project Area, (ii) any hazardous, toxic or harmful substances, wastes, materials, pollutants or contaminants including, without limitation, asbestos, polychlorinated biphenyls, petroleum products, flammable explosives, radioactive materials, infectious substances, materials containing paint or raw materials (which include hazardous constituents) or any other substances or materials which are identified by or regulated by any Environmental Laws, on, in, under or affecting all or any portion of the Project Area, and

(iii) any substances now or hereafter defined as or included in the definitions of "hazardous substances", "hazardous wastes", "hazardous materials", "pollutants", or "toxic substances" under any applicable Environmental Law.

#### 3.3 Developer's Remedial Work.

(a) The LADA shall provide that the Purchaser shall promptly perform (subject to Section 3.5 below) any and all necessary remedial work required by law in order to address Hazardous Materials ("Remedial Work") affecting the non-NPL Project Area. Purchaser shall also be responsible for any Remedial Work on-site in the NPL Project Area, post-Remediation and upon delisting of the Area as an NPL site hereunder, provided, Purchaser shall receive credits against the Purchase Price for such Remedial Work as set forth in Section 3.7 herein, except in the event that Developer or Purchaser caused or exacerbated such Environmental Condition or Hazardous Materials. The Remedial Work shall be performed in a diligent and timely fashion by licensed contractors acting under the supervision of a consulting environmental engineer, and with such insurance coverage pertaining to liabilities arising out of the Remedial Work as is then customarily maintained with respect to such activities. Purchaser shall provide written notice at least fifteen (15) days in advance of the selection of an environmental engineer to perform such services. Purchaser shall also provide the City written notice at least fifteen (15) business days before the commencement of Remedial Work of the names of the contractors selected to perform such Remedial Work, and provide to the City copies of the contracts and other documents entered into with such parties. In addition, Purchaser shall submit to the City promptly upon receipt or preparation thereof, copies of any and all reports, studies, analyses, correspondence, governmental comments or approvals and similar information in connection with any Remedial Work. Any reports to be delivered to the New York State Department of Environmental Conservation ("NYSDEC") with respect to the Remedial Work must be reviewed and approved by the City prior to submission, which approvals shall not be unreasonably withheld or delayed.

(b) It shall be Purchaser's obligation under the LADA to furnish the City's environmental consultant with all invoices, progress reports, plans, and other documents reasonably sufficient to assure the Environmental Consultant that all Remedial Work has been accomplished.

(c) Purchaser shall be liable for the costs (the "Remediation Costs") of performing all Remedial Work for which Purchaser is responsible under the LADA, subject to Section 3.7 below.

3.4 <u>Defense of Claims</u>. If any suit, proceeding, claim or demand is brought or made against the City with respect to Environmental Conditions at the Project Area for which Developer or Purchaser is liable under Section 3.2(c) hereunder, such indemnifying party may elect: (i) to undertake the defense thereof in cooperation with the City and, provided counsel to the indemnifying party is reasonably acceptable to the City, at such indemnifying party's

expense; or (ii) to notify the City to undertake the defense thereof with counsel as may be mutually acceptable to the parties hereto. If the indemnifying party notifies the City to undertake the defense, the City shall undertake the defense at such indemnifying party's expense, said reasonable payments to be made on a monthly basis; and in such case, the indemnifying party may at its option join in the defense, but at its own expense, and the City would control the defense. The parties agree that the indemnifying party shall have the right to compromise or settle any suit or claim in which the City or its Indemnities are named only if such settlement shall result in a full and final release of all claims against the City or its respective Indemnities. In the event of a settlement, the indemnifying party shall remain liable to the City for all reasonable costs of defense that have been incurred by the City.

3.5 Environmental Studies; Option to Withdraw Proposal. Following the execution of this Agreement, during the period in which the Developer is preparing a draft environmental impact statement (a "DEIS") as contemplated herein, the Developer shall engage an environmental consultant to perform a Phase I environmental evaluation of the non-NPL Project Area, and shall do so from time to time thereafter with respect to each Contiguous Area following its approval by the City Council as herein provided, and during the period of preparation of a DEIS or DGEIS for such Contiguous Area. With respect to the non-NPL Project Area, or any Contiguous Area for which the Phase I report reveals a need, in the Developer's reasonable judgment, for a Phase II environmental site investigation, the Developer may cause to be prepared a Phase II report of the results of such site investigation. Copies of all Phase I and Phase II environmental reports obtained by the Developer, as hereinabove described, shall be furnished to the City and their respective environmental consultants for their approval of the Phase II protocols, said approval shall not be unreasonably withheld or delayed. If on the basis of any such Phase I or Phase II environmental report for any parcel(s) within the Project Area or a Contiguous Area, as the case may be, the Developer decides not to proceed with the development of such Project Area, the Developer may elect, at any time and in its sole and absolute discretion, by written notice to the City, to withdraw its proposal for redevelopment of such parcel, whereupon the terms and conditions of this Agreement pertaining to the redevelopment of such parcel, including without limitation the approval and execution of a LADA therefor, shall be of no force and effect, provided, that the Developer shall remain liable with respect to its obligations under (i) Section 3.1(b), relating to any work Developer may have performed in such portion of the Project Area, and (ii) Section 10.2, relating to reimbursement of costs incurred by the City with respect to such portion of the Project Area.

3.6 <u>Tax Credits</u>. Developer or Purchaser may, in consultation with the City, apply to the New York State Department of Environmental Conservation for assistance and benefits (including Brownfield Tax credits and other legal and financial benefits) under the New York State Brownfields Cleanup Program, in connection with Environmental Conditions affecting any Project Area or Contiguous Project Areas, and the City shall cooperate with the Developer and Purchaser in support of any such application.

3.7 <u>Remediation Off-Set</u>. The City shall provide an off-set to the Purchase

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Price for costs incurred prior to or after Closing due to the presence of Hazardous Material on each and every City Property, where such condition exists, in the amount of 100% of such documented costs up to the total Escalated Purchase Price (hereinafter defined) of such Project Parcel, provided, however, that no such off-set shall apply with respect to (A) any costs reimbursed by the Brownfield Program or other Public Funding or other similar program, to the extent that such amounts reimbursed are in excess of the legal and other consulting fees, and all other costs associated with obtaining such reimbursement, or (B) any costs associated with construction activities not exclusively associated with remediation, including: (i) any environmental testing or investigation undertaken by the Developer or Purchaser in connection with its due diligence or subsequent construction activities, as opposed to investigation, testing and specialized construction activities with respect to prior identified contaminated conditions, which would result in an offset; (ii) any investigation, testing, or consulting expenses incurred by the Developer or Purchaser required in connection with a BCP application; (iii) any demolition activities or removal of asbestos from demolished structures; (iv) any removal of underground storage tanks or excavation of non-contaminated soil, as opposed to costs associated with remediation of petroleum, contaminated soil or other hazardous materials associated with such storage tanks, for which there shall be an offset; (v) any grading, site preparation or other designdriven concerns; and (vi) any Environmental Damages arising from or related to Environmental Conditions caused or resulting from the actions of the Developer or Purchaser or their agents, contractors, subcontractors, invitees, licensees, permittees or subtenants which gives rise to liability under any Environmental law. For clarification purposes, except as otherwise provided herein, Purchaser shall be entitled to remediation offsets under this paragraph for those costs identified prior to or after Closing, which would increase the cost of construction or ownership and are anticipated to be incurred due to the presence of potential or continuing Hazardous Materials on the Project Parcels that existed prior to conveyance to Purchaser, including, without limitation, costs of monitoring an environmental condition and incremental construction costs resulting from deed restrictions, institutional or engineering controls on the Project Parcels. In the event that the parties cannot agree on the amount of offset for any Project Parcel, such costs shall be determined by arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, provided, that the parties first engage in mediation to resolve any dispute. If any individual Project Parcel has a purchase price of less than zero after applying all applicable offsets, Purchaser shall receive a credit for the negative value of such property, to be applied against the purchase price of the Project Parcels with a positive value, provided, however, that no credit shall become payable against any individual Project Parcel until such Project Parcel is conveyed to the Purchaser. It is anticipated that the parties will agree on an appropriate escrow or other mechanism to secure the Purchaser's rights to receive such offsets following the Closing.

3.8 <u>Purchase of Project Area Parcels</u>. Purchaser shall have the right to refuse to take title to all or part of the Project Area if the Remediation of the NPL Project Area is not adequate or if the Developer determines that the required remediation of any other Project Parcel is not acceptable, if it creates risks unacceptable to the Purchaser, or if the Purchaser and Developer cannot obtain adequate protection against potential environmental liability to third parties, in all cases, in the reasonable discretion of the Purchaser and Developer.

3.9 <u>Non-City-Property</u>. Developer and the City agree that the Non-City-Property is not part of the NPL Project Area or the non-NPL Project Area. The parties agree that the Developer may conduct Phase I and Phase II environmental site assessments of such property prior to the City's consensual acquisition or condemnation of the Non-City Property. The LADA shall provide that, should Purchasers purchase the Non-City-Property, Purchaser shall be liable for, and shall hold harmless the Indemnitees from and against, any liability under CERCLA relating to the City's interim ownership of the Non-City-Property, post-acquisition or condemnation. The LADA shall also provide that the Purchaser shall promptly perform any and all necessary remedial work on the Non-City-Property, with the exception of migratory contamination from the NPL Project Area, which shall be dealt with as set forth in Section 3.2(d)(ii).

#### ARTICLE IV

#### LAND USE REQUIREMENTS

4.1 <u>Applications for Land Use Approvals</u>. The Developer at its sole cost and expense shall as soon as practicable following the execution of this Agreement, make application to the City Council, the Newburgh Planning Board (the "Planning Board") and/or the Newburgh Zoning Board of Appeals ("ZBA") or other governmental entity having approval authority under applicable State law or applicable City zoning, subdivision or other land development laws, rules and regulations, for any and all land use approvals necessary to accomplish the Project. The Developer shall diligently endeavor to meet all applicable timeframes set forth in Section 8.2. It is acknowledged and agreed that completed applications to the Planning Board and/or ZBA, or any other agency with jurisdiction over the Project for subdivision, site plan, special permit, variances or any other site specific related permit or approval, cannot be fully made until the City enacts any applicable zoning changes related to the Project.

4.2 Environmental Quality Review. The Developer shall, at its sole cost and expense, also undertake all studies and applications required in order for the City to comply with SEQRA and to pursue any other applicable land use proceedings with respect to the Project. The City shall fully cooperate with and diligently assist the Developer and its consultants in furtherance of the studies, applications and proceedings for which the Developer is responsible under this Section 4.2, it being understood and agreed that such cooperation and assistance shall include, but shall not be limited to, the facilitating of interviews and on-going consultations with the City and other governmental officials and the prompt dissemination of information (including technical and statistical data), as the Developer and/or its consultants may request from time to time. The parties acknowledge that the Conceptual Plan for the Project Area described herein is intended to provide a basis for further planning, for meaningful environmental review and for the negotiation of a LADA, and cannot be considered definitive prior to, and may undergo significant revision and renegotiation on the basis of many factors, including environmental findings (including possible mitigation measures) hereafter made by a designated lead agency as

part of the SEQRA process. The Developer acknowledges that (i) the City has not undertaken any commitment to approve or implement the Conceptual Plan or any Project described therein, and that no such commitment shall exist unless and until the SEQRA process is concluded in a manner favorable to such Plan as it may be revised; and (ii) a LADA will not be approved by the City Council unless and until all procedures prerequisite thereto under applicable law have been completed and unless and until such SEQRA procedures have been completed as aforesaid. The City intends to designate the City Council as lead agency with respect to the SEQRA process hereunder.

4.3 <u>LWRP and Zoning Code Revisions</u>. The City and Developer acknowledge that the Project must comply with the City's Local Waterfront Revitalization Plan and the City's Zoning Code in effect when the Project is approved. Nothing herein shall be deemed a waiver of the City's right to enforce amendments to the Zoning Code after Project approval, in the event that the Developer has not taken necessary action to obtain vested rights in the Project or extend its Project approvals, provided that the City has not unlawfully prevented or unreasonably delayed Developer's ability to obtain such vested rights.

## ARTICLE V

## PROPERTY ACQUISITION AND DISPOSITION COSTS

5.1 City Property Acquisition Costs. Subject to the execution of the LADA and the completion of all obligations hereunder, the City shall convey to the Purchaser at Closing the fee simple title in and to the City Property in accordance with the following Purchase Prices established through various Appraisal Reports prepared for the City and the Developer, (i) the Project Parcels consisting of the Consolidated Iron Site, shall total \$1,933,000.00, and (ii) the balance of the City Property (other than the Boat Launch Parcel), also as identified in Schedule A, shall total \$2,061,800.00 ("Base Purchase Prices"). In the LADA, the parties shall allocate the Base Purchase Prices among the Project Parcels in a reasonable manner, based upon Appraisal Reports referred to above, such allocation to be utilized in the event the Project Parcels are acquired in phases under the LADA. It is noted that the parties have not yet determined the Base Purchase Price applicable to the Boat Launch Parcel. Said Purchase Price shall be determined in the same manner as the parties utilized to determine the Base Purchase Prices set forth herein (pursuant to the Exclusivity and Planning Agreement), but also taking into account the terms of the Co-operative Agreement. The Base Purchase Prices shall be increased by 50% of annual CPI appreciation for the period commencing on February 1, 2009, and ending upon the Closing Date, minus any setoffs set forth in Section 3.7 above, or in conjunction with any Public Infrastructure Advances as set forth in Section 2.5(b) herein. Another off-set includes the incremental increase in construction costs specifically due to the presence and/or removal of extraordinary debris or abandoned subsurface infrastructure within the Project Area, in connection with conditions not reasonably found in other similarly situated Hudson River waterfront property, such final amounts to be negotiated subject to the receipt and review of the Project financial and other information as set forth under Section 2.5(f).

## 5.2 Acquisition Costs of Non-City Property.

(a) With respect to real property (including rights of access to or control over real property) acquired by the Purchaser from owners other than the City as contemplated in Section 2.2 (b) and (c) above, the Purchaser shall be solely responsible for paying all costs of such acquisitions, including, but not limited to, the consideration to be paid for the parcel, subject to Purchaser's or Developer's approval of the consideration offered, which shall not be unreasonably withheld or delayed, and all survey, title insurance, legal and closing costs.

**(b)** Prior to the Closing under the LADA for any non-City Properties, Purchaser shall advance, or provide assurance reasonably satisfactory to the City that it shall pay at Closing, all Acquisition Costs and Disposition Costs (as defined hereafter) for any non-City Properties to be acquired hereunder (said advance is referred to as "Developer Funding"). Anything in this Agreement to the contrary notwithstanding, the City shall not have any obligation to acquire any privately owned property or make any legally binding offer to acquire any privately owned property, whether under the EDPL or GML or through arms-length "private" negotiation, unless and until the Purchaser pays the Developer Funding for such property or provides such assurance of payment. On or before the date which is thirty (30) days prior to the date on which the City shall incur any amount of Acquisition Costs, Disposition Costs, or Relocation Costs (as hereinafter defined) approved by the Developer or Purchaser, and in all events at least thirty (30) days prior to the date of closing of transfer of title, the City shall invoice the Purchaser for such costs. Purchaser shall pay to the City in full all previously approved and invoiced Acquisition Costs, Disposition Costs, and Relocation Costs within the time frame set forth in the LADA.

(i) "Acquisition Costs" means all third party out-of-pocket costs incurred or to be incurred by the City to acquire privately owned property pursuant to the EDPL, including, without limitation, all necessary and reasonable legal and other reasonable fees incurred by the City in defending any legal or administrative challenges to such acquisition, in bringing any legal actions to determine the value of the property pursuant to the EDPL, as well as reasonable appraisal fees, surveying costs, and title insurance charges.

(ii) "Disposition Costs" means all third party out-of-pocket costs incurred or to be incurred by the City to dispose of the privately owned property, if necessary, and the City Property, and including, without limitation, all necessary and reasonable legal and other reasonable fees incurred by the City in effecting such disposition including defending any legal or administrative challenges to such disposition, as well as reasonable appraisal fees, consultant fees, surveying costs, and title insurance charges.

(c) The Developer hereby acknowledges and agrees that as of the date of closing of transfer of title there may be outstanding claims for compensation for the property acquired pursuant hereto by the City under the EDPL. The Developer hereby acknowledges and agrees that the Acquisition Costs shall include any and all additional compensation under the

EDPL determined to be due to a property owner by the courts, or agreed to be due to a property owner under a settlement of such owner's claims (subject to the approval of the Developer, which approval shall not be unreasonably withheld or delayed) after the Closing (the "Post-Closing Consideration"). The Post-Closing Consideration shall also be deemed to include all third-party out-of-pocket fees and costs incurred by the City in the prosecution or defense of such actions under the EDPL and/or the negotiation of settlements thereof, said amounts to be expenses under Section 10.2 of this Agreement. To secure the payment by the Purchaser of the Post-Closing Consideration, Purchaser shall deliver to the City at the Closing a letter (or letters) of credit or, at Purchaser's discretion, a payment bond (or bonds) in favor of the City in form and substance reasonably acceptable to the City Corporation Counsel, in the amount of twenty percent (20%) of the aggregate of all "approved" offers formally made by the City to, but rejected by, the owners of the property acquired by the City in connection with the Project (the "Contested Offers"), less any advance payments made to those condemnees by the City, as of the date which is thirty (30) days prior to the Closing Date (the "EDPL Security"). Twenty (20) days prior to the Closing Date, the City shall deliver a written notice to Purchaser, which identifies with particularity the Contested Offers and calculates the amount of the EDPL Security for the Post-Closing Consideration yet to be paid in connection with the Project. The Developer agrees that throughout the pendency of any proceeding under Article 5 of the EDPL, the EDPL Security shall be maintained at the amount required hereunder. All Post-Closing Consideration shall be paid by the City from the EDPL Security; provided, however, that in the event that the amount of the EDPL Security is insufficient to pay the Post-Closing Consideration due and payable, then Purchaser shall be responsible for, and shall pay to the City any such deficiency within twenty (20) business days of a written demand therefor which is accompanied by either a copy of the judgment(s) of the court or of the settlement agreement(s) approved by the court with respect to all Contested Offers. Notwithstanding anything to the contrary in this Agreement, the amounts of all "approved" offers made by the City under the EDPL shall be based on appraisals made by a qualified appraiser, who shall be mutually acceptable to the City and the Developer.

(d) With respect to all properties acquired from a private seller or condemnee, as contemplated hereunder, Purchaser shall be responsible for carrying out all necessary relocation activities, and shall bear all reasonable relocation costs payable to such seller or condemnee, and to its respective tenants, to the extent applicable and subject to all applicable laws, provided, that at Purchaser's request, the City shall cooperate in and assist, where the City deems appropriate in its reasonable discretion, for carrying out all or part of the relocation activities required in connection with the Project. Purchaser shall engage a relocation consultant reasonably satisfactory to the City to assist it in carrying out the relocation program, and Purchaser shall pay the fees and reimbursable expenses charged by the consultant for such service.

#### ARTICLE VII

#### **NON-BINDING EFFECT**

The Developer acknowledges and agrees that this Agreement is not binding on the City until the City Council has approved this Agreement. THE DEVELOPER'S RIGHTS TO THE PROJECT DESCRIBED HEREIN SHALL BE LIMITED TO THE RIGHTS EXPRESSLY SET FORTH HEREIN.

## ARTICLE VIII

#### **CONSULTATION/MILESTONES/TERM**

8.1 <u>Consultation</u>. It is the intent of the parties that during the term of this Agreement, representatives of the Developer and the City shall meet regularly to confer about the progress of the parties' activities under this Agreement. The parties shall endeavor to meet no less frequently than once a month.

## 8.2 <u>Certain Performance Milestones; Term.</u>

(a) By notice to the Developer, and in accordance with the times and procedures set forth in Section 9.2 hereunder, the City may terminate this Agreement, if, for any reason except Unavoidable Delay (as defined hereinafter):

(i) on or before thirty (30) days after the execution of this Agreement, the Developer does not submit an Application or Petition for Rezoning of the Project Area, and any other areas agreed upon by the parties, together with a Full Environmental Assessment Form Part I for the Project, and a preliminary Draft Scoping Document under SEQRA for the Project;

(ii) within one hundred and eighty (180) days after adoption of a final Scoping Document by the SEQRA Lead Agency, the Developer has failed to submit to the designated lead agency under SEQRA a preliminary Draft Environmental Impact Statement ("DEIS") or Draft Generic Environmental Impact Statement ("DGEIS"), as the case may be, covering the Project; or

(iii) the Developer refuses to commence negotiating a LADA upon the completion of the public hearing on the DEIS or DGEIS.

If Developer and the City have not executed a LADA for the City Property and Non-City Property on or before the later of (a) the second  $(2^{nd})$  anniversary of the execution of this Agreement or (b) the thirtieth  $(30^{th})$  day following the completion of all SEQRA and any other governmental environmental review procedures applicable to the Project, at the request of

either party the terms of the LADA shall be submitted to binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, provided, that the parties first engage in mediation to resolve any dispute.

It is expressly agreed by the parties that under no circumstances may this Agreement be terminated as a result of a Developer failure to comply with the time periods for performance set forth above in this Section 8.2, unless and until Developer has received a notice of default pursuant to Section 9.2 and Developer has failed to cure such default within the time frame allowed under Section 9.2.

(b) In order to facilitate implementation of the Project hereunder, including Developer meeting the time periods set forth above, the parties agree that they shall take all reasonable actions to expeditiously facilitate and review Developer's land use applications, including without limitation, all rezoning applications, the relevant SEQRA review and all site plan approval applications. Such expeditious review shall include the conduct of special meetings as reasonably requested, as well as require any City or Developer consultant to prepare, review and/or respond to, as the case may be, the relevant submission in an expeditious and good faith manner. Nothing herein however, requires the City or Developer to conduct any review or take any action prior to a minimum time period prescribed by statute.

(c) In the event of termination of this Agreement under this Article VIII, the Developer shall, subject to the parties rights and obligations under Articles IX or X hereunder, promptly reimburse any funds owed to the City, including, but not limited to, costs incurred in any condemnation proceeding, and the Developer shall not have any claim of right to any monies that have been paid to the City under Article X below, except with respect to such amount of said monies as exceeds the total amount needed by the City, to enable it to pay sums owing to third parties for services described in said Article X.

### ARTICLE IX

#### **DEFAULT**

## 9.1 Default by City.

(a) If the City fails to comply with any material provision of this Agreement (including without limitation failure to comply with any of its payment, reimbursement or other monetary obligations hereunder), or is otherwise in breach of this Agreement, and such failure continues for more than thirty (30) days after written notice from the Developer is given to the City that specifies the failure and requires it to be remedied, such failure shall constitute an event of default (a City Default"); provided, however, that if any such default is not reasonably capable of cure within thirty (30) days, then provided the City promptly commences to cure and diligently prosecutes the same, such cure period shall be extended for such reasonable period of time as necessary to complete said cure. (b) In the event of a City Default, the Developer, in its discretion, may:

(i) waive strict compliance with the pertinent provisions of this Agreement and provide the City with an additional time period within which to rectify, or "cure" the City Default;

(ii) terminate this Agreement, and upon such termination, the City shall be liable for and shall promptly reimburse to the Developer all costs and expenses paid by the Developer to its outside consultants (including legal counsel) in connection with the Project, including costs incurred pursuant to the Exclusivity and Planning Agreement, this Agreement and SEQRA review of the Conceptual Plan and the proposed Project, and upon such reimbursement, the City shall own the plans and specifications prepared by the Developer, provided, that the amount payable by the City under this subparagraph (ii) shall not exceed \$500,000.00 in the aggregate; and

(iii) in addition to any other rights and remedies available at law or in equity, be entitled to seek equitable relief including, but not limited to, specific performance, with respect to the City Default, provided, however, that no municipal entity shall be required to condemn any property, and further provided that the City shall not be liable for any consequential damages (except for the amounts set forth in subparagraph (ii) above).

(c) In the event Developer brings an action for damages (under clause (b)(ii) above), or specific performance (under clause (b)(ii) above), the prevailing party in such proceeding shall be required to reimburse the non-prevailing party for all costs of enforcement, including all legal fees incurred by the prevailing party in pursuing or defending said specific performance claim, as the case may be, in addition to any costs otherwise payable under this Agreement.

## 9.2 <u>Default by Developer</u>.

(a) If the Developer fails to comply with any material provision of this Agreement (including without limitation failure to comply with any of its payment, reimbursement or other monetary obligations hereunder), or is otherwise in material breach of this Agreement, and such failure continues for more than thirty (30) days after written notice from the City is given to the Developer that specifies the failure and requires it to be remedied, such failure shall constitute an event of default (a "Developer Default"); provided, however, that if any such default is not reasonably capable of cure within thirty (30) days, then provided the Developer promptly commences to cure and diligently prosecutes the same, such cure period shall be extended for such reasonable period of time necessary to cure such default. Failure to meet one or more of the dates set forth in Section 8.2(a) shall constitute a material breach. If not cured within the time frames set forth herein after the giving of written notice, such failure shall constitute a Developer Default.

(b) In the event of a Developer Default, the City, may:

(i) waive strict compliance with the pertinent provisions of this Agreement and provide the Developer with an additional time period to rectify, or "cure" the Developer Default; or

(ii) terminate this Agreement, and upon such termination, the Developer shall, subject to the rights and obligations of the parties under Article X hereunder, promptly reimburse to the City any funds owed to each municipal entity with respect to the Project, including, but not limited to, costs incurred in any condemnation proceeding, and the Developer shall not have any claim of right to any monies that have been paid to the City under Article X below, except with respect to such portion of said monies which exceed the total amount needed by the City, as the case may be, to enable such municipal entity to pay sums owing to third parties for services described in said Article X; and

(iii) due to the fact that there would not be an adequate remedy at law, in addition to any other rights and remedies available at law or in equity, be entitled to seek equitable relief including, but not limited to, specific performance, with respect to the Developer Default; provided, however, that the Developer shall not in any case be liable for money damages or consequential damages, or be required to purchase or acquire property, or to expend money to obtain insurable title.

9.3 <u>Effect of LADA</u>. Notwithstanding the foregoing and any provision in this Agreement to the contrary, once a LADA is executed with respect to the Project Area, then this Agreement shall cease to be operative with respect to such Project Area (all of the rights and obligations of the parties with respect to such Project Area under this Agreement having been superseded by such LADA), and any subsequent termination of this Agreement shall not in any way whatsoever affect or impair the rights and obligations of the parties to such executed LADA.

## ARTICLE X

#### CONSULTANT EXPENSES; CERTAIN APPLICATION COSTS

10.1 <u>Developer's In-house Services</u>. The Developer shall at its own expense supply its own services and expertise.

10.2 <u>Reimbursable Municipal Expenses</u>. In addition to other costs to be paid as described in this Agreement, and fees legally required to be paid to the City as part of the zoning and building permit process, the Developer shall be liable for and shall reimburse the City for all of the reasonable costs and expenses paid by the City to its consultants' for reviewing the Project under SEQRA (subject to SEQRA's statutory fee limitation), and for all other reasonable consultant expense incurred by the City in furtherance of the Project (including, but not limited to, defending any lawsuits, environmental consultant costs, and the review and analysis of Developer's financial information) (the "Reimbursable Municipal Expenses"), subject to the

periodic review and approval of the consultant expenses in accordance with the Escrow Agreement attached hereto as Schedule C. Subject to Developer's right to dispute bills and invoices presented to it hereunder, the City shall pay Reimbursable Municipal Expenses in accordance with the terms and conditions of the Escrow Agreement, (subject to Developer's obligation to replenish said Escrow as set forth therein). Upon the execution of this Agreement and the Escrow Agreement (attached hereto as Schedule C) by all parties hereto, the Developer shall deposit with the City an advance in the amount of Fifty Thousand (\$50,000.00) Dollars, which funds shall be held in a separate account maintained by the City (the "Escrow Account"), and applied solely to the payment of Reimbursable Municipal Expenses. When the Escrow Account is reduced below \$25,000.00, the Developer shall deposit an additional sum of money so as to maintain the Account at or near \$50,000.00. In the event of a dispute concerning Reimbursable Municipal Expenses the parties shall promptly confer in a good faith effort to resolve the dispute, provided, that such dispute shall not be cause for non-performance by any party of any of its obligations hereunder.

10.3 <u>Developer's Application Fees</u>. Subject to its review of the financial information to be provided to the City by the Developer under paragraph 2.5(f), the City agrees to consider, and negotiate with the Developer in good faith, a reduction of the application and permit fees payable to the City in connection with the Project.

## ARTICLE XI

#### **DEVELOPER'S EXCLUSIVE RIGHTS**

Developer. During the term of this Agreement, the City shall not: (a) 11.1 designate any person, firm or entity, other than the Developer, as a qualified and eligible sponsor or preferred Developer for the redevelopment of all or any part of the Project Area; or (b) enter into any agreement with any other firm, person or other entity with respect to the redevelopment of all or any part of the Project Area, excepting however, agreements pertaining to zoning and land use actions and related building permits and customary City actions and providing financial assistance for projects proposed by property owners or their designees (provided that such projects comply with any applicable urban renewal plan then in effect); (c) authorize or direct, by written resolution or other formal act voted on by the City, any representative to act on their behalf in connection with any such agreement; (d) offer or agree to use powers of eminent domain to acquire real property in furtherance of any development proposed by any other firm, person or other entity, or (e) enter into any negotiation or discussions (or solicit or accept any offers) with respect to or related to any of the foregoing. The Developer acknowledges that there are projects being planned or that may arise after the date hereof on which the City will need to take normal and customary action in order to provide City services or financial assistance. Said actions shall not constitute a default hereunder by the City, and in all events the City must comply with all laws, rules and regulations and provide services and assistance consistent with their charters.

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#### <u>ARTICLE XII</u>

#### MISCELLANEOUS

12.1 <u>Survival</u>. The following provisions of this Agreement shall survive a termination of this Agreement pursuant to Section 9.1; Sections 9.1, 12.9, 12.15 and 12.19. The following provisions of this Agreement shall survive a termination of this Agreement pursuant to Section 9.2; Sections 3.2(c), 3.4, 9.2, 10.2, 12.9, 12.15 and 12.19. No such survival shall continue beyond the date that a LADA is entered into, except to the extent provided to the contrary in the LADA.

12.2 <u>Negotiated Document</u>. The parties acknowledge that the provisions and language of this Agreement have been negotiated, and agree that no provision of this Agreement shall be construed against any party by reason of such party having drafted such provision of this Agreement.

12.3 [Intentionally omitted]

12.4 <u>Governing Law</u>. This Agreement shall be governed by and construed in accordance with the laws of the State of New York without regard to conflict of laws principles.

12.5 <u>Counterparts</u>. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one and the same instrument, and any of the parties or signatories hereto may execute this Agreement by signing any such counterpart.

12.6 <u>Captions</u>. The captions of this Agreement are for the purpose of convenience of reference only, and in no way define, limit or describe the scope or intent of this Agreement or in any way affect this Agreement.

12.7 <u>Gender, Etc</u>. As used in this Agreement, the masculine shall include the feminine and neuter, the singular shall include the plural, and the plural shall include the singular as the context may require.

12.8 <u>No Third Party Beneficiaries</u>. Except as may be expressly provided to the contrary in this Agreement, nothing contained in this Agreement shall or shall not be construed to confer upon any person other than the parties hereto, any rights, remedies, privileges, benefits or causes of action to any extent whatsoever.

12.9 <u>Successors and Assigns</u>. The agreements, terms, covenants and conditions of this Agreement shall be binding upon and inure to the benefit of the parties hereto and, except as otherwise provided herein, their respective successors and permitted assigns.

12.10 <u>Further Assurances</u>. Each party hereto shall do all acts and things and make, execute and deliver such written instruments as shall from time to time be reasonably required to carry out the terms and provisions of this Agreement.

12.11 <u>No Amendment</u>. Neither this Agreement nor any provisions hereof may be changed, modified, amended, supplemented, altered, waived, discharged or terminated orally, but only by an instrument in writing signed by the party against who enforcement of the change, modification, amendment, supplement, alteration, waiver, discharge or termination is sought, and, if required by any mortgage document, the applicable lender has consented thereto.

12.12 <u>Unavoidable Delay</u>. Notwithstanding any provision of this Agreement, the performance by the City and Developer of their respective obligations under this Agreement and under the LADA, and all time periods for the performance of all such obligations, shall be subject to Unavoidable Delay, and shall be tolled day for day during a period of Unavoidable Delay. For the purposes of this Agreement, Unavoidable Delay means any delay, obstruction or interference resulting from any act or event which has a material adverse effect on a party's rights or duties, provided such act or event is beyond the reasonable control of such party after pursuing all diligent efforts to remedy the delaying condition in an expedient and efficient manner and was not separately or concurrently caused by any negligent or willful act or omission of such party and/or could not have been prevented by reasonable actions on such party's part, including, but not limited to, delay, obstruction, or interference resulting from:

(a) an act of God, landslide, lightning, earthquake, fire, explosion, flood, sabotage or similar occurrence, acts of a public enemy, war, blockage or insurrection, riot or civil disturbance;

(b) any legal proceeding commenced by any third party seeking judicial review of this Agreement and/or of any governmental approvals for any proposed Project or Infrastructure required therefor, and any restraint of law (e.g., injunctions, court or administrative orders, or legal moratorium imposed by a court, or administrative or governmental authority);

(c) the failure of any utility or municipal entity to provide and maintain utilities, services, water and sewer lines and power transmission lines to the Project Area or Contiguous Area, which are required for the construction, as contemplated in this Agreement;

(d) any unexpected or unforeseen subsurface condition at the construction site inconsistent with typical background conditions of a similar site, which shall prevent construction of, or require a material redesign or change in the construction of (or materially adversely affect the completion schedule for) the Project or of Infrastructure, such determination to be made by a qualified engineer;

- (e) strikes, work stoppages or other substantial labor disputes;
- (f) the failure or inability of any subcontractor or supplier to furnish supplies

or services if such failure or inability is itself caused by Unavoidable Delay and could not have been reasonably prevented and the affected party cannot reasonably obtain substitutes therefore;

(g) Governmental delay in completion of environmental review procedures, where such delay is not the result of negligent or willful acts or omissions of the party claiming Unavoidable Delay;

(h) Developer Default with respect to Unavoidable Delay claimed by the City, and City Default with respect to Unavoidable Delay claimed by the Developer, whether or not the same is caused by negligent or willful acts or omissions; and

(i) Governmental delay on the part of Federal, State (including without limitation MTA) or County governmental entities, with respect to the granting of permits, approvals or determinations, or with respect to the transfer of property or rights therein, or in completion of Infrastructure or environmental remediation, where such delay is not the result of negligent or willful acts or omissions of the party claiming Unavoidable Delay.

