Appendix P: Operations and Maintenance (O&M) Plan

Operation and Maintenance Plan
Mercury Refining Superfund Site
Colonie, New York

Prepared for
Mercury Refining Site Remedial Action Group

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List of Abbreviations

AAMP	Ambient Air Monitoring Plan ACM Asbestos Containing Material
BGS	Below Ground Surface
DEC	New York State Department of Environmental Conservation
DI	Deionized
DOH	New York State Department of Health
DOL	New York State Department of Labor
DQO	Data Quality Objective
DSR	Designated Site Representative
EE	Environmental Easement
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
HSCP	Health and Safety Contingency Plan
IC	Institutional Control
ICIAP	Institutional Controls Implementation and Assurance Plan
IDW	Investigation Derived Waste
ISS	In-Situ Solidification/Stabilization
LLC	Limited Liability Corporation
MVA	Mercury Vapor Analyzer
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response (USEPA)
PCB	Polychlorinated Biphenyl
PLM	Polarized Light Microscopy
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDI	Remedial Design Investigation
RDR	Remedial Design Report
ROD	Record of Decision
SEO	Soil Excavation Officer
SEP	Soil Excavation Plan
SMP	Site Management Plan
SSDS	Sub Slab Depressurization System
TCLP	Toxicity Characteristic Leaching Procedure
TEM	Transmission Electron Microscopy
USCS	Unified Soil Classification System
XRF	X-Ray Fluorescence

Section 1

Introduction

This Operations and Maintenance Plan (O&M Plan) has been prepared in accordance with the Remedial Design (RD) and Remedial Action (RA) Statements of Work (SOWs) for the Mercury Refining Superfund Site (Site). The document is also based on relevant portions of guidance documents provided by the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC). The O&M Plan specifies post-remediation activities and requirements applicable to the Site.

1.1 Overview

The O&M Plan includes an Institutional Controls Implementation and Assurance Plan (ICIAP) to implement the Institutional Controls set forth in the Record of Decision (ROD; EPA, September 2008). The O&M Plan also includes a Site Management Plan (SMP) which addresses:

- future excavation of potentially contaminated soils not remediated during remedial construction;
- potential vapor intrusion at existing buildings on-Site and/or those to be constructed in the future;
- monitoring of groundwater to ensure that, following Site remediation, the contamination has attenuated and the groundwater has been remediated;
- monitoring and maintenance of the clay and asphalt/concrete cap;
- preservation of the subsurface mass treated by in situ solidification / stabilization (ISS)
- demolition or alteration of certain existing buildings; and
- periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place.

As further discussed in Section 2, the Site subject to this O&M Plan includes the Mercury Refining Company, Inc. (MERECO) property, which is located at 26 Railroad Avenue on the border of the Towns of Guilderland and Colonie, Albany County, New York (MERECO property). The MERECO property extends north to Railroad Avenue. The former Albany Pallet and Box Company (Albany Pallet) was located on the MERECO property, north of MERECO's former mercury reclamation facility. Allied Building Products Corporation (Allied Building) is located east of the MERECO property. Property currently owned by SealMaster of Buffalo, New York (formerly referred to as the Diamond W. property) is located west of the MERECO property. An additional parcel owned by MERECO lies adjacent to the southern boundary of the SealMaster property. A CSX Railroad right of way and active tracks are located south of the MERECO property. An unnamed tributary to the Patroon Creek (hereinafter referred to as the Unnamed Tributary) flows easterly through a portion of the MERECO property, then south through a culvert under the CSX railroad tracks, and then easterly along the south side of the CSX tracks.

The Site is defined by the extent of potential contamination associated with MERECO's past mercury reclamation processes and includes the MERECO property and portions of the Allied Building property, the SealMaster property, the former Albany Pallet property, and the additional MERECO parcel south of the SealMaster property. The Site also includes the portion of the Unnamed Tributary that is located immediately south of the MERECO property. The Unnamed Tributary reportedly received contaminated stormwater drainage from the storm sewer system that formerly serviced the MERECO property.

A portion of the MERECO property is currently covered by a concrete and asphalt cap which is a single layer cap. The cap was installed to reduce the infiltration of rain water and to prevent direct contact with underlying soils that are contaminated with mercury. The southern portion of the MERECO property is covered by a single-layer clay cap which was installed after the excavation and off Site disposal of mercury and polychlorinated biphenyl (PCB) contaminated soils in 1985. The MERECO property currently includes one building, a three story concrete block structure called the Phase 1 Building. The one story wood frame structure called the Container Storage Building was demolished in 2012 as part of the Remedial Design Investigation of the Site.

1.2 Green Remediation

Green remediation can be defined as the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprints of cleanup actions. The post-remediation activities specified in this O&M Plan will be conducted in accordance with the Green Remediation Plan (see Final RDR) and EPA's Clean and Green Policy (EPA, August 2009). The goal of this requirement is to enhance the environmental benefits of the Site remedy by promoting technologies and practices that are sustainable. The specific objectives of the Clean & Green Policy are to:

- Protect human health and the environment by achieving remedial action goals;
- Support human and ecological use and reuse of remediated land;
- Minimize impacts to water quality and water resources;
- Reduce air emissions and greenhouse gas production;
- Minimize material use and waste production; and
- Conserve natural resources and energy.

Implementation of this O&M Plan presents opportunities to achieve several of these objectives. Specific O&M activities that will provide Clean and Green benefits include the following:

- Maintenance of the clay cap will employ composting and re-use of site vegetation and reseeding with local (non-invasive) grass types.
- Future demolition or alteration of on-Site structures will employ crushing and on-Site reuse of concrete rubble as a portion of the "general fill" requirement during backfill activities. If these materials can not be reused on-Site, preference will be given to disposal at local recycling facilities where the concrete can be recycled, thereby reducing the transportation footprint of these materials.
- Repair of replacement of asphalt/concrete paving used for covering the solidified mass will, if feasible, employ recycled materials. For example, concrete formulated with cement that is amended with combustion by-products will save energy, and reduce greenhouse gas emissions during production.
- Clean diesel fuels and technologies will be used during O&M activities. Clean diesel can include low sulfur fuels or fuels which include a biodiesel component. These fuels will be used during future demolition and excavation activities conducted pursuant to the SMP. Contractors will be required to include fleet and technology information in their reporting submittals, including fuel type and annual fuel usage, and vehicle retrofitting data.

The Green Remediation Plan (see RDR) should be consulted for more details. Future contract documents supplied to O&M contractors will specify particular green technology requirements. Contractors and owners will cooperate in implementing. If a requirement is deemed impractical during planning or construction, this will be documented in the report provided to the regulatory agencies and the Designated Site Representative (DSR) responsible for preparing the annual Periodic Review Report (PRR) and Certification (see below).

1.3 Personnel

The overall responsibility for implementation of this O&M Plan rests with the Mercury Refining Site Remedial Action Group (Group) and the owners of the properties that comprise the Site. The following subsections identify key roles and responsibilities for implementing the O&M Plan, along required training and experience.

1.3.1 Designated Site Representative

As discussed in Sections 2.9 and Section 4 of this O&M Plan, periodic Site inspections will be required to document that the Institutional Controls (ICs) and Engineering Controls (ECs) are properly implemented and maintained. The Group and the property owners will appoint a Designated Site Representative (DSR) as the individual who will directly supervise these inspections and who will prepare the required annual report and certification to the EPA and DEC. The Group and the property owners will be responsible for notifying the DSR of any developments governed by this O&M Plan, including but not limited to emergency repairs, failure of any ECs, and any plans for soil excavation or structural demolition. The DSR will be a New York State licensed professional engineer with appropriate training and experience in the remediation, operation and maintenance of contaminated sites in New York.

1.3.2 Design Engineer

Under New York law, engineering designs must be prepared under the direct supervision of a New York State licensed professional engineer. Such design work would include but not be limited to designs for structural demolition, remediation of contaminated soil, and repair of clay and concrete/asphalt caps. The engineer will have appropriate training and experience in the remediation, operation and maintenance of contaminated sites in New York.

1.3.3 Qualified Environmental Professional

Work involving the characterization of environmental media and the reporting of the results to the EPA and DEC must be performed by a qualified environmental professional. As defined by the DEC in DER-10, “qualified environmental professional” means a person, including a firm headed by such person, who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding the presence of releases or threatened releases to the surface or subsurface of a site or off-site areas, sufficient to meet the objectives and performance factors for the areas of practice identified by this guidance. Such a person must:

1. hold a current Professional Engineer's or a Professional Geologist's license or registration and have the equivalent of three years of full-time relevant experience in site investigation and remediation of the type detailed in DER-10; or
2. be a site remediation professional licensed or certified by the federal government, a state or a recognized accrediting agency, to perform investigation or remediation tasks identified by DER-10, and have the equivalent of three years of full-time relevant experience. Examples of such license or certificate include the following titles:
   a. Licensed Site Professional, by the State of Massachusetts;

b. Licensed Environmental Professional, by the State of Connecticut;
c. Qualified Environmental Professional by the Institute of Professional Environmental Practice; or
d. Certified Hazardous Materials Manager, by the Institute of Hazardous Materials Management.

1.3.4 Soil Excavation Officer

As discussed in Section 3.3, future on-Site soil excavations will be subject to the SMP and conducted under a soil excavation plan (SEP). A Soil Excavation Officer (SEO) will be in charge of proper implementation of the SEP. The SEO will be a qualified environmental professional trained under the appropriate OSHA regulations (i.e., 29 CFR 1910.120) and with appropriate experience supervising activities on contaminated sites. The SEO will be on Site as necessary to ensure proper implementation of the SEP.