12.13. <u>Inconsistent Provisions</u>. In the event of inconsistent provisions, the terms and provisions of this Agreement shall prevail over and hereby supersede the Exclusivity and Planning Agreement.

12.14 <u>Entire Agreement</u>. This Agreement, together with the Schedules hereto, contain all of the promises, agreements, conditions, inducements and understandings between and amongst the parties hereto concerning the proposed Project and there are no promises, agreements, conditions, inducements or understandings, oral or written, expressed or implied, between them other than as expressly set forth herein and therein.

12.15 No Recourse. All covenants, stipulations, promises, agreements and obligations of the Developer and the City contained in this Agreement shall be deemed to be the covenants, stipulations, promises, agreements and obligations of the Developer and the City respectively, and not of any officer, partner, member, shareholder, agent, servant or employee of the Developer or of the City in any capacity, and no recourse under or upon any obligation, covenant or agreement contained in this Agreement, or otherwise based or in respect thereof, shall be had against any past, present or future officer, partner, member, shareholder, agent, servant or employee of the Developer or of the City or any member of the Developer, either directly or through the Developer or any successor thereto or any person executing this Agreement. It is expressly understood that this Agreement is an obligation of the Developer and of the City and that no personal liability whatever shall attach to, or is or shall be incurred by, any such officer, partner, member, shareholder, agent, servant or employee of the Developer or of the City or any member of the Developer, either directly or through the Developer or any successor thereto or any person executing this Agreement. Any and all such personal liability of, and any and all such rights and claims against, every such officer, partner, member, shareholder, agent, servant or employee of the Developer or of the City under or by reason of the obligations, covenants, or agreements contained in this Agreement or implied therefrom are, to the extent

permitted by law, expressly waived and released as a condition of, and as a consideration for, the execution of this Agreement.

12.16 <u>Public Announcements.</u> Each of the parties agrees not to make or issue or cause to be made or issued any public announcement, press release, media release or other publicity concerning this Agreement, the parties hereto, the Conceptual Plan or any planning, land acquisition, land disposition, financing, relocation or other concepts addressed in this Agreement, without the prior consent of each of said parties.

12.17 <u>Notice</u>. Any notice, demand, request or other communication which under the terms of this Agreement must or may be given or made or served by any of the parties hereto shall be in writing and shall be given or made by mailing the same by registered or certified mail, express courier, or by hand delivery, addressed as set forth below:

If to the City:	City of Newburgh City Hall – 83 Broadway Newburgh, New York 12550 Attention: Jean-Ann McGrane, City Manager
with a copy to:	City of Newburgh City Hall – 83 Broadway Newburgh, New York 12550 Attention: Geoffrey Chanin, Esq., Corporation Counsel
	Zarin & Steinmetz 81 Main Street, Suite 415 White Plains, New York 10601 Attention: Michael Zarin, Esq.
If to the Developer:	Howard Kaufman, Esq. Executive Vice-President and General Counsel LeylandAlliance LLC

LeylandAlliance LLC 16 Sterling Lake Road Tuxedo, New York 10987

With a copy to: Larry Wolinsky, Esq. Jacobwitz & Gubits, LLP Counsel to Leyland Alliance LLC 158 Orange Avenue Walden, New York 12586

Any of the parties hereto or their counsel may designate by notice in writing a new or other address to which such notice or demand shall thereafter be given, made or mailed.

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No Assignment or Transfer. Developer may not assign this Agreement 12.18 or the LADA without the consent of the City, such consent not to be unreasonably withheld or delayed, provided, it is expressly understood that the Developer herein was selected specifically for, among other reasons, its successful track record in similar projects, its creativity and comprehensive view of the Project, willingness to expend the necessary resources to advance the Project, including, the Charrette, the nature and personality of its principals, and other tangible and intangible factors that would be relevant in the City's determination with respect to consenting to any assignment of this Agreement. No consent shall be required with respect to any assignment to an Affiliate or Successor (as each is hereinafter defined) of Developer. An "Affiliate" as used herein shall include any entity in which the principals of Developer directly or indirectly own not less than a 25% interest, and in which the principals of the Developer retain daily management and control of the Project. A "Successor" shall include any entity that acquires all or substantially all of the business of Developer. Notwithstanding the foregoing or any provision of this Agreement, the Developer may from time to time before and after closing of title on any Project Parcel, assign and/or pledge its interests under this Agreement, the LADA and/or in and to the Project, and the membership interests in Developer, solely as collateral or security, to one or more equity participants and/or lenders in connection with equity financing, "mezzanine" financing or other financing for the construction of the Project.

12.19. Confidential Information. During the course of this Agreement, the parties may acquire knowledge or come into possession of confidential, sensitive or proprietary information belonging to the other party in connection with the Project. The parties agree that they will keep and maintain such information securely and confidentially, and not disclose such information to any third parties, including, the media, nor use such information in any manner publicly or privately, without receiving the prior approval, in writing, of the other party authorizing such use. The parties agree to be responsible for compliance herein by their subsidiaries, affiliates, employees, representatives, advisors and/or agents. Nothing herein contained shall be deemed to prohibit parties from complying with any rules, regulations, statutes, or order of any court or regulatory authority with competent jurisdiction. This provision does not apply to information, which (i) is or becomes generally available to the public other than as a result of unauthorized disclosure by one of the parties, or (ii) was available to the other party on a non-confidential basis from a source other than a party herein. The parties' obligations under this clause to maintain the confidentiality of such information and to refrain from using such information in any manner without the prior written approval of the other party shall survive the termination or expiration of this Agreement. Concurrently herewith, the parties are entering into a separate Confidentiality Agreement related hereto.

or indirectly own not less than a 25% interest, and in which the principals of the Developer retain daily management and control of the Project. A "Successo" shall include any entity that acquires all or substantially all of the business of Developer. Notwithstanding the foregoing or any provision of this Agreement, the Developer may from time to time before and after closing of title on any Project Parcel, assign and/or pledge its interests under this Agreement, the LADA and/or in and to the Project, and the membership interests in Developer, solely as collateral or security, to one or more equity participants and/or lenders in connection with equity financing, "mezzanine" financing or other financing for the construction of the Project.

12.19. Confidential Information. During the course of this Agreement, the Datiles may acquire knowledge or come into possession of contidential reporting of prostation information belonging to the other party in connection with the Project. The parties agree that they will keep and maintain such information securely and confidentially, and not disclose such information to any third parties, including, the media, nor use such information in any manner publicly or privately, without receiving the prior approval, in writing, of the other party authorizing such use. The parties agree to be responsible for compliance herein by their subsidiaries, affiliates, employees, representatives, advisors and/or agents. Nothing herein contained shall be deemed to prohibit parties from complying with any rules, regulations, statutes, or order of any court or regulatory authority with competent jurisdiction. This provision does not apply to information, which (i) is or becomes generally available to the public other than as a result of unauthorized disclosure by one of the parties, or (ii) was available to the other party on a non-confidential basis from a source other than a party herein. The parties' obligations under this clause to maintain the confidentiality of such information and to refrain from using such information in any manner without the prior written approval of the other party shall survive the termination or expiration of this Agreement. Concurrently herewith, the parties are entering into a separate Confidentiality Agreement related hereto.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

CITY OF NEWBURGH

Jean-Ann McGrane, City Manager

Dated: \_\_\_\_\_7/24/07

LEYLAND ALLIANCE LLC

HAC By: \_\_\_\_\_\_\_ Steves. Maun, President

Dated: 8/14/200.7

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APPENDIX D

#### ENVIRONMENTAL EASEMENT

THIS INDENTURE made this \_\_\_\_\_day of \_\_\_\_\_\_, 200\_\_, between \_[Owners(s)] residing at (or having an office at ) \_\_\_\_\_\_, (the "Grantor"), and The People of the State of New York (the "Grantee"), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties (including brownfield sites) that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of environmental easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and of ensuring the potential restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that environmental easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program, such as state brownfield sites or federal National Priorities List sites, or eliminate potential exposure pathways to hazardous substances, hazardous waste or petroleum; and;

WHEREAS, Grantor is the owner of real property located in the City/Town/Village of \_\_\_\_\_\_, County, New York known and designated on the tax map of the \_\_\_\_\_\_, of \_\_\_\_\_\_ as tax map parcel number \_\_\_\_\_\_, section \_\_\_\_block \_\_\_\_\_, lot \_\_\_\_\_, being the same as that property conveyed to Grantor by deed on \_\_\_\_\_\_, and recorded in the Land Records of the County Clerk at Page \_\_\_\_\_, Liber \_\_\_\_\_\_ of \_\_\_\_\_\_, Deeds, comprised of approximately \_\_\_\_\_\_ acres, and hereinafter more fully described in Schedule A attached hereto and made a part hereof ( the "Controlled Property"); and;

Attach an adequate legal description of the property subject to the easement, or reference a recorded map. If the easement is on only a part of a parcel of land which is not subdivided into encumbered and unencumbered portions, a legal description needs

### to be created by a survey bearing the seal and signature of a licensed land surveyor with reference to a metes and bounds description.

WHEREAS, the Controlled Property is part of the Superfund Site ("Site"), which the U.S. Environmental Protection Agency ("EPA"), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9605, placed on the National Priorities List, as set forth in Appendix B of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300, by publication in the Federal Register on June 14, 2001; and

WHEREAS, in a Record of Decision dated October 4, 2006 (the "ROD"), the Regional Administrator of EPA Region 2 selected, and NYSDEC concurred with, a "response action" for the Site, which provides, in pertinent part, for the following actions:

1. excavation of contaminated soil exceeding the residential cleanup standard for lead of 400 parts per million to a depth of 6 feet below ground surface across the 7-acre Site and off-Site disposal;

2. excavation to the water table and off-Site disposal of soils, if any, which exceed the State cleanup criteria for volatile organic compounds and polychlorinated biphenyls;

3. placement of a readily-visible demarcation material at the interface between the excavations and backfill;

4. institutional controls in the form of an environmental easement and/or restrictive covenant that will at a minimum require:

(a) restricting any excavation below the soil cover's demarcation layer of six feet unless the excavation activities are in compliance with an EPA-approved Site Management Plan ("SMP"),

(b) restricting new construction at the Site unless an evaluation of the potential for vapor intrusion is conducted an mitigation, if necessary, is performed in accordance with an EPA-approved SMP, and

(c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met;

WHEREAS, the Commissioner does hereby acknowledge that the Department accepts this Environmental Easement in order to ensure the protection of human health and the environment and to achieve the requirements for remediation established at this Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the covenants and mutual promises contained herein and the terms and conditions of **Consent Decree Number**\_\_\_\_\_, Grantor grants, conveys and releases to Grantee a permanent Environmental Easement pursuant to

Article 71, Title 36 of the ECL in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. <u>Purposes</u>. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the potential restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. <u>Institutional and Engineering Controls</u>. The following controls apply to the use of the Controlled Property, run with the land are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees, and any person using the Controlled Property:

A. The Controlled Property may be used for residential, commercial, and/or recreational use subject to the restrictions in 2.B. below and as long as the following long term engineering control is employed:

[Readily visible demarcation material at the interface between the excavations and backfill (approximately 6 feet below ground surface)]

B. The Controlled Property may not be used for a higher level of use than identified in 2.A. above and the above-stated engineering control may not be discontinued without an amendment or extinguishment of this Environmental Easement. The Controlled Property is subject to the following restrictions on use:

i. excavation below the soil cover's demarcation layer of six feet is prohibited unless the excavation activities are in compliance with an EPA approved SMP;

ii. new construction at the Site is prohibited unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with the EPA-approved SMP; and

iii. use of groundwater at the Site as a source of potable or process water is prohibited until groundwater quality standards are met at the Site.

C. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant of Title 36 to

### Article 71 of the Environmental Conservation Law.

D. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

E. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by the NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with any Site Management Plan for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

3. <u>Right to Enter and Inspect</u>. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions. Nothing in this Environmental Easement shall limit or otherwise affect the rights of NYSDEC or EPA to entry and access or EPA's authority to take response action.

4. <u>Reserved Grantor's Rights</u>. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Controlled Property, all rights as fee owner of the Controlled Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer the underlying fee interest to the Controlled Property by operation of law, by deed, or by indenture, subject and subordinate to this Environmental Easement;

### 5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this environmental easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person intentionally violates this environmental easement, the Grantee may revoke any Certificate of Completion provided under ECL Article 27, Title 14, or the Satisfactory Completion of Project provided under ECL Article 56, Title 5 with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach. Grantor shall then have a reasonable amount of time from receipt of such notice to cure. At the expiration of said second period, Grantee may commence any proceedings and take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement in accordance with applicable law to require compliance with the terms of this Environmental Easement.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar its enforcement rights in the event of a subsequent breach of or noncompliance with any of the terms of this Environmental easement.

6. <u>Notice</u>. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing its County tax map number or the Liber and Page or computerized system tracking/ identification number and address correspondence to:

Division of Environmental Enforcement Office of General Counsel New York State Department of Environmental Conservation 625 Broadway Albany New York 12233-5500, and

U.S. Environmental Protection Agency, Region 2 Office of Regional Counsel - NY/Caribbean Superfund Branch 290 Broadway, 17<sup>th</sup> Floor New York, NY 10007.

Such correspondence shall be delivered by hand, or by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. <u>Recordation</u>. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in

the office of the recording officer for the county or counties where the Controlled Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. <u>Amendment</u>. This Environmental Easement may be amended only by an amendment executed by the Commissioner of the New York State Department of Environmental Conservation, with prior written consent of EPA, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. <u>Extinguishment</u>. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, with prior written consent of EPA, and filed with the office of the recording officer for the county or counties where the Controlled Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. <u>Joint Obligation</u>. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. <u>Third-Party Beneficiary</u>. Grantor and Grantee hereby agree that the United States, through EPA, shall be, on behalf of the public, third-party beneficiaries of the benefits, rights and obligations conveyed to Grantee in this instrument; provided that nothing in this instrument shall be construed to create any obligations on the part of EPA or create any right of access or use by the general public.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Grantor's Name

By:	 	
Title:	 	
Date:		

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation

By:

Alexander B. Grannis, Commissioner

)

#### **Grantor's Acknowledgment**

STATE OF NEW YORK )
) ss:

COUNTY OF

On the \_\_\_\_\_\_ day of \_\_\_\_\_\_, in the year 200\_, before me, the undersigned, personally appeared \_\_\_\_\_\_\_, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public - State of New York

**Grantee's Acknowledgment** 

STATE OF NEW YORK ) ) ss: COUNTY OF )

On the \_\_\_\_\_\_ day of \_\_\_\_\_\_, in the year 200\_, before me, the undersigned, personally appeared \_\_\_\_\_\_, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public - State of New York Attachment: Schedule A - Legal Description of Controlled Property

### ORANGE COUNTY CLERK'S OFFICE RECORDING PAGE THIS PAGE IS PART OF THE INSTRUMENT – DO NOT REMOVE TYPE IN BLACK INK:

NAME(S) OF PARTY(S) TO DOCUMENT

The City of Newburgh People of the State of New York ...

THIS IS PAGE ONE OF THE RECORDING

ATTACH THIS SHEET TO THE FIRST PAGE OF EACH RECORDED INSTRUMENT ONLY

### DO NOT WRITE BELOW THIS LINE

SECTION 40 BLOCK 3

aving Pternmetz

81 Main St. Duite 415 White Plamis, 14 10601

RECORD AND RETURN TO: (name and address)

Hus Helen Collier March

LOT

INSTRUMENT TYPE: DEED\_\_\_\_\_MORTGAGE\_\_\_\_SATISFACTION\_\_\_ASSIGNMENT\_\_\_OTHER\_\_\_\_\_\_\_\_\_

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2089 BLOOMING GROVE (TN)	4289	MONTGOMERY (TN)	NO. PAGES 12	_ CROSS REF
2001 WASHINGTONVILLE (VLG)	4201	· · ·	CERT. COPY	ADD'L X-REF
2003 SO. BLOOMING GROVE (VLG)	4203	MONTGOMERY (VLG)	MAP#	PGS.
2289 CHESTER (TN)	4205	WALDEN (VLG)		
2201 CHESTER (VLG)	4489	MOUNT HOPE (TN)	PAYMENT TYPE:	СНЕСК 🗸
2489 CORNWALL (TN)	4401	OTISVILLE (VLG)		CASH
2401 CORNWALL (VLG)	4600	NEWBURGH (TN)		CHARGE
2600 CRAWFORD (TN)	4800	NEW WINDSOR (TN)		NO FEE
2800 DEERPARK (TN)		TUXEDO (TN)	Taxable	
3089 GOSHEN (TN)	5001	TUXEDO PARK (VLG)	CONSIDERATION	\$ <sup>(7)</sup>
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4003 HARRIMAN (VLG)	1300	PORT JERVIS	(J) NAT.PE	R-CR.UN/1 OR 2
4005 KIRYAS JOEL (VLG)			(K) CONDO	
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DONNA L. BENSON ORANGE COUNTY CLERK

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## DECLARATION OF COVENANTS, RESTRICTIONS AND ENVIRONMENTAL EASEMENT

This Declaration of Covenants, Restrictions and Environmental Easement is made this <u>B</u><u>M</u> day of <u>MA9</u>, 2012by and between The City of Newburgh, a municipal corporation, located at 83 Broadway, Newburgh, New York 12550 ("Grantor"), and the People of the State of New York (the "Grantee"), acting through their Commissioner of the New York State Department of Environmental Conservation with its Central Office, located at 625 Broadway, Albany, New York 12233 ("Grantee").

### WITNESSETH:

WHEREAS, Grantor is the owner in fee of real property located at 1 Washington Street, in the City of Newburgh, County of Orange, State of New York, more particularly described on Exhibit A attached hereto and made a part hereof together with any buildings and improvements thereon and appurtenances thereto (the "Property"); and

WHEREAS, the Property is part of the Consolidated Iron and Metal Co. Superfund Site ("Site"), the location of a former scrap metal processing facility which the U.S. Environmental Protection Agency ("EPA"), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9605, placed on the National Priorities List, as set forth in Appendix B of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300, by publication in the Federal Register on June 14, 2001; and

WHEREAS, in a Record of Decision dated October 4, 2006 ("ROD"), the Regional Administrator of EPA Region 2 selected, and the New York State Department of Environmental Conservation ("NYSDEC") concurred with, a rem edial action for the Site which provided, in part, for the following actions:

- 1. excavation of contaminated soils exceeding the residential cleanup standard for lead of 400 parts per million to a depth of six feet below ground surface across the 8.33  $\pm$  acre Site and off-Site disposal;
- 2. excavation to the water table and off-Site disposal of soils which exceed the State cleanup criteria for volatile organic compounds and polychlorinated biphenyls;
- 3. placement of a readily-visible demarcation material at the interface between the excavations and the soil used as backfill (approximately six feet below the ground surface);
- 4. institutional controls in the form of an environmental easement and/or restrictive covenant that will, at a minimum, require:

- (a) restricting any excavation below the soil cover's demarc ation layer of six feet unless the excavation activities are in compliance with an EPA-approved Site Management Plan ("S MP");
- (b) restricting new construction at the Site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in accordance with an EPA-approved SMP, and
- (c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met.

WHEREAS, Grantor entered into a Consent Decree, Docket No. 08-CV-07378-SCR ("Consent Decree") with the United States on be half of EPA, which was entered in the United States District Court for the Southern District of New York on January 31, 2009; and

WHEREAS, the construction activities associated with the remedial action have been completed at the Site and a Preliminary Close-Out Report was issued on September 9, 2010; and

WHEREAS, pursuant to the Consent Decree, Grantor agreed to implement institutional controls in the form of an Environmental Easement pursuant to Article 71, Title 36 of the NYS Environmental Conservation Law, and a Declaration of Covenants and Restrictions, including but not limited to providing a right of access over the Property for purposes of a) implementing, facilitating or monitoring the remedial action; and b) imposing on the Property, restrictions that will run with the land for the purpose of protecting human health and the environment; and

WHEREAS, Grantor wishes to cooperate fully with the Grantee in the implementation of all response actions at the Site;

### NOW, THEREFORE:

- 1. <u>Grant</u>: Grantor, on behalf of itself, its successors and assigns, for ten dollars and other good and valuable consideration, receipt whereof is hereby acknowledged, does hereby give, grant, covenant and declare in favor of the Grantee that the Property shall be subject to restrictions on use and rights of access as set forth in this Declaration of Covenants, Restrictions and Environmental Easement, and does give, grant and convey to the Grantee the perpetual right to enforce said restrictions and covenants, which shall be of the nature and character, and for the purposes hereinafter set forth, with respect to the Property.
- 2. <u>Purpose</u>: It is the purpose of this instrument to convey to the Grantee real property rights, which will run with the land, facilitate the remediation of past environmental contamination and to impose use restrictions and covenants to protect human health and the environment by reducing the risk of exposure to contaminants.

3. <u>Restrictions</u>: The following restrictions apply to the use of the Property, run with the land and are binding on the Grantor and its successors in title and assigns:

(a) excavation below the soil cover's demarcation layer of six feet is prohibited unless the excavation activities are in compliance with the EPA-approved SMP for the Site, a copy of which can be reviewed at the Newburgh Free Library, 124 Grand Street, Newburgh, New York

12550;(b) new construction is prohibited unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with the EPA-approved SMP for the Site;

for the Sile; (c) use of groundwater as a source of potable or process water is prohibited until groundwater quality standards are met; and

quality standards are met, and (d) no portion shall be used for single family housing, vegetable gardening (except community gardens with notice to EPA and NYSDEC approval), raising livestock or producing animal products for human consumption.

- 4. <u>Modification or termination of restrictions and covenants:</u> The restrictions specified in the preceding paragraph of this instrument may only be modified or terminated, in whole or in part, in writing, by the Grantee, provided, however, that any modification or termination of said restrictions shall not adversely affect the remedy selected by EPA and NYSDEC for the Site. If requested by the Grantor, such writing will be executed by Grantee in recordable form. Any request by Grantor for a modification or termination, in writing by made, not less than 30-days in advance of any modification or termination, in writing by Grantor to NYSDEC and to EPA in accordance with paragraph 15 of this instrument.
- 5. <u>Right of access</u>: Grantor hereby conveys to Grantee and to EPA a right of access to the Property at all reasonable times for the following purposes, which shall run with the land and be binding on Grantor, their successors and /or assigns, and on any tenants or any other parties having an interest and/or rights to the Property:
  - a) Performing and/or monitoring response actions at the Site;
  - b) Verifying any data or information submitted to the United States;
  - c) Conducting investigations relating to contamination at or near the Site;
  - d) Assessing the need for, planning, or implementing additional response actions at or near the Site;
  - e) Obtaining samples;
  - f) Assessing Grantor's compliance with the Consent Decree;

- g) Determining whether the Site is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by or pursuant to the Consent Decree; and
- h) Inspecting and copying records or other documents maintained or generated by Grantor or its agents relating to activities at the Site.
- 6. <u>Reserved rights of Grantor</u>: Grantor hereby reserves unto itself, its successors, and assigns, all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, rights, covenants and easements granted herein.
- 7. <u>Federal authority</u>: Nothing in this document shall limit or otherwise affect EPA's rights of entry and access or EPA's authorit y to take response actions under CERCLA, the NCP, or other federal law.
- 8. <u>State authority</u>: Nothing herein shall constitute a waiver of any rights the State may have pursuant to the Environmental Conservation Law, regulations and/or relevant provisions of statutory or common law.
- 9. <u>No public access and use</u>: No right of access or use by the general public to any portion of the Property is conveyed, granted or contemplated by this instrument, nor shall this instrument convey any rights of enforcement to any third parties, other than the United States, through EPA.
- 10. <u>Public notice</u>: Grantor, on behalf of itself, its successors and assigns, agrees to include in each instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases and mortgages, a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO A DECLARATION OF COVENANTS, RESTRICTIONS AND ENVIRONMENTAL EASEMENT, DATED \_\_\_\_\_\_, 20\_\_, RECORDED IN THE ORANGE COUNTY CLERK'S OFFICE ON \_\_\_\_\_\_, 20\_\_, IN BOOK \_\_\_\_\_\_, PAGE \_\_\_\_\_, IN FAVOR OF, AND ENFORCEABLE BY, THE PEOPLE OF THE STATE OF NEW YORK AND BY THE UNITED STATES OF AMERICA AS THIRD-PARTY BENEFICIARY.

Within thirty (30) days of the date any such instrument of conveyance is executed, Grantor agrees to provide Grantee and EPA with a certified true copy of said instrument and, if it has been recorded in the public land records, its recording reference.

- 11. <u>Enforcement</u>: The Grantee shall be entitled to enforce the terms of this instrument by resort to specific performance. All remedies available hereunder shall be in addition to any and all other remedies at law or in equity, including CERCLA. Any forbearance, delay or omission to exercise Grantee's rights under this in strument in the event of a breach of any term of this instrument shall not be deemed to be a waiver by the Grantee of such term or of any of the rights of the Grantee under this instrument.
- 12. <u>Damages</u>: Grantee shall also be entitled to recover damages for breach of any covenant or violation of the terms of this instrument including any impairment to the remedial action that increases the cost of the selected response action for the Site as a result of such breach or violation.
- 13. <u>Waiver of certain defenses</u>: Grantor hereby waives any defense of laches, estoppel, or prescription.
- 14. <u>Covenants</u>: Grantor hereby covenants that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good and lawful right and power to sell and convey it or any interest therein, and that the Property is free and clear of encumbrances.
- 15. <u>Notices</u>: Any notice, demand, request, consent, approval or communication under this instrument that either party desires or is required to give to the other shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Grantor: Attn: City Manager City of Newburgh 83 Broadway Newburgh, NY 12550 To Grantee: Office of General Counsel NYS Department of Environmental Conservation 625 Broadway Albany, NY 12233-1500

With a copy to:

Corporation Counsel City of Newburgh 83 Broadway Newburgh, NY 12550 NYS Department of Environmental Conservation Division of Environmental Remediation Site Control 625 Broadway Albany, New York 12233

A copy of each such communication shall also be sent to EPA in the same manner as to Grantor or Grantee, and addressed to the following two addressees:

U.S. Environmental Protection Agency Emergency & Remedial Response Division

Western New York Remediation Branch Attention: Consolidated Iron and Metal Co. Superfund Site Remedial Project Manager 290 Broadway, 20<sup>th</sup> Floor, New York, New York 10007-1866

U.S. Environmental Protection Agency Office of Regional Counsel Attention: Consolidated Iron and Metal Co. Superfund Site Attorney 290 Broadway, 17<sup>th</sup> Floor, New York, New York 10007-1866

- 16. <u>General provisions</u>:
  - a) <u>Controlling law</u>: The interpretation and performance of this instrument shall, with respect to the Environmental Easement, be governed by the laws of the State of New York and with respect to all other matters, shall be governed by the laws of the United States, or, if there are no applicable federal laws, by the law of the state where the Property is located.
  - b) <u>Liberal construction</u>: Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the grant to effect the purpose of this instrument and the policy and purpose of CERCLA. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.
  - c) <u>Severability</u>: If any provision of this instrument, or the application of it to any person or circumstance, is found to be invalid, the remainder of the provisions of this instrument, or the application of such provisions to persons or circumstances other than those to which it is found to be invalid, as the case may be, shall not be affected thereby.
  - d) <u>Entire agreement</u>: This instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior discussions, negotiations, understandings, or agreements relating thereto, all of which are merged herein; provided that nothing in this instrument shall be deemed to alter or modify the Consent Decree entered into between Grantor and the United States on January 3, 2009 relating to the Consolidated Iron Superfund Site.
  - e) <u>No forfeiture</u>: Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

- f) <u>Joint obligation</u>: If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.
- g) <u>Successors</u>: The covenants, easements, terms, conditions, and restrictions of this instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Property. The term "Grantor", wherever used herein, and any pronouns used in place thereof, shall include the persons and/or entities named at the beginning of this document, identified as "Grantor" and their personal representatives, heirs, successors, and assigns. The term "Grantee", wherever used herein, and any pronouns used in place thereof, shall mean the People of the State of New York acting through the Commissioner of NYSDEC or through any successor department or agency of the State of New York.
- h) <u>Captions</u>: The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.
- i) <u>Counterparts</u>: The parties may execute this instrument in two or more counterparts, which shall, in the aggregate, be signed by both parties; each counterpart shall be deemed an original instrument as against any party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.
- j) <u>Third-Party Beneficiary</u>: Grantor and Grantee hereby agree that the United States, through EPA, shall be, on behalf of the public, a third-party beneficiary of the benefits, rights and obligations conveyed to Grantee in this instrument; provided that nothing in this instrument shall be construed to create any obligations on the part of EPA.

TO HAVE AND TO HOLD unto the Grantee and its assigns forever.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Executed this 26 day of April, 2012

GRANTOR:

City of Newburgh Title:

### Grantor's A cknowledgment

STATE OF NEW YORK ) ) ss:

COUNTY OF ORANGE )

On the  $\underline{\mathcal{M}}_{day}$  of  $\underline{A}\underline{f}\underline{K}\underline{L}_{day}$ , in the year 2012, before me, the undersigned, personally appeared  $\underline{K}\underline{L}\underline{L}\underline{A}\underline{L}\underline{D}\underline{F}\underline{H}\underline{E}\underline{K}\underline{E}\underline{K}_{day}$ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as  $\underline{M}\underline{M}\underline{M}\underline{A}\underline{B}\underline{C}\underline{M}_{day}$  of the City of Newburgh, and that by his signature on the instrument, the City of Newburgh, upon behalf of which the individual acted, executed the instrument.

Nøtary Public - State of New York

MICHELLE KELSON Notary Public, State Of New York Sullivan County Clerk's #2564 Commission Expires: March 20, 20

THIS DECLARATION OF COVENANTS, RESTRICTIONS AND ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner

By: Schick, Acting Director

Robert W. Schick, Acting Director Division of Environmental Remediation

Date: MAY 8, 2012

Grantee's Ack nowledgment

STATE OF NEW YORK )

) ss:

)

COUNTY OF

On the <u>getter</u> day of <u>May</u>, in the year 20/), before me, the undersigned, personally appeared <u>Robert W. Schick</u>, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his signature on the instrument, the People of the State of New York, upon behalf of which the individual acted, executed the instrument.

State of New York Public N

David J. Chiusano Notary Public, State of New York No. 01CH5032146 Qualified in Schenectady County Commission Expires August 22, 20

## EXHIBIT A

### Declaration of Covenants, Restrictions and Environmental Easement Description of Property Consolidated Iron and Metal Co. Superfund Site

OMPANIES

Engineers / Surveyors Piarners Environmental Scientists Landscape Architects Chazen Engineering, Land Surveying & Landscape Architecture Co., P.C. Chazen Environmental Services, Inc. 21 Fox Straet, Poughkeepsie, New Tork 12601 Phone: (345) 454-3980 Fax: (345) 454-4926 www.chazencompanies.com Copied Darket Office: (349) 273-6055 Orange County Office: (349) 1573-1535 North County Office: (349) 122-6513

### SURVEY DESCRIPTION

ALL that plot, piece or parcel of land situate and being in the City of Newburgh, County of Orange and State of New York bounded and described as follows:

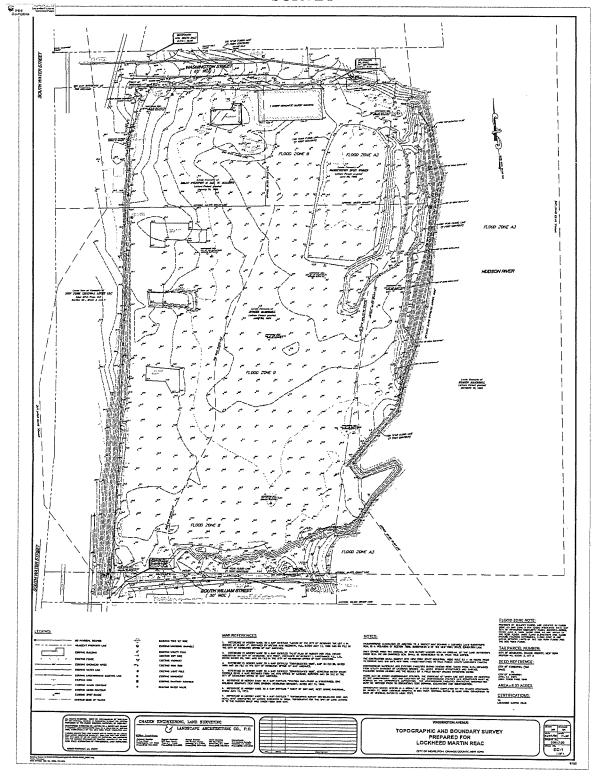
BEGINNING at the northwesterly corner of the herein described parcel, said point being on the southerly bounds of Washington Street and said point being on the easterly bounds of the lands now or formerly of New York Central Lines LLC as described in Liber 5154 of deeds at page 183; thence along the division line between the herein described parcel and said southerly bounds of Washington Street, S  $85^{\circ}13'06''$  E 405.43 feet to a point on the westerly shoreline of the Hudson River, said point being the northeasterly corner of the herein described parcel; thence southerly along the westerly shoreline of the Hudson River as it winds and turns approximately 1023 feet, (having a tie course of S 13'01'35'' W \$20.77 feet), to the southeasterly corner of the herein described parcel, said point being on the northerly bounds of South William Street; thence along the division line between the herein described parcel and northerly bounds of South William Street, N  $84^{\circ}24'02''$  W 340.29 feet to the southwesterly corner of the herein described parcel, said point being on the easterly bounds of the aforesaid lands now or formerly of New York Central Lines LLC; thence along the division line between the herein described parcel and said lands of New York Central Lines LLC, N 07'25'24'' E 722.73 feet and N 17'26'54'' E 87.60 feet to the point or place of beginning.

CONTAINING \$.33 ACRE OF LAND MORE OR LESS

March 25, 2008

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EXHIBIT B SURVEY



# APPENDIX B METES AND BOUNDS AND ENVIRONMENTAL EASEMENT

### ORANGE COUNTY CLERK'S OFFICE RECORDING PAGE THIS PAGE IS PART OF THE INSTRUMENT – DO NOT REMOVE TYPE IN BLACK INK:

NAME(S) OF PARTY(S) TO DOCUMENT

The City of Newburgh People of the State of New York ...