1.3.5 On-Site Workers

Workers conducting intrusive work in on-Site areas with a potential for exposure to hazardous substances must have completed 40 hours of comprehensive health and safety training along with the required eight hour annual refresher classes, which meets the requirements of Title 29, Code of Federal Regulations Part 1910.120 (29 CFR 1910.120). Other personnel requirements related to worker health and safety are specified in the Health and Safety Contingency Plan (see Final RDR). Routine workers engaged only in the ordinary work-place activities of the current industrial users of the Site (i.e., Allied Building, SealMaster, 26 Railroad Avenue, Inc.) do not require special training under 29 CFR 1910.120.

Section 2

Institutional Controls Implementation and Assurance Plan

2.1 Introduction

The Record of Decision (ROD) for the Mercury Refining Superfund Site requires the imposition of institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site. Specifically, environmental easements/restrictive covenants will be filed in the property records of Albany County. The easements/covenants will at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the existing clay cap on the southern portion of the Mercury Refining Property; (c) preserve the integrity of the solidified/stabilized mass; (d) prevent the excavation of soils which lie beneath the Phase 1 Building, which housed Mercury Refining's operations, and the Container Storage Building (CSB), which was used to store incoming mercury bearing material for processing, unless the excavation follows a Site Management Plan (see below); and (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

This section of the O&M Plan presents the Institutional Controls Implementation and Assurance Plan (ICIAP) to implement the institutional controls set forth in the ROD. The subsections of this ICIAP provide:

- A description of the pathways for potential human exposure to waste material that may remain during and/or after completion of construction of the Remedial Action (RA):
- A description of the areas where human activities should be restricted, including legal descriptions for such areas, sample maps, and a plan for preparing final survey maps (e.g., survey of hazardous waste cap);
- A list of properties where Institutional Controls (ICs) are needed;
- A description of the proposed IC's and their purpose;
- A description of the proposed duration of each IC and an explanation for such duration;
- A schedule for implementing each IC;
- A schedule for completing title work;
- Draft ICs enforceable under state law to;
  - Limit the Site properties to industrial uses;
  - Preserve the integrity of the existing clay cap and concrete/asphalt cap on the Mercury Refining Property;
  - Preserve the integrity of the solidified-stabilized mass after ISS;
  - Prevent the excavation of Site soils unless the excavation follows the SMP (see Section 3);
  - Prevent the demolition/decommissioning of the Phase 1 Building, the former CSB slab, or the former Albany Pallet Company structure ("Quonset Hut") unless the work is conducted in accordance with the Site Management Plan; and
  - Restrict the use of groundwater as a source of potable or process water until the groundwater quality standard for mercury is met.

- Identification of each affected property owner with authority to implement each IC, including title insurance commitments or other title evidence acceptable to EPA and DEC for proposed institutional controls;
- A description of all prior liens and encumbrances existing on any real property that may affect the ICs or the protectiveness of the remedy, and a plan for the release or subordination of any such liens and encumbrances (unless EPA and DEC waive the release or subordination of such liens or encumbrances);
- A plan for monitoring, maintaining, reporting on, and ensuring the continued efficacy of the ICs and a contingency plan in the event ICs are ineffective; and
- A schedule for annual certifications regarding whether the ICs and Engineering Controls (ECs) remain in place, whether the ICs have been complied with, and enforcement of the ICs.

2.2 Pathways for Potential Human Exposure

Several pathways have been identified for potential human exposure to mercury-impacted media that may remain after completion of construction of the RA.

2.2.1 Routine Workers at MERECO, SealMaster and Allied Properties

Potential exposure pathways could arise if the clay and asphalt/ concrete cap on the MERECO property were removed in the future, or if the cover and clean fill over the solidified/stabilized soil on the MERECO and Allied properties were removed in the future. In such cases, routine workers potentially could be exposed to surface soil via incidental ingestion, dermal contact, and inhalation of particulates. Routine workers potentially could also be exposed to volatiles, including mercury, in subsurface soil via vapor intrusion into indoor air.

2.2.2 Construction Workers at MERECO, SealMaster and Allied Properties

Potential exposure pathways could arise for construction workers engaged in intrusive activities. This potential exists not only on the MERECO property, but also on the SealMaster and Allied properties including but not limited to the general vicinity of previously identified areas of soil impacts that will be removed during the RA. Such intrusive construction activities include but are not limited to subsurface utility installation and repair, construction of foundations for new structures, and landscaping. Construction workers engaged in intrusive construction activities could be exposed to soil via incidental ingestion, dermal contact, and inhalation of particulates, as well as inhalation of mercury vapor in the breathing zone. On the MERECO property only, construction workers engaged in non-intrusive activities, including demolition of the Phase 1 Building, the former CSB slab and the Quonset Hut, could be exposed to mercury-impacted structural materials and surfaces via incidental ingestion, dermal contact, and inhalation of particulates, as well as to mercury vapor via inhalation in the breathing zone.

2.2.3 Trespassers on MERECO, SealMaster and Allied Properties

Trespassers on the MERECO, SealMaster and Allied properties face potential exposure to impacted soils if the clay and asphalt/concrete cap or other clean materials covering potentially contaminated soils at the Site are removed at some point in the future. This potential includes but is not limited to the general vicinity of previously identified areas of soil impacts that were removed during the RA. Trespassers could be exposed to surface soil via incidental ingestion, dermal contact, and inhalation of particulates. Trespassers could also be exposed mercury vapor in indoor air.

2.2.4 Users of Groundwater

Unless otherwise restricted, all fresh groundwater in New York State is classified for use as a potable water supply. Users of groundwater underlying portions of the MERECO and Allied properties have a potential to be exposed to dissolved mercury via ingestion and dermal contact. Users of groundwater for non-potable purposes such as watering lawns and cleaning have a potential to be exposed to dissolved mercury via inhalation of mists and dermal contact.

2.2.5 Recreational Users of Unnamed Tributary, Patroon Creek and I-90 Pond

Recreational Users of the Unnamed Tributary, Patroon Creek and I-90 Pond have a potential to be exposed to mercury from potential sources including the Site. Potential exposure pathways could be associated with wading in these water bodies with incidental ingestion and dermal exposure to sediment and surface water, and ingestion of fish from the creek and pond.

2.3 Areas Where Activities Should Be Restricted

Areas where human activities should be restricted have been identified based on the aforementioned, potential exposure pathways. The areas consist of the MERECO, SealMaster and Allied properties and a portion of the CSX railroad property. Subject to the results of post remedial construction sampling and analysis of sediments, surface water and biota in the Unnamed Tributary, Patroon Creek and I-90 pond, it may be necessary to restrict human activities in these water bodies.

The area subject to restrictions is shown on Figure 2-1. The area consists of the parcels designated A through I in the following table:

TABLE 2-1. PARCELS SUBJECT TO INSTITUTIONAL CONTROLS

PARCEL (Figure 2-1)	OWNER (from 2012 Albany County Tax Roll)	TOWN	TAX PARCEL NUMBER (from Albany County Tax Map)
A	26 Railroad Avenue, Inc.	Colonie	53.10-4-4.0
B	26 Railroad Avenue, Inc.	Guilderland	53.09-1-9.0
C	26 Railroad Avenue, Inc.	Guilderland	53.09-1-10.2
D	Mercury Refining Company, Inc.	Guilderland	53.09-1-8.2
E	Richard Friedenthal (now SealMaster)	Colonie	53.10-4-3.0
F	Richard Friedenthal (now SealMaster)	Guilderland	53.09-1-8.1
G	Albany 40 Associates, LLC	Colonie	53.10-4-5.1
H	Albany 40 Associates, LLC	Guilderland	53.09-1-10.3
I	CSX Transportation, Inc.	Guilderland	53.05-1-16

The legal descriptions of these parcels are provided in Attachment A. At the conclusion of the remedial construction, a final survey map prepared by a New York State licensed land surveyor will be prepared. The final survey map will include the following:

- Boundaries of the above-listed parcels;
- Extent of the clay/pavement cap;
- Final limits of soil and sediment removal;
- Horizontal extent of mass stabilized by ISS;
- Locations of long-term groundwater monitoring wells; and
- Locations of post-excavation confirmation samples.

Per DEC requirements (DEC, December 2010), the final survey map must also:

1. bear the name, address, telephone number, signature and certification of the professional land surveyor who performed the survey, his or her official seal and registration number, the date the survey was completed, and the dates of all the surveyor's revisions;
2. be certified to the New York State Department of Environmental Conservation;
3. show boundaries drawn to a convenient scale, with that scale clearly indicated. A graphic scale, shown in feet and meters, must be included;
4. identify the symbols and abbreviations that are used on the survey by the use of a legend;
5. accurately present diagrams;
6. show the point of beginning of the legal description(s);
7. include a correct legal description(s);
8. include a statement of the acreage in the legal description(s);
9. indicate both the measured bearings/angles/distances and the deed(s) description(s), if they differ;
10. provide the identifying titles of all recorded/filed maps and deeds with their appropriate recording data, filing dates and map numbers;
11. provide the section, block and lot/ tax map/ section numbers/letters of the surveyed premises;
12. show the location of all buildings/monuments/overlaps/encroachments upon the surveyed property with their locations defined by measurement perpendicular to the nearest perimeter boundaries;
13. show all observable evidence of easements and or servitudes and underground easements and or servitudes with their recording information (such as those created by roads, right-of-way, water courses, drains, telephone, telegraph, or electric lines, water sewer, gas cable lines or oil or gas pipelines) on or across the surveyed property and on adjoining properties if they appear to affect the surveyed property, or any easements of record which may, based upon their location or use, impair or otherwise limit proposed development;
14. show any "blanket floating" easements;
15. depict the location of visible improvements within five feet of each side of boundary lines.
16. show a path of legal access for ingress and egress to and from the Site for the Grantee, its agents, employees or other representative of the State to use to access the Site;
17. show ponds, lakes, springs, rivers or a natural water boundary bordering on or running through the surveyed property; the survey must measure the location of the natural water boundary and note on the survey the date of the measurement;
18. depict the area(s) of wetlands; restricted use zones;
19. depict the environmental easement area with corresponding metes & bounds description(s) and acreage;
20. depict the area affected by engineering controls with corresponding metes and bounds with acreage, measurements with description(s) of the engineering control (for example Cap or Soil Management Plan Area);
21. show Methane/VOC system, Site Cap, Clean fill, Concrete, Demarcation Layer, area not under environmental control, Asphalt or building structures, footprint of future buildings (where known), and other Site features, remedial equipment or structures;
22. clearly state "Environmental Easement Description" or "Deed Restriction", with the DEC Site Number next to it;

23. include the following statement: “The engineering and institutional controls for this Easement are set forth in the Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@gw.dec.state.ny.us”. This reference must be located in a prominent place on the face of the survey and be in at least 15-point type;
24. show the sheet number and total number of sheets on each sheet if the survey consists of more than one sheet; and
25. show the record title description(s) of the surveyed tract and any new description(s) prepared by the surveyor on the face of the survey.

2.4 Proposed Institutional Controls

This section describes the proposed Institutional Controls, their purpose, and duration.

2.4.1 Restrict Site to Industrial Use

The use of the parcels designated in Section 2.2 will be restricted to industrial activities. For the purposes this document, industrial use means use for or in a manufacturing, mining, or chemical process or use in the operation of factories, processing plants, and similar sites. The Town of Colonie Zoning District Map (Adopted January 4, 2007 by Local Law #1 of 2007) indicates the Site and surrounding properties are zoned Industrial. The parcels comprising the Site are currently used for:

1. Precious metals recovery and recycling (26 Railroad Avenue, Inc.);
2. Wholesale and retail distribution of exterior building construction materials (Allied Building Supplies, Inc.); and
3. Wholesale distribution of pavement maintenance materials and equipment (SealMaster).

In accordance with Town of Colonie zoning law, these current operations are considered to constitute industrial use.

The industrial use restriction will remain in place unless and until further remedial action, including additional soil remediation, is undertaken pursuant to EPA and DEC oversight to eliminate the risks associated with alternative usages (e.g., commercial).

2.4.2 Preserve Clay and Pavement Cap

The southern portion of the Property is covered by a single-layer clay cap which was installed after the excavation and off-Site disposal of mercury and polychlorinated biphenyl (PCB)-contaminated soils in 1985. The northeastern portion of the MERECO Property is currently covered by a concrete and asphalt cap which is a single-layer cap. The cap was installed to reduce the infiltration of rain water and to prevent direct contact with underlying soils which are contaminated with mercury. Portions of the concrete and asphalt cap will be removed during remedial construction to enable excavation of mercury contaminated soils and implementation of ISS. These areas will be repaved upon completion of the remedial construction. If the integrity of the existing clay cap is compromised by remedial construction, it will be fully restored at the conclusion of construction activities. Easements and or deed restrictions will be established which require the maintenance of the clay cap (e.g., regular mowing, repair of erosion) and those portions of the asphalt/concrete cap necessary to protect the stabilized mass or prevent contact with shallow soils potentially contaminated with mercury.

Preservation of the clay and pavement cap will be required until further soil remediation under the cap is undertaken pursuant to EPA and DEC oversight and the potential exposure pathways are thereby eliminated.

2.4.3 Preserve Stabilized Mass

ISS conducted during remedial construction will create a stabilized mass of soil extending from surface to a depth of approximately 65 feet below ground surface (bgs). The stabilized mass will exist on both the current Mercury Refining and Allied properties. The ongoing purpose of the stabilized mass will be to immobilize mercury in surface soils and soils below the water table where the groundwater had a dissolved mercury concentration which exceeded the cleanup level of 0.7 parts per billion (ppb) for mercury in groundwater. It will be necessary to preserve the physical integrity of the solidified mass because its ability to immobilize mercury depends significantly on reducing the flow of groundwater through the mass and contacting the mercury contained within. Upon completion of ISS, the solidified mass will be covered by a minimum of two feet of clean structural fill and paving to protect it from mechanical disturbance and reduce weathering by freeze/thaw cycles. Easements and or deed restrictions will be established which require the owners 1) to prevent mechanical disturbance of the stabilized mass (e.g., excavation, boring, trenching) and 2) to maintain the integrity of the pavement covering protecting the area of the stabilized mass.

2.4.4 Control Excavation of Soils

The ROD requires the control of future excavation of soils not remediated during remedial construction, to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. This restriction includes, but is not limited to, soils beneath the Phase 1 Building and the former CSB slab on the Mercury Refining property, and soils on the former Albany Pallet property, the Allied Building property, and the SealMaster property. Easements and or deed restrictions will be established which require the owners to conduct any excavations in accordance with the SMP (Section 3), which specifies requirements for future soil excavation or disturbance, the management and disposal of excavated material, and the use of imported soil/fill for backfill, grading or landscaping.

2.4.5 Control Building Demolition

Only one of the buildings used by MERECO, the Phase 1 Building, remains on Site. The former CSB was demolished during the RDI to facilitate the characterization of underlying soil and groundwater contamination. Based on the mercury recovery and waste handling processes formerly conducted in the Phase 1 Building and the former CSB, as well as the building's age, there is a potential for the structural materials to contain residues of mercury or other hazardous substances. Accordingly, demolition of the Phase 1 Building or the CSB slab has a potential to release hazardous substances into the environment and generate demolition debris that constitutes a regulated waste. The age of the Quonset Hut located north of the Phase 1 Building, and its potential to have been impacted by historical releases of mercury indicate a similar potential for this structure. Easements and or deed restrictions will be established which require the owner of the Phase 1 Building, CSB slab and Quonset Hut to conduct any structural alterations or demolition activities in accordance with the SMP (Section 3) to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

2.4.6 Restrict Use of Groundwater

No current usage of groundwater has been identified on the MERECO, SealMaster, Allied or CSX properties. Potable water is supplied to MERECO, SealMaster and Allied by the Latham Water District of the Town of Colonie. However, as previously noted, all fresh groundwater in New York State is classified for use as a potable water supply unless otherwise restricted. Easements and or deed restrictions will be established which prohibit owners of these four properties from installing water supply wells or otherwise using groundwater as a source of potable or process water. The restrictions will remain in force until groundwater quality standards are met.

2.5 Implementation of Institutional Controls

Under the Consent Decree for Remedial Action and Recovery of Response Costs between the Mercury Refining Site Remedial Action Group and the EPA (the Consent Decree), environmental easements, deed restrictions or restrictive covenants will be filed in the property records of Albany County. The DEC provides guidance for implementing institutional controls in New York (DEC, December 2010). A copy of this guidance document is provided in Attachment B. In accordance with this guidance, an environmental easement (EE) is the required instrument for memorializing land use restrictions on State Superfund Sites and non-registry sites where the consent order, or applicable oversight document, was signed after October 7, 2003.

The following subsections provide a summary of the implementation process. Attachment B should be consulted for details. Based on the assumed task durations, the process of implementing the institutional controls is anticipated to require a total of approximately 14 months.

2.5.1 Draft Environmental Easement

Estimated duration 8 weeks). Draft environmental easements will be prepared by the Group in consultation with the owners of the properties that comprise the Site. A model EE document provided by the DEC can be downloaded from DEC's website at http://www.dec.ny.gov/chemical/48236.html. A modified form of the EE may be proposed, but any revisions to the model form must be explained and specifically identified in a cover letter. The draft easements will be submitted to the EPA and DEC for review and comment.

2.5.2 Updated Title Reports and Deeds

Estimated duration 12 weeks. Each title report will be current within 6 months and include copies of any encumbrances (e.g., mortgages, judgments, easements, leases, liens, etc.), and the following other Title information:

a. A Certification Page for each title report that includes an indication as to who has the right to convey or mortgage the property that is subject to the EE; Schedule A, providing the legal description of the property; and Schedule B, listing the exceptions to the title or issues which require clearance or amplification before the title company is willing to issue its policy.

b. A copy of the tax map attached to each report;

c. A proposed title insurance policy to be underwritten by a New York State licensed title insurance company. The policy should be in the amount of $35,000 with the State (The People of the State of New York acting through their Commissioner of the Department of Environmental Conservation) listed as the insured; and

d. A certification from the title company that 1) sufficient title and lien research has been conducted to identify all necessary legal and equitable interests; and 2) the signatures of the identified grantors on the EE satisfy legal requirements necessary to provide the State with an interest in the property superior to all other interests or to provide notice to those other parties. The title company should insure the boundaries of the encumbered property as it appears on the final survey.

Current deeds will be assembled and/or prepared.

2.5.3 Survey

Estimated duration 8 weeks. The final surveys will be prepared once the current deeds are available. The surveys will include a graphic scale; legend; section, block and lot; and physical address. The survey will clearly identify the property as described in the current deed, or area(s) of the Site to be addressed by the EE, with corresponding metes and bounds description. The survey will also include other information, as addressed by the survey requirements identified in Section 2.3 of this O&M Plan.

2.5.4 Other Required Documents

Estimated duration 8 weeks. As required, additional documents will include a commitment letter and a proposed final policy from the title company stating that it will issue the proposed title insurance policy upon recording of the EE; organizational documents and partnership agreements with evidence of successors in interest such as LLC Documents/Certificate of Incorporation papers/Limited; and partnership papers, etc. of the owners of the property, where applicable.

2.5.5 Execution, Recording and Notices

Estimated duration 24 weeks (including review by EPA and DEC). After review of the EE packages by the EPA and the DEC's Office of General Counsel and any necessary revisions to the documentation, the Site owners will sign the easement forms and the documents will be provided in a final form for execution by the EPA and DEC. The EE's will be recorded at the office of the Albany County Clerk. Receipts will be provided to the EPA and DEC. Notices will be served on the required parties within 60 days of filing. Proof of service will be provided to EPA and DEC within 90 days of filing. A copy of the notice and certification of service on the parties will be filed in the Albany County Clerk's office.