THIS IS PAGE ONE OF THE RECORDING

ATTACH THIS SHEET TO THE FIRST PAGE OF EACH RECORDED INSTRUMENT ONLY

### DO NOT WRITE BELOW THIS LINE

SECTION 40 BLOCK 3

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81 Main St. Duite 415 White Plamis, 14 10601

RECORD AND RETURN TO: (name and address)

Hus Helen Collier March

LOT

INSTRUMENT TYPE: DEED\_\_\_\_\_MORTGAGE\_\_\_\_SATISFACTION\_\_\_ASSIGNMENT\_\_\_OTHER\_\_\_\_\_\_\_\_\_

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4005 KIRYAS JOEL (VLG)			(K) CONDO	
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DONNA L. BENSON ORANGE COUNTY CLERK

Received From Handenburgh

RECORDED/FILED 09/11/2012/ 09:45:04 DONNA L. BENSON County Clerk ORANGE COUNTY, NY FILE#20120084382 RT WY / BK 13405PG 1340 RECORDING FEES 115.00 TTX# 000674 T TAX 0.00 Receipt#1499416 rose



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### NOW, THEREFORE:

- 1. <u>Grant</u>: Grantor, on behalf of itself, its successors and assigns, for ten dollars and other good and valuable consideration, receipt whereof is hereby acknowledged, does hereby give, grant, covenant and declare in favor of the Grantee that the Property shall be subject to restrictions on use and rights of access as set forth in this Declaration of Covenants, Restrictions and Environmental Easement, and does give, grant and convey to the Grantee the perpetual right to enforce said restrictions and covenants, which shall be of the nature and character, and for the purposes hereinafter set forth, with respect to the Property.
- 2. <u>Purpose</u>: It is the purpose of this instrument to convey to the Grantee real property rights, which will run with the land, facilitate the remediation of past environmental contamination and to impose use restrictions and covenants to protect human health and the environment by reducing the risk of exposure to contaminants.

3. <u>Restrictions</u>: The following restrictions apply to the use of the Property, run with the land and are binding on the Grantor and its successors in title and assigns:

(a) excavation below the soil cover's demarcation layer of six feet is prohibited unless the excavation activities are in compliance with the EPA-approved SMP for the Site, a copy of which can be reviewed at the Newburgh Free Library, 124 Grand Street, Newburgh, New York

12550;(b) new construction is prohibited unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with the EPA-approved SMP for the Site;

for the Sile; (c) use of groundwater as a source of potable or process water is prohibited until groundwater quality standards are met; and

quality standards are met, and (d) no portion shall be used for single family housing, vegetable gardening (except community gardens with notice to EPA and NYSDEC approval), raising livestock or producing animal products for human consumption.

- 4. <u>Modification or termination of restrictions and covenants:</u> The restrictions specified in the preceding paragraph of this instrument may only be modified or terminated, in whole or in part, in writing, by the Grantee, provided, however, that any modification or termination of said restrictions shall not adversely affect the remedy selected by EPA and NYSDEC for the Site. If requested by the Grantor, such writing will be executed by Grantee in recordable form. Any request by Grantor for a modification or termination, in writing by made, not less than 30-days in advance of any modification or termination, in writing by Grantor to NYSDEC and to EPA in accordance with paragraph 15 of this instrument.
- 5. <u>Right of access</u>: Grantor hereby conveys to Grantee and to EPA a right of access to the Property at all reasonable times for the following purposes, which shall run with the land and be binding on Grantor, their successors and /or assigns, and on any tenants or any other parties having an interest and/or rights to the Property:
  - a) Performing and/or monitoring response actions at the Site;
  - b) Verifying any data or information submitted to the United States;
  - c) Conducting investigations relating to contamination at or near the Site;
  - d) Assessing the need for, planning, or implementing additional response actions at or near the Site;
  - e) Obtaining samples;
  - f) Assessing Grantor's compliance with the Consent Decree;

- g) Determining whether the Site is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by or pursuant to the Consent Decree; and
- h) Inspecting and copying records or other documents maintained or generated by Grantor or its agents relating to activities at the Site.
- 6. <u>Reserved rights of Grantor</u>: Grantor hereby reserves unto itself, its successors, and assigns, all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, rights, covenants and easements granted herein.
- 7. <u>Federal authority</u>: Nothing in this document shall limit or otherwise affect EPA's rights of entry and access or EPA's authorit y to take response actions under CERCLA, the NCP, or other federal law.
- 8. <u>State authority</u>: Nothing herein shall constitute a waiver of any rights the State may have pursuant to the Environmental Conservation Law, regulations and/or relevant provisions of statutory or common law.
- 9. <u>No public access and use</u>: No right of access or use by the general public to any portion of the Property is conveyed, granted or contemplated by this instrument, nor shall this instrument convey any rights of enforcement to any third parties, other than the United States, through EPA.
- 10. <u>Public notice</u>: Grantor, on behalf of itself, its successors and assigns, agrees to include in each instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases and mortgages, a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO A DECLARATION OF COVENANTS, RESTRICTIONS AND ENVIRONMENTAL EASEMENT, DATED \_\_\_\_\_\_, 20\_\_, RECORDED IN THE ORANGE COUNTY CLERK'S OFFICE ON \_\_\_\_\_\_, 20\_\_, IN BOOK \_\_\_\_\_\_, PAGE \_\_\_\_\_, IN FAVOR OF, AND ENFORCEABLE BY, THE PEOPLE OF THE STATE OF NEW YORK AND BY THE UNITED STATES OF AMERICA AS THIRD-PARTY BENEFICIARY.

Within thirty (30) days of the date any such instrument of conveyance is executed, Grantor agrees to provide Grantee and EPA with a certified true copy of said instrument and, if it has been recorded in the public land records, its recording reference.

- 11. <u>Enforcement</u>: The Grantee shall be entitled to enforce the terms of this instrument by resort to specific performance. All remedies available hereunder shall be in addition to any and all other remedies at law or in equity, including CERCLA. Any forbearance, delay or omission to exercise Grantee's rights under this in strument in the event of a breach of any term of this instrument shall not be deemed to be a waiver by the Grantee of such term or of any of the rights of the Grantee under this instrument.
- 12. <u>Damages</u>: Grantee shall also be entitled to recover damages for breach of any covenant or violation of the terms of this instrument including any impairment to the remedial action that increases the cost of the selected response action for the Site as a result of such breach or violation.
- 13. <u>Waiver of certain defenses</u>: Grantor hereby waives any defense of laches, estoppel, or prescription.
- 14. <u>Covenants</u>: Grantor hereby covenants that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good and lawful right and power to sell and convey it or any interest therein, and that the Property is free and clear of encumbrances.
- 15. <u>Notices</u>: Any notice, demand, request, consent, approval or communication under this instrument that either party desires or is required to give to the other shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Grantor: Attn: City Manager City of Newburgh 83 Broadway Newburgh, NY 12550 To Grantee: Office of General Counsel NYS Department of Environmental Conservation 625 Broadway Albany, NY 12233-1500

With a copy to:

Corporation Counsel City of Newburgh 83 Broadway Newburgh, NY 12550 NYS Department of Environmental Conservation Division of Environmental Remediation Site Control 625 Broadway Albany, New York 12233

A copy of each such communication shall also be sent to EPA in the same manner as to Grantor or Grantee, and addressed to the following two addressees:

U.S. Environmental Protection Agency Emergency & Remedial Response Division

Western New York Remediation Branch Attention: Consolidated Iron and Metal Co. Superfund Site Remedial Project Manager 290 Broadway, 20<sup>th</sup> Floor, New York, New York 10007-1866

U.S. Environmental Protection Agency Office of Regional Counsel Attention: Consolidated Iron and Metal Co. Superfund Site Attorney 290 Broadway, 17<sup>th</sup> Floor, New York, New York 10007-1866

- 16. <u>General provisions</u>:
  - a) <u>Controlling law</u>: The interpretation and performance of this instrument shall, with respect to the Environmental Easement, be governed by the laws of the State of New York and with respect to all other matters, shall be governed by the laws of the United States, or, if there are no applicable federal laws, by the law of the state where the Property is located.
  - b) <u>Liberal construction</u>: Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the grant to effect the purpose of this instrument and the policy and purpose of CERCLA. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.
  - c) <u>Severability</u>: If any provision of this instrument, or the application of it to any person or circumstance, is found to be invalid, the remainder of the provisions of this instrument, or the application of such provisions to persons or circumstances other than those to which it is found to be invalid, as the case may be, shall not be affected thereby.
  - d) <u>Entire agreement</u>: This instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior discussions, negotiations, understandings, or agreements relating thereto, all of which are merged herein; provided that nothing in this instrument shall be deemed to alter or modify the Consent Decree entered into between Grantor and the United States on January 3, 2009 relating to the Consolidated Iron Superfund Site.
  - e) <u>No forfeiture</u>: Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

- f) <u>Joint obligation</u>: If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.
- g) <u>Successors</u>: The covenants, easements, terms, conditions, and restrictions of this instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Property. The term "Grantor", wherever used herein, and any pronouns used in place thereof, shall include the persons and/or entities named at the beginning of this document, identified as "Grantor" and their personal representatives, heirs, successors, and assigns. The term "Grantee", wherever used herein, and any pronouns used in place thereof, shall mean the People of the State of New York acting through the Commissioner of NYSDEC or through any successor department or agency of the State of New York.
- h) <u>Captions</u>: The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.
- i) <u>Counterparts</u>: The parties may execute this instrument in two or more counterparts, which shall, in the aggregate, be signed by both parties; each counterpart shall be deemed an original instrument as against any party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.
- j) <u>Third-Party Beneficiary</u>: Grantor and Grantee hereby agree that the United States, through EPA, shall be, on behalf of the public, a third-party beneficiary of the benefits, rights and obligations conveyed to Grantee in this instrument; provided that nothing in this instrument shall be construed to create any obligations on the part of EPA.

TO HAVE AND TO HOLD unto the Grantee and its assigns forever.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Executed this 26 day of April, 2012

GRANTOR:

City of Newburgh Title:

### Grantor's A cknowledgment

STATE OF NEW YORK ) ) ss:

COUNTY OF ORANGE )

On the  $\underline{\mathcal{M}}_{day}$  of  $\underline{A}\underline{f}\underline{K}\underline{L}_{day}$ , in the year 2012, before me, the undersigned, personally appeared  $\underline{K}\underline{L}\underline{L}\underline{A}\underline{L}\underline{D}\underline{F}\underline{H}\underline{E}\underline{K}\underline{E}\underline{K}_{day}$ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as  $\underline{M}\underline{M}\underline{M}\underline{A}\underline{B}\underline{C}\underline{M}_{day}$  of the City of Newburgh, and that by his signature on the instrument, the City of Newburgh, upon behalf of which the individual acted, executed the instrument.

Nøtary Public - State of New York

MICHELLE KELSON Notary Public, State Of New York Sullivan County Clerk's #2564 Commission Expires: March 20, 20

THIS DECLARATION OF COVENANTS, RESTRICTIONS AND ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner

By: Schick, Acting Director

Robert W. Schick, Acting Director Division of Environmental Remediation

Date: MAY 8, 2012

Grantee's Ack nowledgment

STATE OF NEW YORK )

) ss:

)

COUNTY OF

On the <u>getter</u> day of <u>May</u>, in the year 20/), before me, the undersigned, personally appeared <u>Robert W. Schick</u>, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his signature on the instrument, the People of the State of New York, upon behalf of which the individual acted, executed the instrument.

State of New York Public N

David J. Chiusano Notary Public, State of New York No. 01CH5032146 Qualified in Schenectady County Commission Expires August 22, 20

# EXHIBIT A

#### Declaration of Covenants, Restrictions and Environmental Easement Description of Property Consolidated Iron and Metal Co. Superfund Site

OMPANIES

Engineers / Surveyors Piarners Environmental Scientists Landscape Architects Chazen Engineering, Land Surveying & Landscape Architecture Co., P.C. Chazen Environmental Services, Inc. 21 Fox Straet, Poughkeepsie, New Tork 12601 Phone: (345) 454-3980 Fax: (345) 454-4926 www.chazencompanies.com Copied Darket Office: (349) 273-6055 Orange Copied Office: (349) 107-6153 North Convey Office: (349) 102-6513

#### SURVEY DESCRIPTION

ALL that plot, piece or parcel of land situate and being in the City of Newburgh, County of Orange and State of New York bounded and described as follows:

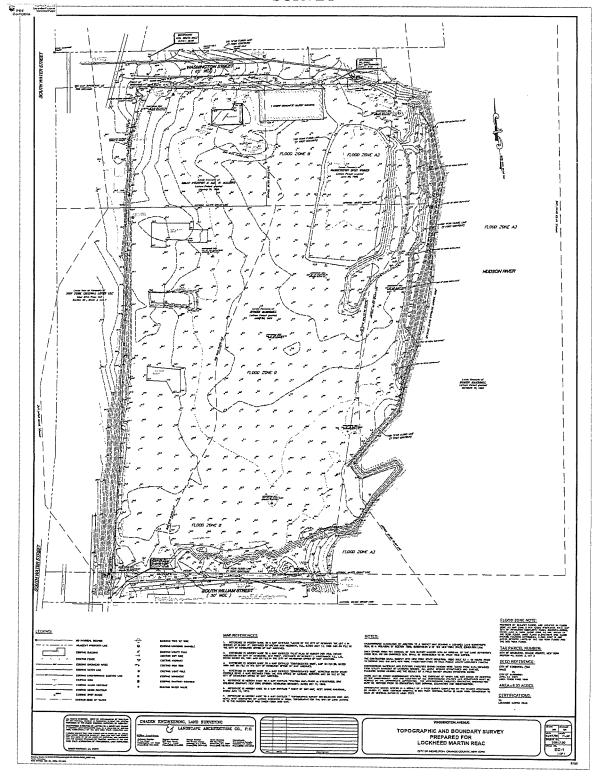
BEGINNING at the northwesterly corner of the herein described parcel, said point being on the southerly bounds of Washington Street and said point being on the easterly bounds of the lands now or formerly of New York Central Lines LLC as described in Liber 5154 of deeds at page 183; thence along the division line between the herein described parcel and said southerly bounds of Washington Street, S  $85^{\circ}13'06''$  E 405.43 feet to a point on the westerly shoreline of the Hudson River, said point being the northeasterly corner of the herein described parcel; thence southerly along the westerly shoreline of the Hudson River as it winds and turns approximately 1023 feet, (having a tie course of S 13'01'35'' W \$20.77 feet), to the southeasterly corner of the herein described parcel, said point being on the northerly bounds of South William Street; thence along the division line between the herein described parcel and northerly bounds of South William Street, N  $84^{\circ}24'02''$  W 340.29 feet to the southwesterly corner of the herein described parcel, said point being on the easterly bounds of the aforesaid lands now or formerly of New York Central Lines LLC; thence along the division line between the herein described parcel and said lands of New York Central Lines LLC, N 07'25'24'' E 722.73 feet and N 17'26'54'' E 87.60 feet to the point or place of beginning.

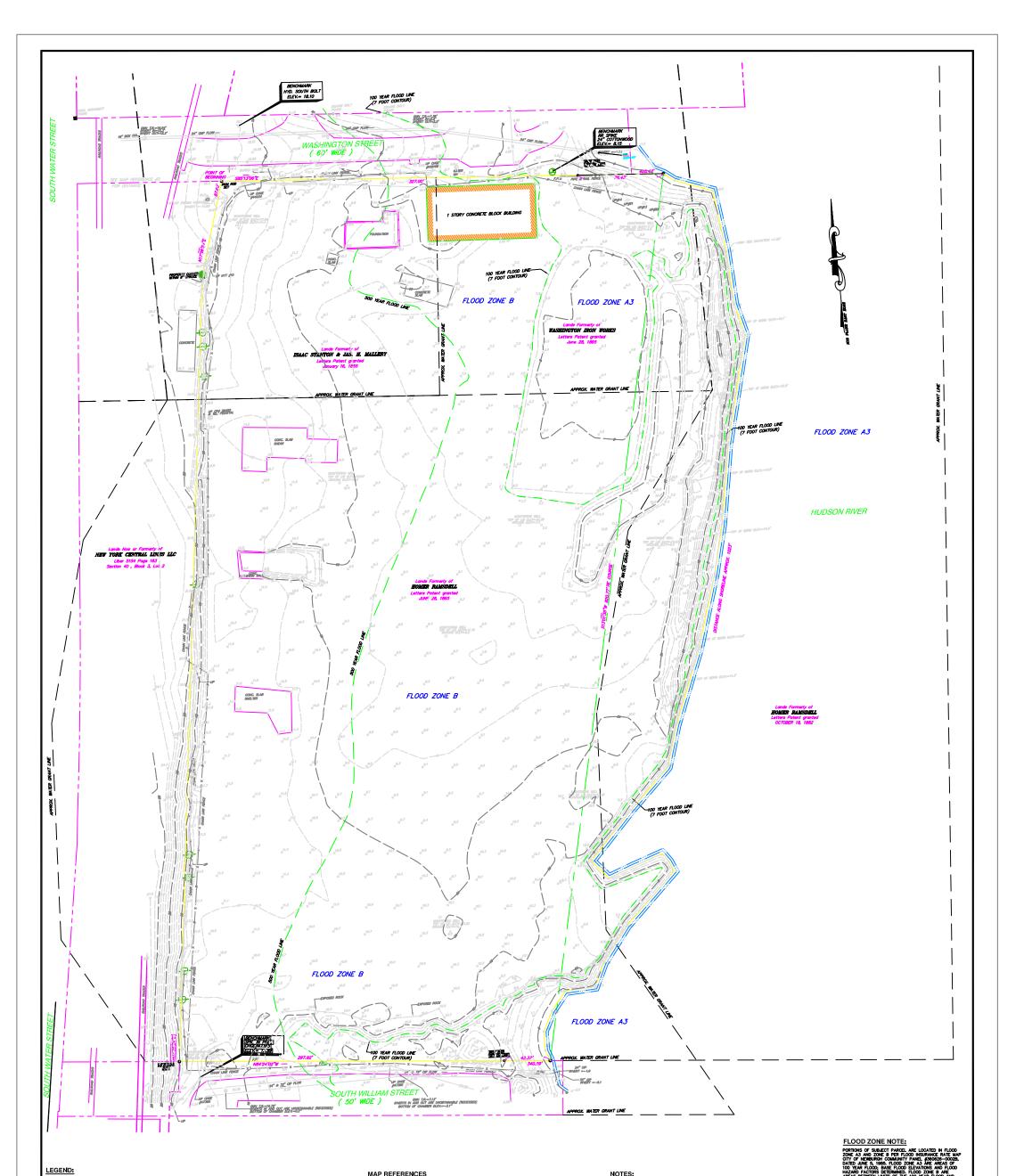
CONTAINING \$.33 ACRE OF LAND MORE OR LESS

March 25, 2008

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EXHIBIT B SURVEY

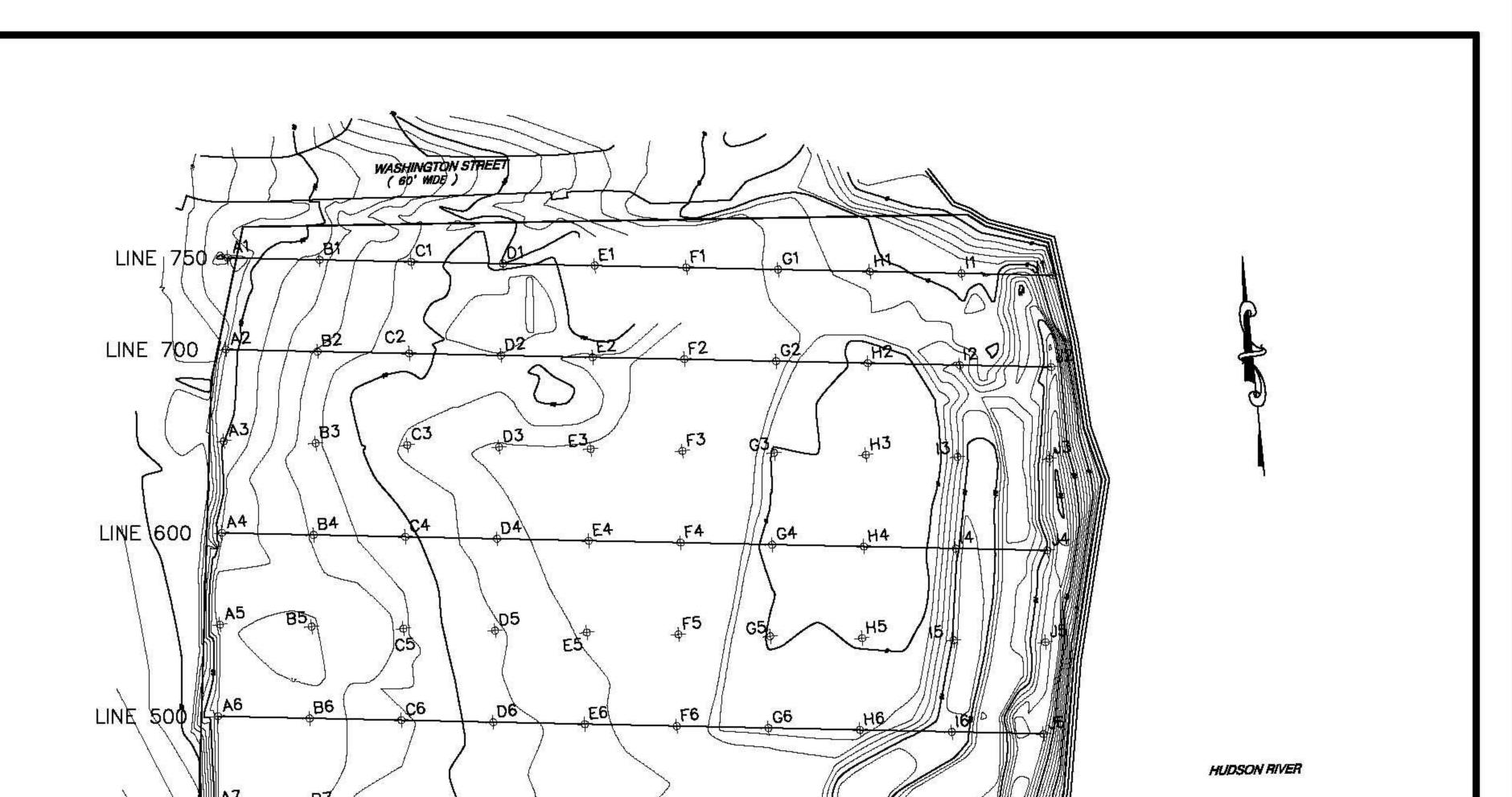




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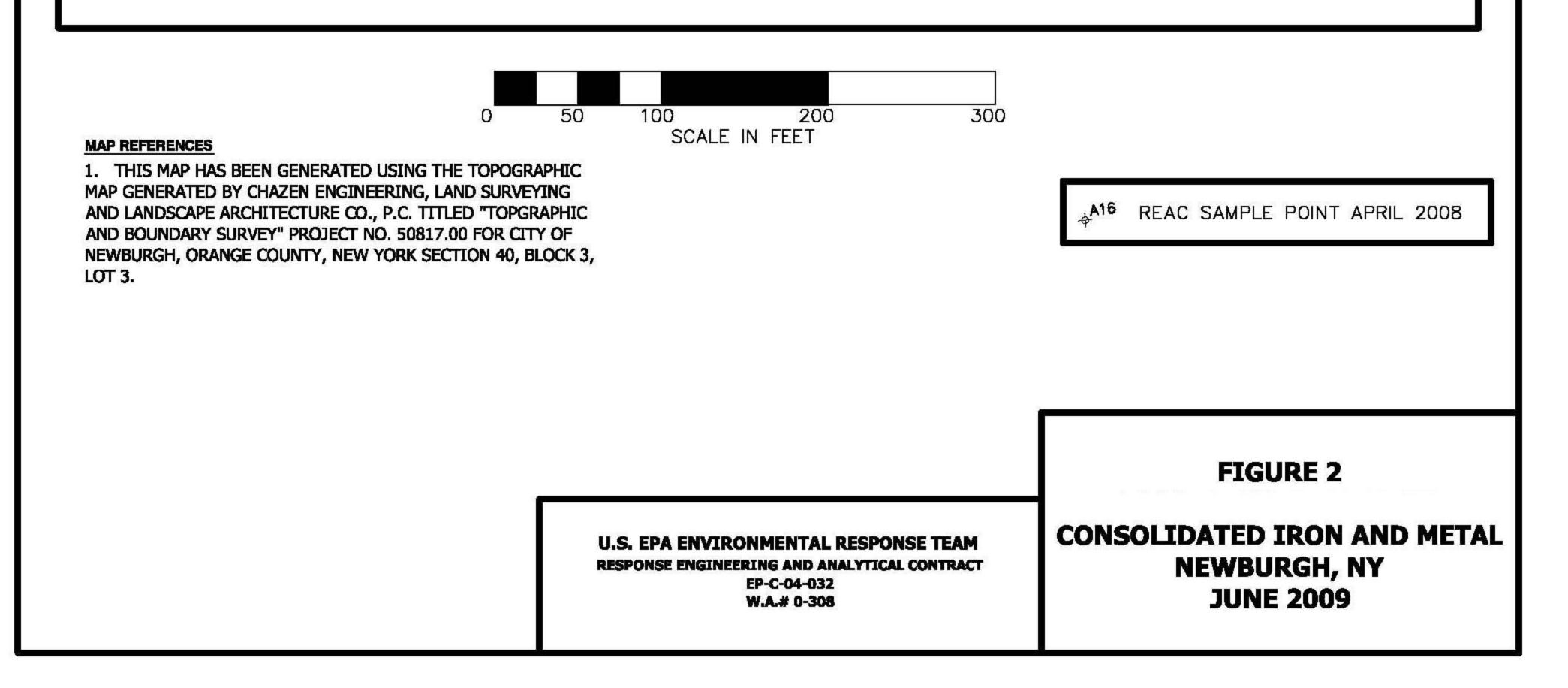
# APPENDIX C

# POST-EXCAVATION SAMPLING RESULTS ALL DATA FILES ATTACHED ON CD



A7 +₿7 /o7<sup>‡</sup> E7<sup>⊕</sup> + ₩ ₩ B8 A8 LINE 400 \_G8 H8 F8 08 **C8** É8 PA D9 **⊕**H9 <sup>-</sup>€C9 <sup>⊕</sup>E9 <sup>⊕</sup>G9 LINE 300 10 Ø10 \_E10 F10 G10 ,H10 cid B10 ₽D11 \_<mark>⊕</mark>B11 cl E11 G11 A12 \_B12 <sub>\_</sub>ር1ጵ D12 E12 \_G12 LINE 200 .H1 .\_B13 \_**D13** F13 \$ G1\$ C13 E13 H13 A14 B14 ,C14 ,D14 \_E14 F14 LINE 614 100 ,Η' A15 \_C15 815 \_D15 \_E15 F15 816 CIE LINE O SOUTH WILLIAM STREET

SOUTH WATER STREE



# APPENDIX D EXCAVATION WORK PLAN

# CONSOLIDATED IRON AND METAL ORANGE COUNTY, NEW YORK Appendix D – Excavation Work Plan

EPA Site Number: NY0002455756/NYSDEC Site Number: 336055 C.T. Male Project No. 11.1083

Prepared for:

The City of Newburgh 93 Broadway Newburgh, New York 12550

Prepared by: C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, P.C. 652 State Route 299, suite 204-B Highland, New York 12528 (845) 883-0964

**OCTOBER 2013** 

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	Site

# **APPENDIX D – EXCAVATION WORK PLAN**

#### **D-1** NOTIFICATION

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

Wayne Mizerak Division of Environmental Remediation NYS Department of Environmental Conservation 635 Broadway, 11<sup>th</sup> Floor Albany, New York 12233-7014 wjmizera@gw.dec.state.ny.us

Mike Negrelli UESEPA Region 2 290 Broadway, 20<sup>th</sup> Floor New York, New York 10007-1866 <u>Negrelli.mike@epa.gov</u>

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format,
- Identification of disposal facilities for potential waste streams, and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

#### **D-2 SOIL SCREENING METHODS**

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

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

#### **D-3 STOCKPILE METHODS**

Soil stockpiles of contaminated material will be placed on a 6 mil plastic surface and encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

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

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

#### D-4 MATERIALS EXCAVATION AND LOAD OUT

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

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

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

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

A truck wash, decontamination station or soil removal procedure will be operated on-site if truck tires come into contact with contaminated site soils. The qualified environmental professional will observe outbound trucks and document that the truck tires are washed before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking. The qualified environmental professional will observe for and document that all egress points for truck and equipment transport from the site are free of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a soilfree condition with respect to site-derived materials.

#### D-5 MATERIALS TRANSPORT OFF-SITE

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

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

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

Truck transport routes are to be considered prior to future development. The most appropriate route takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during future site development. Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

#### D-6 MATERIALS DISPOSAL OFF-SITE

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

Off-site disposal locations for excavated soils will be identified in the preexcavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal

quantities and associated documentation will be reported to the EPA and NYSDEC and EPA in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

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

#### D-7 MATERIALS REUSE ON-SITE

Soils used for the soil cover system (i.e., above the demarcation layer) may be reused on-site or off without restriction as long as it has not been contaminated by site activity. Historic fill and other site soils with no evidence of contamination is acceptable for re-use on-site below the demarcation layer, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Historic fill and other site soils with evidence of petroleum impacts as determined by a qualified environmental professional approved by EPA and NYSDEC will not be allowed to be reused on-site unless PID screening results and chemical testing is reviewed and allowed by EPA and NYSDEC. The frequency and chemical parameters of analytical testing may vary depending on the type of reuse but should be discussed with EPA and NYSDEC after reporting the evidence of a petroleum release and prior to implementing sampling. The following guidelines are also provided:

- Sampling may be omitted for soils which are not obviously petroleum contaminated and which will be reused below the demarcation layer or for soils which will be disposed of off-site. Any sampling required by the disposal facility would still need to be conducted.
- In order for the soil to be reused off-site, it would have to meet the requirements of 6 NYCRR 375-6.8(a), unrestricted soil cleanup objectives (SCOs).
- In order for the soil to be used as part of the cover system, it would have to meet the requirements of 375-6.8(a) and the lower of the SCOs for the protection of

human health for restricted residential use and the SCOs for the protection of groundwater defined by 6 NYCRR 375-6.8(b).

• Soil which is sampled, but does not meet the requirements of the previous two bullets and is not obviously petroleum contaminated, may be reused below the demarcation layer or disposed off-site.

Soils which are obviously petroleum contaminated must be treated and/or disposed of off-site. If treated soils are to be reused, sampling would be necessary to determine appropriate reuse.

The qualified environmental professional will observe for and document that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site.

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

#### D-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

#### D-9 COVER SYSTEM RESTORATION

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

#### D-10 BACKFILL FROM OFF-SITE SOURCES

Imported backfill proposed for use at the site will be approved by the qualified environmental professional and/or EPA and NYSDEC. Imported backfill will be in compliance with provisions in this SMP prior to delivery to the site.

The source of the imported backfill will be documented. Backfill from industrial sites, petroleum spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site. Solid waste will not be imported onto the site.

Imported backfill will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.8(a). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards governing the imported backfill are listed in Appendix 5 of DER-10, Technical Guidance for Site Investigation and Remediation (May 2010), under the unrestricted use column. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by EPA and NYSDEC. Imported backfill shall be deemed

cleaned by analytical testing. Imported backfill will be analyzed according to the following schedule:

Contaminant	Volatile Organic	Semi-volatile Org	ganic Compounds,		
	Compounds	Inorganics & F	CBs/Pesticides		
Imported Backfill			Discrete		
Quantity in Cubic	Discrete Samples	Composite Samples	Samples/Composites		
Yards			1 1		
0 - 50	1	1	3-5 Discrete samples		
51 - 100	2	1	from different		
101 - 200	3	1	locations in the fill		
201 - 300	4	1	being provided will		
301 - 400	4	2	compromise a		
401 - 500	5	2	composite sample		
501 - 800	6	2	for analysis		
801 - 1,000	7	2			
> 1,000	Add an additional two	o volatile organic comp	ound discrete samples		
	and one composite sample for each additional 1,000 cubic yards or				
	consult with EPA and NYSDEC				

Table D.10.1: Recommended Number of Soil Samples for Soil Imported to the Site

#### **D-11 STORMWATER POLLUTION PREVENTION**

There is the potential for future construction activity at this site and the disturbance is likely to exceed one (1) acre. A Stormwater Pollution Prevention Plan (SWPPP) would be required. The SWPPP would be site plan specific and conform to the development requirements. This will provide guidance to the contractor doing the construction activities. With the preparation of the SWPPP comes a requirement for submitting a Notice of Intent to EPA and NYSDEC upon completion of SWPPP to document the project exists and gain permit coverage. The NOI will be completed with

direction and input from the site owner and/or remedial party. In addition to the SWPPP, Erosion and Sediment Control (ESC) plans will be design and prepared as applicable for implementing the construction activity in accordance with the stormwater regulations.

For implementing construction activities with disturbance with less than one (1) acre, erosion and sediment controls will be installed around the down gradient perimeter of the work areas and around temporary stockpiles of excavated soil and imported backfill. Erosion and sediment controls will be observed once a week, and repaired within 24 hours of discovery of deficiencies.

#### **D-12 CONTINGENCY PLAN**

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

Sampling will be performed on tank or drum contents, and surrounding soils, etc., as necessary, to determine the nature of the material and proper disposal method. Chemical analysis will be performed for Target Analyte List (TAL) metals; Target Compound List (TCL) volatiles and semi-volatiles, TCL pesticides and PCBs or by the disposal facility's requirements, unless the site history and previous sampling results provide justification to reduce the list of analytes. In this case, a reduced list of analytes will be proposed to the EPA and NYSDEC for approval prior to sampling.

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

#### D-13 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (CAMP) requirements are listed below as excerpted from NYSDOH's Generic Community Air Monitoring Plan. Exceedances of action levels listed in the CAMP will be reported to EPA and NYSDEC and NYSDOH Project Managers.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Continuous monitoring will not be required during placement of clean soil cover or asphalt cover, once the base layer of the clean material or demarcation layer is placed over the site. Community Air Monitoring Plans often include monitoring requirements for volatile organic compounds (VOCs); however, only low levels of VOCs were identified at the site during the remedial investigation. NYSDOH concurrence must be obtained on a case by case basis before remove VOC monitoring from the CAMP during invasive activities. The CAMP for this site includes monitoring as described below.

Periodic monitoring for VOCs will be required during intrusive and non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

#### VOC and Particulate Monitoring, Response Levels, and Actions

VOC and particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary monitoring stations.

The monitoring should be performed using real-time monitoring equipment capable of measuring partculate matter less than 10 micrometers in size (PM-10) and VOC to less than one part per million and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate or VOC action levels. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m<sup>3</sup>) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind levels and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind levels, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.
- If VOCs exceed the action levels determined for the compounds of concern and approved by the EPA, NYSDEC and NYSDOH, then work must be stopped and a re-evaluation of site activities considered. It may be necessary to increase the level of personal protection employed for the proscribed tasks.