2.6 Authority to Implement Controls

The following table, based on publically available records, lists the parties with current authority to implement the institutional controls:

TABLE 2-2. AUTHORITY TO IMPLEMENT INSTITUTIONAL CONTROLS

OWNER	PROPERTY
Albany 40 Associates, LLC Attn: Allied Building/Rosalind Gundling PO Box 511 East Rutherford, NJ 07073	Allied Building parcels.
26 Railroad Avenue, Inc. Attn: Mercury Refining 26 Railroad Avenue Albany, NY 12205	Mercury Refining and former Albany Pallet parcels.
30 Railroad Avenue, LLC 555 Ludwig Avenue Buffalo, NY 14240	SealMaster (former Diamond W) parcels.
CSX Transportation, Inc. 500 Water Street Jacksonville, FL 32202	Railroad parcel.

2.7 Prior Liens and Encumbrances

The title reports obtained by the Group (Section 2.5.2) will contain a description of all prior liens and encumbrances existing on any real property that may affect the institutional controls or the protectiveness of the remedy. The Group, through its legal counsel, will endeavor to obtain the release or subordination of such liens or encumbrances unless EPA and DEC waive such release.

2.8 Maintenance and Monitoring

Unless alternative arrangements acceptable to the EPA and DEC are made by the owners of the affected parcels, the Group will be responsible or periodic inspections to ascertain that the institutional controls remain in effect. The periodic inspections will be performed by a qualified person under the direct supervision of a New York Sate licensed professional engineer. Any concerns or deficiencies will be reported to the property owner for correction, as well as to the EPA, DEC and the Designated Site Representative (DSR) responsible for preparing the Periodic Review Report (PRR) and Certification (see Section 4). Corrective measures and maintenance are described in Section 3.

The affected parcels will be inspected at least annually as follows:

1. The clay cap in the southern portion of the Mercury Refining property will be visually inspected to determine that it has been mowed regularly and that no vegetation with deep root systems (i.e., shrubs, trees) is growing in the cap. Any erosion of the cap or the overlying top soil will be noted.
2. The paving over the area of ISS on the MERECO and Allied properties will be visually inspected to identify any indications that the integrity of the pavement or the underlying stabilized mass has been compromised. Potential concerns include cracking and excessive weathering of the paving, failure to maintain the paving (including sealing cracks), evidence of subsidence, and evidence of excavation or other penetration of the pavement or the underlying stabilized mass.
3. The inspector will note any evidence of groundwater usage, such as the presence of a supply well completion, protective casing, etc.
4. The inspector will note any readily observable evidence of Site usage that is not consistent with the industrial use limitation.
5. The inspector will note any readily observable evidence of soil excavation or disturbance, including landscaping. The inspector will interview available Site personnel to identify the circumstances of the excavation/disturbance and obtain documentation of proper soil characterization and disposal in accordance with the SMP.

The EPA and DEC will be notified immediately upon identification of any evidence (including lack of maintenance) that the institutional controls are ineffective or that owners have otherwise not fulfilled their obligations under the environmental easements. The Group will coordinate as needed with the EPA and DEC to correct the deficiency and, if necessary, will prepare and submit to EPA and DEC a plan to restore the efficacy of the institutional control(s).

Section 3

Site Management Plan

This Site Management Plan (SMP) governs post RA activities on the Site properties, including:

- future excavation of soils including, but not limited to, soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property, and soils on the Albany Pallet Property, the Allied Building Property, and the SealMaster property, which will not be remediated by the RA;
- the evaluation and mitigation of potential for vapor intrusion at existing buildings on-Site and/or those to be constructed in the future;
- proper management of all Site remedy components post-construction, including monitoring of groundwater to ensure that, following Site remediation, the contamination has attenuated and the groundwater has been remediated;
- operation and maintenance of the clay and asphalt/concrete cap;
- demolition or alteration of the existing buildings on-Site, to protect the health and safety of workers and the nearby community and to ensure proper disposal of any building debris; and
- periodic monitoring of the Unnamed Tributary, Patroon Creek and I-90 Pond.

Personnel requirements for implementing this SMP are detailed in Reporting requirements associated with the SMP are presented in Section 4.

3.1 Personnel Requirements

The work specified in this SMP must be supervised and performed by individuals with the appropriate training and experience. Section 1.3 describes key roles, responsibilities and qualifications. A summary of the roles, responsibilities and contact information for each individual also appears in the Quality Assurance Project Plan (see QAPP, Worksheets 5 and 7, RDR).

3.2 Data Quality

The work specified in this SMP includes the collection and analysis of samples of environmental media, including soil, soil vapor, air, building materials, groundwater, surface water, sediment and biota. Sample collection and handling, laboratory analysis, data validation, and data management will be conducted in compliance with the procedures specified in the Quality Assurance Project Plan (see RDR).

Implementation of this SMP requires satisfying the following Data Quality Objectives (DQOs):

- For soil, identify and, if present, define the vertical and lateral extent of soils with mercury concentrations in excess of 5.7 mg/kg (ppm) to be excavated and managed for off-Site disposal.
- For groundwater, verify that concentrations of dissolved mercury meet the remedial objective of 0.7 µg/L (ppb) after implementation of ISS.
- For soil vapor, assess whether sub-slab elemental mercury vapor concentrations beneath the Phase 1 Building meet the EPA OSWER screening guideline of 3.0 ug/m^3 based on an attenuation factor of 0.1 and a Target Indoor Air Concentration to satisfy both the risk level ($R=10^{-5}$) and the target hazard index (HI=1).

- For indoor air, assess whether mercury vapor concentrations in the Phase 1 Building meet the EPA OSWER screening guideline of 0.3 ug/m^3, the Target Indoor Air Concentration to satisfy both the risk level ($R=10^{-5}$) and the target hazard index (HI=1).
- For wastes, determine hazardous/non-hazardous waste disposal requirements for on-Site soils.

DQOs for sediment, surface water and biota are specified in the Ecological Verification Sampling Plan (Attachment C).

3.3 Soil Excavation Plan

The purpose of this portion of the SMP is to prevent or control the future excavation of soils including, but not limited to, soils beneath the Phase 1 and former Container Storage Buildings on the Mercury Refining property, and soils on the former Albany Pallet Property, the Allied Building property, and the SealMaster property. Subsections describe requirements for community and worker health and safety, pre-excavation characterization of soils, excavation controls, waste management and disposal, and reporting.

3.3.1 Definitions

The following terms (listed in alphabetical order) are defined for use in this section:

- **Contaminated Debris:** Debris from the demolition, replacement or repair of any underground utilities located on the subject properties. Contaminated Debris includes but is not limited to sewer, water, gas or other piping which may consist of concrete, clay, plastic or metal. Contaminated Debris does not include pavement millings.
- **Excavated Material:** Existing soil, fill or buried utility bedding that has been moved or disturbed within subject properties, and Contaminated Debris. Excavated material does not include pavement millings.
- **Excavation:** The movement or disturbance of existing soil, fill or buried sewer pipe/bedding within the subject properties, or the demolition or movement of Contaminated Debris. Pavement millings are excluded from this definition.
- **Soil Excavation Officer (SEO):** The qualified environmental professional responsible for the proper implementation of this portion (Section 3.3) of the Site Management Plan.
- **Soil Excavation Plan (SEP):** A reference to the portion of this SMP governing future excavation or disturbance of soil (i.e., Section 3.3).

3.3.2 Community and Worker Health and Safety

Excavation activities will be conducted in accordance with the HSCP and the AAMP (see RDR) to protect on-Site workers and the surrounding community, respectively. Dust control action levels and mitigation measures during soil excavation are discussed in Section 3.3.4.4.

3.3.3 Pre-Excavation Sampling and Analysis

The Site history and previous soil investigations indicate a potential for concentrations of mercury in soil to exceed the 6NYCRR Part 375 Soil Cleanup Objective (Industrial Use) of 5.7 mg/kg (ppm) in unidentified areas of the MERECO, Allied and SealMaster properties. Such areas might include limited portions of the margins of remedial excavations that were not included in post excavation or remedial design sampling, or randomly distributed, isolated mercury that was transported by vehicle tires or runoff

from past fire fighting episodes on the MERECO property. Outside the area of MERECO's former retorting operations, these potential soil impacts are likely to be shallow (less than 2 feet below grade). However, elevated mercury concentrations have been found at greater depths (as great as 7 feet bgs) in an area of the Allied property and the MERECO parcel south of the SealMaster property.

Prior to excavating or otherwise disturbing any soil, the area proposed for excavation must be delineated and properly characterized to determine whether the particular soil to be excavated contains mercury concentrations in excess of the 5.7 ppm action level. Soil sampling work will be conducted by a qualified environmental professional in accordance with the HSCP (see RDR).

Samples should be collected via soil borings, test pitting and/or hand trowel, depending on the extent and depth of the proposed excavation. Depending on logistics, a direct-push rig (e.g., GeoProbe®) may be used to advance borings. Continuous soil samples will be collected from each soil boring using a macro-core sampler with a dedicated, clean acetate liner. Each macro-core sampler will be advanced only 2 feet before retrieval to improve overall recovery and depth control within the entire direct-push boring.

Samples from each sampler will be screened in the field using a Jerome 431-X mercury vapor analyzer (MVA) or equivalent. Readings for each sample interval will be recorded on a field log. Calibrating procedures and instructions for using an MVA will be as determined by the individual manufacturer. The samples will also be screened for noticeable signs of contamination (i.e., visible elemental mercury). Soil samples will be observed for physical properties such as color, sorting, etc. The grain size of the sampled soils will be visually characterized in the field by an experienced hydrogeologist and logged in accordance with a system after Burmister (1959). In addition, the Burmister classification will be converted to the Unified Soil Classification System (USCS) on the final boring log. Procedures for recording field data are provided in the QAPP (see RDR).

At a minimum, one soil sample will be collected from each two foot interval from surface to the base of the proposed excavation, at a rate not less than one boring per 100 ft^2 of excavation area.

Samples for chemical analysis will be immediately transferred from the acetate liners via the use of stainless steel scoops, trowels, or equivalent tools to appropriate laboratory-supplied containers and stored and handled according to procedures outlined in the QAPP. Sampling equipment will be disposed of or decontaminated after the collection of each sample in accordance with the procedures outlined in the QAPP.

Samples (including QA/QC samples) will be analyzed by a DOH ELAP-certified laboratory for Mercury by EPA Method SW-846 7471A. Previous data indicate that exceedances of the cleanup level (if any) are typically limited to depths of two feet or less. Therefore, the laboratory may be instructed to analyze the samples sequentially based on depth, with the two most surficial samples (0-2 ft. and 2-4 ft bgs) analyzed first. Analysis will continue to subsequent depths, if appropriate, until results indicate that mercury is detected at concentrations less than 5.7 mg/kg.

Each borehole will be backfilled with clean fill (sand) or bentonite pellets upon completion and any soil not used for chemical analysis will be handled in the same manner as investigation derived waste as outlined in Section 3.3.4. If the total mercury concentration in any soil slated for excavation indicates a potential for the soil to fail the Toxicity Characteristic Leaching Procedure (TCLP) limit of 0.2 mg/L in leachate (i.e., total mercury is greater than 20 times the TCLP limit, or 4 ppm), soil sample(s) will also be analyzed for TCLP Mercury by EPA Method SW-846 7470A.

Soil sample locations will be documented by field measurements within the area proposed for excavation unless more than four sample locations (400 ft^2) are required, in which case soil sample locations will be surveyed by a New York State licensed land surveyor.

3.3.4 Investigation-Derived Waste Management

Investigation-derived waste (IDW) generated from field activities will be containerized in labeled 55-gallon DOT-approved steel drums and staged on the MERECO property for characterization and disposal. Information contained on the label will include the drum contents, name, address and telephone number of generator; date(s) the material was placed in the drum; and a contact name/telephone number. Wastes will be separated based on type and inventoried. For example, separate drums will be filled for contaminated soil, decontamination wastewater, used personal protective equipment (PPE), and general trash.

Available analytical data from environmental media will be correlated with the particular contents of each IDW drum and the drums will then be classified into four categories as 1) non-hazardous (concentrations of TCLP mercury < 0.2 milligrams per liter (mg/L), 2) hazardous (concentrations of TCLP mercury >0.2 mg/L), 3) hazardous and exceeding Land Disposal Restriction (LDR) limits and therefore requiring treatment (concentrations of TCLP mercury>0.2 mg/L and total mercury concentrations >260 mg/kg), or 4) containing free elemental mercury.

Based on the expected mercury concentrations in the unremediated area of the Site, IDW is expected to be classified as non-hazardous. A table displaying the comparison of analytical data, drum contents and hazardous classification will be prepared. IDW will be disposed of in accordance with applicable Federal, State, and Local regulations.

3.3.5 Excavation Controls

3.3.5.1 Supervision

An Soil Excavation Officer (SEO) will be in charge of proper implementation of the SEP. The SEO will be a qualified environmental professional trained under the appropriate OSHA regulations (i.e., 29 CFR 1910.120) and with appropriate experience supervising activities on contaminated sites. The SEO will be on Site as necessary to ensure proper implementation of the SEP.

3.3.5.2 Site Preparation

Several general Site preparation activities will be performed by the owner and contractors prior to initiating any Excavation activities. These preparation activities include utility clearances and identification, installation of erosion controls, provisions for Site security, clearing and removal of any vegetation, and preparation of a “clean” access area as described in this SEP.

Utility Clearance and Identification

Underground and above ground utilities that could affect or be affected by Excavation activities will be identified prior to the initiation of any intrusive soil activities. Locations of all utilities will be marked out by an independent company (UFPO / DIGSAFE or equivalent). When all utility locations have been identified, the owner and construction contractor will review the locations and determine if any utilities will be in conflict with the proposed construction plans. If any utility conflicts are identified the owner and construction contractor and the appropriate utility company will discuss what actions will need to be taken.

Erosion and Sedimentation Controls

The owner and construction contractor will carefully conduct Site-disturbing activities to minimize the erosion of soils and fill and impacts on the off-Site environment including man-made drainage channels, storm sewer systems and downstream waterways, etc. Erosion and sediment controls are an integral part of the construction sequence and SEP and will be required to be in place prior to commencing any intrusive soil activities. The owner and contractors will plan and conduct Site activities in a manner that

minimizes the extent of unprotected soil and protects as much of the natural vegetation as possible. In addition, the owner and contractors will minimize the time that soil is left unprotected. Erosion control and soil excavation activities will follow the construction sequencing to maximize the effectiveness of the erosion control strategy. The selection of specific erosion and sedimentation control measures during construction activities will depend on a number of parameters, including the type and duration of construction activities, Site topography, type of ground covers, and maintenance considerations. The measures will include the use and placement of silt fencing, impermeable liner material, geotextiles, rip rap, seed, and mulch. The sediment and erosion controls will be inspected on a daily basis and repaired as soon as practicable if damage is observed until a final surface cover has been provided in all areas.

Work Area Security

The owner and contractors will implement security measures at the Site that provide safeguards for the general public and create a protective barrier around Excavation and Excavated Material locations. Security measures may consist of temporary fencing or barriers, warning tape, maintenance of sign in / sign out sheets, and practicing safe work procedures. The type of work area security will depend on the type of construction activities being performed and the location of these activities.

Clearing and Removing of Vegetation

To facilitate construction activities, existing vegetation and other obstructions may be removed from the Site after notification and approval of the owner. Any vegetation, movable items or structures that may have been in contact with contaminated soil/fill or may be contaminated will need to be characterized for disposal prior to removal from the Site. No removal of trees or brush from the areas of construction will occur without authorization from the SEO. No ground cover will be permitted to be burned. Fugitive dust created as a result of any construction/excavation will be mitigated in accordance with the Dust Control procedures outlined in the AAMP and this SEP. Implementation of dust suppression will be determined by the SEO.

Clean Access Area

Due to the potential of encountering subsurface contamination during Excavation activities, a “clean” transition area will be established at various locations for access / egress to specific work areas. The “clean” area will be used for equipment / material deliveries, and loading of any contaminated material for off-Site treatment or disposal. The type of “clean” area will vary depending on the anticipated level of contamination, location of the work area, and the type of work to be completed at the location. The owner and contractors will evaluate the specific work required and upon approval of the SEO will construct a “clean” area to facilitate the progression of construction activities.

3.3.5.3 Soil Excavation, Handling, and Disposal During Excavation Activities

Due to the potential of discovering and handling contaminated soil on the subject properties, the owner and contractors will be required to execute construction activities in a manner that minimizes the potential for inadvertent releases to the environment, unsafe conditions for on-Site and off-Site personnel. During construction activities the owner and contractors will adhere to the following practices and precautions during any intrusive soil excavation or grading activities.

Personnel Training and Protection

Due to the presence of contaminated soils, fill and/or debris in the areas governed by this SEP, the owner and contractors will be required to use only personnel properly trained under the appropriate OSHA regulations (i.e., 29 CFR 1910.120) and provided with appropriate personal protection equipment. The types of required training and protection will be determined by the SEO.

Equipment

In general, the equipment used for any excavation or grading may involve one or more of the following: excavator, backhoe, grade-all, front-end loader, bulldozer, jackhammer or other suitable types of construction equipment. Other equipment used in the course of construction activities involving the disturbance of soils may include sheeting and shoring devices and drilling/augering equipment. All equipment used in the areas subject to the SEP will be properly decontaminated at the end of its use, in order to prevent any contamination from migrating from the Site. The owner and contractors will be responsible for implementing specific equipment cleaning procedures subject to approval of the SEO. These procedures should include the removal of any visible accumulations of soil on equipment tires or surfaces either manually or through the use of a high-pressure water spray. Any water generated during equipment decontamination will be managed in accordance with Section 3.3.9.

Limits of Excavation/Grading

Excavation and grading will only be completed for areas inside the limits identified on the approved construction plans. Any excavations or grading outside the limits shown on the plans will need to discussed and approved by the SEO or oversight agency prior to any intrusive activities into the soil. During construction, all excavation limits, grading elevations, foundation elevations, and utility installations will be verified through the use of survey control and visual observations.

Handling and Storage of Excavated Material

Excavated Material will be stockpiled on polyethylene sheeting and covered securely with polyethylene sheeting at the end of each workday to prevent migration of contaminants due to wind or precipitation. Stockpiles are to be continuously maintained to promote proper drainage of precipitation off or around the stockpiles. Procedures for handling water that contacted contaminated material are identified in Section 3.3.8. All equipment, vehicles, materials, and personnel used to maintain the stockpile area will undergo decontamination procedures prior to leaving the stockpile area and accessing other “clean” areas of the Site. Handling of Excavated Material will be kept to a minimum to reduce the potential for contaminants being released to the environment.

Exposed Excavations

During construction activities the amount of exposed excavation is to be minimized whenever possible. At the end of each workday, exposed excavations are to be covered with polyethylene sheeting to prevent the potential migration of contaminants by precipitation or wind. In addition to covering exposed excavations, erosion and sediment control measures must be followed through the use of silt fencing, hay bales, mulch, or other methods approved by the SEO or the EPA and DEC.