All readings must be recorded and be available for the EPA, NYSDEC and NYSDOH personnel to review.

#### D-14 ODOR CONTROL PLAN

Nuisance odors were not encountered during the implementation of the remedy and during the disturbance of existing site soils. Therefore, an odor control plan is not

needed for future excavation at the site. If nuisance odors are observed during future site excavation work, actions should be implemented to mitigate off-site impacts from odors.

If needed, the odor control plan should be capable of controlling emissions of nuisance odors off-site (and on-site, if there are residents or tenants on the property). Specific odor control methods to be used could include (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors cannot be controlled by the previous means, additional measures to control the odor may include (a) direct load-out of soils for off-site disposal; (b) use of chemical odorants in spray or misting systems; and (c) implement monitoring of odors in surrounding neighborhoods.

If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until nuisance odors have been abated. EPA and NYSDEC and NYSDOH will be notified of odor complaints about the project. Implementation of odor controls, including the halt of work, is the responsibility of the site owner and/or remedial party's qualified environmental professional, and any measures that are implemented will be discussed in the Periodic Review Report.

#### D-15 DUST CONTROL PLAN

A dust suppression plan that addresses fugitive dust emissions from invasive onsite work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of water trucks for road wetting. The truck will be equipped with water cannons capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Gravel will be used on roadways to promote a clean and dust-free road surface.
- On-site roads area of disturbance will be limited in total area to minimize the area required for dust suppression techniques.

### **D-16 OTHER NUISANCES**

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all intrusive activities. A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

#### Appendix 1A New York State Department of Health Generic Community Air Monitoring Plan

#### Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

#### Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

**Continuous monitoring** will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during <u>non-intrusive</u> activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

### VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

### Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter  $(mcg/m^3)$  greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

#### Appendix 1B Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);

(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;

(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);

- (e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;

(h) Logged Data: Each data point with average concentration, time/date and data point number

(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;

(1) Operating Temperature: -10 to  $50^{\circ}$  C (14 to  $122^{\circ}$  F);

(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential-such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

# APPENDIX E

# MONITORING WELL CONSTRUCTION LOGS

Appendix E Monitoring Well Construction Diagrams

ie Name:	U.S. Environmental F Consolidated Iron and Newburgh, Orange C AD 47 HSA Hollow-Ster	I Metal Site ounty, New York	Well No.: Location: Initial Water Level (ft. bgs) Geologist: North: East. Depth to Bottom (ft. bgs):	Single-Cased Monitoring W. <u>Mus-1</u> <u>Foot of Washington</u> <u>Newsburgh, NY</u> <u>O. Couruso</u> <u>Elevation (A.amsl):</u> <u>20-1</u>
Annular Space De Type of Surface Seal: Type of Annular Grou Type of Seal: Type of Filter Pack:	<u>Concret</u> <u>Cemen</u> <u>Beneton</u>	ilpenetonite		Depths - (feet) GROUND SUBFACE Sand
Well Constructio		Type of Material		Borehole Diameter * <b>\O</b> ``
Riser Casing	4-inch. 8-inch.			12     Top of Seal       2     Total Seal Interval       14     Top of Sand
Measurements Riser pipe length ( Screen length (ft)	R)	18		Top of Screen
Screen slot size (in Depth to water (fl.	bgs)	0.010		10 Total Screen Interva
Affiliation:	). Caruso CDM	S bentionite		20 Bottom of Screen 27 Bottom of Borchole

			······	
CDM	•			Single-Cased Monitoring Well
			Well No.:	<u>MW-2</u>
Vient: Nie Name:	U.S. Environmental Pro Consolidated Iron and I		Location:	Foot of Washington St. Newburgh, NY
Project Location:	Newburgh, Orange Cou		Initial Water Level (ft. bgs):	
Drilling Contractor:		inty, then Tolk	Geologist:	Q. Caruso
Drill Rig:	HSA		North: East:	Flevetion (B envil)
Drilling Method:	HSA		Depth to Bottom (ft. bgs):	2 5 5 10 31. 20 ft tic
Annular Space D				Depths - (feet)
Type of Surface Seal	Concret	و		GROUND SURFACE
Type of Annular Gro	ut: <u>Censen</u>	<u>L</u>  Benkonik		
Type of Scal:	Bentonit	c Rellets		Sand
Type of Filter Pack:	±1 San	8		
Well Construction	on Materials			Borehole Diameter = 10
· · · · · · · · · · · · · · · · · · ·	Diameter	Type of Materia		
Screen	4-inch.	PVC		
Riser Casing	4-inch.	Pvc		14 Top of Seal
Flush Mount Typ	e 8-inch.	Stick-UP		2 Total Seal Interval
Measurements				Top of Sand
Riser pipe length (	A)	20		<u>\8</u> Top of Screen
Screen length (ft)		10		
Screen slot size (in	) <b>c</b>	), DIO		
Depth to water (fl.	bgs)	3.75		
Depth to bedrock (	ft. bgs)			Total Screen Interval
Inspected by:	Q. Cerruso			·
Affiliation:	CDM	<u>.</u>		
REMARKS:				
	6 5/81D an			
	to equal at a			28 Bottom of Screen 30 Bottom of Borehole
- Usec	144 gallons	of grown		Bottofil of Dotentile

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	CDM			······			Single-Cased Monitoring We	:11
					Well No		<u>MW-3</u>	-
			vironmental Protection Agency dated Iron and Metal Site			1:	Foot of Wachington St Newsburgh, NY	•
				nty, New York	 Initial W	ater Level (fl. bgs)		
	Drilling Contractor:	AD+		inty, New Tork	Geologis			
		HUL	<u>`</u>	······································	North:	East:	Q. Caruso	
	Drill Rig: Drilling Method:	HSH	i			Bottom (ft; bgs):	Elevation (fl.amsl): 2555 - 4055 28.09 A +ic	
ł				·····		Bonom (n. ogs).	Dg1 20:01 H HI	
	Annular Space De	tails					Depths - (feet)	
	Type of Surface Seal:		-	oncrete			GROUND SURFACE	
	Type of Annular Grou			Bentonite	-		• • • • • •	
	Type of Seal: -	Ben	your	e Pellets			Sand	
	Type of Filter Pack:	<u> </u>	Sand			A A	Deter Diana IO	İ
	Well Constructio	n Materials				AA	Borehole Diameter = 10	
		Di	ameter	Type of Material				
	Screen	4-	inch.	PVC				
	Riser Casing	4-1	nch.	PVC	]		Top of Seal	
1	Flush Mount Type	8-11	nch.	Stick-up			2. Total Seal Interval	
	Measurements		÷				<u>    13     </u> Top of Sand	
	Riser pipe length (	ft)		17			Top of Screen	
dNumSla	Screen length (ft)			10				
10w>> <<	Screen slot size (in	)	c	010.0				
Format( <<)	Depth to water (fl.	bgs)	9	80.1				
< <pre>&lt;<pre>c<projfile>&gt; &lt;<c0aiatemplate>&gt; &lt;<format(<<now>&gt;&gt; &lt;<c0anumslastb>&gt;</c0anumslastb></format(<<now></c0aiatemplate></projfile></pre></pre>	Depth to bedrock (	fi. bgs)	-	<b>•</b>			10 Total Screen Interva	
Data Temp	Inspected by:	J. Carris	20					
ŝ	Affiliation:	CDM	·					
ProjFij	REMARKS:							
Ş	-used (	o els ID a	UNCer!	2			00	
)	-used 5	hage #	sand	Ā			25 Bottom of Screen	
÷	- Used ( - Used 5 - Used 3:	5 options	20	grout			<b>27</b> Bottom of Borehole	
Ϋ́ L				-				1

<<Pre><<Pre><<Pre>CeProJFile>> <<CDataT cmplate>> <<Format(<<Now>>> <<fdNumSlastb>> >>

·						······································	
CDM					,	_	d Monitoring Well
	•			Well No		HW-H	
, ent:	U.S. Environmental Protection Agency			Location	1:	Newsburg	hashington St.
ic Name:	······································	insolidated Iron and Metal Site					
-	Project Location: Newburgh, Orange County, New York				fater Level (ft. bgs).		20
Drilling Contractor		<u> </u>		Geologis		<u>Q.Carv</u>	
Drill Rig:	1-40110W-	Stem the	ger	North:	East:	95 EV	vation (A.amsl): 
Drilling Method:	HSA			Depth to	Bottom (ft. bgs):		<u>ugs 20:03 -11-10</u>
Annular Space I	Details					Depths - (fe	et)
Type of Surface Se	al: <u>Co(</u>	orete				_GI	ROUND SURFACE
Type of Annular G		rut Ber		-			
Type of Seal:	Bentoni	•	43			S	and
Type of Filter Pack	<u>#1 So</u>	and			MM	DL.I. 15	iameter = <b>\O``</b>
Well Construc	tion Materials				AA	Borenole D	
	` Di	ameter	Type of Material				
Screen	4-	inch.	PUC				
Riser Casing	4-1	indn.	4 VC			\1	Top of Seal
Flush Mount T	ype 8-:	ran su	rick-up			2	Total Seal Interval
Measurements		<u></u> i				_13_	_ Top of Sand
Riser pipe lengi	h (fl)	17	<b>\</b>			15	Top of Screen
Screen length (f	1)	10	>				
Screen slot size	(in)	0.0	0				
Depth to whiter (	fl. bgs)	7.98	'bgs			10	
Depth to bedroc	k (fl. bgs)					10	Total Screen Interval
Inspected by:	april C	anno					
Affiliation	CDM	<u></u>					
REMARKS:		-					
ised 6	5/8-100	nderz				25	Bottom of Screen
sed 6 (sed 9 (sed 9 (sed 4	bage of	# 1 sand				29	Bottom of Borchole
· USED 4	10 . <i>eīs</i> o 04	grout					

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·····				
CDM				Single-Cased Monitoring Well
	Environmental Des	testion As-sec	Well No.:	MW-S
) —	5. Environmental Pro nsolidated Iron and N		Location	Foot of washington . It. Newburgh, NY
	wburgh, Orange Cou	· · · · · · · · · · · · · · · · · · ·	– Initial Water Level (ft. bgs).	
	ADAT		- Geologist:	Q.Caruso
	BA	· · · · · · · · · · · · · · · · · · ·	North: East:	Elevation (ft.anisl):
Drilling Method:	tollow-Ster	n Quger	Depth to Bottom (fl. bgs):	31 A- bg 0 33.8 fitic
Annular Space Detai	ls			Depths - (feet)
Type of Surface Seal	Concrete			GROUND SURFACE
Type of Annular Grout:	Cement	Bentonite		
Type of Seal:	Bentonite	Penets		Sand
Type of Filter Pack:	#1 Sa	ncl		
Well Construction N	Materials	• •		Borehole Diameter = <b>\O</b>
· · · · · · · · · · · · · · · · · · ·	Diameter	Type of Material		
Screen	4-inch.	rnc.		
Riser Casing	4-1man.	Pre		Top of Seal
Flush Mount Type	8-inch	Stick-up		2 Total Seal Interval
Measurements	,			19 Top of Sand
Riser pipe length (ft)		23		21 Top of Screen
Screen length (fl)		10		
Screen slot size (in)	0	.010		
Depth to water (ft. bgs)		13 \$t. bgs		
Depth to bedrock (fl. bg	(s)	· · · · · · · · · · · · · · · · · · ·		Towi Screen Interval
Inspected by: Q.C.	aruso			
	DM			
REMARKS:		·······		
	ils iDauge	V.C.		
- Used 5	Dago the son	d		3) Bottom of Screen
- Used 5	56 9012. 09 6	yrout		33 Bottom of Borchole
······································	<u> </u>	<u></u>		

Set and the set of sequences set because showers could have set of set of the set of se

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ſ <del></del>				
CDM				Single-Cased Monitoring Well
	· · · ·		Well No.:	MW-le
<i></i>	U.S. Environmental Pro		Location	Foot of Washington St.
	Consolidated Iron and I		· · · · · · · · · · · · · · · · ·	Newburgh, NY
	Vewburgh, Orange Cou	nry, New York	Initial Water Level (ft. bgs	0
Drilling Contractor:			Geologist:	Q. Caruso
Drill Rig:	HSA	· · · · · · · · · · · · · · · · · · ·	North: East:	
Drilling Method:	HSA		Depth to Bottom (ft. bgs):	23 ft tos 26.50 ft tic
Annular Space De	ails		· · · ·	Depths - (feet)
Type of Surface Seal:	Concret	٤		GROUND SURFACE
Type of Annular Grout		Bentonite		
Type of Seal:	Bentonité	e Pellets		Sand
Type of Filter Pack:	#1 Sand	<del></del>		
Well Construction	n Materials			Borehole Diameter = 10
	Diameter	Type of Material		
Character in the second		<u>م</u>		
Séreen	H-inon.	PVC		
Riser Casing	4-inch.	PNC		Top of Seal
Flush Mount Type	8-inon,	Stick-up		2. Total Seal Interval
Measurements		· · · · · · · · · · · · · · · · · · ·		Top of Sand
	······			i i i i i i i i i i i i i i i i i i i
Riser pipe length (ft	)	15		13 Top of Screen
Screen length (ft)		10		
Screen slot size (in)	C	0.010		
Depth to water (fl. b	gs) L	-1.18 'bgs		
Depth to bedrock (fl.				10 Total Screen Interval
Inspected by:	Caruso			
Affiliation:	COM			
REMARKS:				
-Lised Lo	518 1D auger	2		
) - Lunch S	i hags of #1	Sand		23 Bottom of Screen
- Usedra	518 1 D auger 5 bags of #1 13 gallons of	grant	<u>(tetete)mann(tetete</u> )	25 Bottom of Borchole

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Client: U.S. Environmental P Site Name: Consolidated Iron and Project Location: Newburgh, Orange Co Drilling Contractor: AD&T Drill Rig: HSA Drilling Method: HSA	Metal Site	Well No.: Location: Initial Water Level (ft. bgs): Geologist: North: East: Depth to Bottorn (ft. bgs):	Single-Cased Monitoring Well <u>MW-7</u> <u>Foot of Wownington St.</u> Newburgh, NY <u>8 ft bgs</u> <u>Q.Caruso</u> <u>Elevation (ft.amsl):</u> <u>23 ft bgs</u> 24.79 ft; Depths - (feet)
Annular Space Details Type of Surface Seal: <u>Concrete</u>			
-	2K/Bentonite		GROUND SURFACE
Type of Seal: Bentonits	e Pellets		Sand
Type of Filter Pack: 41 Sour	<u>~</u>		Borehole Diameter = 10
Well Construction Materials	·····		
Diameter	Type of Material		
Screen 4-inch	RNC		
Riser Casing 4-inch	PVC	1 88	9 Top of Seal
Flush Mount Type 8:00	Stick-up		2 Total Seal Interval
Measurements			Top of Sand
Riser pipe length (A)	15		<u>    13     </u> Top of Screen
Screen length (ft)	10		
Screen slot size (in)	0.010		
Depth to water (ft. bgs)			
Depth to bedrock (fl. bgs)			Total Screen Interval
Inspected by: <u>A. Carruso</u> Affiliation: <u>CDM</u>			
REMARKS: -Used 654 1D c -Used 5 bags of -Used gallon	ugers f#1 Sand s of Grout		23 Bottom of Screen Bottom of Borehole

Figure 5-1 Monitoring Well Construction Diagram Consolidated Iron and Metal Site Newburgh, New York