Site Restoration

The contractor will be responsible for providing, placing and compacting suitable backfill material from a clean source approved by the EPA and DEC. Representative samples of material proposed for backfilling from any other source will be tested in accordance with DER-10 by submitting samples to a New York State Department of Health (DOH) approved laboratory for chemical analysis of the following parameters:

- Pesticides/PCBs;
- Target Compound List (TCL) volatile organic compounds;
- TCL semi-volatile organic compounds;
- Target Analyte List (TAL) inorganics;

- Physical analysis (sieve) if required; and
- pH.

The results of the chemical analyses will be submitted to the SEO for approval. If analysis of the backfill sample indicates unacceptable chemical or physical characteristics, the contractor will identify and provide an alternative backfill source.

Characterization of Excavated Material

Unless otherwise tested, all Excavated Material will be assumed to contain mercury above the 6NYCRR Part 375 Soil Cleanup Objective (Industrial Use) of 5.7 mg/Kg (ppm). Sampling and analysis of excavated soils will be done in conformance with the requirements of the permitted, off-Site disposal facility. These requirements typically specify the rate of sampling (no. samples/volume soil) as well as the particular analytical parameters and methodologies. The owner and contractors will be required to maintain accurate records for all sample analysis performed during construction activities.

A permitted waste disposal facility's waste approval requirements may require submittal of the results of Toxicity Characteristic Leaching Procedure (TCLP) analyses for mercury prior to acceptance of Excavated Material. The SEO will be responsible for the collection of representative samples from the stockpile(s) of Excavated Material. The samples will be submitted to a laboratory certified by DOH ELAP to perform TCLP analyses. The regulatory limit for mercury in the TCLP extract is 0.2 mg/L (ppm). In the unlikely event that one or more TCLP mercury results for a portion of the Excavated Material exceed this regulatory limit, that portion of Excavated Material will be managed as a RCRA characteristic hazardous waste and disposed of in a facility permitted to accept such material.

Off-Site Disposal

All Excavated Material will be disposed of off-Site. The owner will be responsible for the transportation and disposal of the Excavated Material in accordance with applicable regulations. Based on the analytical results obtained from soil during the RI and Remedial Design Investigation, it is anticipated that most or all soil will be classified and disposed of as non-hazardous waste. Waste soils must be transported by vehicles that have a valid 6NYCRR Part 364 permit or equivalent.

The DSR responsible for preparation of the annual PRR and Certification will be notified through documentation and reporting in accordance with all applicable requirements. Reportable information will include, at a minimum, the type and concentration of contamination present, the expected or known quantity of the contaminated material, and the method of treatment or disposal of the contaminated material.

The owner and contractors will set up a loading area alongside the stockpiled Excavated Material and load the trucks from the edge. The off-Site haul truck will be draped with polyethylene sheeting to protect the outside of the truck and tires from coming in contact with any Excavated Material. The trucks will be inspected prior to leaving the area to determine whether decontamination is required.

3.3.5.4 Dust Controls

During Excavation activity and handling of Excavated Material, real-time monitoring of dust will be performed in accordance with the Ambient Air Monitoring Plan (AAMP, see RDR). The current standard for fugitive dust is for an integrated (average) measurement over a 15 minute sampling time. Particulate concentrations will be monitored continuously directly downwind of the work area. The particulate monitoring will 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 will be outfitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. A background particulate level will be established for each work site.

If the work zone PM-10 particulate level is 0.1 milligram per cubic meter (mg/m^3) greater than background for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that work zone PM-10 particulate levels do not exceed 0.15 mg/m^3 above the background level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, work zone PM-10 particulate levels are greater than 0.15 mg/m^3 above the background 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 work zone PM-10 particulate concentration to within 0.15 mg/m^3 of the background level and in preventing visible dust migration.

All readings will be recorded and be available for review by the EPA, DEC and the DSR responsible for preparation of the annual PRR and Certification. The particulate levels referenced herein are guidance values applicable at the time this document was created, and are subject to change in accordance with applicable standards, criteria and guidance values at the time the work is to be performed.

In the event that the action level is reached, or if there is visible dust leaving the Site, one or more of the following dust suppression techniques will be employed:

- Applying water on haul roads;
- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly tarped containers;
- Restricting on-Site vehicle speeds to 5 mph;
- Covering excavated areas and staged material after excavation activity ceases with polyethylene sheeting;
- Closing or completing excavations as soon as practicable.

Atomizing water sprays may be used to prevent overly wet conditions. If the above dust suppression techniques do not lower particulates to an acceptable level, or if extreme wind conditions occur, work will be suspended until appropriate corrective measures are approved or the extreme wind conditions subside.

3.3.6 Pavement Repair/Replacement

3.3.6.1 General Repair Activities

Construction activities that may be conducted during the repair and/or replacement of the existing pavement, gravel sub-base and asphaltic layer(s) include the filling of potholes/cracks, the scarification and replacement of the asphalt layer(s), and seal coating and chipping of the roadway surface. Maintenance or replacement of storm drainage features, such as replacement of drainage culverts/manholes, etc. is not covered in this section, but included in Section 3.3.4 – Excavation Controls.

3.3.6.2 Surface Repair Activities

Surface repair activities that do not disturb the subgrade material may be conducted in accordance with standard procedures. This includes the application of a surficial seal compound to address surface cracking and the application of overall seal coating/chipping applications. The repair of potholes in the top and base layer of asphalt may also be conducted in accordance with standard procedures. If repair activities include excavation below the asphalt and the subbase gravel, construction activities should be conducted in accordance with the procedures in Section 3.3.4.

3.3.6.3 Removal/Scarification and Replacement of Asphalt

For removal and/or scarification of asphalt pavement top and/or base layer, general work area preparations will be performed by the contractor prior to initiating activities. These activities may include the delineation of utility valve boxes, manholes, and other structures/items located in the asphalt roadway, and delineation of the work area. Proper precautions should be conducted to ensure protection of existing features.

The removal/scarification activities of the asphalt base and top layer(s) may be conducted in accordance with standard procedures. The removed asphalt will be contained by the contractor and may be recycled/disposed of in accordance with standard procedures. Removed/scarified asphaltic materials are not considered contaminated and do not require contaminated material handling procedures. If removal of the existing soil beneath the asphalt/subbase gravel is required as part of the construction activities, then the contractor must conduct these removal/excavation activities in accordance with Section 3.3.4.

3.3.7 Augering/Drilling Activities

Construction activities may include augering or drilling into the subgrade for the installation of telephone poles, fencing, support posts, etc. When conducted on the subject properties, these activities will disturb subgrade materials that are assumed to be contaminated, and will require handling and disposal procedures as described below. In addition, the contractor will comply with the requirements for supervision, Site preparation, utility clearance and identification, erosion and sedimentation controls, work area security, clearing and removing of vegetation, and clean access area.

The equipment used for the installation of telephone poles, guard rail supports, or other support structures may involve augers, drill rigs or other suitable types of equipment used for drilling into the subsurface.

3.3.7.1 Handling of Auger/Drill Soil Cuttings

The contractor will conduct augering/drilling procedures in a manner such that the augered/drilled soil cuttings are contained as they are removed from the borehole. Once the location of the bore hole has been determined, and utilities have been identified in accordance with the requirements of this SEP, the contractor will place polyethylene sheeting in the area around where the augering/drilling will be located. The sheeting will include a berm around the perimeter, constructed by wrapping the polyethylene around a suitable material (e.g. 6” x 6” timber), to create a soil/water containment area. The purpose of the sheeting and berm is to contain the soil and water resulting from the augering/drilling operations as the drilling equipment is advanced into the subsurface, and to prevent contact of the subsurface soils with the surrounding areas. The contractor will advance the auger/drill at a continuous rate that prevents removal of excess soil and/or water from the borehole. As the augering/drilling progresses, the contractor will containerize the soil cuttings by transferring the soil into containers (e.g. drums) for subsequent sampling and disposal, in accordance with this SEP. Procedures for handling water that collects in the polyethylene sheeting bermed areas are included in Section 3.3.8.

3.3.7.2 Equipment Cleaning and Decontamination

Equipment used on the properties subject to the requirements of this SEP will be properly cleaned and decontaminated at the completion of the construction activities in order to prevent cross contamination from subsurface materials to areas or other equipment outside the designated area. The owner and contractors will be responsible for implementing specific equipment cleaning procedures subject to approval of the SEO. These procedures will include, but not be limited to, the removal of visible accumulations of soil on the augering or drilling equipment, tires and other surfaces either manually or by high pressure water spray. Any water, solids or sludge generated during equipment decontamination will be managed in accordance with Sections 3.3.5.3 and 3.3.8.

3.3.8 Stormwater Management and Dewatering

Construction activities may include subsurface utility installations and electrical ductbanks and manholes, sheeting, piling, and the installation of equipment foundations. During these activities and others which may impact stormwater runoff, stormwater management/sediment and erosion controls and discharge and necessary treatment will be installed. In addition to the stormwater management and control measures specified in this SEP, other local, state and federal regulations may apply.

3.3.8.1 Stormwater Run-On

Stormwater run-on will be controlled during Excavation activities through diversion to surface swales away from excavations. Run-on will be diverted from entering the excavations through the construction and maintenance of soil berms wrapped with liner at the limit of excavations, deflecting flows which are not impacted by construction or excavation activities to surface swales or natural drainage areas, or other equally effective methods.

As noted previously, Excavated Material will be, staged and shipped off-Site for disposal.

- **Soil Staging Area:** The soil staging area will be constructed to prevent Excavated Material and runoff from entering surrounding areas. A sump pit should collect all runoff from the staging area. Sediment collected in this sump will be added to stockpiled soils. Waters collected in the staging area sumps will be pumped to water storage tanks, treated if required and disposed of off-Site.
- **Erodible Soils:** The removal of existing ground cover may expose erodible soils or fill. During construction activities, dust control measures will be implemented as described in Section 3.3.5.4 and the AAMP, if required. Any landscaped areas disturbed during the project period will be treated in the appropriate manner by the placement of seed and mulch for grass areas.
- **Temporary Measures:** The owner and contractors will implement temporary stormwater control measures when the potential exists for erosion channels to form and/or measurable sediment deposits to wash into low lying areas. The owner and contractors will utilize such temporary stormwater control measures as silt fencing, diversion dikes, check dams and/or temporary seeding to provide effective stormwater management.
- **Vegetation and Mulch:** Soil exposed during construction activities that will not have an impervious layer applied will be covered by grass seed and mulch, or crushed stone upon completion of the project.

3.3.8.2 Dewatering Excavations During Construction Activities

The owner and contractors should to the greatest extent practicable prevent water resulting from precipitation from entering open excavations through the use of earthen berms, swales, or sedimentation basins. Any water that enters an open excavation will be classified and handled as contaminated water requiring treatment by a permitted facility prior to discharge or disposal. Water

which collects in the excavations as a result of groundwater intrusion will be pumped from excavations as necessary when it impedes excavation, sampling, or affects the ability to achieve compaction of backfilled soils.

Water pumped from excavations will be discharged to temporary holding tanks. The collected water will be sampled, treated if necessary, and disposed of off-Site in accordance with all applicable standards.

3.3.9 Equipment Decontamination Water

Water utilized for decontamination of equipment will be supplied by fire hydrants located on the Site, potable water from the Town, or potable water from another off-Site source.

Water utilized in equipment decontamination will be treated at a permitted facility and discharged in accordance with all applicable standards. The owner and contractors will set up portable decontamination stations to decontaminate heavy equipment or parts of heavy equipment (e.g., excavator bucket) at specific work areas.

3.3.10 Emergency Repairs

If, at any time, emergency repairs are required for subgrade utilities, the owner and contractors will follow the requirements of this plan to the extent practicable. However, if the repairs, including excavation, must be conducted on an emergency basis, and it is not practical to follow the requirements due to an imminent danger or threat to human health and safety, the contractor may make the repairs as necessary. Once the danger or threat is mitigated and/or the emergency repairs are conducted, the contractor must then conduct any additional activities in accordance with this plan.

For example, if it is not possible to construct a soil/water containment area for placement of excavated soil/water due to time constraints while addressing an emergency repair of a gas line, then the contractor may forgo this requirement in order to conduct the emergency repair. However, once the emergency situation is abated, the contractor must containerize the excavated soil and dispose of the material in accordance with the requirements of Section 3.3.5. The contractor must remove any excavated subgrade materials from the surrounding work area in accordance with the requirements of this plan and obtain approval from the SEO.

In the event emergency repairs are necessary, the owner will notify the DSR responsible for preparation of the annual PRR and Certification as soon as possible and no later than 5 days after the repairs are complete, and provide a written report within 30 days detailing the reason for the emergency repairs, how this SEP was followed, any necessary deviations, and measures taken to evaluate/mitigate any potential exposures and/or release of contaminants.

3.3.11 Health And Safety

There are potential health and safety concerns associated with the presence of mercury on the subject properties. These and other concerns, including but not limited to general safety practices, work permits, excavation shoring/bracing requirements, ladders, excavation barriers, confined space entry procedures, explosive gas monitoring, mechanical/electrical lock-out procedures, back-flow prevention, notifications, and so forth are not addressed herein. It is the responsibility of the owner, contractor, utility company or any others involved in Excavation activity to identify and comply with the applicable requirements of, OSHA, and other local, state and federal agencies. These requirements will include, at a minimum, the preparation of a Site-specific, activity-specific Health and Safety Plan (HASP), ensuring that workers have appropriate training and medical monitoring, the use of appropriate personal protective equipment, etc. Proper health and safety procedures must be followed at all times. The requirements of the activity-specific HASP will be no less protective than those of the HSCP (see RDR).

Invasive work performed at the property will be conducted in accordance with the applicable local, state, and federal regulations to protect worker health and safety, and in accordance with the AAMP (see RDR).

3.3.11.1 Construction Personnel Protection

The owner, its employees, and contractors engaged in subsurface construction or maintenance activities (e.g., utility workers) will be required to implement appropriate health and safety procedures. These procedures will involve, at a minimum, donning adequate personal protective equipment, performing appropriate air monitoring, and implementing other engineering controls as necessary to mitigate potential ingestion, inhalation and contact with residual constituents in the soils. Recommended health and safety procedures include, but may not be limited to, the following:

- While conducting invasive work at the Site, the owner and any contractors will provide safe and healthful working conditions.
- The owner and contractors will comply with the New York State Department of Labor regulations and published recommendations and regulations promulgated under the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. The owner and contractors will insure that the work is performed in accordance with recognized safe work practices.
- The owner and contractors will be responsible for the safety of the owner's and contractor's employees and the public. The owner and contractors will be solely responsible for the adequacy and safety of the construction methods, materials, equipment and the safe prosecution of the work.
- The owner and contractors are responsible to ensure that the project personnel have been trained in accordance with 29 CFR 1910.120.
- The owner and contractors will have a HASP, written in accordance with 29 CFR 1926.65, prepared, signed and sealed by a safety professional; a safety professional and/or a trained safety representative(s) active on the job whenever the work is in progress; an effective and documented safety training program; and a safety work method check list system. Recognition as a safety professional will be based on a minimum of certification by the Board of Certified Safety Professionals as a Certified Safety Professional and 5 years of professional safety management experience in the types of construction and conditions expected to be encountered on the Site.
- Personnel employed by the owner and contractors or subcontractors or any visitors whenever entering the job site, will be required to wear appropriate personal protection equipment required for that area.

3.3.11.2 Community Air Monitoring Program

Air monitoring will be performed during Excavation activities and movement of Excavated Material in accordance with the AAMP (see RDR) and the DOH Generic Community Air Monitoring Plan included therein. All air monitoring readings will be recorded in a logbook and will be available for review by the EPA, DEC, and DOH.

3.3.12 Notification Requirements

The protocols of this SEP are activated by any Excavation activity or movement of Excavated Material. The SEP protocols do not apply to repaving or the movement of pavement millings or subbase material.

Except in emergencies, the owner will notify the DSR responsible for preparation of the annual PRR and Certification a minimum of five business days in advance of the planned activity. The SEO and owner will provide this activity specific SEP to the contractors and subcontractors and be sure the contractors and subcontractors implement the activity specific SEP.

In the event of an emergency, the owner will notify the DSR responsible for preparation of the annual PRR and Certification as soon as possible and then submit a report detailing how this SEP was followed and any necessary deviations.

3.4 Evaluation of Vapor Intrusion

Given the volatility of elemental mercury, a potential exists for mercury vapor intrusion in the Phase 1 Building and any buildings to be constructed in the future. This potential exists primarily in the vicinity of the mass stabilized by ISS, where the greatest concentrations of elemental mercury have been observed, but cannot be definitively ruled out in other areas without measurement of mercury concentrations in soil vapor. Mercury soil vapor measurements were obtained under and adjacent to the Phase 1 Building during the RDI to establish baseline conditions prior to implementation of ISS. During ISS, soil vapor and indoor air will be monitored to evaluate whether the physical and thermal effects of ISS are exacerbating the potential for mercury vapor intrusion. Upon completion of the remedial construction, mercury concentrations will be measured in soil vapor beneath and adjacent to the Phase 1 Building slab to assess whether vapor intrusion has a potential to adversely affect indoor air quality, and whether mitigation measures are warranted.

Before the completion of the design for any new building on the properties subject to this O&M Pan, mercury concentrations in soil vapor will be measured within the footprint of the proposed structure to ascertain whether the building design should include vapor intrusion mitigation measures such as a sub-slab depressurization system.

The following sections detail procedures for the installation of soil vapor probes and collection of soil vapor and indoor/ambient air samples.

3.4.1 Community and Worker Health and Safety

Soil vapor probe installation activities will be conducted in accordance with the provisions of the Health and Safety Contingency Plan (see Final RDR) and the Ambient Air Monitoring Plan (see Final RDR). Community air monitoring will not be required for the sampling of probes and ambient/indoor air as there is no potential for particulate or vapor emissions that could impact the area beyond the immediate work zone.

3.4.2 Post-Remediation Monitoring

Soil vapor samples will be collected from locations adjacent to the Phase 1 Building and beneath the floor slab of the building for the purpose of evaluating mercury vapor concentrations in soil gas after implementation of ISS. The locations will be selected in the field based on proximity to the stabilized mass and to avoid interfering with present-day usage of the MERECO facility. A minimum of four permanent soil vapor probes will be installed, with two targeting sub-slab conditions and two targeting conditions between the building and the stabilized mass. Sampling will be conducted during two sequential heating seasons (November to March), at which point a recommendation will be made to the EPA and DEC whether to discontinue monitoring, continue monitoring, or institute mitigation measures. During each sampling event, a contemporaneous indoor air and ambient (outdoor) air sample will also be collected. These will facilitate the evaluation of ongoing operations (off- or on-Site) that may contribute to indoor air contamination.

3.4.3 Installation of Soil Vapor Probes

Soil vapor probes will be installed as follows:

- A direct-push drill rig (e.g., GeoProbe®) will be used to advance a 2-inch diameter borehole to a depth of 5 feet bgs.