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)	Site Name: C	Consolidated Ir	on and ]	ntection Agency Metal Site nty, New York	Well No Location Initial W Geologis North:	i: 'ater Level (fl. bgs):	Single-Cased Monitoring Well <u>MW-8</u> <u>Fost of Washington St.</u> Newburgh, NY <u>A. Caruso</u> <u>Elevation (fl.amsl)</u> :
	Drilling Method:	HSA			Depth to	Bottom (ft. bgs):	305+ bgs 32.18 ft tic
	Annular Space Det	ails					Depths - (feet)
	Type of Surface Seal:	<u> </u>	nere	4e			GROUND SURFACE
	Type of Annular Grout	Cer	nen	+   Bertonite			
	Type of Seal:	Bent	0114	e Pellets			Sand
	Type of Filter Pack: Well Construction		sar	<u>ک</u>			Borehole Diameter = \O
		Dia	meter	Type of Material			
	Screen	4-ir	ncin.	PVC	-		
	Riser Casing	4-in	ien.	PVC			Top of Seal
	Flush Mount Type	8-in	<i>ъ</i> л.	Stick-up			2 Total Seal Interval
	Measurements	•.	,				<u>18</u> Top of Sand
~~~~~	Riser pipe length (f	i)		22			20 Top of Screen
selSmuNb	Screen length (ft)			10			
TV COMOD	Screen slot size (in)			0.010			
Format(<√	Depth to water (ft. )	bgs)					- -
late>> <<	Depth to bedrock (f	t. bgs)					Total Screen Interval
>> < <pre>&lt;<pre>CopyFile&gt;&gt; &lt;<datatemplate>&gt; &lt;<format(<<now>&gt;&gt; &lt;</format(<<now></datatemplate></pre>convertex</pre>	Inspected by:	<u>Carus.</u> CDM	o				
\$ ) \$	REMARKS: - USED - USED	6 5/8 10 ~5 100/95 ~80 galle	aug s of ms d	ers #1 Sand f grout			30 Bottom of Screen 32 Bottom of Borehole

>> <<ProjFile>> <<DataTemplate>> <<Eomat(<<Now>> <<fONumSlash>>>

Figure 5-1 Monitoring Well Construction Diagram Consolidated Iron and Metal Site Newburgh, New York

Client: )e Name: Project Location: Drilling Contractor: Drill Rig: Drilling Method:	U.S. Environmental P Consolidated Iron and Newburgh, Orange Co ADQT HSA HSA	Metal Site	Well No.: Location: 	Single-Cased Monitoring Well <u>MW-Q</u> Foot of Wash. St. Newburgh, NY <u>A. Caruso</u> Elevation (fl amsl): <u>24 Shrogs 27.42 fl</u>
Annular Space De	etails			Depths - (feet)
Type of Surface Seal:	Concre	te		GROUND SURFACE
Type of Annular Grou	I <u>Cement</u>	f Bentonite		
Type of Seal:	Bentonite	Pellets		Sand
Type of Filter Pack:	#1 San	<u>k</u>		
Well Constructio	n Materials			Borehole Diameter = 10
	Diameter	Type of Material		
Screen	4-inch.	PVC		
Riser Casing	4-inen.	PVC		Top of Seal
Flush Mount Type	8-inen.	Stick-up		2. Total Seal Interval
Measurements	•			Top of Sand
Riser pipe length (f	ł)	16		14 Top of Screen
Screen length (A)		10		
Screen slot size (in)	0.	010		
Depth to water (fl. bgs) 10.85' 1095				
Depth to bedrock (fl. bgs)			Total Screen Interval	
Inspected by:	. Coiruso			
Ailiation: CDM				
REMARKS: -USed 6 -USed 5 -Used 3	518 1D ang 100gs of # 54 gals. of q	es I saind grout		24 25 Bottom of Screen Bottom of Borehole

Figure 5-1 Monitoring Well Construction Diagram Consolidated Iron and Metal Site Newburgh, New York

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COMPANY: _Geologic/RST 2	WELL NO.: <u>MW-10</u>				
CLIENT: <u>USEPA</u>	DATE: <u>6/30/2010</u>				
SITE: Consolidated Iron					
ADDRESS: 1 Washington Street					
Newburgh, NY					
WELL C	DESERVATIONS				
WELL CASING AND LID:	LOCKED:Y				
WELL DIAMETER: <u>4'</u>	STICKUP HEIGHT: <u>3.5'</u>				
MEASURING POINT: _Top of Casing (TOC)					
VAPOR READINGS: PID: BACKGROUND READING	0 INSIDE WELL CASING:0.1				
FID: BACKGROUND READING	INSIDE WELL CASING:				
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - N	O THICKNESS:NA INCHES				
GROUNDWATER	LEVEL INFORMATION				
MEASURED - RECORDED PREVIOUSLY					
(A) DEPTH TO WATER: <u>10.9</u>	TIME MEASURED _13:30				
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:				
(C) DEPTH TO WELL BOTTOM:18.5	TIME MEASURED: _13:30				
PURGING AND WATER	PARAMETERS INFORMATION				
PURGING DATE: <u>6/30/2010</u>					
PURGING METHOD: <u>Submersible pumps</u>					
DEVICE DESCRIPTION: Myers pump and Grundfos pump with flow through cell					
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5' FT; SCREEN/WELL: <u>8.5 – 18.5</u> FT;					
WATER SURFACE:					
PURGED WATER:					

SITE: Consolidated Iron

WELL NO.: <u>MW-10</u>

DEVELOPER: \_\_\_\_\_

DATE: <u>6/30/2010</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	рН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)
	43	Gallons removed	with	Myers pump	
Then	use	Grundfos	with	Flow	Through Cell
Initial	44	17.15	8.31	0.719	*
14:06	48	15.70	8.15	0.738	*
14:12	53	15.79	8.16	0.739	380
14:19	58	15.67	8.16	0.742	78
14:26	63	15.75	8.11	0.742	34
14:31	68	15.82	8.11	0.742	42
14:38	73	15.83	8.11	0.743	26
14:44	78	15.85	8.12	0.744	24

\* None recorded due to measurement being off scale.

1. STOPPED PURGING AT: <u>14</u>	:45_
----------------------------------	------

2. TOTAL VOLUME PURGED: \_\_\_\_79 Gallons

COMPANY:Geologic/RST 2 WELL NO.:W	V-09				
CLIENT: <u>USEPA</u> DATE: <u>6/29/20</u>	<u>10</u>				
SITE: Consolidated Iron					
ADDRESS: <u>1 Washington Street</u>					
Newburgh, NY					
WELL OBSERVATION	ONS				
WELL CASING AND LID:	LOCKED:Y				
WELL DIAMETER: _4"	STICKUP HEIGHT: 3.5'				
MEASURING POINT: Top of Casing (TOC)					
VAPOR READINGS: PID: BACKGROUND READING 0	INSIDE WELL CASING:0				
FID: BACKGROUND READING	INSIDE WELL CASING:				
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NO TH	ICKNESS:NA INCHES				
GROUNDWATER LEVEL IN	FORMATION				
MEASURED - RECORDED PREVIOUSLY					
(A) DEPTH TO WATER: <u>14'</u>	TIME MEASURED1:30				
(B) DEPTH TO WATER WITH PUMP IN THE WELL: $13.5$ '	TIME MEASURED:1:35				
(C) DEPTH TO WELL BOTTOM:21'	TIME MEASURED:1:30				
PURGING AND WATER PARAMET	ERS INFORMATION				
PURGING DATE: <u>6/29/10</u>					
PURGING METHOD:Submersible pumps					
DEVICE DESCRIPTION: Meyer and Grundfos Pump with flow through cell					
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM: _0.5 FT; SCREEN/WELL: _11'-21' FT;					
WATER SURFACE:	,				
PURGED WATER:					

SITE: Consolidated Iron

WELL NO.: MW-09

DEVELOPER: Geologic/RST 2

DATE: <u>6/29/10</u>

	GALLONS				TURBIDITY
TIME	REMOVED	TEMPERATURE (°C)	рН	CONDUCTIVITY (mS/cm)	(NTU)
	25	Gallons removed	with	Myer	Pump:
	Then use	Grundfos	pump	with	Flo-thru Cell
2:18	28	13.97	8.12	0.794	313
2:22	30	13.95	8.07	0.794	212
2:30	33	13.94	8.10	0.794	138
2:40	34	14.03	8.12	0.790	116
2:48	35	13.97	8.16	0.791	65
2:54	37	13.95	8.18	0.793	48
2:58	38	13.95	8.18	0.791	42
3:00	40	13.95	8.18	0.792	44

\* None recorded due to measurement being off scale.

1.	<b>STOPPED</b>	PURGING AT:	3:01
	SIGILE	1011011101111	

2. TOTAL VOLUME PURGED: <u>40 Gallons</u>

T

COMPANY, Casleria/DST 2 WELL N						
	NO.: <u>MW-08</u>					
CLIENT: <u>USEPA</u> DATE: _	6/29/2010					
SITE: <u>Consolidated Iron</u>						
ADDRESS: <u>1 Washington Street</u>						
Newburgh, NY						
WELL OBS	SERVATIONS					
WELL CASING AND LID:	LOCKED:					
WELL DIAMETER:4"	STICKUP HEIGHT: <u>3.5</u> '					
MEASURING POINT: _Top of Casing (TOC)						
VAPOR READINGS: PID: BACKGROUND READING 0	INSIDE WELL CASING:0					
FID: BACKGROUND READING	INSIDE WELL CASING:					
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NO	THICKNESS:NA INCHES					
GROUNDWATER L	EVEL INFORMATION					
MEASURED - RECORDED PREVIOUSLY						
(A) DEPTH TO WATER: <u>10.2</u>	TIME MEASURED _9:17					
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:					
(C) DEPTH TO WELL BOTTOM: _18.2	TIME MEASURED: _9:18					
PURGING AND WATER PA	ARAMETERS INFORMATION					
PURGING DATE: <u>6/29/10</u>						
PURGING METHOD:Submersible Pump						
DEVICE DESCRIPTION: Mayer Pump						
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5	FT; SCREEN/WELL: _8.2-18.2 FT;					
WATER SURFACE:						
PURGED WATER:						

SITE: Consolidated Iron

WELL NO.: <u>MW-08</u>

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/29/10</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	pН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)
9:40	20	19.49	8.58	0.649	*
Dry	at	20 gallons	wait	for recharge	
9:58	30	19:30	8.46	0.641	*
Dry	at	35 gallons	wait	for recharge	
Pumping	1.5 gpm				
10:14	40	19.95	8.44	0.640	*
10:22	50	19.57	8.42	0.632	391
11:06	80	21.75	8.33	0.655	*
11:15	90	20.95	8.41	0.645	193
11:25	100	20.57	8.40	0.647	174
11:36	105	19.96	8.35	0.653	46
11:49	110	20.24	8.36	0.656	89
11:56	130	20.60	8.40	0.657	41
12:09	140	20.60	8.37	0.657	72
12:18	150	20.13	8.35	0.658	50
	* 3.7				

\* None recorded due to measurement being off scale.

STOPPED PURGING AT: 12:18 1.

2. TOTAL VOLUME PURGED: <u>150 gallons</u> Depth to water average 12.4' while pumping

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COMPANY:Geologic/RST 2 WELL NO.:	MW-07			
CLIENT: <u>USEPA</u> DATE: <u>6/28</u>	3/10, 6/29/10			
SITE: Consolidated Iron				
ADDRESS: <u>1 Washington Street</u>				
Newburgh, NY				
WELL OBSER	VATIONS			
WELL CASING AND LID:	LOCKED:Y			
WELL DIAMETER:4"	STICKUP HEIGHT: <u>3.5</u>			
MEASURING POINT: _Top of Casing(TOC)				
VAPOR READINGS: PID: BACKGROUND READING 0	INSIDE WELL CASING:0			
FID: BACKGROUND READING	INSIDE WELL CASING:			
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NO	THICKNESS: _NA INCHES			
GROUNDWATER LEVI	EL INFORMATION			
MEASURED - RECORDED PREVIOUSLY				
(A) DEPTH TO WATER: <u>10.2</u>	TIME MEASURED _10:40			
(B) DEPTH TO WATER WITH PUMP IN THE WELL: 9.4'	TIME MEASURED: 10:47			
(C) DEPTH TO WELL BOTTOM:19'	TIME MEASURED:			
PURGING AND WATER PARA	AMETERS INFORMATION			
PURGING DATE: <u>6/28 - 6/29/10</u>				
PURGING METHOD:Submersible Pump				
DEVICE DESCRIPTION: Gold 10GS05422				
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5' FT; SCREEN/WELL: _9-19' FT;				
WATER SURFACE:				
PURGED WATER:				

SITE: Consolidated Iron

WELL NO.: <u>MW-07</u>

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/28,6/29/10</u>

	GALLONS	TEMPERATURE		CONDUCTIVITY	TURBIDITY
TIME	REMOVED	(°C)	pН	(mS/cm)	(NTU)
Initial	Water	Black and	Silty	No Readings	Taken
10:51	10	18.96	8.33	0.574	*
Dry	at	11 Gallons		Wait for	Recharge
11:00	30	19.76	8.44	0.587	*
11:07	35	18.70	8.61	0.600	479
Pump	Stops:	Broken Pump:		Replace	Pump
<b>6/29-</b> 7:46	50	17.58	8.15	0.587	*
7:56	80	17.34	8.56	0.598	220
8:00	90	16.90	8.48	0.601	115
8:10	100	16.89	8.46	0.598	75
8:21	120	16.88	8.44	0.596	54
8:35	135	16.99	8.41	0.599	24
8:40	145	17.10	8.41	0.605	53
8:51	150	17.14	8.44	0.606	115

\* None recorded due to measurement being off scale.

- 1. STOPPED PURGING AT: <u>8:53</u>
- 2. TOTAL VOLUME PURGED: <u>150+ Gallons</u>

DTW average 14.3' while pumping.

COMPANY:Geologic/RST 2	WELL NO.: <u>MW-06</u>
CLIENT: <u>USEPA</u>	DATE: <u>7/2/2010</u>
SITE: Consolidated Iron	
ADDRESS: <u>1 Washington Street</u>	
Newburgh, NY	
WELL OF	BSERVATIONS
WELL CASING AND LID:	LOCKED:Y
WELL DIAMETER: <u>4"</u>	STICKUP HEIGHT: <u>3.5'</u>
MEASURING POINT: _Top of Casing (TOC)	
VAPOR READINGS: PID: BACKGROUND READING	0 INSIDE WELL CASING:0
FID: BACKGROUND READING	INSIDE WELL CASING:
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NO	THICKNESS:NA INCHES
GROUNDWATER I	LEVEL INFORMATION
MEASURED - <del>RECORDED PREVIOUSLY</del>	
(A) DEPTH TO WATER: $10.2'$	TIME MEASURED8:00
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:
(C) DEPTH TO WELL BOTTOM:17'	TIME MEASURED:8:00
PURGING AND WATER I	PARAMETERS INFORMATION
PURGING DATE: <u>7/2/2010</u>	
PURGING METHOD: <u>Submersible pump</u>	
DEVICE DESCRIPTION: Myer pump and Grundfos pump with	th flow through cell
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5	_ FT; SCREEN/WELL: <u>7 – 17'</u> FT;
WATER SURFACE:	
PURGED WATER:	

SITE: Consolidated Iron

WELL NO.: <u>MW-06</u>

DEVELOPER: <u>Geologic</u>

DATE: <u>7/2/2010</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	pН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)	
	15	Gallons Removed	with	Myer	Pump	
Initial	15	19.83	8.11	0.533	*	
8:30	20	20.26	8.54	0.556	*	
8:40	25	19.61	8.55	0.571	486	
8:45	30	19.42	8.55	0.574	177	
8:58	35	19.35	8.53	0.571	163	
9:09	40	19.40	8.54	0.576	228	
9:20	45	19.50	8.49	0.579	63	
9:30	50	19.45	8.52	0.581	60	
Increase fl	low slightly a	nd clean out flow	through c	ell		
9:48	60	19.33	8.52	0.579	45	
9:59	65	19.35	8.47	0.579	32	
10:10	70	19.35	8.42	0.580	29	

\* None recorded due to measurement being off scale.

1. STOPPED PURGING AT: \_\_\_\_10:11\_\_\_\_\_

2. TOTAL VOLUME PURGED: <u>70 Gallons</u>

COMPANY:Geologic/RST 2	WELL NO.: <u>MW-05</u>				
CLIENT: <u>USEPA</u>	DATE: <u>6/30/2010</u>				
SITE: Consolidated Iron					
ADDRESS: 1 Washington Street					
Newburgh, NY					
WELL C	BSERVATIONS				
WELL CASING AND LID:	LOCKED: <u>Y</u>				
WELL DIAMETER:4"	STICKUP HEIGHT: <u>3.5'</u>				
MEASURING POINT: _Top of Casing(TOC)					
VAPOR READINGS: PID: BACKGROUND READING	0 INSIDE WELL CASING:0				
FID: BACKGROUND READING	INSIDE WELL CASING:				
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - N	O THICKNESS:NA INCHES				
GROUNDWATER	LEVEL INFORMATION				
MEASURED - RECORDED PREVIOUSLY					
(A) DEPTH TO WATER: <u>11.0'</u>	TIME MEASURED _8:35				
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	<u>10.7'</u> TIME MEASURED:8:36				
(C) DEPTH TO WELL BOTTOM:18.4'	TIME MEASURED:8:35				
PURGING AND WATER	PARAMETERS INFORMATION				
PURGING DATE: <u>6/30/2010</u>					
PURGING METHOD: <u>Submersible pump</u>					
DEVICE DESCRIPTION: Myers pump and Grundfos pump with flow through cell					
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5' FT; SCREEN/WELL: <u>8.4 – 18.4'</u> FT;					
WATER SURFACE:					
PURGED WATER:					

SITE: Consolidated Iron

WELL NO.: <u>MW-05</u>

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/30/2010</u>

	GALLONS	TEMPERATURE		CONDUCTIVITY	TURBIDITY
TIME	REMOVED	(°C)	рН	(mS/cm)	(NTU)
	28	Gallons Removed	with	Myers	Pump
Initial	28	14.64	8.19	0.762	*
9:22	33	14.39	8.24	0.764	*
9:28	38	14.22	8.18	0.760	148
9:44	55	14.34	8.20	0.760	12.9
9:51	57	14.49	8.16	0.757	11.1
9:55	60	14.67	8.19	0.757	9.6
10:05	65	14.61	8.07	0.755	9.3
10:11	70	14.62	8.18	0.755	9.2

\* None recorded due to measurement being off scale.

2. TOTAL VOLUME PURGED: \_\_\_\_\_70\_Gallons\_\_\_\_

<sup>1.</sup> STOPPED PURGING AT: \_\_\_10:14\_\_\_\_

COMPANY: _Geologic/RST 2 WELL NO.:	MW-04			
CLIENT: <u>USEPA</u> DATE: <u>6</u>	/29-6/30/10			
SITE: Consolidated Iron				
ADDRESS: <u>1 Washington Street</u>				
Newburgh, NY				
WELL OBSERVA	TIONS			
WELL CASING AND LID:	LOCKED:Y			
WELL DIAMETER: _4"	STICKUP HEIGHT: <u>3.5'</u>			
MEASURING POINT: <u>Top of Casing (TOC)</u>				
VAPOR READINGS: PID: BACKGROUND READING 0	INSIDE WELL CASING:0			
FID: BACKGROUND READING	INSIDE WELL CASING:			
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NO	THICKNESS:NA INCHES			
GROUNDWATER LEVEL	INFORMATION			
MEASURED - RECORDED PREVIOUSLY				
(A) DEPTH TO WATER: <u>11.1'</u>	TIME MEASURED3:23			
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:			
(C) DEPTH TO WELL BOTTOM:18.7'	TIME MEASURED:3:23			
PURGING AND WATER PARAM	ETERS INFORMATION			
PURGING DATE: <u>6/29-30/10</u>				
PURGING METHOD:				
DEVICE DESCRIPTION: Myer pump and Grundfos Pump with flow through cell				
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5' FT; SCREEN/WELL:8.7-18.7 FT;				
WATER SURFACE:				
PURGED WATER:				

SITE: Consolidated Iron

WELL NO.: <u>MW-04</u>

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/29-6/30/10</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	рН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)
Purge	28	Gallons with	Myer	Pump	Then use Grundfos
6/30/10 7:42	32	13.35	8.20	0.599	124
7:53	42	13.41	8.2	0.600	72
7:58	47	13.32	8.19	0.603	69
8:10	51	13.42	8.15	0.604	47
8:14	53	13.42	8.12	0.605	39
8:19	55	13.56	8.12	0.603	40

\* None recorded due to measurement being off scale.

2. TOTAL VOLUME PURGED: <u>55 gallons</u>

Т

COMPANY: Geologic/RST 2	WELL NO.: <u>MW-03</u>
CLIENT: <u>USEPA</u>	DATE: <u>6/25/2010</u>
SITE: Consolidated Iron	
ADDRESS: 1 Washington Street	
Newburgh, NY	
v	WELL OBSERVATIONS
WELL CASING AND LID:	LOCKED:Y
WELL DIAMETER: _ 4"	STICKUP HEIGHT: <u>3.5</u>
MEASURING POINT:Top Of Casing (TOC)	
VAPOR READINGS: PID: BACKGROUND RE	CADING 0 INSIDE WELL CASING:0
FID: BACKGROUND RE	CADING INSIDE WELL CASING:
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: -	NO THICKNESS: INCHES
GROUND	WATER LEVEL INFORMATION
<u>MEASURED</u> - RECORDED PREVIOUSLY	
(A) DEPTH TO WATER: <u>12.85'</u>	TIME MEASURED0815
(B) DEPTH TO WATER WITH PUMP IN THE	E WELL: TIME MEASURED:
(C) DEPTH TO WELL BOTTOM:19.7'_	TIME MEASURED:0815
PURGING AND	WATER PARAMETERS INFORMATION
PURGING DATE: <u>6/25/10</u>	
PURGING METHOD: <u>Submersible Pump</u>	
DEVICE DESCRIPTION: Gold Pump	
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM	1: _0.5 FT; SCREEN/WELL:9.7 – 19.7' FT;
ONE WELL VOLUME = 4.4 GALLONS	

SITE: Consolidated Iron

WELL NO.: MW-03

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/25/2010</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	pН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)
10:05	5	18.31	7.73	0.775	*
Dry at 11	Gallons.	Wait for		recharge	
Water	Is	Black and	full	Of	Silt
10:26	12	21.13	7.51	0.729	*
10:30	20	19.8	7.45	0.708	*
10:34	30	19.70	7.45	0.703	156
10:45	32	23.56	7.78	0.711	*
10:53	45	20.13	7.73	0.673	*
10:58	50	21.25	7.72	0.661	*
11:07	55	21.87	7.50	0.648	*
11:12	60	20.61	7.61	0.667	741
11:16	70	19.33	7.83	0.698	339
11:20	75	20.72	7.82	0.681	408
11:23	80	19.28	7.88	0.701	160
11:26	90	19.28	7.85	0.706	90
11:32	95	19.70	7.83	0.703	143
11:38	100	19.69	7.87	0.698	141
11:46	110	19.91	7.91	0.698	75
11:52	115	19.95	7.90	0.699	97
11:58	125	19.75	7.90	0.685	134
12:03	135	19.52	7.12	0.700	60
12:08	140	19.70	7.88	0.700	109
TIME	GALLONS REMOVED	TEMPERATURE (°C)	рН 2	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)

12:15	145	19.81	8.02	0.697	93
12:20	150	19.43	8.12	0.702	270
					^Pump Moved
Turbidity of well volum		elow 50 NTU afte	er removi	ng 150 gallons, wh	ich is 33.7

\* None recorded due to measurement being off scale.

2. TOTAL VOLUME PURGED: <u>150 Gallons</u>

<sup>1.</sup> STOPPED PURGING AT: <u>12:20</u>

COMPANY: _Geologic/RST 2	WELL NO.: <u>MW-02</u>					
CLIENT: USEPA	DATE: <u>6/30/2010</u>					
SITE: Consolidated Iron						
ADDRESS: 1 Washington Street						
Newburgh, NY						
WELL O	BSERVATIONS					
WELL CASING AND LID:	LOCKED:Y					
WELL DIAMETER:4"	STICKUP HEIGHT: <u>3.5'</u>					
MEASURING POINT:Top of Casing_(TOC)	_					
VAPOR READINGS: PID: BACKGROUND READING	0 INSIDE WELL CASING:0					
FID: BACKGROUND READING	INSIDE WELL CASING:					
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - N	O THICKNESS:NA INCHES					
GROUNDWATER	LEVEL INFORMATION					
MEASURED - RECORDED PREVIOUSLY						
(A) DEPTH TO WATER: $13.2'$	TIME MEASURED10:35					
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:					
(C) DEPTH TO WELL BOTTOM:19.80	TIME MEASURED:10:35					
PURGING AND WATER	PARAMETERS INFORMATION					
PURGING DATE: <u>6/30/2010</u>						
PURGING METHOD: Submersible Pump						
DEVICE DESCRIPTION: Myers pump and Grundfos pump with flow through cell						
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5 FT; SCREEN/WELL: <u>9.8 – 10.8</u> , FT;						
WATER SURFACE:						
PURGED WATER:						

SITE: Consolidated Iron

WELL NO.: <u>MW-2</u>

DEVELOPER: <u>Geologic/RST 2</u>

DATE: <u>6/30/2010</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	рН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)
	32	Gallons Removed	with	Meyers	Pump
Initial	32	22.8	8.14	0.719	*
11:25	37	15.81	8.20	0.801	396
11:35	47	15.38	8.23	0.804	41.5
11:41	52	15.25	8.23	0.804	25.9
11:47	58	15.15	8.31	0.804	37
11:52	63	15.24	8.30	0.803	22.1
11:58	68	15.16	8.30	0.830	15.5
12:01	70	15.13	8.30	0.804	15.4

\* None recorded due to measurement being off scale.

2. TOTAL VOLUME PURGED: <u>70 Gallons</u>

<sup>1.</sup> STOPPED PURGING AT: <u>12:02</u>

T

COMPANY:Geologic/RST 2	WELL NO.: <u>MW-01</u>								
CLIENT: <u>USEPA</u>	DATE: <u>7/1/2010</u>								
SITE: Consolidated Iron									
ADDRESS: <u>1 Washington Street</u>									
Newburgh, NY									
WELL OBSERVATIONS									
WELL CASING AND LID:	LOCKED:Y								
WELL DIAMETER: <u>4</u> "	STICKUP HEIGHT: <u>3.5'</u>								
MEASURING POINT: _Top of Casing (TOC)									
VAPOR READINGS: PID: BACKGROUND READING	0 INSIDE WELL CASING:226								
FID: BACKGROUND READING	INSIDE WELL CASING:								
NAPL LAYER OBSERVED: <u>N</u> SAMPLED: YES - NC	THICKNESS:NA INCHES								
GROUNDWATER LEVEL INFORMATION									
MEASURED - RECORDED PREVIOUSLY									
(A) DEPTH TO WATER: <u>15.8'</u>	TIME MEASURED10:54								
(B) DEPTH TO WATER WITH PUMP IN THE WELL:	TIME MEASURED:								
(C) DEPTH TO WELL BOTTOM:22.5'	TIME MEASURED: _10:54								
PURGING AND WATER PARAMETERS INFORMATION									
PURGING DATE: <u>7/1/2010</u>									
PURGING METHOD:Submersible pump									
DEVICE DESCRIPTION: Myer pump and Grundfos pump with flow through cell									
PUMP/BAILER INTAKE DEPTH: TOP - BOTTOM:0.5' FT; SCREEN/WELL: _ <u>12.5 – 22.5'</u> FT;									
WATER SURFACE:									
PURGED WATER:									

SITE: Consolidated Iron

WELL NO.: MW-01

DEVELOPER: <u>Geologic/RST 2</u>

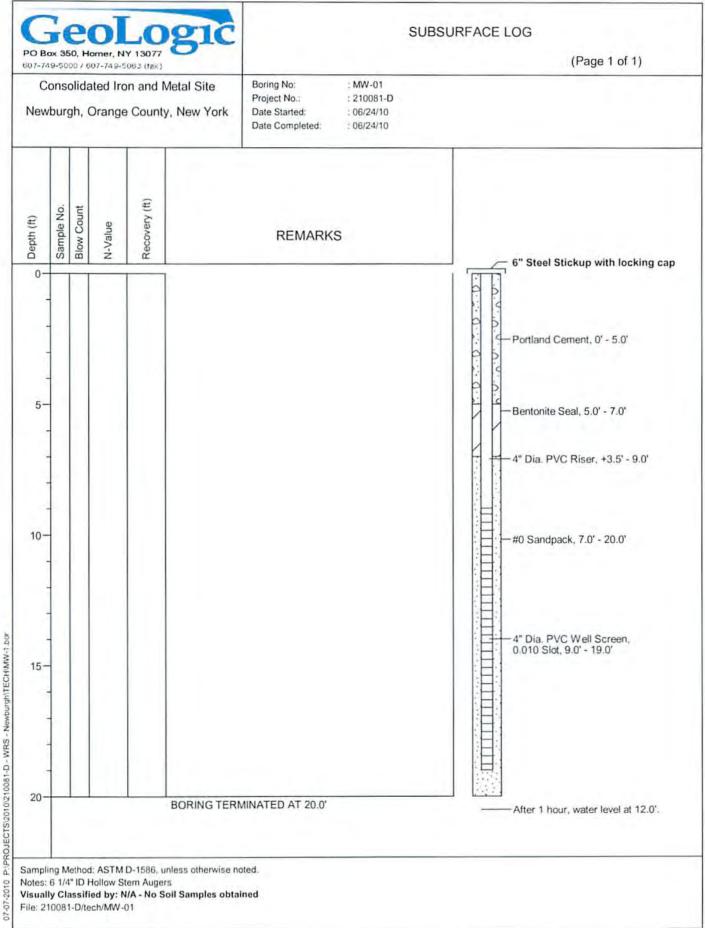
DATE: <u>7/1/2010</u>

TIME	GALLONS REMOVED	TEMPERATURE (°C)	рН	CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)	
	10	Gallons Removed	with	Myer	Pump	
12:08	11	25.89	7.67	0.678	541	
12:12	12	24.79	7.46	0.624	531	
12:19	13	24.11	7.55	0.616	438	
12:28	14	23.74	7.63	0.610	282	
12:39	15	23.75	7.72	0.592	193	
12:52	16	23.30	7.80	0.590	129	
12:58	17	23.07	7.84	0.587	72	
13:01	18	22.85	7.85	0.582	69	
13:12	19	22.66	7.88	0.586	53	
13:19	20	22.77	7.89	0.586	48	
13:26	21	22.65	7.89	0.588	50	
13:33	22	22.75	0.790	0.583	48	
temperatur		d are not represen		nl/min with water of groundwater tempe		

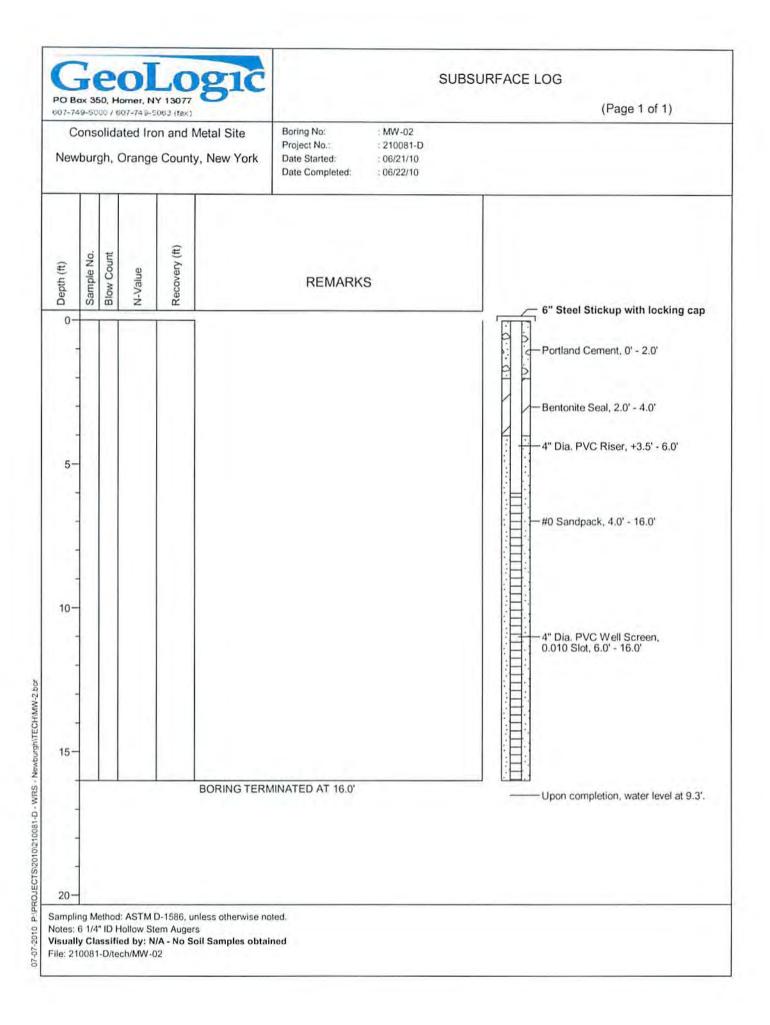
\* None recorded due to measurement being off scale.

1. STOPPED PURGING AT: <u>13:34</u>

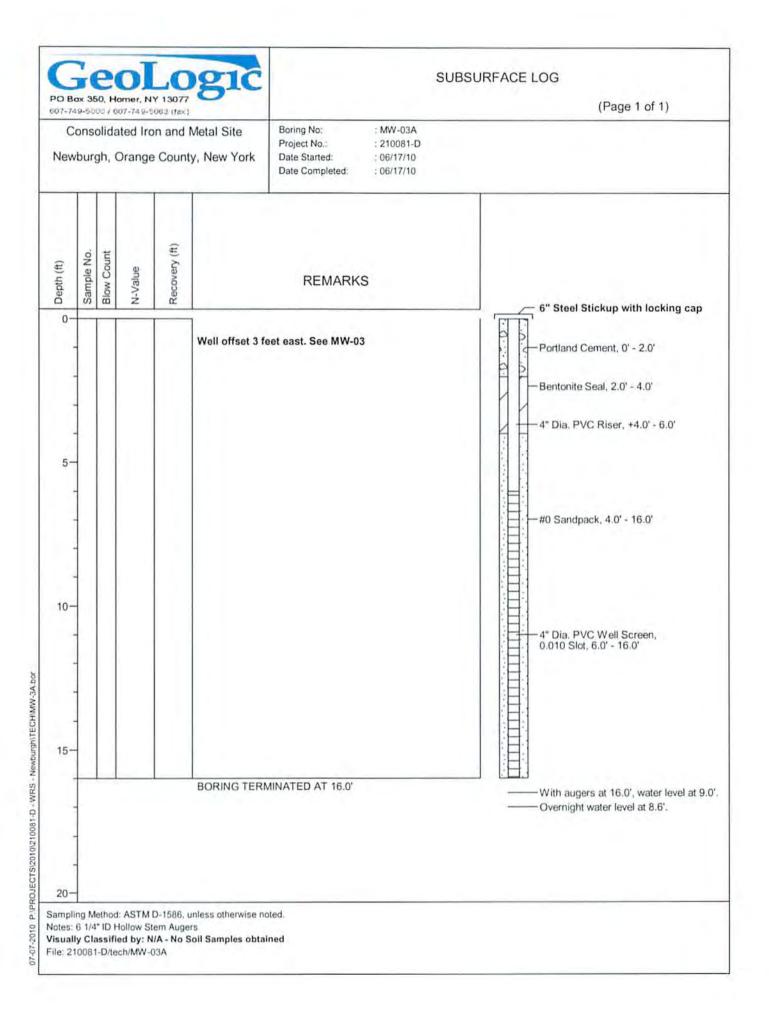
2. TOTAL VOLUME PURGED: <u>22 Gallons</u>

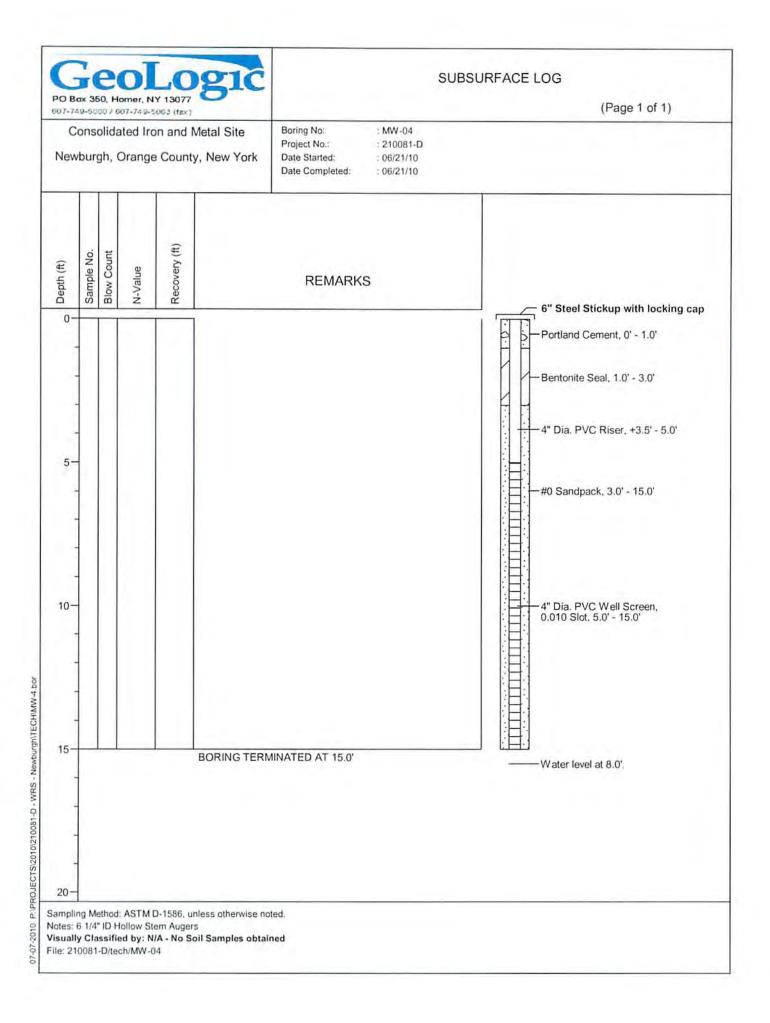


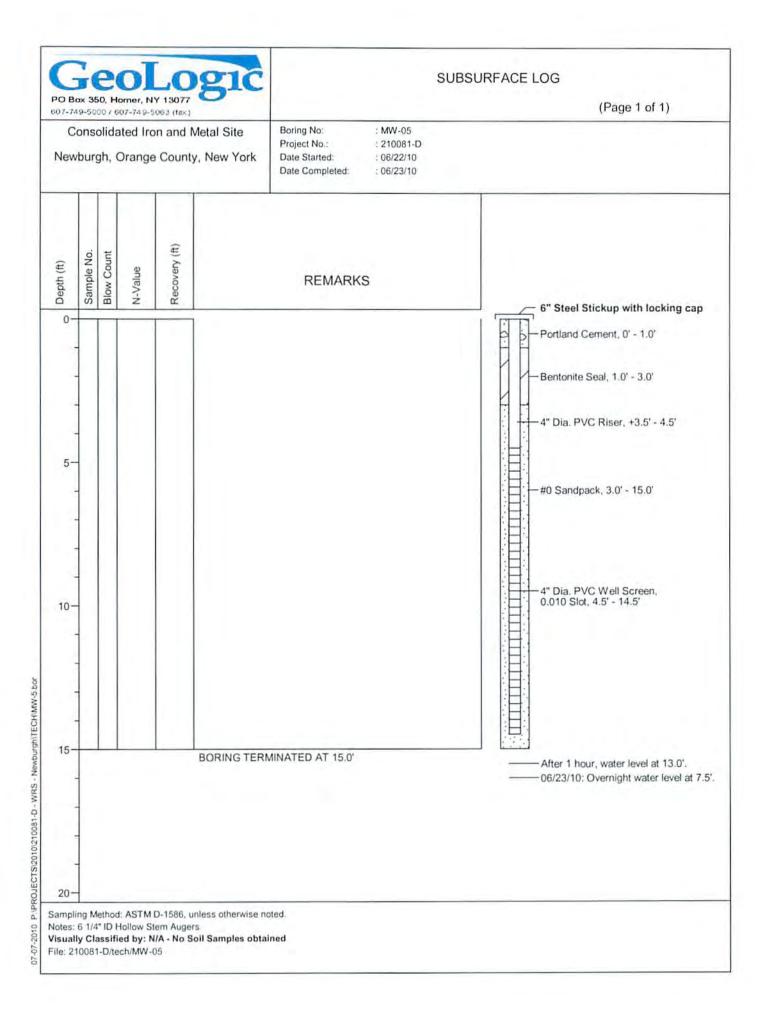
P:/PROJECTS/2010/210081-D - WRS - Newburgh/TECH/MW-1.bor

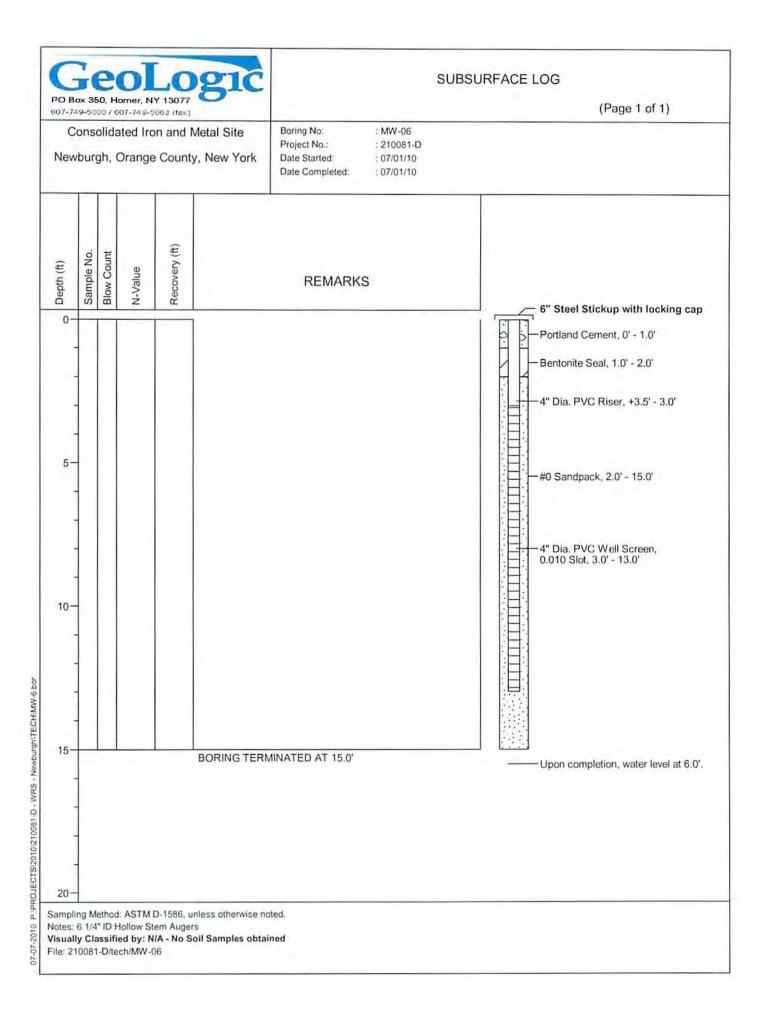


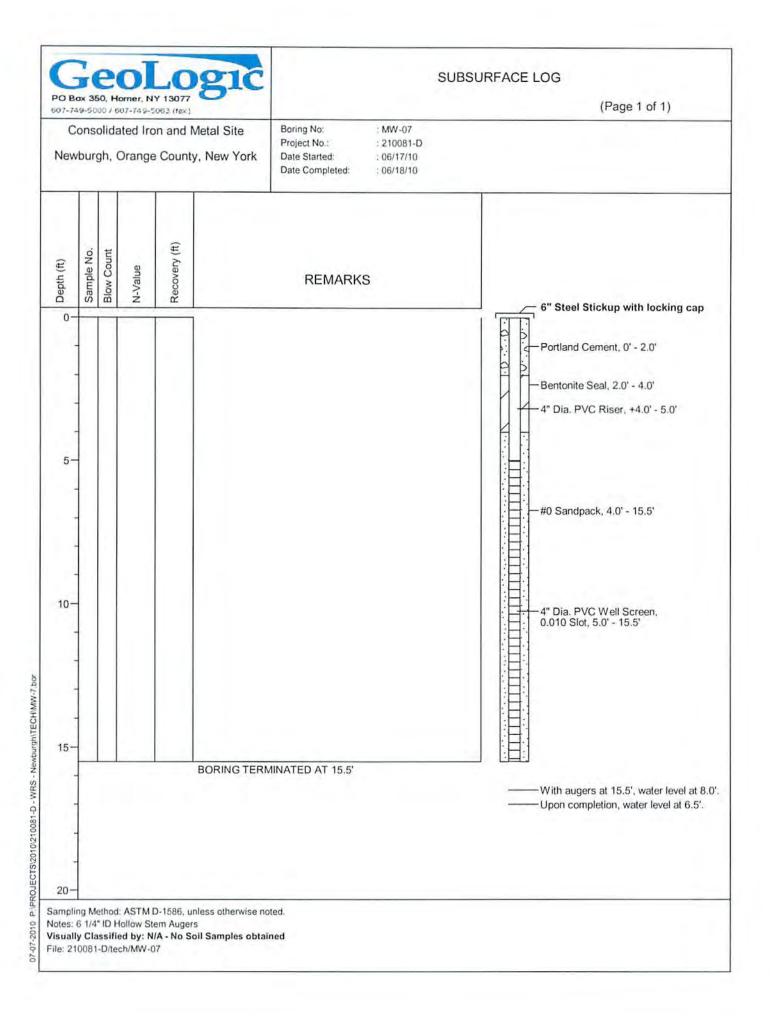
Consolidated Iron and Metal Site Newburgh, Orange County, New York		Metal Site	(Page 1 of 1) Boring No: : MW-03 Project No.: : 210081-D Date Started: : 06/17/10 Date Completed: : 06/17/10		
Depth (ft) Sample No. Blow Count	N-Value Recovery (ft)		DESCRIPTION	REMARKS	
				Note: Drilled to 15.0°, could not install we due to drilling over top of the previously abandoned well. Pulled out and regroute boring.	

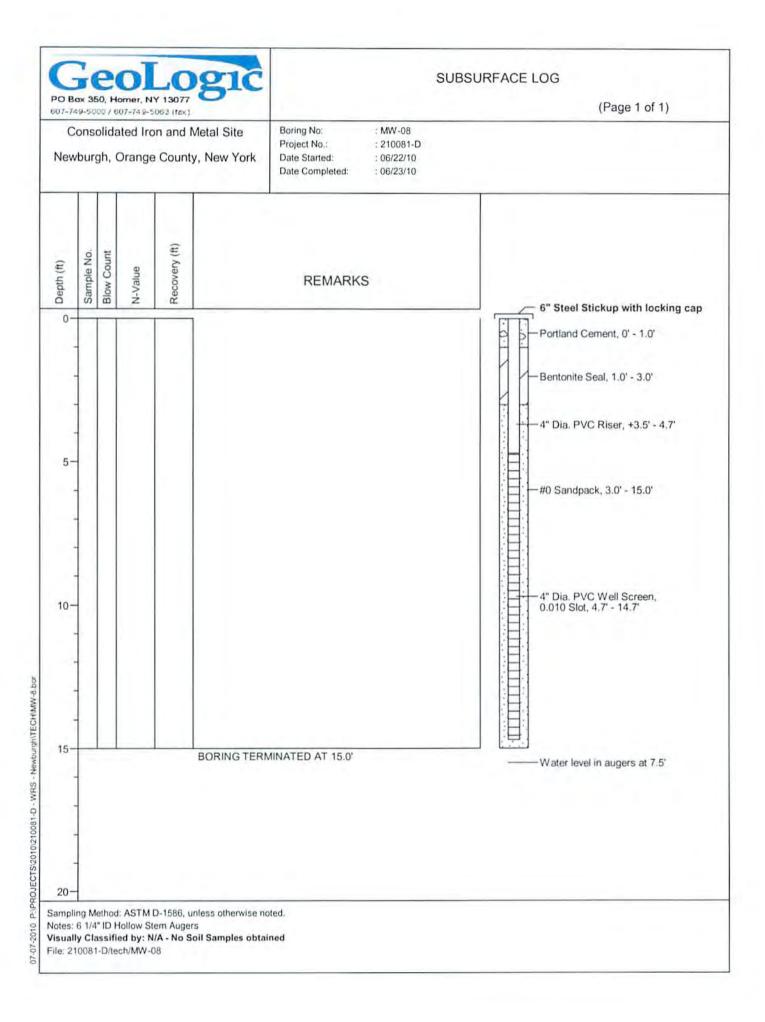


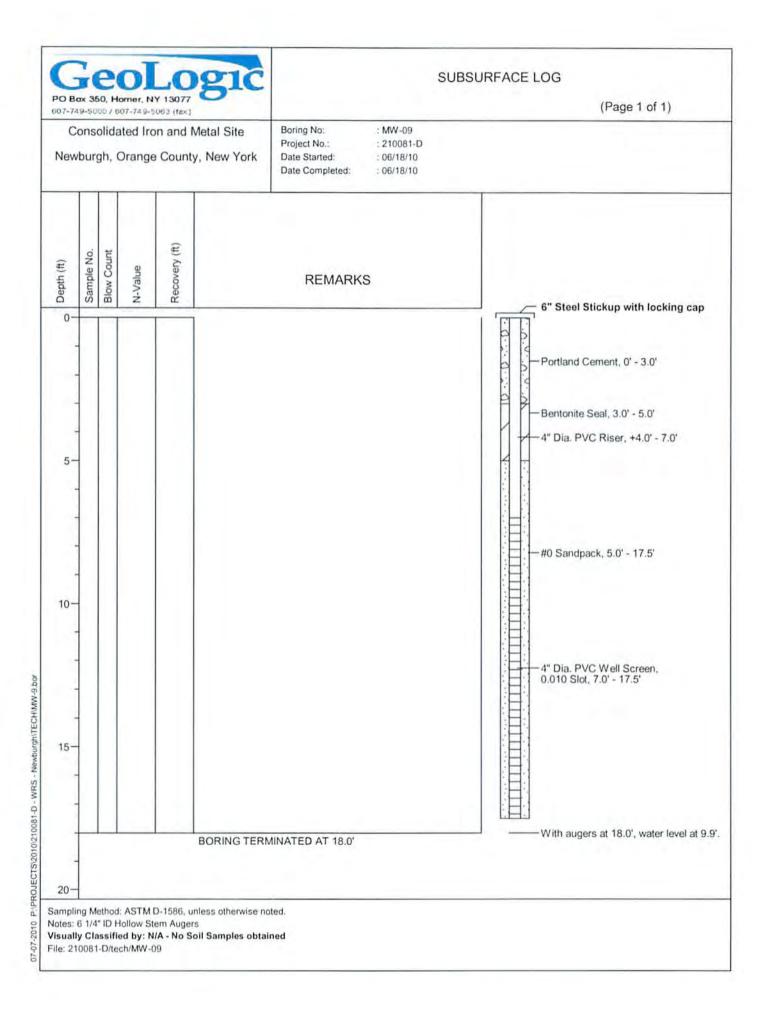


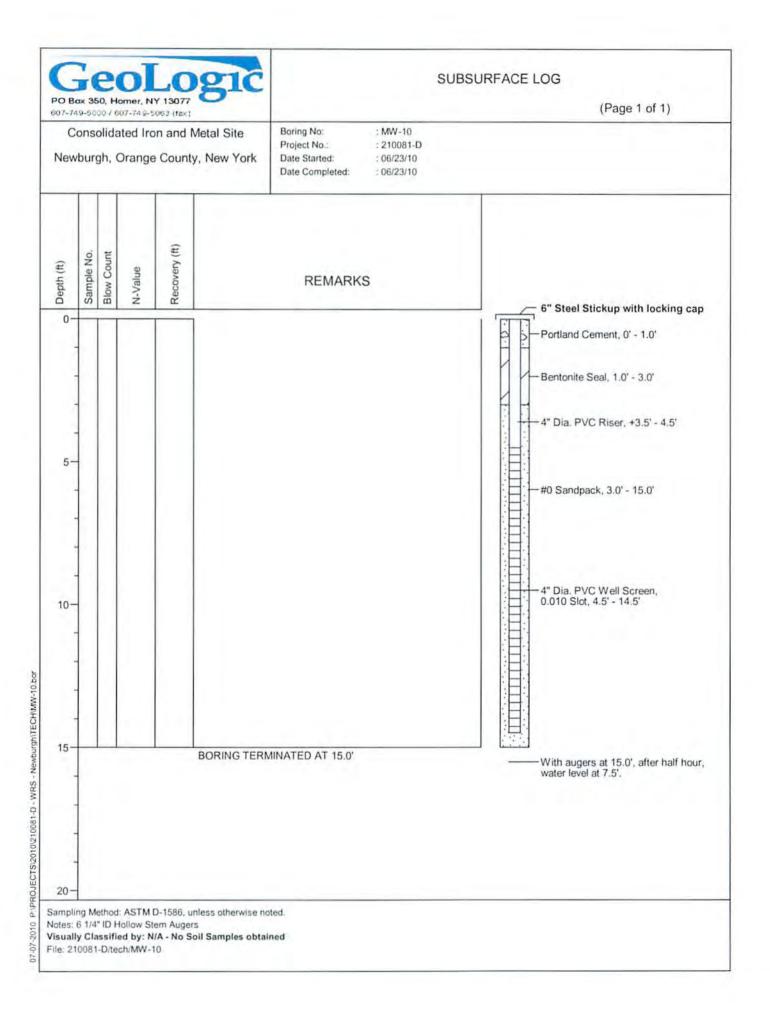












# C.T. MALE ASSOCIATES

# APPENDIX F

# GROUNDWATER SAMPLING LOGS

C.T	Г. М <i>і</i>	ALE	ASS				
		2 2		GEOPROBE SUBS BORING NO.: ELEV.: START DATE: SHEET OF	SURFACE EXPLORATION LOG DATUM: FINISH DATE:		
PRO	JECT:			CTM PROJEC	T NO.:		
LOC	ATION:	:		CTM OBSE	RVER:		
	S	SAMPLE		1			
DEPTH (FT.)	INTERVAL	NUMBER	RECOVERY (FT)	SAMPLE CLASSIFICATION	NOTES		
_4	1		<u>ا</u>	4			
	1						
8	1		'	4			
	1						
<u>12</u>	1		<u> </u> '	1			
	1						
<u>16</u>	1		<u> </u> '				
20	1						
20	1						
24	1						
	1						
28	1		'	4			
	ING CON			GEOPROBE TYPE:	GROUNDWATER LEVEL READINGS		
	OD OF S/						
ASSE MAY H	SSMENT	T PURP	POSES. TO THE	IATION SHOWN HEREON WAS OBTAINED FOR C.T. MALE IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THE E SAME INFORMATION AVAILABLE TO C.T.MALE. IT IS PRESENTEI			
GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.							

## C.T. MALE ASSOCIATES

## **Groundwater Services Field Log**

DATE:		PROJECT NAME:		
PROJECT NO.:		PROJECT LOCATION:		
SAMPLING PERSONNEL:				
MONITORING WELL ID#:		NOTES TAKEN BY:		
DEPTH TO WATER: FROM:		BAILER ID:		
DEPTH TO BOTTOM: FROM:		BAILER: LAB CLEANED / FIELD CLEANED		
WATER COLUMN HEIGHT:	BAILER: STAINLESS STEEL			
		OTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: GALLONS TIME STARTED: OBSERVATIONS: COLOR GALLONS SHEEN OTHER GALLONS	; ;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS PURGE METHOD: TIME FINISHED: ODOR TURBIDITY		
WATER RECOVERY HEIGHT:	;	RECOVERY TIME IN MINUTES:		
FIELD PARAMETERS: pH	/	TEMPERATURE		
CONDUCTIVITY	1	OTHER		
SAMPLE COLLECTION TIME:				
NOTES:				



# Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers

## **GROUND WATER FORUM ISSUE PAPER**

Douglas Yeskis\* and Bernard Zavala\*\*

#### BACKGROUND

The Ground Water, Federal Facilities and Engineering Forums were established by professionals from the United States Environmental Protection Agency (USEPA) in the ten Regional Offices. The Forums are committed to the identification and resolution of scientific, technical, and engineering issues impacting the remediation of Superfund and RCRA sites. The Forums are supported by and advise OSWER's Technical Support Project, which has established Technical Support Centers in laboratories operated by the Office of Research and Development (ORD), Office of Radiation Programs, and the Environmental Response Team. The Centers work closely with the Forums providing state-of-the-science technical assistance to USEPA project managers.

This document provides sampling guidelines primarily for ground-water monitoring wells that have a screen or open interval with a length of ten feet or less and which can accept a sampling device. Procedures that minimize disturbance to the aquifer will yield the most representative ground-water samples. This document provides a summary of current and/or recommended ground-water sampling procedures. This document was developed by the Superfund/RCRA Ground Water Forum and incorporates comments from ORD, Regional Superfund hydrogeologists and others. These guidelines are applicable to the majority of sites, but are not intended to replace or supersede regional and/or project-specific sampling plans. These guidelines are intended to assist in developing sampling plans using the project-specific goals and objectives. However, unusual and/or site-specific circumstances may require approaches other than those specified in this document. In these instances, the appropriate Regional hydrologists/geologists should be contacted to establish alternative protocols.

#### ACKNOWLEDGMENTS

A document of this scope involved significant participation from a number of people, such that any omission in these acknowledgments is purely unintentional. We thank all of the participants involved in the development of this document! The authors acknowledge the active participation and valuable input from the committee from the Ground Water Forum of Dick Willey, Region 1; Ruth Izraeli and Kevin Willis, Region 2; Kathy Davies, Region 3; Robert Puls, ORD-NRMRL; and Steve Gardner, ORD-NERL. In addition, valuable input from former members of the committee are gratefully acknowledged. And finally, the peer reviews of the document completed by Franceska Wilde of the Water Division of the U.S. Geological Survey, Reston, VA; Richard Duwelius and Randy Bayless of the Indiana District of the U.S. Geological Survey, Indianapolis, IN; Steve White of the Omaha District of the U.S. Army Corps of Engineers, Omaha, NE and Karl Pohlmann of the Desert Research Institute, Las Vegas, NV are gratefully acknowledged.



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Walter W. Kovalick, Jr., Ph.D. Director

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#### INTRODUCTION

The goal of ground-water sampling is to collect samples that are "representative" of in-situ groundwater conditions and to minimize changes in groundwater chemistry during sample collection and handling. Experience has shown that ground-water sample collection and handling procedures can be a source of variability in water-quality concentrations due to differences in sampling personnel, sampling procedures, and equipment (U.S. Environmental Protection Agency, 1995).

Several different ground-water sampling procedures can be used, which vary primarily through the criteria used to determine when a sample is representative of ground-water conditions. No single method or procedure is universally applicable to all types of groundwater-sampling programs; therefore, consideration should be given to a variety of factors when determining which method is best suited to sitespecific conditions. These site-specific conditions include sampling objectives, equipment availability, site location, and physical constraints. This paper will discuss each of these conditions and how they may contribute to the decision in choosing the appropriate sampling methodology and equipment to be used during ground-water sampling.

This paper focuses on ground-water sampling procedures for monitoring wells only where separate, freephase, Non-Aqueous Phase Liquids (NAPLs) are not present in the monitoring well. Residential and/or municipal-production wells where special sampling procedures and considerations need to be implemented are not discussed in this document. The recommendations made in this paper are based on findings presented in the current literature, and will be subject to revision as the understanding of groundwater-sampling procedures increases.

#### SAMPLING OBJECTIVES

The objective of a good sampling program should be the collection of a "representative" sample of the current ground-water conditions over a known or specified volume of aquifer. Ideally to meet this objective, sampling equipment, sampling method, monitoring well construction, monitoring well operation and maintenance, and sample handling procedures should not alter the chemistry of the sample. A sample that is obtained from a poorly constructed well, or using improper sampling equipment, or using poor sampling techniques, or which has been preserved improperly, can bias the sampling results. Unrepresentative samples can lead to misinterpretations of ground-water-quality data. Generally, the costs of obtaining representative ground-water samples are insignificant when compared to potential remedial responses that may be implemented based on erroneous data or when considering the overall monitoring program costs over the life of the program (Nielson, 1991).

The data quality objectives (DQOs) of the sampling program should be thoroughly developed, presented and understood by all parties involved. To develop the DQOs, the purpose of the sampling effort and data use(s) should be clearly defined. The sampling guidelines presented here can be used for a variety of monitoring programs, these include site assessment, contaminant detection, site characterization, remediation, corrective action and compliance monitoring.

For example DQOs for a site characterization sampling effort might vary from those of a remediation monitoring sampling effort. This difference could be in how much of the screen interval should be sampled. A site characterization objective may be to collect a sample that represents a composite of the entire (or as close as is possible) screened interval of the monitoring well. On the other hand, the monitoring objective of a remediation monitoring program may be to obtain a sample that represents a specific portion of the screened interval.

Additionally, the site characterization may require analyses for a broad suite of contaminants, whereas, the remediation monitoring program may require fewer contaminants to be sampled. These differences may dictate the type of sampling equipment used, the type of information collected, and the sampling protocol.

In order to develop applicable DQOs, a site conceptual model should be developed. The site conceptual model should be a dynamic model which is constantly revised as new information is collected and processed. The conceptual model, as it applies to the DQOs, should focus on contaminant fate and transport processes, such as contaminant pathways, how the geologic materials control the contaminant pathways (depositional environments, geologic structure, lithology, etc.), types of contaminants present (i.e., hydrophobic versus hydrophilic), and the processes that influence concentrations of the contaminants present such as dilution, biodegradation, and dispersion. The detail of the conceptual model will depend greatly on the availability of information, such as the number of borings and monitoring wells and the amount of existing analytical data. Clearly, a site that is being investigated for the first time will have a much simpler conceptual model compared to a site that has had a Remedial Investigation, Feasibility Study, and Remedial Design, (or, within the RCRA Program, a RCRA Facility Assessment, a RCRA Facility Investigation, and a Corrective Measures Study), and is currently in remediation/corrective action monitoring. Specific parameters that a conceptual model should describe that may impact the design of a groundwater-sampling program include:

> a) The thickness, lateral extent, vertical and horizontal flow direction, and hydraulic conductivity contrasts of the geologic materials controlling contaminant transport from the site (thick units versus thin beds versus fractures, etc.)

b) The types of contaminants to be sampled (volatile organic compounds, semi-volatile organic compounds, metals, etc.) and factors that could bias sampling results (turbidity for metals, co-solvation effects on PCBs, etc.)

c) Lateral and vertical distribution of contamination (contaminants distributed throughout an entire unit being monitored versus localized distribution controlled by small scale features, etc.) Vertical aquifer characterization is strongly recommended prior to the completion of a ground-water monitoring well installation program. A detailed vertical aquifer characterization program should include field characterization of hydraulic conductivities, determination of vertical and horizontal flow directions, assessment of lithologic and geologic variations, and determination of vertical and horizontal contaminant distributions. The successful aquifer characterization program provides detailed information to guide the technical and cost-effective placement, vertically and areally, of monitoring wells.

#### INFORMATION NEEDED PRIOR TO SAMPLING

To ensure appropriate methodology and expedient collection of water-quality samples, information is needed before a sample is collected. Some information should be obtained prior to the start of field activities such as well condition, construction, water-level information, contaminant types and concentrations, and direction(s) of ground-water flow. Field measurements, such as depth to water and total well depth will be needed prior to purging. Before commencement of all field activities, the field health and safety plan should be consulted under the direction of the site health and safety officer.

#### BACKGROUND DATA

Well construction and maintenance information are needed to better plan the sampling program, optimize personnel, and obtain more representative samples. Prior to field activities, personnel should have specific information including well casing diameter, borehole diameter, casing material, lock number and keys, physical access to wells, and length of and depth to well screen. The diameter of each well casing is used to select the correct equipment and technique for purging and sampling the well. A site map with possible physical barriers and description of access is necessary to allow for the selection of proper equipment based on several factors, such as portability, ease of repair, power sources, containment of purge water, and well accessibility. The length and depth of each well screen and depth to water is important when placing a sampling device's intake at the proper depth for purging and sampling and for choosing a sampling device. Well development information is needed to ensure that purging and sampling rates will not exceed well development extraction rates. Previous sampling information should be provided and

evaluated to determine the nature and concentrations of expected contaminants. This will be useful in determining the appropriate sampling method and quality assurance/quality control (QA/QC) samples (for example, field duplicates, equipment blanks, trip blanks). Attachment 1 is an example of a sampling checklist for field personnel. This information should be kept in the field for easy access during sampling activities.

When evaluating previous sampling information, consideration should be given to the amount of time that has expired between the last sampling effort and the planned sampling effort. If this time exceeds one year, the need for redevelopment of the monitoring wells should be evaluated. The necessity of redevelopment can be evaluated by measuring constructed depth compared to the measured depth. If the depth measurement indicates siltation of the monitoring well screen, or evidence exists that the well screen is clogged, the well should be redeveloped prior to sampling. The assessment of the condition of the monitoring wells should be completed several weeks prior to sampling activities in order to allow the proper recovery of the developed wells. This is especially important in wells where prior sampling has indicated high turbidity. The time for a well to re-stabilize after development is dependent on site-specific geology and should be specified in the site sampling plan. The development method, if necessary, should be consistent with the sampling objectives, best technical criteria and USEPA guidelines (Aller et al., 1991; Izraeli et al., 1992; Lapham et al., 1997).

#### **REFERENCE POINT**

Each well should be clearly marked with a well identifier on the outside and inside of the well casing. Additionally, each well should have a permanent, easily identified reference point from which all depth measurements are taken. The reference point (the top of the inner casing, outer casing, or security/protective casing) should remain constant through all measurements, should be clearly marked on the casing and its description recorded. Whenever possible, the inner casing is recommended as a reference point, because of the general instability of outer casings due to frost heaving, vehicular damage, and other phenomena which could cause movement of casings. The elevation of this reference point should be known and clearly marked at the well site (Nielson, 1991). This reference point should also have a known latitude and longitude that are consistent with the Regional and National Minimum Data Elements requirements. The elevation of the reference point should be surveyed relative to Mean Sea Level (MSL) using the NAVD 88 datum.

#### TOTAL WELL DEPTH

The depth of the well is required to calculate the volume of standing water in the well and to document the amount of siltation that may have occurred. Moreover, measuring the depth to the bottom of a well provides checks for casing integrity and for siltation of the well screen. Corrosion can cause leaking or collapse of the well casing, which could lead to erroneous or misleading water-level measurements. Corrosion, silting, and biofouling can clog well screens and result in a sluggish response or no response to water-level changes, as well as changes in ground-water chemistry. Well redevelopment or replacement may be needed to ensure accurate collection of a representative water-quality sample.

Total well depths should be measured and properly recorded to the nearest one-tenth of a foot using a steel tape with a weight attached. The steel tape should be decontaminated before use in another well according to the site specific protocols. A concern is that when the steel tape and weight hit the bottom of the well, sediment present on the bottom of a well may be stirred up, thus increasing turbidity which will affect the sampling results. The frequency of total well depth measurements varies, with no consensus for all hydrogeologic conditions. The United States Geological Survey (USGS) recommends a minimum of once a year (Lapham et al., 1997). USEPA also recommended one measurement per year (Barcelona et al., 1985) but later recommended a total well depth be taken every time a water-quality is collected or a water-level reading taken (Aller et al., 1991). Therefore, when possible, the total depth measurements should be taken following the completion of sampling (Puls and Barcelona, 1996). When total-well-depth measurements are needed prior to sampling, as much time as possible should be allowed prior to sampling, such as a minimum of 24 hours. The weight of electric tapes are generally too light to determine accurate total well depth. If the total well depth is greater than 200 feet, stretching of the tape must be taken into consideration.

#### DEPTH TO WATER

All water levels should be measured from the reference point by the use of a weighted steel tape and chalk or an electric tape (a detailed discussion of the pros and cons of the different water level devices is provided in Thornhill, 1989). The steel tape is a more accurate method to take water levels, and is recommended where shallow flow gradients (less than 0.05 foot/feet or 0.015 meter/meters) or deep wells are encountered. However, in those cases where large flow gradients or large fluctuations in water levels are expected, a calibrated electric tape is acceptable. The water level is calculated using the well's reference point minus the measured depth to water. At depths approximately greater than 200 feet, the water-levelmeasuring device should be chosen carefully, as some devices may have measurable stretching.

The depth-to-water measurement must be made in all wells to be sampled prior to activities in any single well which may change the water level, such as bailing, pumping, and hydraulic testing. All readings are to be recorded to the nearest one-hundredth of a foot.

The time and date of the measurement, point of reference, measurement method, depth-to-water level measurement, and any calculations should be properly recorded. In addition, any known, outside influences (such as tidal cycles, nearby pumping effects, major barometric changes) that may affect water levels should be noted.

#### **GROUND-WATER SAMPLING METHODS**

The ground-water sampling methods to be employed should be dependent on site-specific conditions and requirements, such as data-quality objectives and well accessibility. Ground-water sampling methods vary based on the type of device used, the position of the sampler intake, the purge criteria used, and the composition of the ground water to be sampled (e.g., turbid, containing high volatile organics, etc.). All sampling methods and equipment should be clearly documented, including purge criteria, field readings, etc. Examples of appropriate documentation are provided in Attachment 2 of this document and Appendix E of the U.S. Environmental Protection Agency, 1995 document. The water in the screen and filter pack is generally in a constant state of natural flux as ground water passes in and out of the well. However, water above the screened section remains relatively isolated and become stagnant. Stagnant water is subject to physio-chemical changes and may contain foreign material, which can be introduced from the surface or during well construction, resulting in non-representative sample data. To safeguard against collecting a sample biased by stagnant water, specific well-purging guidelines and techniques should be followed.

A non-representative sample also can result from excessive pumping of the monitoring well. Stratification of the contaminant concentrations in the aquifer may occur, or heavier-than-water compounds may sink to the lower portions of the aquifer. Excessive pumping can dilute or increase the contaminant concentrations from what is representative of the sampling point.

#### PURGING AND SAMPLING DEVICES

The device used to purge and sample a well depends on the inner casing diameter, depth to water, volume of water in the well, accessibility of the well, and types of contaminants to be sampled. The types of equipment available for ground-water sampling include hand-operated or motor-driven suction pumps, peristaltic pumps, positive displacement pumps, submersible pumps, various in-situ devices and bailers made of various materials, such as PVC, stainless steel and Teflon®. Some of these devices may cause volatilization and produce high pressure differentials, which could result in variability in the results of pH, dissolved oxygen concentrations, oxidation-reduction potential, specific electrical conductance, and concentrations of metals, volatile organics and dissolved gases. Therefore, the device chosen for well purging and sampling should be evaluated for the possible effects it may have on the chemical and physical analyses. In addition, the types of contaminants, detection levels, and levels of concern as described by the site DQOs should be consulted prior to the selection of a sampling device. The same device used for purging the monitoring well should be used for sampling to minimize agitation of the water column (which can increase turbidity, increase volatilization, and increase oxygen in the water).

In general, the device used for purging and sampling should not change geochemical and physical parameters and/or should not increase turbidity. For this reason, low-flow submersible or positive-displacement pumps that can control flow rates are recommended for purging wells. Dedicated sampling systems are greatly preferred since they avoid the need for decontamination of equipment and minimize turbulence in the well. If a sampling pump is used, the pump should be lowered into the well as slowly as possible and allowed to sit as long as possible, before pumping commences. This will minimize turbidity and volatilization within the well.

Sampling devices (bladders, pumps, bailers, and tubing) should be constructed of stainless steel, Teflon®, glass, and other inert materials to reduce the chance of these materials altering the ground water in areas where concentrations of the site contaminants are expected to be near detection limits. The sample tubing thickness should be maximized and the tubing length should be minimized so that the loss of contaminants through the tubing walls may be reduced and the rate of stabilization of ground-water parameters is maximized. The tendency of organics to sorb into and out of many materials makes the appropriate selection of sample tubing materials critical for these trace analyses (Pohlmann and Alduino, 1992; Parker and Ranney, 1998). Existing Superfund and RCRA guidance suggest appropriate compatible materials (U.S. Environmental Protection Agency, 1992). Special material considerations are important when sampling for non-routine analyses, such as agedating and biological constituents.

Preferably, wells should be purged and sampled using a positive-displacement pump or a low-flow submersible pump with variable controlled flow rates and constructed of chemically inert materials. If a pump cannot be used because the recovery rate is so slow (less than 0.03 to 0.05 gallons per minute or 100 to 200 milliliters per minute) and the volume of the water to be removed is minimal (less than 5 feet (1.6 meters) of water), then a bailer with a double check valve and bottom-emptying device with a control-flow check valve may be used to obtain the samples. Otherwise, a bailer should not be used when sampling for volatile organics because of the potential bias introduced during sampling (Pohlmann, et al., 1990; Yeskis, et al., 1988; Tai, et al., 1991). A peristaltic pump also may be used under these conditions, unless the bias by a negative pressure may impact the contaminant concentrations of concern (generally at depths greater than 15 to 20 feet (4.5 to 6 meters) of lift). Bailers should also be avoided when sampling for metals due to increased turbidity that occurs during the deployment of the bailer, which may bias inorganic and strongly hydrophobic parameters. Dedicated sampling pumps are recommended for metals sampling because the pumps avoid the generation of turbidity from frequent sampler deployment (Puls et al., 1992). A number of alternate sampling devices are becoming available, including passive diffusion samplers (Vroblesky and Hyde, 1997; Vroblesky, 2001a and b) and other in-situ sampling devices. These devices may be particularly useful to sampling lowpermeability geologic materials, assuming the device is made of materials compatible with the analytical parameters, meet DQOs, and have been properly evaluated. However, the site investigator should ensure the diffusion membrane materials are selected for the contaminants of concern (COCs) present at the site. Comparison tests with an approved sampling method and diffusion samplers should be completed to confirm that the method is suitable for the site.

#### POSITION OF SAMPLE INTAKE

Essentially there are two positions for placement of the sample pump intake, within the screen and above the screen. Each of the positions offers advantages and disadvantages with respect to the portion of the well screen sampled, data reproducibility and potential purge volumes.

When the sampling pump intake is set above the well screen, the pump generally is set just below the water level in the well. The sampling pump then is pumped until a purge criterion is reached (commonly either stabilization of purge parameters or a set number of well volumes). If the distance between the water level and the top of the screen is long, there is concern that the water will be altered geochemically as it flows along the riser pipe, as water flows between the well screen and the sampling pump intake. This is especially a concern if the riser pipe is made of similar material as the COC (such as a stainless steel riser with nickel as a COC, or PVC with organics as a COC). Keely and Boateng (1987) suggested that to minimize this potential influence, the sample pump be lowered gradually while purging, so that at the time of

the sampling the pump intake is just above the screen. This would minimize contact time between the ground water and the well construction materials while sampling, as well as ensure the evacuation of the stagnant water above the screen.

With the final location of the sampling pump intake just above the well screen, the sample results may be more reproducible than those collected by positioning the pump intake within the well screen. Results may be more reproducible because the sampler can ensure that the ground water is moving into the well with the same portions of the aquifer being sampled each time assuming the same pump rate. If the pump is placed into different portions of the screen each time, different portions of the aquifer may be sampled. Of course, this can be avoided by the use of dedicated, permanently installed equipment. Additionally, the placement of the pump at the same vertical position within the screen can be ensured by the use of calibrated sampling pump hose, sounding with a weighted tape, or using a pre-measured hose.

The placement of the pump above the screen does not guarantee the water-quality sample represents the entire well screen length. Any bias in the pump placement will be consistently towards the top of the well screen and/or to the zone of highest hydraulic conductivity. Another possible disadvantage, or advantage, depending on the DQOs, of the placement of the pump above the well screen is that the sample may represent a composite of water quality over the well screen. This may result in dilution of a portion of the screen that is in a contaminated portion of an aquifer with another portion that is in an uncontaminated portion of the aquifer. However, shorter well screens would minimize this concern.

When the pump intake is positioned within the well screen, its location is recommended to be opposite the most contaminated zone in the well screen interval. This method is known as the low-flow, low-stress, micropurge, millipurge, or minimal drawdown method. The well is then purged with a minimal drawdown (usually 0.33 feet (0.1 meters) based on Puls and Barcelona, 1996) until selected water-quality-indicator parameters have stabilized. Use of this method may result in the vertical portion of the sampled aquifer being smaller than the well screen length. This method is applicable primarily for short well-screen lengths (less than 5 feet (1.6 meters)) to better characterize the vertical distribution of contaminants (Puls and Barcelona, 1996). This method should not be used with well-screen lengths greater than 10 feet (3 meters). By using this method, the volume of purge water can be reduced, sometimes significantly, over other purging methods.

However, two potential disadvantages of this method exist. The first potential disadvantage may involve the lower reproducibility of the sampling results. The position of the sampling pump intake may vary between sampling rounds (unless adequate precautions are taken to lower the pump into the exact position in previous sampling rounds, or a dedicated system is used), which can result in potentially different zones within the aquifer being sampled. This potential problem can be overcome by using dedicated sampling pumps and the problem may be minimized by the use of short well screens. The second potential disadvantage, or advantage, depending on the DQOs, may be that the sample which is collected may be taken from a small portion of the aquifer volume.

#### **PURGE CRITERIA**

#### "Low-Stress Approach"

The first method for purging a well, known as the lowstress approach, requires the use of a variable-speed, low-flow sampling pump. This method offers the advantage that the amount of water to be containerized, treated, or stored will be minimized. The low-stress method is based on the assumption that pumping at a low rate within the screened zone will not draw stagnant water down, as long as drawdown is minimized during pumping. Drawdown should not exceed 0.33 feet (0.1 meters) (Puls and Barcelona, 1996). The pump is turned on at a low flow rate approximating the estimated recovery rate (based on the drawdown within the monitoring well during sampling). This method requires the location of the pump intake to be within the saturated-screened interval during purging and sampling. The water-qualityindicator parameters (purge parameters), pH, specific electrical conductance, dissolved oxygen concentration, oxidation-reduction potential, temperature and turbidity, are monitored at specific intervals. The specific intervals will depend on the volume within the tubing (include pump and flow-through cell volumes), pump rate and drawdown; commonly every three to

five minutes. These parameters should be recorded after a minimum of one tubing volume (include pump and flow-through-cell volumes) has been purged from the well. These water-quality-indicator parameters should be collected by a method or device which prevents air from contacting the sample prior to the reading, such as a flow-through cell (Barcelona et al., 1985; Garske and Schock, 1986; Wilde et al., 1998). Once three successive readings of the water-qualityindicator parameters provided in Table 1 have stabilized, the sampling may begin. The water-qualityindicator parameters that are recommended include pH and temperature, but these are generally insensitive to indicate completion of purging since they tend to stabilize rapidly (Puls and Barcelona, 1996). Oxidation-reduction potential may not always be an appropriate stabilization parameter, and will depend on site-specific conditions. However, readings should be recorded because of its value as a double check for oxidizing conditions, and for some fate and transport issues. When possible, especially when sampling for contaminants that may be biased by the presence of turbidity, the turbidity reading is desired to stabilize at a value below 10 Nephelometric Turbidity Units (NTUs). For final dissolved oxygen measurements, if the readings are less than 1 milligram per liter, they should be collected with the spectrophotometric method (Wilde et al., 1998, Wilkin et al., 2001), colorimetric or Winkler titration (Wilkin et al., 2001). All of these water-quality-indicator parameters should be evaluated against the specifications of the accuracy and resolution of the instruments used.

During purging, water-level measurements must be taken regularly at 30-second to five-minute intervals (depending on the hydraulic conductivity of the aquifer, diameter of the well, and pumping rate) to document the amount of drawdown during purging. The water-level measurements will allow the sampler to control pumping rates to minimize drawdown in the well.

#### "Well-Volume Approach"

The second method for purging wells is based on proper purging of the stagnant water above the screened interval and the stabilization of waterquality-indicator parameters prior to sampling. Several considerations in this method need to be evaluated before purging. For monitoring wells where the water level is above the screens, the pump should be set near the top of the water column, and slowly lowered during the purging process. For water columns within the well screen, the pump should be set at a sufficient depth below the water level where drawdown during pumping does not allow air to enter the pump. The pump should not be allowed to touch or draw sediments from the bottom of the well, especially when sampling for parameters that may be impacted by turbidity. The well-purging rate should not be great enough to produce excessive turbulence in the well, commonly no greater than one gallon per minute (3.8 liters per minute) in a 2-inch well. The pump rate during sampling should produce a smooth, constant (laminar) flow rate, and should not produce turbulence during the filling of bottles. As a result, the expected flow rate for most wells will be less than one gallon per minute (3.8 liter per minute), with expected flow rates of about one-quarter gallon per minute (500 milliliter per minute).

The stabilization criteria for a "well-volume approach" may be based on the stabilization of water-qualityindicator parameters or on a pre-determined well volume. Various research indicates that purging criteria based on water-quality-indicator parameter stabilization may not always correlate to stabilization of other parameters, such as volatile organic compounds (Gibs and Imbrigiotta, 1990; Puls et al., 1990). A more technically rigorous sampling approach that would yield more consistent results over time would be a time-sequential sampling program at regular wellvolume intervals while measuring water-qualityindicator parameters. However, the cost would be prohibitive for most sites. For comparison of waterquality results, by sampling under the same conditions (same purge volume and rate, same equipment, same wells, etc.) temporal evaluations of trends may be considered.

The stabilization requirements of the water-qualityindicator parameters are consistent with those described above for the low-stress approach. The parameters should be recorded approximately every well volume; when three successive readings have reached stabilization, the sample(s) are taken (Barcelona et al., 1985). If a ground-water monitoring well has been sufficiently sampled and characterized (at least several rounds of water-quality samples obtained, including the field parameters, during several seasonal variations), and if water-quality-indicator parameters are no longer needed as a part of site characterization and/or monitoring, then samples could be obtained based on a specific number of well volumes at the previous pumping rates.

#### LOW-PERMEABILITY FORMATIONS

Different procedures must be followed in the case of slow-recovery wells installed in low hydraulic conductivity aguifers. The following procedures are not optimum, but may be used to obtain a ground-water sample under less than ideal conditions. One suggested procedure is to remove the stagnant water in the casing to just above the top of the screened interval, in a well screened below the water table, to prevent the exposure of the gravel pack or formation to atmospheric conditions (McAlary and Barker, 1987). At no point should the pump be lowered into the screened interval. The pumping rate should be as low as possible for purging to minimize the drawdown in the well. However, if a well has an open interval across the water table in a low permeability zone, there may be no way to avoid pumping and/or bailing a well dry (especially in those cases with four feet of water or less in the well and at a depth to water greater than 20 to 25 feet (which is the practical limit of a peristaltic pump)). In these cases, the well may be purged dry. The sample should be taken no sooner than two hours after purging and after a sufficient volume for a water-quality sample, or sufficient recovery (commonly 90%) is present (Herzog et al., 1988). In these cases, a bailer with a double check valve with a flow-control, bottom-emptying device may be used, since many sampling pumps may have tubing capacities greater than the volume present within the well. If the depth of well and water column are shallow enough, consideration of a very low-flow device, such as a peristaltic pump, should be considered, especially if constituents are present that are not sensitive to negative pressures that may be created with the use of the peristaltic pump. If such constituents are present and sampled with a peristaltic pump, a negative bias may be introduced into the sampling results. To minimize the bias, thick-walled, non-porous tubing should be used, except for a small section in the pump heads, which require a greater degree of flexibility. As stated earlier in this paper, the DQOs for the sampling should be consulted to consider the potential impact of the sampling device on the potential bias versus the desired detection levels.

Another method to be considered for low-permeability conditions is the use of alternative sampling methods, such as passive diffusion samplers and other in-situ samplers. As more sites are characterized with these alternative sampling methods and devices, the potential bias, if any, can be evaluated with regard to the sampling DQOs. Regional hydrologists/geologists and Regional quality-assurance specialists should be consulted on the applicability of these methods for the site-specific conditions.

#### DECISION PROCESS FOR DETERMINING APPLICABLE SAMPLING METHODOLOGY

Once the project team has determined the sampling objectives and DQOs, reviewed the existing data, and determined the possible sampling devices that can be used, the team must decide the appropriate sampling methodology to be used. Table 2 provides a summary of considerations and rationale to be used in establishing the proper ground-water-sampling program using site-specific conditions and objectives.

#### POTENTIAL PROBLEMS

The primary objective is to obtain a sample representative of the ground water moving naturally (including both dissolved and particulate species) through the subsurface. A ground-water sample can be compromised by field personnel in two primary ways: taking an unrepresentative sample and handling the (representative) sample incorrectly. There are numerous ways of introducing foreign contaminants into a sample. These must be avoided by following strict sampling protocols and transportation procedures, and utilizing trained personnel. Common problems with sampling include the use of inappropriate sample containers and field composites, and the filtration of turbid samples.

#### SAMPLE CONTAINERS

Field samples must be transferred from the sampling equipment to the container that has been specifically prepared for that given parameter. Samples must not be composited in a common container in the field and then split in the lab. The USEPA Regional policy on sample containers should be consulted to determine the appropriate containers for the specified analysis.

#### FIELD FILTRATION OF TURBID SAMPLES

The USEPA recognizes that in some hydrogeologic environments, even with proper well design, installation, and development, in combination with the lowflow purging and sampling techniques, sample turbidity cannot be reduced to ambient levels. The well construction, development, and sampling information should be reviewed by the Regional geologists or hvdrologists to see if the source of the turbidity problems can be resolved or if alternative sampling methodologies should be employed. If the water sample is excessively turbid, the collection of both filtered and unfiltered samples, in combination with turbidity, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pumping rate, and drawdown data is recommended. The filter size used to determine TSS and TDS should be the same as used in the field filtration. An in-line filter should be used to minimize contact with air to avoid precipitation of metals. The typical filter media size used is 0.45 µm because this is commonly accepted as the demarcation between dissolved and non-dissolved species. Other filter sizes may be appropriate but their use should be determined based on site-specific criteria (examples include grain-size distribution, ground-water-flow velocities, mineralogy) and project DQOs. Filter sizes up to 10.0 µm may be warranted because larger size filters may allow particulates that are mobile in ground water to pass through (Puls and Powell, 1992). The changing of filter media size may limit the comparability of the data obtained with other data sets and may affect their use in some geochemical models. Filter media size used on previous data sets from a site, region or aguifer and the DQOs should be taken into consideration. The filter media used during the ground-water sampling program should be collected in a suitable container and archived because potential analysis of the media may be helpful for the determination of particulate size, mineralogy, etc.

The first 500 to 1000 milliliters of a ground-water sample (depending on sample turbidity) taken through the in-line filter will not be collected for a sample in order to ensure that the filter media has equilibrated to the sample (manufacturer's recommendations also should be consulted). Because bailers have been shown to increase turbidity while purging and sampling, bailers should be avoided when sampling for trace element, metal, PCB, and pesticide constituents. If portable sampling pumps are used, the pumps should be gently lowered to the sampling depth desired, carefully avoiding lowering it to the bottom of the well, and allowed to sit in order to allow any particles mobilized by pump placement to settle. Dedicated sampling equipment installed in the well prior to the commencement of the sampling activities is one of the recommended methods to reduce turbidity artifacts (Puls and Powell, 1992; Kearl et al., 1992; Puls et al., 1992; Puls and Barcelona, 1996).

#### SAMPLER DECONTAMINATION

The specific decontamination protocol for sampling devices is dependent on site-specific conditions, types of equipment used and the types of contaminants encountered. Once removed from the well, nondedicated sampling equipment should be decontaminated to help ensure that there will be no crosscontamination between wells. Disposable items such as rope and low-grade tubing should be properly disposed between wells. Cleaning thoroughly that portion of the equipment that is going to come into contact with well water is especially important. In addition, a clean plastic sheet should be placed adjacent to or around the well to prevent surface soils from coming in contact with the purging and sampling equipment. The effects of cross-contamination can be minimized by sampling the least contaminated well first and progressing to the more contaminated ones. Equipment blanks should be collected on a regular basis from non-dedicated equipment, the frequency depending on the sampling plan and regional protocols, to document the effectiveness of the decontamination procedures.

The preferred method is to use dedicated sampling equipment whenever possible. Dedicated equipment should still be cleaned on a regular basis to reduce biofouling, and to minimize adsorption effects. Dedicated equipment should have equipment blanks taken after every cleaning.

#### **POST-SAMPLING ACTIVITIES**

Specific activities should be completed at monitoring wells at regular intervals to ensure the acquisition of representative ground-water samples. Activities include hydraulic conductivity testing to determine if a monitoring well needs redeveloping and/or replacing. Another activity that needs to be completed is regular surveying of well measuring points impacted by frost heaving and site activities. The schedules of these activities are to be determined on a site-by-site basis in consultation with regional geologists or hydrologists, but at a minimum, should be every five years.

#### CONCLUSION

This document provides a brief summary of the stateof-the-science to be used for Superfund and RCRA ground-water studies. As additional research is completed, additional sampling experience with other sampling devices and methods and/or additional contaminants are identified, this paper may be revised to include the new information/concerns. Clearly there is no one sampling method that is applicable for all sampling objectives. As new methods and/or equipment are developed, additional standard operating procedures (SOPs) should be developed and attached to this document. These SOPs for groundwater sampling should include, at a minimum: introduction, scope and application, equipment, purging and sampling procedures, field quality control, decontamination procedures and references. Example SOP's for the low-stress/minimal-drawdown and wellvolume sampling procedures have been included as Attachments 3 and 4. These example SOPs are to be considered a pattern or starting point for site-specific ground-water-sampling plans. A more detailed discussion of sampling procedures, devices, techniques, etc. is provided in various publications by the USEPA (Barcelona et al., 1985; U.S. Environmental Protection Agency, 1993) and the U.S. Geological Survey (Wilde et al., 1998).

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# TABLES:

Stablization Criteria with References for Water-Quality-Indicator Parameters

and

Applicability of Different Approaches for Purging and Sample Monitoring Wells This page is intentionally blank.

TABLE 1: Stabilization Criteria with References for Water-Quality-Indicator Parameters

Parameter	Stabilization Criteria	Reference		
рН	+/- 0.1	Puls and Barcelona, 1996; Wilde et al., 1998		
specific electrical conductance (SEC)	+/- 3%	Puls and Barcelona, 1996		
oxidation-reduction potential (ORP)	+/- 10 millivolts	Puls and Barcelona, 1996		
turbidity	+/- 10% (when turbidity is greater than 10 NTUs)	Puls and Barcelona, 1996; Wilde et al., 1998		
dissolved oxygen (DO)	+/- 0.3 milligrams per liter	Wilde et al., 1998		

TABLE 2: Applicability of Different Approaches for Purging and Sampling Monitoring Wells	lls
Low-Stress Approach Well-Volume Approach	Others (such as passive diffusior samplers, in-situ samplers, and ot non-traditional ground-water samp

	Low-Stress Approach	Well-Volume Approach	<b>Others</b> (such as passive diffusion samplers, in-situ samplers, and other non-traditional ground-water sampling pumps)
Applicable Geologic Materials¹	Materials with moderate to high hydraulic conductivities. May be applicable to some low hydraulic conductivities, if can meet minimal drawdown criteria.	Materials with low to high hydraulic conductivities	Materials with very low to high hydraulic conductivities
Aquifer/Plume Characterization Data Needs prior to Choosing Sampling Method <sup>2</sup>	High definition of vertical hydraulic conductivity distribu- tion and vertical contaminant distribution	Plume and hydraulic conductivity distributions are less critical	May need to consider the degree of hydraulic and contaminant vertical distribution definition dependent on Data Quality Objectives and sampler type.
Constituent Types Method is Applicable	Mainly recommended for constituents which can be biased by turbidity in wells. Applicable for most other contaminants.	Applicable for all sampling parameters. However, if turbidity values are elevated, low-stress approach may be more appli- cable if constituents of concern are turbidity sensitive.	Constituents of concern will be dependent on the type of sampler.
Data Quality Objectives	<ol> <li>High resolution of plume definition both vertically and horizontally.</li> <li>Reduce bias from other sampling methods if turbidity is of concern.</li> <li>Target narrow sections of aquifer.</li> </ol>	<ol> <li>Basic site characterization</li> <li>Moderate to high resolution of plume definition (will be depen- dent on screen length).</li> <li>Target sample composition to represent entire screened/open interval</li> </ol>	<ol> <li>Can be applicable to basic site characterization, depending on sampler and methodology used.</li> <li>Can reduce bias from other sampling methods.</li> <li>May yield high resolution of plume definition.</li> </ol>

Hydraulic conductivities of aquifer materials vary from low hydraulic conductivities (clays, silts, very fine sands) to high conductivities (gravels, sands, weathered hydraulic conductivity. To assign absolute values of hydraulic conductivities to well performance and sustainable pumping rates cannot be completed because of ground-water sampling pump. For instance, in a well being pumped at 4 liters per minute (l/min) with less than 0.1 feet of drawdown, can be considered to have high hydraulic conductivity. A well that can sustain a 0.2 to 0.4 l/min pumping rate, but has more than 0.5 feet of drawdown can be considered to have low bedrock zones). This term for the use on this table is subjective, and is more dependent on the drawdown induced in a monitoring well when sampled with a the many factors in monitoring well construction, such as well diameter, screen open area, and length of screen.

<sup>2</sup> See last paragraph under the SAMPLING OBJECTIVES section.

ATTACHMENT 1 Example Sampling Checklist This page is intentionally blank.

#### SAMPLING CHECKLIST

Well Identification:\_\_\_\_\_

Map of Site Included: Y or N Wells Clearly Identified with Roads: Y or N Well Construction Diagram Attached: Y or N

#### Well Construction:

Diameter of Borehole:	Diameter of Casing:
Casing Material:	Screen Material:
Screen Length:	Total Depth:

Approximate Depth to Water:\_\_\_\_\_ Maximum Well Development Pumping Rate:\_\_\_\_\_ Date of Last Well Development:\_\_\_\_\_

#### **Previous Sampling Information:**

Was the Well Sampled Previously: Y or N (If Sampled, Fill Out Table Below)

Table of Previous Sampling Information										
Parameter	Previously Sampled	Number of Times Sampled	Maximum Concentration	Notes (include previous purge rates)						

This page is intentionally blank.

ATTACHMENT 2 Example Ground-Water Sampling Field Sheets This page is intentionally blank.

GROUND-WATER SAMPLING RECORD			D				Well ID:			
Facility Na	mo:				Date://			Station #:		
·										
Well Dept	h:	Depth to	epth to Water: Well Diameter:							
Casing Ma	aterial.:	Vo	II Volume:_							
Sampling Crew:										
Type of Pu	Imp:		Tubir	ng Material	l:Pump se			et atft.		
Weather Conditions:		NOTES:								
		GF	ROUND-WA	ATER SAMPLING PARAMETERS				 3		
Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. <u>(⁰C)</u>	SEC ( <u>µ</u> S/cm)	pН	ORP (mV)	Turbidity (NTU)	
			Parameters	tokon with						
			Falameters							
			)TR #:							
Paramete	rs Collected	ł			Num	ber of Bottle	es	Bottle Lot I	Number	
				-	_					
				-	_					
				_	_					

#### **Ground Water Sampling Log**

Site Name: Well Depth( Ft-BTOC <sup>1</sup> ):	Well #: Screen Interval(Ft):	Date:
Well Dia.:	Casing Material:	Sampling Device:
Pump placement(Ft from TOC <sup>2</sup> ):		
Measuring Point:	Water level (static)(Ft):	
Water level (pumping)(Ft):	Pump rate(Liter/min):	
Sampling Personnel:		

Other info: (such as sample numbers, weather conditions and field notes)

Time	Pumping rates (L/Min)	Water level (ft)	DO (mg/L)	ORP (mv)	SEC <sup>3</sup>	Turb. (NTU)	рН	Temp. (C <sup>0</sup> )	Volume pumped (L)

#### Water Quality Indicator Parameters

Type of Samples collected:

1 casing volume was:	Stabilizatio	n Criteria
Total volume purged prior to sample collection: <sup>1</sup> BTOC-Below Top of Casing	D.O.	+/- 0.3 mg/l
<sup>2</sup> TOC-Top of Casing	Turb.	+/- 10%
<sup>3</sup> Specific Electrical Conductance	S.C.	+/- 3%
	ORP	+/- 10 mV
	рН	+/- 0.1 unit

## ATTACHMENT 3 Example Standard Operating Procedure:

Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdow Ground-Water Sample Collection This page is intentionally blank.

#### INTRODUCTION

The collection of "representative" water samples from wells is neither straightforward nor easily accomplished. Ground-water sample collection can be a source of variability through differences in sample personnel and their individual sampling procedures, the equipment used, and ambient temporal variability in subsurface and environmental conditions. Many site inspections and remedial investigations require the sampling at ground-water monitoring wells within a defined criterion of data confidence or data quality, which necessitates that the personnel collecting the samples are trained and aware of proper samplecollection procedures.

The purpose of this standard operating procedure (SOP) is to provide a method that minimizes the impact the purging process has on the ground-water chemistry and the volume of water that is being purged and disposed of during sample collection. This will take place by placing the pump intake within the screen interval and by keeping the drawdown at a minimal level (0.33 feet) (Puls and Barcelona, 1996) until the water quality parameters have stabilized and sample collection is complete. The flow rate at which the pump will be operating will depend upon both hydraulic conductivity of the aquifer and the drawdown with the goal of minimizing the drawdown. The flow rate from the pump during purging and sampling will be at a rate that will not compromise the integrity of the analyte that is being sampled. This sampling procedure may or may not provide a discrete groundwater sample at the location of the pump intake. The flow of ground-water to the pump intake will be dependent on the distribution of the hydraulic conductivity (K) of the aquifer within the screen interval. In order to minimize the drawdown in the monitoring well, a lowflow rate must be used. "Low-Flow" refers to the velocity with which water enters the pump intake from the surrounding formation in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface, which can be affected by flow regulators or restrictions (Puls and Barcelona, 1996). This SOP was developed by the Superfund/RCRA Ground Water Forum and draws from an USEPA's Ground Water Issue Paper, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedure, by Robert W. Puls and Michael J. Barcelona. Also, available USEPA Regional SOPs

regarding Low-Stress (Low-Flow) Purging and Sampling were used for this SOP.

#### SCOPE AND APPLICATION

This SOP should be used primarily at monitoring wells that have a screen or an open interval with a length of ten feet or less and can accept a sampling device that minimizes the disturbance to the aquifer or the water column in the well casing. The screen or open interval should have been optimally located to intercept an existing contaminant plume(s) or along flowpaths of potential contaminant releases. Knowledge of the contaminant distribution within the screen interval is highly recommended and is essential for the success of this sampling procedure. The ground-water samples that are collected using this procedure are acceptable for the analyses of ground-water contaminants that may be found at Superfund and RCRA contamination sites. The analytes may be volatile, semi-volatile organic compounds, pesticides, PCBs, metals, and other inorganic compounds. The screened interval should be located within the contaminant plume(s) and the pump intake should be placed at or near the known source of the contamination within the screened interval. It is critical to place the pump intake in the exact location or depth for each sampling event. This argues for the use of dedicated, permanently installed, sampling devices whenever possible. If this is not possible, then the placement of the pump intake should be positioned with a calibrated sampling pump hose sounded with a weighted-tape or using a pre-measured hose. The pump intake should not be placed near the bottom of the screened interval to avoid disturbing any sediment that may have settled at the bottom of the well.

Water-quality-indicator parameters and water levels must be measured during purging, prior to sample collection. Stabilization of the water-quality-indicator parameters as well as monitoring water levels are a prerequisite to sample collection. The water-qualityindicator parameters that are recommended include the following: specific electrical conductance, dissolved oxygen, turbidity, oxidation-reduction potential, pH, and temperature. The latter two parameters are useful data, but are generally insensitive as purging parameters. Oxidation-reduction potential may not always be appropriate stabilization parameter, and will depend on site-specific conditions. However, readings should be recorded because of its value as a double check for oxidation conditions and for fate and transport issues.

Also, when samples are collected for metals, semivolatile organic compounds, and pesticides, every effort must be made to reduce turbidity to 10 NTUs or less (not just the stabilization of turbidity) prior to the collection of the water sample. In addition to the measurement of the above parameters, depth to water must be measured during purging (U.S. Environmental Protection Agency, 1995).

Proper well construction, development, and maintenance are essential for any ground-water sampling procedure. Prior to conducting the field work, information on the construction of the well and well development should be obtained and that information factored into the site specific sampling procedure. The Sampling Checklist at the end of this attachment is an example of the type of information that is useful.

Stabilization of the water-quality-indicator parameters is the criterion for sample collection. But if stabilization is not occurring and the procedure has been strictly followed, then sample collection can take place once three (minimum) to six (maximum) casing volumes have been removed (Schuller et al., 1981 and U.S. Environmental Protection Agency., 1986; Wilde et al., 1998; Gibs and Imbrigiotta., 1990). The specific information on what took place during purging must be recorded in the field notebook or in the groundwater sampling log.

This SOP is not to be used where non-aqueous phase liquids (NAPL) (immiscible fluids) are present in the monitoring well.

#### EQUIPMENT

- Depth-to-water measuring device An electronic water-level indicator or steel tape and chalk, with marked intervals of 0.01 foot. Interface probe for determination of liquid products (NAPL) presence, if needed.
- Steel tape and weight Used for measuring total depth of well. Lead weight should not be used.
- Sampling pump Submersible or bladder pumps with adjustable rate controls are preferred. Pumps are to be constructed of inert materials, such as

stainless steel and Teflon®. Pump types that are acceptable include gear and helical driven, centrifugal (low-flow type), and air-activated piston. An adjustable rate, peristaltic pump can be used when the depth to water is 20 feet or less.

- Tubing Teflon® or Teflon®-lined polyethylene tubing is preferred when sampling for organic compounds. Polyethylene tubing can be used when sampling inorganics.
- Power source If a combustion type (gasoline or diesel-driven) generator is used, it must be placed downwind of the sampling area.
- Flow measurement supplies flow meter, graduated cylinder, and a stop watch.
- Multi-parameter meter with flow-through cell This • can be one instrument or more contained in a flow-through cell. The water-quality-indicator parameters that are monitored are pH, ORP/Eh, (ORP) dissolved oxygen (DO), turbidity, specific conductance, and temperature. Turbidity readings must be collected before the flow cell because of the potential for sediment buildup, which can bias the turbidity measurements. Calibration fluids for all instruments should be NIST-traceable and there should be enough for daily calibration throughout the sampling event. The inlet of the flow cell must be located near the bottom of the flow cell and the outlet near the top. The size of the flow cell should be kept to a minimum and a closed cell is preferred. The flow cell must not contain any air or gas bubbles when monitoring for the water-gualityindicator parameters.
- Decontamination supplies Including a reliable and documented source of distilled water and any solvents (if used). Pressure sprayers, buckets or decontamination tubes for pumps, brushes and non-phosphate soap will also be needed.
- Sample bottles, sample preservation supplies, sample tags or labels, and chain-of-custody forms.
- Approved Field Sampling and Quality Assurance Project Plan.
- Well construction, field, and water quality data from the previous sampling event.
- Well keys and map of well locations.
- Field notebook, ground-water sampling logs, and calculator. A suggested field data sheet (groundwater sampling record or ground-water sampling log) are provided at the end of this attachment.

- Filtration equipment, if needed. An in-line disposable filter is recommended.
- Polyethylene sheeting placed on ground around the well head.
- Personal protective equipment as specified in the site Health and Safety Plan.
- Air monitoring equipment as specified in the Site Health and Safety Plan.
- Tool box All needed tools for all site equipment used.
- A 55-gallon drum or container to contain the purged water.

Construction materials of the sampling equipment (bladders, pumps, tubing, and other equipment that comes in contact with the sample) should be limited to stainless steel, Teflon®, glass, and other inert material. This will reduce the chance that sampling materials alter the ground-water where concentrations of the site contaminants are expected to be near the detection limits. The sample tubing diameter should be maximized and the tubing length should be minimized so that the loss of contaminants into and through the tubing walls may be reduced and the rate of stabilization of ground-water parameters is maximized. The tendency of organics to sorb into and out of material makes the appropriate selection of sample tubing material critical for trace analyses (Pohlmann and Alduino, 1992; Parker and Ranney, 1998).

#### PURGING AND SAMPLING PROCEDURES

The following describes the purging and sampling procedures for the Low-Stress (Low-Flow)/ Minimal Drawdown method for the collection of ground-water samples. These procedures also describe steps for dedicated and non-dedicated systems.

Pre-Sampling Activities (Non-dedicated and dedicated system)

1. Sampling must begin at the monitoring well with the least contamination, generally up-gradient or farthest from the site or suspected source. Then proceed systematically to the monitoring wells with the most contaminated ground water.

2. Check and record the condition of the monitoring well for damage or evidence of tampering. Lay out polyethylene sheeting around the well to minimize the likelihood of contamination of sampling/purging equipment from the soil. Place monitoring, purging and sampling equipment on the sheeting.

3. Unlock well head. Record location, time, date, and appropriate information in a field logbook or on the ground-water sampling log (See attached ground-water sampling record and ground-water sampling log as examples).

4. Remove inner casing cap.

5. Monitor the headspace of the monitoring well at the rim of the casing for volatile organic compounds (VOC) with a photo-ionization detector (PID) or flame ionization detector (FID) and record in the logbook. If the existing monitoring well has a history of positive readings of the headspace, then the sampling must be conducted in accordance with the Health and Safety Plan.

6. Measure the depth to water (water level must be measured to nearest 0.01 feet) relative to a reference measuring point on the well casing with an electronic water level indicator or steel tape and record in logbook or ground-water sampling log. If no reference point is found, measure relative to the top of the inner casing, then mark that reference point and note that location in the field logbook. Record information on depth to ground water in the field logbook or groundwater sampling log. Measure the depth to water a second time to confirm initial measurement; measurement should agree within 0.01 feet or re-measure.

7. Check the available well information or field information for the total depth of the monitoring well. Use the information from the depth of water in step six and the total depth of the monitoring well to calculate the volume of the water in the monitoring well or the volume of one casing. Record information in field logbook or ground-water sampling log.

#### Purging and Sampling Activities

8A. Non-dedicated system - Place the pump and support equipment at the wellhead and slowly lower the pump and tubing down into the monitoring well until the location of the pump intake is set at a predetermined location within the screen interval. The placement of the pump intake should be positioned with a calibrated sampling pump hose, sounded with a weighted-tape, or using a pre-measured hose. Refer to the available monitoring well information to determine the depth and length of the screen interval. Measure the depth of the pump intake while lowering the pump into location. Record pump location in field logbook or ground-water sampling log.

8B. Dedicated system - Pump has already been installed, refer to the available monitoring well information and record the depth of the pump intake in the field logbook or ground-water sampling log.

9. Non-dedicated system and dedicated systems -Measure the water level (water level must be measured to nearest 0.01 feet) and record information on the ground-water sampling log, leave water level indicator probe in the monitoring well.

10. Non-dedicated and dedicated systems - Connect the discharge line from the pump to a flow-through cell. A "T" connection is needed prior to the flowthrough cell to allow for the collection of water for the turbidity measurements. The discharge line from the flow-through cell must be directed to a container to contain the purge water during the purging and sampling of the monitoring well.

11. Non-dedicated and dedicated systems - Start pumping the well at a low flow rate (0.2 to 0.5 liter per minute) and slowly increase the speed. Check water

level. Maintain a steady flow rate while maintaining a drawdown of less than 0.33 feet (Puls and Barcelona, 1996). If drawdown is greater than 0.33 feet, lower the flow rate. 0.33 feet is a goal to help guide with the flow rate adjustment. It should be noted that this goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience (Puls and Barcelona, 1996).

12. Non-dedicated and dedicated systems - Measure the discharge

rate of the pump with a graduated cylinder and a stop watch. Also, measure the water level and record both flow rate and water level on the ground-water sampling log. Continue purging, monitor and record water level and pump rate every three to five minutes during purging. Pumping rates should be kept at minimal flow to ensure minimal drawdown in the monitoring well.

13. Non-dedicated and dedicated systems - During the purging, a minimum of one tubing volume (including the volume of water in the pump and flow cell) must be purged prior to recording the water-quality indicator parameters. Then monitor and record the water-quality- indicator parameters every three to five minutes. The water-quality indicator field parameters are turbidity, dissolved oxygen, specific electrical conductance, pH, redox potential, and temperature. Oxidation-reduction potential may not always be an appropriate stabilization parameter, and will depend on site-specific conditions. However, readings should be recorded because of its value as a double check for oxidizing conditions. Also, for the final dissolved oxygen measurement, if the readings are less than 1 milligram per liter, it should be collected and analyze with the spectrophotometric method (Wilde et al., 1998 Wilkin et al., 2001), colorimetric or Winkler titration (Wilkin et al., 2001). The stabilization criterion is based on three successive readings of the water quality field parameters; the following are the criteria which must be used:

Parameter	Stabilization Criteria	Reference
рН	+/- 0.1 pH units	Puls and Barcelona, 1996; Wilde et al., 1998
		Wilde et al., 1996
specific electrical	+/- 3% S/cm	Puls and Barcelona, 1996
conductance (SEC)		
oxidation-reduction	+/- 10 millivolts	Puls and Barcelona, 1996
potential (ORP)		
turbidity	+/- 10% NTUs (when turbidity	Puls and Barcelona, 1996;
	is greater than 10 NTUs)	Wilde et al., 1998
dissolved oxygen	+/- 0.3 milligrams per liter	Wilde et al., 1998

Once the criteria have been successfully met indicating that the water quality indicator parameters have stabilized, then sample collection can take place.

14. If a stabilized drawdown in the well can't be maintained at 0.33 feet and the water level is approaching the top of the screened interval, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. It should be noted whether or not the pump has a check valve. A check valve is required if the pump is shut off. Under no circumstances should the well be pumped dry. Begin pumping at a lower flow rate, if the water draws down to the top of the screened interval again, turn pump off and allow for recovery. If two tubing volumes (including the volume of water in the pump and flow cell) have been removed during purging, then sampling can proceed next time the pump is turned on. This information should be noted in the field notebook or ground-water sampling log with a recommendation for a different purging and sampling procedure.

15. Non-dedicated and dedicated systems - Maintain the same pumping rate or reduce slightly for sampling (0.2 to 0.5 liter per minute) in order to minimize disturbance of the water column. Samples should be collected directly from the discharge port of the pump tubing prior to passing through the flow-through cell. Disconnect the pump's tubing from the flow-through cell so that the samples are collected from the pump's discharge tubing. For samples collected for dissolved gases or VOC analyses, the pump tubing needs to be completely full of ground water to prevent the ground water from being aerated as it flows through the tubing. The sequence of the samples is immaterial unless filtered (dissolved) samples are collected and they must be collected last (Puls and Barcelona, 1996). All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container. When filling the VOC samples, a meniscus must be formed over the mouth of the vial to eliminate the formation of air bubbles and head space prior to capping. In the event that the ground water is turbid, (greater then 10 NTUs), a filtered metal (dissolved) sample also should be collected.

If filtered metal sample is to be collected, then an inline filter is fitted at the end of the discharge tubing and the sample is collected after the filter. The in-line filter must be pre-rinsed following manufacturer's recommendations and if there are no recommendations for rinsing, a minimum of 0.5 to 1 liter of ground water from the monitoring well must pass through the filter prior to sampling.

16A. Non-dedicated system - Remove the pump from the monitoring well. Decontaminate the pump and dispose of the tubing if it is non-dedicated.

16B. Dedicated system - Disconnect the tubing that extends from the plate at the wellhead (or cap) and discard after use.

17. Non-dedicated system - Before locking the monitoring well, measure and record the well depth (to 0.1 feet).

Measure the total depth a second time to confirm initial measurement; measurement should agree within 0.01 feet or re-measure.

18. Non-dedicated and dedicated systems - Close and lock the well.

#### **DECONTAMINATION PROCEDURES**

Decontamination procedures for the water level meter and the water quality field parameter sensors. The electronic water level indicator probe/steel tape and the water-quality field parameter sensors will be decontaminated by the following procedures:

1. The water level meter will be hand washed with phosphate-free detergent and a scrubber, then thoroughly rinsed with distilled water.

2. Water quality field parameter sensors and flowthrough cell will be rinsed with distilled water between sampling locations. No other decontamination procedures are necessary or recommended for these probes since they are sensitive. After the sampling event, the flow cell and sensors must be cleaned and maintained per the manufacturer's requirements.

Decontamination Procedure for the Sampling Pump

Upon completion of the ground water sample collection the sampling pump must be properly decontaminated between monitoring wells. The pump and discharge line including support cable and electrical wires which were in contact with the ground water in the well casing must be decontaminated by the following procedure:

- 1. The outside of the pump, tubing, support cable and electrical wires must be pressure-sprayed with soapy water, tap water, and distilled water. Spray outside of tubing and pump until water is flowing off of tubing after each rinse. Use bristle brush to help remove visible dirt and contaminants.
- 2. Place the sampling pump in a bucket or in a short PVC casing (4-in. diameter) with one end capped. The pump placed in this device must be completely submerged in the water. A small amount of phosphate-free detergent must be added to the potable water (tap water).
- 3. Remove the pump from the bucket or 4-in. casing and scrub the outside of the pump housing and cable.
- 4. Place pump and discharge line back in the 4-in. casing or bucket, start pump and recirculate this soapy water for 2 minutes (wash).
- 5. Re-direct discharge line to a 55-gallon drum. Continue to add 5 gallons of potable water (tap water) or until soapy water is no longer visible.
- 6. Turn pump off and place pump into a second bucket or 4-in. casing that contains tap water. Continue to add 5 gallons of tap water (rinse).
- 7. Turn pump off and place pump into a third bucket or 4-in. casing which contains distilled/deionized water, continue to add 3 to 5 gallons of distilled/ deionized water (final rinse).
- 8. If a hydrophobic contaminant is present (such as separate phase, high levels of PCBs, etc.), an additional decontamination step, or steps, may be added. For example, an organic solvent, such as reagent-grade isopropanol alcohol may be added as a first spraying/bucket prior to the soapy water rinse/bucket.

#### FIELD QUALITY CONTROL

Quality control (QC) samples must be collected to verify that sample collection and handling procedures were performed adequately and that they have not compromised the quality of the ground-water samples. The appropriate EPA program guidance must be consulted in preparing the field QC sample requirements for the site-specific Quality Assurance Project Plan (QAPP).

There are five primary areas of concern for quality assurance (QA) in the collection of representative ground-water samples:

- 1. Obtaining a ground-water sample that is representative of the aquifer or zone of interest in the aquifer. Verification is based on the field log documenting that the field water-quality parameters stabilized during the purging of the well, prior to sample collection.
- 2. Ensuring that the purging and sampling devices are made of materials, and utilized in a manner that will not interact with or alter the analyses.
- 3. Ensuring that results generated by these procedures are reproducible; therefore, the sampling scheme should incorporate co-located samples (duplicates).
- 4. Preventing cross-contamination. Sampling should proceed from least to most contaminated wells, if known. Field equipment blanks should be incorporated for all sampling and purging equipment, and decontamination of the equipment is therefore required.
- 5. Properly preserving, packaging, and shipping samples.

All field QC samples must be prepared the same as regular investigation samples with regard to sample volume, containers, and preservation. The chain-ofcustody procedures for the QC samples will be identical to the field ground-water samples. The following are QC samples that must be collected during the sampling event:

- Sample Type Frequency Field duplicates 1 per 20 samples Matrix spike 1 per 20 samples Matrix spike duplicate 1 per 20 samples Equipment blank per Regional require-
- Trip blank (VOCs)
- Temperature blank
- ments or policy
- 1 per sample cooler
- 1 per sample cooler

•

#### HEALTH AND SAFETY CONSIDERATIONS

Depending on the site-specific contaminants, various protective programs must be implemented prior to sampling the first well. The site Health and Safety Plan should be reviewed with specific emphasis placed on the protection program planned for the sampling tasks. Standard safe operating practices should be followed, such as minimizing contact with potential contaminants in both the liquid and vapor phase through the use of appropriate personal protective equipment.

Depending on the type of contaminants expected or determined in previous sampling efforts, the following safe work practices will be employed:

Particulate or metals contaminants

- 1. Avoid skin contact with, and incidental ingestion of, purge water.
- 2. Use protective gloves and splash protection.

Volatile organic contaminants

- 1. Avoid breathing constituents venting from well.
- 2. Pre-survey the well head space with an appropriate device as specified in the site Health and Safety Plan.
- If monitoring results indicate elevated organic constituents, sampling activities may be conducted in level C protection. At a minimum, skin protection will be afforded by disposable protective clothing, such as Tyvek®.

General practices should include avoiding skin contact with water from preserved sample bottles, as this water will have pH less than 2 or greater than 10. Also, when filling pre-acidified VOA bottles, hydrochloric acid fumes may be released and should not be inhaled.

#### **POST-SAMPLING ACTIVITIES**

Several activities need to be completed and documented once ground-water sampling has been completed. These activities include, but are not limited to the following:

1. Ensuring that all field equipment has been decontaminated and returned to proper storage location. Once the individual field equipment has been decontaminated, tag it with date of cleaning, site name, and name of individual responsible.

- 2. Processing all sample paperwork, including copies provided to the Regional Laboratory, Sample Management Office, or other appropriate sample handling and tracking facility.
- 3. Compiling all field data for site records.
- 4. Verifying all analytical data processed by the analytical laboratory against field sheets to ensure all data has been returned to sampler.

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#### SAMPLING CHECKLIST

Well Identification:\_\_\_\_\_

Map of Site Included: Y or N Wells Clearly Identified with Roads: Y or N Well Construction Diagram Attached: Y or N

#### Well Construction:

Diameter of Borehole:	Diameter of Casing:
Casing Material:	Screen Material:
Screen Length:	Total Depth:

Approximate Depth to Water:\_\_\_\_\_ Maximum Well Development Pumping Rate:\_\_\_\_\_ Date of Last Well Development:\_\_\_\_\_

#### **Previous Sampling Information:**

Was the Well Sampled Previously: Y or N (If Sampled, Fill Out Table Below)

	Table of Previous Sampling Information							
Parameter	Previously Sampled	Number of Times Sampled	Maximum Concentration	Notes (include previous purge rates)				

#### **Ground Water Sampling Log**

Site Name: Well Depth( Ft-BTOC <sup>1</sup> ):	Well #: Screen Interval(Ft):	Date:
Well Dia.:	Casing Material:	Sampling Device:
Pump placement(Ft from TOC <sup>2</sup> ):		
Measuring Point:	Water level (static)(Ft):	
Water level (pumping)(Ft):	Pump rate(Liter/min):	
Sampling Personnel:		

Other info: (such as sample numbers, weather conditions and field notes)

Time	Pumping rates (L/Min)	Water level (ft)	DO (mg/L)	ORP (mv)	Turb. (NTU)	SEC <sup>3</sup> (S/cm)	pН	Temp. (C <sup>0</sup> )	Volume pumped (L)

### Water Quality Indicator Parameters

Type of Samples collected:

1 casing volume was:	Stabilization Criteria			
Total volume purged prior to sample collection:	D.O. Turb. S.C.	+/- 0.3 mg/l +/- 10% +/- 3%		
<sup>1</sup> BTOC-Below Top of Casing <sup>2</sup> TOC-Top of Casing <sup>3</sup> Specific Electrical Conductance	ORP pH	+/- 10 mV +/- 0.1 unit		

# ATTACHMENT 4 Example Standard Operating Procedure:

Standard Operating Procedure for the Standard/Well-Volume Method for Collecting a Ground-Water Sample This page is intentionally blank.

#### INTRODUCTION

The collection of "representative" water samples from wells is neither straightforward nor easily accomplished. Ground-water sample collection can be a source of variability through differences in sampling personnel and their individual sampling procedures, the equipment used, and ambient temporal variability in subsurface and environmental conditions. Many site inspections and remedial investigations require the sampling at ground-water monitoring wells within a defined criterion of data confidence or data quality, which necessitates that the personnel collecting the samples are trained and aware of proper samplecollection procedures.

The objectives of the sampling procedures described in this document are to minimize changes in groundwater chemistry during sample collection and transport to the laboratory and to maximize the probability of obtaining a representative, reproducible groundwater sample. Sampling personnel may benefit from a working knowledge of the chemical processes that can influence the concentration of dissolved chemical species.

The well-volume method described in this standard operating procedure (SOP) provides a reproducible sampling technique with the goal that the samples obtained will represent water quality over an entire open interval of a short-screened (ten feet or less) well. This technique is appropriate for long-term and detection monitoring of formation water quality. The resulting sample generally represents a composite of the screened interval, and thus integrates small-scale vertical heterogeneities of ground-water chemistry. This sampling technique also is useful for screening purposes for detection monitoring of contaminants in the subsurface. However, the detection of a low concentration of contaminant in a thin contaminated zone or with long well screens may be difficult and should be determined using detailed vertical profiling techniques.

This method may not be applicable for all groundwater-sampling wells, such as wells with very low yields, fractured rock, and some wells with turbidity problems. As always, site-specific conditions and objectives should be considered prior to the selection of this method for sampling.

#### SCOPE AND APPLICATION

The objective of a good sampling program should be the collection of a representative sample of the current ground-water conditions over a known or specified volume of aquifer. To meet this objective, the sampling equipment, the sampling method, the monitoring well construction, monitoring well operation and maintenance, and sample-handling procedures should not alter the chemistry of the sample.

An example of how a site's Data Quality Objectives (DQOs) for a characterization sampling effort might vary from those of a remediation monitoring sampling effort could be a difference of how much of the screened interval or aquifer should be sampled. A site characterization objective may be to collect a sample that represents a composite of the entire (or as close as is possible) screened interval of the monitoring well.

Additionally, the site characterization may require a large suite of contaminants to be sampled and analyzed, whereas, the remediation monitoring program may require fewer contaminants sampled and analyzed. These differences may dictate the type of sampling equipment used, the type of information collected, and the sampling protocol.

This sampling method described is for monitoring wells. However, this method should not be used for water-supply wells with a water-supply pump, with long-screened wells in complex hydrogeologic environments (such as fractured rock), or wells with separate phases of liquids (such as a Dense or Light Non-Aqueous Phase Liquids) present within the screened interval.

#### EQUIPMENT

- Depth-to-water measuring device An electronic water-level indicator or steel tape and chalk, with marked intervals of 0.01 foot. Interface probe for measuring separate phase liquids, if needed.
   Pressure transducer and data logger optional for frequent depth-to-water measuring in same well.
- Steel tape and weight Used for measuring total depth of well. Lead weights should not be used.
- Sampling pump Submersible or bladder pumps with adjustable rate controls are preferred. Pumps

are to be constructed of inert materials, such as stainless steel and Teflon®. Pump types that are acceptable include gear and helical driven, centrifugal (low-flow type), and air-activated piston. Adjustable rate, peristaltic pumps can be used when the depth to water is 20 feet or less.

- Tubing Inert tubing should be chosen based on the types and concentrations of contaminants present, or expected to be present in the monitoring well. Generally, Teflon®-based tubing is recommended when sampling for organic compounds. Polyethylene or Teflon® tubing can be used when sampling for inorganic constituents.
- Power source If a combustion type (gasoline or diesel-driven) device is used, it must be located downwind of the point of sample collection. If possible, it should also be transported to the site and sampling location in a different vehicle from the sampling equipment.
- Flow-measurement equipment Graduated cylinder or bucket and a stop watch, or a flow meter that can be disconnected prior to sampling.
- Multi-parameter meter with flow-through cell This can be one instrument or multiple probes/instruments contained in a flow-through cell. The waterquality-indicator parameters that are measured in the field are pH, oxidation/reduction potential (ORP, redox, or Eh), dissolved oxygen (DO), turbidity, specific electrical conductance (SEC), and temperature. Calibration standards for all instruments should be NIST-traceable, within expiration dates of the solutions, and sufficient for daily calibration throughout the sampling collection.
- Decontamination supplies A reliable and documented source of distilled water and any solvents (if used). Pressure sprayers, buckets or decontamination tubes for pumps, brushes and non-phosphate soap also will be needed.
- Sample bottles, sample preservation supplies and laboratory paperwork. Also, several coolers, and sample packing supplies (absorbing packing material, plastic baggies, etc.).
- Approved plans and background documents -Approved Field Sampling Plan, Quality Assurance Project Plan, well construction data, field and water-quality data from the previous sampling collection.
- Site Access/Permission documentation for site entry.

- Well keys and map showing locations of wells.
- Field notebook, field data sheets and calculator. A suggested field data sheet is provided at the end of this attachment.
- Filtration equipment If needed, this equipment should be an in-line disposable filter used for the collection of samples for analysis of dissolved constituents.
- Polyethylene sheeting Used for decontamination stations and during sampling to keep equipment clean.
- Site Health and Safety Plan and required equipment - The health and safety plan along with site sign-in sheet should be on site and be presented by the site health and safety officer. Personnel-protective and air-monitoring equipment specified in the Site Health and Safety Plan should be demonstrated, present and in good working order on site at all times.
- Tool box All needed tools for all site equipment used.
- A 55-gallon drum or container to contain the purged water.

Construction materials of the sampling equipment (bladders, pump, bailers, tubing, etc.) should be limited to stainless steel, Teflon®, glass, and other inert materials when concentrations of the site contaminants are expected within the detection limit range. The sample tubing thickness and diameter should be maximized and the tubing length should be minimized so that the loss of contaminants absorbed to and through the tubing walls may be reduced and the rate of stabilization of ground-water parameters is maximized. The tendency of organics to sorb into and out of many materials makes the appropriate selection of sample tubing materials critical for these trace analyses (Pohlmann and Alduino, 1992; Parker and Ranney, 1998).

Generally, wells should be purged and sampled using the same positive-displacement pump and/or a lowflow submersible pump with variable controlled flow rates and constructed of chemically inert materials. If a pump cannot be used because the recovery rate of the well is so low (less than 100 to 200 ml/min) and the volume of the water to be removed is minimal (less than 5 feet of water in a small-diameter well), then a Teflon® bailer, with a double check valve and bottom-emptying device with a control-flow check valve may be used to obtain the samples. Otherwise, a bailer should not be used when sampling for volatile organics because of the potential bias introduced during sampling (Yeskis et al., 1988; Pohlmann et al., 1990; Tai et al., 1991). Bailers also should be avoided when sampling for metals because repeated bailer deployment has the potential to increase turbidity, which biases concentrations of inorganic constituents. Dedicated sampling pumps are recommended for metals sampling (Puls et al., 1992).

In addition, for wells with long riser pipes above the well screen, the purge volumes may be reduced by using packers above the pumps. The packer materials should be compatible with the parameters to be analyzed. These packers should be used only on wells screened in highly permeable materials, because of the lack of ability to monitor water levels in the packed interval. Otherwise, if pumping rates exceed the natural aquifer recovery rates into the packed zone, a vacuum or negative pressure zone may develop. This may result in a failure of the seal by the packer and/or a gaseous phase may develop, that may bias any sample taken.

#### PURGING AND SAMPLING PROCEDURE

#### WATER-LEVEL MEASUREMENTS

The field measurements should include total well depth and depth to water from a permanently marked reference point.

#### TOTAL WELL DEPTH

The depth of each well should be measured to the nearest one-tenth of a foot when using a steel tape with a weight attached and should be properly recorded. The steel tape should be decontaminated before use in another well according to the site specific protocols. A concern is that when the steel tape and weight hit the bottom of the well, sediment present on the bottom of a well is stirred up, thus increasing turbidity, which will affect the sampling results. In these cases, as much time as possible should be allowed prior to sampling, such as a minimum of 24 hours. If possible, total well depth measurements can be completed after sampling (Puls and Barcelona, 1996). The weight of electric tapes is generally too light to determine accurate total well depth. If the total well depth is greater than 200 feet, stretching of the tape must be taken into consideration.

#### DEPTH TO WATER

All water levels should be measured from the reference point by use of a weighted steel tape and chalk or an electronic water-level indicator (a detailed discussion of the pros and cons of the different water level devices is provided in Thornhill, 1989). The steel tape is a more accurate method to take water levels, and is recommended where shallow flow gradients (less than 0.05 feet/feet) or deep wells are encountered. However, in those cases where large flow gradients or large fluctuations in water levels are expected, a calibrated electric tape is acceptable. The water level is calculated using the well's surveyed reference point minus the measured depth-to-water and should be measured to the nearest one hundredth of a foot.

The depth-to-water measurement must be made in each well to be sampled prior to any other activities at the well (such as bailing, pumping, and hydraulic testing) to avoid bias to the measurement. All readings are to be recorded to the nearest one hundredth of a foot. When possible, depth-to-water and total well depth measurements should be completed at the beginning of a ground-water sampling program, which will allow any turbidity to settle and allow a more synoptic water-level evaluation. However, if outside influences (such as tidal cycles, nearby pumping effects, or major barometric changes) may result in significant waterlevel changes in the time between measurement and sampling, a water-level measurement should be completed immediately prior to sampling. In addition, the depth-to-water measurement during purging should be recorded, with the use of a pressure transducer and data logger sometimes more efficient (Barcelona et al., 1985, Wilde et al., 1998).

The time and date of the measurement, point of reference, measurement method, depth-to-water measurement, and any calculations should be properly recorded in field notebook or sampling sheet.

#### STATIC WATER VOLUME

From the information obtained for casing diameter, total well depth and depth-to-water measurements, the volume of water in the well is calculated. This value is one criteria that may be used to determine the volume of water to be purged from the well before the sample is collected. The static water volume may be calculated using the following formula:

 $V = r^{2}h(0.163)$ Where:

=	static volume of water in well (in gallons)
=	inner radius of well casing (in inches)
=	length of water column (in feet) which is equal to the total well depth minus depth to water.
=	a constant conversion factor that compensates for the conversion of the casing radius from inches to feet for 2-inch diameter wells and the conver- sion of cubic feet to gallons, and pi ( $\pi$ ). This factor would change for different diameter wells.
	= =

Static water volumes also may be obtained from various sources, such as Appendix 11.L in Driscoll (1986).

#### WELL PURGING

#### PURGE VOLUMES

In most cases, the standing water in the well casing can be of a different chemical composition than that contained in the aquifer to be sampled. Solutes may be adsorbed or desorbed from the casing material, oxidation may occur, and biological activity is possible. Therefore, the stagnant water within the well must be purged so that water that is representative of the aquifer may enter the well.

The removal of at least three well volumes is suggested (USEPA, 1986; Wilde et al., 1998). The amount of water removed may be determined by collecting it in a graduated pail of known volume to determine pumping rate and time of pumping. A flow meter may also be used, as well as capturing all purged water in a container of known volume.

The actual number of well volumes to be removed is based on the stabilization of water-quality-indicator parameters of pH, ORP, SEC, DO, and turbidity. The

water initially pumped is commonly turbid. In order to keep the turbidity and other probes from being clogged with the sediment from the turbid water, the flowthrough cell should be bypassed initially for the first well volume. These measurements should be taken and recorded every 1/2 well volume after the removal of 1 to 1 1/2 well volume(s). Once three successive readings of the water-quality-indicator parameters provided in the table have stabilized, sampling may begin. The water-quality-indicator parameters that are recommended include pH and temperature, but these are generally insensitive to indicate completion of purging since they tend to stabilize rapidly (Puls and Barcelona, 1996). ORP may not always be an appropriate stabilization parameter, and will depend on sitespecific conditions. However, readings should be recorded because of its value as a double check for oxidizing conditions, and for some fate and transport issues. When possible, especially when sampling for contaminants that may be biased by the presence of turbidity, the turbidity reading is desired to stabilize at a value below 10 Nephelometric Turbidity Units (NTUs). For final DO measurements, if the readings are less than 1 milligram per liter, they should be collected with the spectrophotometric method (Wilde et al., 1998, Wilkin et al., 2001), colorimetric or Winkler titration (Wilkin et al., 2001). All of these water-quality-indicator parameters should be evaluated against the specifications of the accuracy and resolution of the instruments used. No more than six well volumes should be purged, to minimize the over pumping effects described by Gibs and Imbrigiotta (1990).

#### **Purging Methods**

In a well that is not being pumped, there will be little or no vertical mixing in the water column between sampling events, and stratification may occur. The water in the screened section may mix with the ground water due to normal flow patterns, but the water above the screened section will remain isolated and become stagnant. Persons sampling should realize that stagnant water may contain foreign material inadvertently or deliberately introduced from the surface, resulting in unrepresentative water quality. To safeguard against collecting nonrepresentative stagnant water in a sample, the following guidelines and techniques should be adhered to during sample collection:

Parameter	Stabilization Criteria	Reference
рН	+/- 0.1	Puls and Barcelona, 1996;
		Wilde et al., 1998
specific electrical	+/- 3%	Puls and Barcelona, 1996
conductance (SEC)		
oxidation-reduction	+/- 10 millivolts	Puls and Barcelona, 1996
potential (ORP)		
turbidity	+/- 10% (when turbidity is	Puls and Barcelona, 1996;
	greater than 10 NTUs)	Wilde et al., 1998
dissolved oxygen (DO)	+/- 0.3 milligrams per liter	Wilde et al., 1998

Table of Stabilization Criteria with References for Water-Quality-Indicator Parameters

1. As a general rule, monitoring wells should be pumped or bailed (although bailing is to be strongly avoided) prior to collecting a sample. Evacuation of a minimum of three volumes of water in the well casing is recommended for a representative sample. In a high-yielding ground-water formation where there is no stagnant water in the well above the screened section (commonly referred to as a water-table well), evacuation prior to sample withdrawal is not as critical but serves to field rinse and condition sampling equipment. The purge criteria has been described previously and will be again in the SAMPLING PRO-CEDURES section on the following page. The rate of purging should be at a rate and by a method that does not cause aeration of the water column and should not exceed the rate at which well development was completed.

2. For wells that can be pumped or bailed to dryness with the sampling equipment being used, the well should be evacuated to just above the well screen interval and allowed to recover prior to sample withdrawal. (Note: It is important not to completely dewater the zone being sampled, as this may allow air into that zone which could result in negative bias in organic and metal constituents.) If the recovery rate is fairly rapid and time allows, evacuation of more than one volume of water is preferred.

3. A non-representative sample also can result from excessive prepumping of the monitoring well. Stratification of the contaminant concentrations in the ground-water formation may occur or heavier-thanwater compounds may sink to the lower portions of the aquifer. Excessive pumping can decrease or increase the contaminant concentrations from what is representative of the sampling point of interest, as well as increase turbidity and create large quantities of waste water.

The method used to purge a well depends on the inner diameter, depth-to-water level, volume of water in the well, recovery rate of the aquifer, and accessibility of the well to be sampled. The types of equipment available for well evacuation include hand-operated or motor-driven suction pumps, peristaltic pumps, submersible pumps, and bailers made of various materials, such as stainless steel and Teflon®. Whenever possible, the same device used for purging the well should be left in the well and used for sampling, generally in a continual manner from purging directly to sampling without altering position of the sampling device or turning off the device.

When purging/sampling equipment must be reused in other wells, it should be decontaminated consistent with the decontamination procedures outlined in this document. Purged water should be collected and screened with air-monitoring equipment as outlined in the site health and safety plan, as well as waterquality field instruments. If these parameters and/or the facility background data suggest that the water is hazardous, it should be contained and disposed of properly as determined on a site-specific basis.

During purging, water-level measurements should be recorded regularly for shallow wells, typically at 15- to 30-second intervals. These data may be useful in computing aquifer transmissivity and other hydraulic characteristics, and for adjusting purging rates. In addition, these data will assure that the water level doesn't fall below the pump intake level

#### SAMPLING PROCEDURES

Ground-water sample collection should take place immediately following well purging. Preferably, the same device should be used for sample collection as was used for well purging, minimize further disturbance of the water column, and reduce volatilization and turbidity. In addition, this will save time and avoid possible contamination from the introduction of additional equipment into the well, as well as using equipment materials already equilibrated to the ground water. Sampling should occur in a progression from the least to most contaminated well, if known, when the same sampling device is used.

The sampling procedure is as follows:

- Remove locking well cap. Note location, time of day, and date in field notebook or on an appropriate log form.
- 2) Note wind direction. Stand upwind from the well to avoid contact with gases/vapors emanating from the well.
- 3) Remove well casing cap.
- If required by site-specific conditions, monitor headspace of well with appropriate air-monitoring equipment to determine presence of volatile organic compounds or other compounds of concern and record in field logbook.
- 5) If not already completed, measure the water level from the reference measuring point on the well casing or protective outer casing (if inner casing not installed or inaccessible) and record it in the field notebook. Alternatively, if no reference point exists, note that the water level measurement is from the top of the outer protective casing, top of inside riser pipe, ground surface, or some other position on the well head. Have a permanent reference point established as soon as possible after sampling. Measure at least twice to confirm measurement; the measurement should agree within 0.01 feet or re-measure. Decontaminate the water-level-measuring device.

- 6) If not already completed, measure the total depth of the well (at least twice to confirm measurement; the measurement should agree within 0.01 feet or re-measure) and record it in the field notebook or on log form. Decontaminate the device used to measure total depth. If the total well depth has been measured recently (in the past year), then measure it at the conclusion of sampling.
- Calculate the volume of water in the well and the volume to be purged using the formula previously provided.
- 8) Lay plastic sheeting around the well to minimize the likelihood of contamination of equipment from soil adjacent to the well.
- 9) Rinse the outside of sampling pump with distilled water and then, while lowering the pump, dry it with disposable paper towels.
- 10) Lower the pump (or bailer) and tubing down the well. The sampling equipment should never be dropped into the well because this will cause degassing of the water upon impact. This may also increase turbidity, which may bias the metals analysis. The lowering of the equipment should be slow and smooth!
- 11) The pump should be lowered to a point just below the water level. If the water level is above the screened interval, the pump should be above the screened interval for the reasons provided in the purging section.
- 12) Turn the pump on. The submersible pumps should be operated in a continuous, low-flow manner so that they do not produce pulsating flows, which cause aeration in the discharge tubing, aeration upon discharge, or resuspension of sediments at the bottom of the well. The sampling pump flow rates should be lower than or the same as the purging rates. The purging and sampling rates should not be any greater than well development rates.
- 13) Water levels should be monitored during pumping to ensure that air does not enter the pump and to help determine an appropriate purging rate.
- 14) After approximately one to two well volumes are removed, a flow-through cell will be hooked up to the discharge tubing of the pump. If the

well discharge water is not expected to be highly turbid, contain separate liquid phases, or minimal bacterial activitiy that may coat or clog the electrodes within the flow-through cell, then the cell can be immediately hooked up to the discharge tubing. This cell will allow measurements of water-quality-indicator parameters without allowing contact with the atmosphere prior to recording the readings for temperature, pH, ORP, SEC, DO and turbidity.

- 15) Measurements for temperature, pH, ORP, SEC, DO, and turbidity will be made at each one-half well volume removed. Purging may cease when measurements for all five parameters have stabilized (provided in the earlier table) for three consecutive readings.
- 16) If the water level is lowered to the pump level before three volumes have been removed, the water level will be allowed to recover for 15 minutes, and then pumping can begin at a lower flow rate. If the pump again lowers the water level to below the pump intake, the pump will be turned off and the water level allowed to recover for a longer period of time. This will continue until a minimum of two well volumes are removed prior to taking the ground-water sample.
- If the water-quality-indicator parameters have 17) stabilized, sample the well. Samples will be collected by lowering the flow rate to a rate that minimizes aeration of the sample while filling the bottles (approximately 300 ml/min). Then a final set of water-guality-indicator parameters is recorded. The pump discharge line is rapidly disconnected from the flowthrough cell to allow filling of bottles from the pump discharge line. The bottles should be filled in the order of volatile organic compounds bottles first, followed by semi-volatile organic compound's/pesticides, inorganics, and other unfiltered samples. Once the last set of samples is taken, if filtering is necessary, an in-line disposable filter (with appropriately chosen filter size) will be added to the discharge hose of the pump. Then the filtered samples will be taken. If a bailer is used for obtaining the samples, filtering occurs at the sampling location immediately after the sample is obtained from the bailer by using a suction

filter. The first one-half to one liter of sample taken through the filter will not be collected, in order to assure the filter media is acclimated to the sample. If filtered samples are collected, WITHOUT EXCEPTION, filtering should be performed in the field as soon as possible after collection, and not later in a laboratory.

- 18) All appropriate samples that are to be cooled, are put into a cooler with ice immediately. All of the samples should not be exposed to sunlight after collection. Keep the samples from freezing in the winter when outside temperatures are below freezing. The samples, especially organics, cyanide, nutrients, and other analytes with short holding times, are recommended to be shipped or delivered to the laboratory daily. Ensure that the appropriate samples that are to be cooled remain at 4°C, but do not allow any of the samples to freeze.
- 19) If a pump cannot be used because the recovery rate is slow and the volume of the water to be removed is minimal (less than 5 feet of water), then a Teflon® bailer, with a double check valve and bottom-emptying device with a control-flow check valve will be used to obtain the samples. The polypropylene rope used with the bailer will be disposed of following the completion of sampling at each well.
- 20) The pump is removed from the well and decontaminated for the next sampling location.

Additional precautions to ensure accurate and representative sample collection are as follows:

- Check valves on bailers, if bailers are used, should be designed and inspected to ensure that fouling problems do not reduce delivery capabilities or result in aeration of the sample.
- The water should be transferred to a sample container in a way that will minimize agitation and aeration.
- If the sample bottle contains no preservatives, the bottle should be rinsed with sample water, which is discarded before sampling. Bottles for sample analyses that require preservation should be prepared before they are taken to the well. Care should be taken to avoid overfilling bottles so that the preservative is not lost. The pH should be checked and more preservatives added to inor-

ganic sample bottles, if needed. VOA bottles that do not meet the ph requirements need to be discarded and new sample bottles with more preservative added should be prepared immediately.

 Clean sampling equipment should not be placed directly on the ground or other contaminated surfaces either prior to sampling or during storage and transport.

Special Consideration for Volatile Organic Compound Sampling

The proper collection of a sample for dissolved volatile organics requires minimal disturbance of the sample to limit volatilization and therefore a loss of volatiles from the samples. Preferred retrieval systems for the collection of un-biased volatile organic samples include positive displacement pumps, low-flow centrifugal pumps, and some in-situ sampling devices. Field conditions and other constraints will limit the choice of appropriate systems. The principal objective is to provide a valid sample for analysis, one that has been subjected to the least amount of turbulence possible.

 Fill each vial to just overflowing. Do not rinse the vial, nor excessively overflow it, as this will effect the pH by diluting the acid preservative previously placed in the bottle. Another option is to add the acid at the well, after the sample has been collected. There should be a convex meniscus on the top of the vial.

2) Do not over tighten and break the cap.

- 3) Invert the vial and tap gently. Observe the vial closely. If an air bubble appears, discard the sample and collect another. It is imperative that no entrapped air remains in the sample vial. Bottles with bubbles should be discarded, unless a new sample cannot be collected, and then the presence of the bubble should be noted in the field notes or field data sheet. If an open sample bottle is dropped, the bottle should be discarded.
- 4) Orient the VOC vial in the cooler so that it is lying on its side, not straight up.
- 5) The holding time for VOCs is 14 days. It is recommended that samples be shipped or delivered to the laboratory daily. Ensure that

the samples remain at 4°C, but do not allow the samples to freeze.

#### Field Filtration of Turbid Samples

The USEPA recognizes that in some hydrogeologic environments, even with proper well design, installation, and development, in combination with the lowflow rate purging and sampling techniques, sample turbidity cannot be reduced to ambient levels. The well construction, development, and sampling information should be reviewed by the Regional geologists or hydrologists to see if the source of the turbidity problems can be resolved or if alternative sampling methods should be employed. If the water sample is excessively turbid, the collection of both filtered and unfiltered samples, in combination with turbidity, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pumping rate, and drawdown data is recommended. The filter size used to determine TSS and TDS should be the same as used in the field filtration. An in-line filter should be used to minimize contact with air to avoid precipitation of metals. The typical filter media size used is 0.45 µm because this is commonly accepted as the demarcation between dissolved and non-dissolved species. Other filter sizes may be appropriate, but their use should be determined based on site-specific criteria (examples include grain-size distribution, ground-water flow velocities, mineralogy) and project DQOs. Filter sizes up to 10.0 µm may be warranted because larger size filters may allow particulates that are mobile in ground water to pass through (Puls and Powell, 1992). The changing of filter media size may limit the comparability of the data obtained with other data sets and may affect their use in some geochemical models. Filter media size used on previous data sets from a site, region, or aguifer and the DQOs should be taken into consideration. The filter media used during the ground-water sampling program should be collected in a suitable container and archived because potential analysis of the media may be helpful for the determination of particulate size, mineralogy, etc.

The first 500 to 1000 milliliters of sample taken through the filter, depending on sample turbidity, will not be collected for a sample, in order to ensure that the filter media has equilibrated to the sample. Manufacturers' recommendations also should be consulted. Because bailers have been shown to increase turbidity while purging and sampling, they should be avoided when sampling for trace element, metal, PCB, and pesticide constituents. If portable sampling pumps are used, the pumps should be gently lowered to the sampling depth desired, carefully avoiding being lowered to the bottom of the well. The pumps, once placed in the well, should not be moved to allow any particles mobilized by pump placement to settle. Dedicated sampling equipment installed in the well prior to the commencement of the sampling activities is one of the recommended methods to reduce turbidity artifacts (Puls and Powell, 1992; Kearl et al., 1992; Puls et al., 1992; Puls and Barcelona, 1996).

#### **DECONTAMINATION PROCEDURES**

Once removed from the well, the purging and sampling pumps should be decontaminated by scrubbing with a brush and a non-phosphate soapy-water wash, rinsed with water, and rinsed with distilled water to help ensure that there is no cross-contamination between wells. The step-by-step procedure is:

- Pull pump out of previously sampled well (or out of vehicle) and use three pressure sprayers filled with soapy water, tap water, and distilled water. Spray outside of tubing and pump until water is flowing off of tubing after each rinse. Use bristle brush to help remove visible dirt, contaminants, etc.
- 2) Have three long PVC tubes with caps or buckets filled with soapy water, tap water and distilled water. Run pump in each until approximately 2 to 3 gallons of each decon solution is pumped through tubing. Pump at low rate to increase contact time between the decon solutions and the tubing.
- 3) Try to pump decon solutions out of tubing prior to next well. If this cannot be done, compressed air may be used to purge lines. Another option is to install a check valve in the pump line (usually just above the pump head) so that the decon solutions do not run back down the well as the pump is lowered down the next well.
- 4) Prior to lowering the pump down the next well, spray the outside of the pump and tubing with distilled water. Use disposable paper towels to dry the pump and tubing.

5) If a hydrophobic contaminant is present (such as separate phase, high levels of PCBs, etc.), an additional decon step, or steps, may be added. For example, an organic solvent such as reagent-grade isopropanol alcohol may be added as a first rinse prior to the soapy water rinse.

If the well has been sampled with a bailer that is not disposable, the bailer should be cleaned by washing with soapy water, rinsing with tap water, and finally rinsing with distilled water. Bailers are most easily cleaned using a long-handled bottle brush.

It is especially important to clean thoroughly the portion of the equipment that will be in contact with sample water. In addition, a clean plastic sheet should be placed adjacent to or around the well to prevent surface soils from coming in contact with the purging equipment. The effects of cross-contamination also can be minimized by sampling the least contaminated well first and progressing to the more contaminated ones. The bailer cable/rope (if a bailer is used) and plastic sheet should be properly discarded, as provided in the site health and safety plan, and new materials provided for the next well.

#### FIELD QUALITY CONTROL

The quality assurance (QA) targets for precision and accuracy of sampling programs are based on accuracy and precision guidelines established by the USEPA. When setting targets, keep in mind that all measurements must be made so that the results are representative of the sample water and site-specific conditions. Various types of blanks are used to check the cleanliness of the field-handling methods. These are known as field blanks, and include field equipment blanks and transport blanks. Other QA samples include spike samples and duplicates.

There are five primary areas of concern for QA in the collection of representative ground-water samples:

1. Obtaining a sample that is representative of water in the aquifer or targeted zone of the aquifer. Verify log documentation that the well was purged of the required volume or that the temperature, pH, ORP, SEC, DO and turbidity stabilized before samples were extracted.

- 2. Ensuring that the purging and sampling devices are made of materials and utilized in a manner that will not interact with or alter the analyses.
- Generating results that are reproducible. Therefore, the sampling scheme should incorporate co-located samples (duplicates).
- 4. Preventing cross-contamination. Sampling should proceed from least to most contaminated wells, if known. Field equipment blanks should be incorporated for all sampling and purging equipment; decontamination of the equipment is therefore required.
- 5. Ensuring that samples are properly preserved, packaged, and shipped.

#### FIELD EQUIPMENT BLANKS

To ensure QA and quality control, a field equipment blank must be included in each sampling run, or for every twenty samples taken with the sampling device. Equiptment blanks allow for a cross check and, in some cases, quantitative correction for imprecision that could arise due to handling, preservation, or improper cleaning procedures.

Equipment blanks should be taken for each sample bottle type that is filled. Distilled water is run through the sampling equipment and placed in a sample bottle (the blank), and the contents are analyzed in the lab like any other sample. Following the collection of each set of twenty samples, a field equipment blank will be obtained. It is generally desirable to collect this field equipment blank after sampling a relatively highly contaminated well. These blanks may be obtained through the following procedure:

- a) Following the sampling event, decontaminate all sampling equipment according to the site decontamination procedures and before collecting the blank.
- b) VOA field blanks should be collected first, prior to water collected for other TAL/TCL analyses. A field blank must be taken for all analyses.
- c) Be sure that there is enough distilled water in the pump so that the field equipment blank can be collected for each analysis.
- d) The water used for the field equipment blank should be from a reliable source, documented

in the field notebooks, and analyzed as a separate water-quality sample.

#### TRIP BLANKS

A trip blank should be included in each sample shipment and, at a minimum, one per 20 samples. Bottles, identical to those used in the field, are filled with reagent-grade water. The source of the reagent-grade water should be documented in the field notebooks, including lot number and manufacture. This sample is labeled and stored as though it is a sample. The sample is shipped back to the laboratory with the other samples and analysis is carried out for all the same constituents.

#### DUPLICATE SAMPLES

Duplicate samples are collected by taking separate samples as close to each other in time and space as practical, and should be taken for every 20 samples collected. Duplicate samples are used to develop criteria for acceptable variations in the physical and chemical composition of samples that could result from the sampling procedure. Duplicate results are utilized by the QA officer and the project manager to give an indication of the precision of the sampling and analytical methods.

#### HEALTH AND SAFETY CONSIDERATIONS

Depending on the site-specific contaminants, various protective programs must be implemented prior to sampling the first well. The site health and safety plan should be reviewed with specific emphasis placed on the protection program planned for the sampling tasks. Standard safe operating practices should be followed, such as minimizing contact with potential contaminants in both the liquid and vapor phases through the use of appropriate personal protective equipment.

Depending on the type of contaminant expected or determined in previous sampling efforts, the following safe work practices will be employed:

Particulate or metals contaminants

- 1. Avoid skin contact with, and accidental ingestion of, purge water.
- 2. Wear protective gloves and splash protection.

Volatile organic contaminants

- 1. Avoid breathing constituents venting from well.
- 2. Pre-survey the well head space with an appropriate device as specified in the Site Health and Safety Plan.
- 3. If air monitoring results indicate elevated organic constituents, sampling activities may be conducted in Level C protection. At a minimum, skin protection will be afforded by disposable protective clothing, such as Tyvek®.

General practices should include avoiding skin contact with water from preserved sample bottles, as this water will have pH less than 2 or greater than 10. Also, when filling, pre-preserved VOA bottles, hydrochloric acid fumes may be released and should not be inhaled.

#### **POST-SAMPLING ACTIVITIES**

Several activities need to be completed and documented once ground-water sampling has been completed. These activities include, but are not limited to:

- Ensuring that all field equipment has been decontaminated and returned to proper storage location. Once the individual field equipment has been decontaminated, tag it with date of cleaning, site name, and name of individual responsible.
- Processing all sample paperwork, including copies provided to Central Regional Laboratory, Sample Management Office, or other appropriate sample handling and tracking facility.
- Compiling all field data for site records.
- Verifying all analytical data processed by the analytical laboratory against field sheets to ensure all data has been returned to sampler.

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# MONITOR WELL CONSTRUCTION LOG

Project Number

C.T. MALE ASSOCIATES

	Decise of Name
Protective Enclosure	Project Name Boring No Well No Boring No Town/City
$\downarrow$ ft. elev. $\downarrow$ $\downarrow$ $\downarrow$ LAND SURFACE	County State
<pre>ft. elevinch diameter drilled holeinch diameter,inch diameter,inch diameter,inch diameter,inch diameter,inch diameter,inch diameter,inch diameter,inch diameter,</pre>	County State Installation Date(s) Drilling Contractor Drilling Method Water Depth From Top of Riserft C.T. Male Observer Notes:
Gravel Pack     Sand Pack     Formation Collapse     ft*     ft*     t*     Depth below land surface.	

Project Number \_\_\_\_\_



# MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES

ft. elev. ft. elev.	Project Name
2.0 inch diameter         drilled hole         Well casing (PVC),         1.25 inch diameter         minite       glurry         t*         t*         ft*         Vell Screen         1.25, inch diameter         ft*         gravel Pack         Sand Pack         Formation Collapse         ft*         x.x       ft*	Installation Date(s) Drilling Contractor Drilling Method Water Depth From Top of Riserft Drilling Observer Notes:
* Depth below land surface.	

C.T. MALE ASSOCIATES					)CI	ATE	S		SUBSURFACE EXPLORATION BORING NO.: ELEV.: DATE: DATE: FINISH D SHEET OF	TUM:				
PRO	JECT	:							CTM PROJECT NO	.:				
LOC	ATIO	N:							CTM OBSERVER	!:				
DEPTH (FT.)	SAN EA	NO.	BL 0/6			AMPL 18/24		RECOVERY	SAMPLE CLASSIFICATION			NO	TES	
$\frac{5}{10}$ $\frac{10}{20}$ $\frac{25}{30}$														
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									SUCH AUTHORIZED USERS.	SAN	IPLE C	LASSI	FICATION BY:	

# C.T. MALE ASSOCIATES

# APPENDIX G SITE WIDE INSPECTION FORMS

Page 1 of 4

	Date:	
Inspection Personnel:		
Weather Conditions:		
Subsurface soils are contaminated by cadmium, lead, total PC MTBE) at levels exceeding restricted residential Soil Cleanu Currently, protection of public health and the environment to c provided by an engineered cover system consisting of between feet of clean fill underlain by a demarcation barrier. The location depicted on Figure 1 of the Site Management Plan (SMP).	p Objectives contaminated p 3.5 and more of the cover s	(SCOs). media is than 10 system is
Cover System Inspection		
Has the overall condition of the cover system changed from the previous inspection (if first inspection, respond with N/A)?	Yes	No
If Yes, provide detail and identify on Site Plan		
Is soil cover system adequately vegetated to prevent erosion?	Yes	No
If No, identify locations and provide detail on attached Site Plan		

Page 2 of 4

Is there evidence that the soil cover system has been eroded by wind, water and/or planned or unplanned construction activ	Yes vities?	No						
If Yes, identify locations and provide detail on attached Site Plan								
T .1 ·1 .1 .1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1 ·1	N	NT						
Is there evidence that the soil cover system has been breached (i.e., areas where surface appears patched, signs of excavation)	Yes	No						
If Yes, identify locations and provide detail on attached Site Plan								
Is there evidence that the soil cover system has been breached in site activities?	ntentionally b Yes	y planned No						
(i.e., areas where surface appears patched, signs of excavation)	100							
If Yes, identify locations and provide detail on attached Site Plan								
Is there evidence that the shoreline stabilization measures have	been Yes	No						
breached (i.e., areas where shoreline appears to be eroded our u	unstabile)?							

If Yes, identify locations and provide detail on attached Site Plan

Page 3 of 4

Have photographs been taken of the cover system and shoreline for inclusion in the site inspection report.	Yes	No
If No, give reason		
Are the existing groundwater monitoring wells intact and accessible? If No, please describe the condition	Yes	No
Were the groundwater monitoring wells sampled during this inspection? If No, why and when is the next scheduled monitoring well sampling even		No
Are there any violations of the use restrictions observed	Yes	No
(e.g., non-community vegetable gardens)?Are the remedy components poinstitutional controls, and that shall also	st-construction,	such as
Has there been any change in the use restrictions on the site or	Yes	No
the necessary provisions for ensuring that the easement covenant remains effective? If No, list and/or identify	in place and is	
in roo, instance of recently		

Page 4 of 4

Are there any changes to site operations and maintenance requirements Yes\_\_\_\_ No\_\_\_\_ for the components of the remedy? If Yes, please describe

C.T. MALE ASSOCIATES						ATE	S		SUBSURFACE EXPLORATION BORING NO.: ELEV.: DATE: DATE: FINISH D SHEET OF	TUM:				
PROJECT:									CTM PROJECT NO	.:				
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AVAILABLE TO C.T.MALE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.					SAN	IPLE C	LASSI	FICATION BY:						