- Once the borehole is complete a 2 foot long, 1-inch diameter PVC slotted screen (0.010") will be set in the borehole with clean silica sand filter pack material placed in the annulus surrounding the screen. The screened interval will be from 3 to 5 feet.
- A hydrated bentonite slurry will be placed in the annular space above the filter pack to provide a seal in the borehole from surface contamination and to minimize infiltration of ambient air.
- The top of the soil vapor probe will be completed with a male-threaded, appropriately sized tubing-barb to be used with the sampling tubing. The barb will be completed with a cap so that infiltration by outside air will be minimized.
- Soil vapor probes will be fitted with flush mount protective casings.

Probe installation work and will be conducted in accordance with the QAPP and HSCP.

3.4.4 Collection of Soil Vapor Samples

Soil vapor samples will be collected no less than two weeks following the installation of the soil vapor probes. Samples will not be collected on days when high humidity or rainfall may impact the readings from the field monitoring equipment.

- One (1) Teflon®-lined polyethylene sampling tube will be connected to the tubing-barb for use in sampling. The tube will be secured to not allow debris to clog the tube and/or potentially contaminate the sample. The sampling point will be sealed around the tubing using modeling clay.
- Prior to collecting the sub-slab soil gas sample, a "leak-test" will be performed to ensure tightness of the seal. A 3-gallon modified plastic bucket will be placed over the top of the sample point. The soil vapor sampling tube will be threaded through a gas-tight fitting in the bucket to allow for sample collection without removing the bucket. The base of the bucket will be suitably sealed to the ground or floor surface (e.g., using bentonite clay). The bucket will have tubing at the top of the chamber to introduce the tracer gas (helium) into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. A helium detector will be attached to the valve fitting at the bottom of the chamber to verify the presence of the tracer gas. The valve will be closed after the chamber has been enriched with helium at concentrations >50%. After the test set-up, the sample point will be purged of three volumes (inner volume of sample point and sample tubing) of soil gas. Purging will be conducted using an air pump adjusted to a low rate of 200 ml/min or less. During purging, the helium concentration will be monitored at the vent of the air pump. A helium reading of greater than 5% of the concentration within the bucket surrounding the sample point is indicative of a leak in the seal. If the readings indicate a poor seal, the sample point will be reset and the leak detection process repeated until it is found to be free of leaks.
- The sampling probe will be purged for approximately 10 minutes. This is intended to exchange air from the sampling tubing, which could potentially dilute or otherwise bias the sample.
- A reading will be taken with the mercury vapor analyzer to measure mercury vapors. At locations with mercury below the detection capability of the meter, selected samples will be analyzed by Method IO-5 to quantify the lower levels.
- To collect a sample for laboratory analysis for total mercury by IO-5, gold-coated bead traps will be used with a Teflon particulate filter before the trap so that no particulate can be trapped and skew results. When assembling, installing and removing the traps particle-free gloves will be worn at all times and samplers will stand down-wind to prevent contamination by shedding particles from clothing, etc.

- The trap with filter will be connected to a pump which will draw air through the trap at a constant rate of 0.3 L/min. The calibrated range of the method is 5 ng to approximately 7.5 mg depending on the variety of trap used in sampling. Therefore, to target the method range, the pumping duration will likely be the minimum practical.
- The samples will be sent to a DOH ELAP certified laboratory for analysis.

3.4.5 Data Evaluation

All data will be validated and managed in accordance with the QAPP (see RDR). New York State currently does not have any standards, criteria or guidance values for concentrations of mercury in soil vapor (DOH, 2006). Sub-slab mercury vapor concentrations beneath the Phase 1 Building will be compared with the EPA OSWER screening guideline of 3.0 ug/m^3 based on an assumed attenuation factor of 0.1 and a Target Indoor Air Concentration that satisfies both the prescribed risk level ($R=10^{-5}$) and the target hazard index (HI=1). Indoor/ambient air concentrations will be compared to the EPA OSWER screening guideline of 0.3 ug/m^3, which is the Target Indoor Air Concentration that satisfies both the prescribed risk level ($R=10^{-5}$) and the target hazard index (HI=1).

3.4.6 Mitigation

In the event that soil vapor concentrations of mercury indicate that vapor intrusion mitigation is needed, the property owner will be responsible to design, install and operate a system in accordance with available guidance, including that provided by the New York Sate Department of Health (DOH, 2006). An active sub-slab depressurization system (SSDS) is the preferred mitigation method for buildings with a basement slab or a slab-on-grade foundation. An SSDS would involve retrofitting the existing Phase 1 Building or, in the case of new buildings, be installed during the construction of the building. Buildings having more than one foundation design feature (e.g., a basement under one portion and a crawl space beneath the remainder) may require a combination of mitigation methods.

The mitigation measure(s) will be designed by a New York Sate licensed professional engineer with appropriate training and experience in mitigating soil vapor intrusion. Detailed technical guidance on designing and installing mitigation systems is provided in various documents, including but not limited to the following:

1. References provided in ASTM's E-2121 and the EPA's Model Standards and Techniques for Control of Radon in New Residential Buildings;
2. Radon Reduction Techniques for Existing Detached Houses: Technical Guidance (Third Edition) for Active Soil Depressurization Systems EPA [EPA 625/R-93-011, October 1993];
3. Radon Prevention in the Design and Construction of Schools and Other Large Buildings EPA [EPA 625-R-92-016, June 1994].

If mitigation systems are implemented, the operation, maintenance and monitoring (OM&M) protocols for the system will be submitted to the EPA, DEC and the DSR responsible for preparing the annual PRR and Certification. The mitigation system OM&M activities will also be documented and reported in the annual PRR and Certification.

3.5 Groundwater Monitoring

After implementation of ISS, periodic monitoring of groundwater will be conducted to ensure that the dissolved mercury concentrations in the vicinity of the stabilized mass have attenuated and the groundwater has been remediated. In accordance with the ROD, the compliance standard is 0.7 ug/L (ppb) *dissolved* mercury. Laboratory analyses of groundwater samples containing suspended solids (turbidity) are likely to significantly overstate the actual concentration of dissolved mercury in groundwater. Therefore, as was the case with the Remedial Design Investigation, measures will be

employed during construction and subsequent sampling of compliance monitoring wells to ensure that sample turbidity is minimized. This section specifies the locations, depths and construction methods for compliance monitoring wells, as well as the methods to be used for sampling, analysis and data evaluation. The work will be conducted in accordance with the QAPP (see RDR).

The performance monitoring wells will be sampled quarterly for an initial period of two years. Samples will be analyzed for mercury by EPA Method 7470A. If the analytical results indicate the performance standard has been achieved, sampling frequency will, with the concurrence of the EPA and DEC, be reduced to an annual basis thereafter.

3.5.1 Community and Worker Health and Safety

The monitoring well installation and groundwater monitoring field activities will be conducted in accordance with the provisions of the HSCP (see RDR) and the AAMP (see RDR). Community air monitoring will not be required for well sampling events as there is no potential for particulate or vapor emissions that could impact the area beyond the immediate work zone.

3.5.2 Proposed Performance Monitoring Wells

A total of four well clusters, each consisting of a shallow, intermediate and deep well, are proposed for performance monitoring of groundwater (Figure 3-1). Two of the well clusters, MW-ISS-12 (S,I,D) and MW-ISS-13 (S,I,D), were installed in downgradient locations during the RDI. A third monitoring well cluster (MW-ISS-14 (S,I,D) will be installed at a location east of these wells to monitor groundwater quality downgradient from the eastern portion of the stabilized mass. The fourth monitoring well cluster, MW-ISS-15 (S,I,D), will be installed north of the stabilized mass to monitor upgradient groundwater quality. The proposed locations of the downgradient monitoring wells are based on pre-ISS groundwater flow directions reported in the Supplemental RDI Report (BC, 2013), and on the expectation that groundwater flow lines will be altered by the presence of the solidified mass. Contoured water table elevations obtained from the shallow monitoring wells, and intermediate and deep potentiometric surfaces indicated that groundwater in the shallow, intermediate and deep portions of the aquifer flows in a south-southwest direction, towards the Unnamed Tributary. This is consistent with the groundwater flow directions identified earlier in the RI.

The location of MW-ISS-14 (S,I,D) shown on Figure 3-1 is considered preliminary. After implementation of ISS and before new monitoring wells are installed, post-ISS groundwater data will be evaluated to determine whether the proposed locations relative to the stabilized mass and altered flow patterns are appropriate. The final location of MW-ISS-14 (S,I,D) will be determined after evaluating three rounds of post-ISS water level measurements obtained from monitoring wells MW-ISS-12 (S,I,D) and MW-ISS-13 (S,I,D). The three rounds will be conducted at approximately two-day intervals in order to confirm that water levels have equilibrated after ISS. In addition, prior to finalizing well locations, groundwater samples may be collected and analyzed for mercury and other parameters to evaluate potential changes in groundwater chemistry caused by the ISS. The water level measurements and any collection and analysis of groundwater samples will be conducted in accordance with the QAPP.

The new wells will be located no closer than approximately 20 feet from any abandoned wells so that they will not be influenced by grout used in the abandonment. It should be noted that early monitoring wells OW-2, OW-3, and MW-2D, which are slated for abandonment, are located downgradient from the proposed performance monitoring wells and are therefore unlikely to influence groundwater characteristics at the performance monitoring wells. Monitoring well OW-4, also slated for abandonment, is located side-gradient from upgradient performance monitoring well cluster MW-ISS-15 (S,I,D). In the event that initial performance monitoring data indicate that chemical effects of ISS (e.g., elevated pH) are affecting the chemical properties of groundwater samples such that the samples do not accurately reflect dissolved mercury concentrations downgradient from the stabilized mass, it may be

necessary to install one or more substitute monitoring well clusters for continued performance monitoring.

3.5.3 Monitoring Well Installation

Conventional 2" PVC monitoring wells will be installed utilizing the Drive and Wash Casing method. The Drive and Wash Casing method minimizes "drag down" of potential mercury contamination from shallower intervals, and allows for better control over the placement of a secondary sand pack around the pre-packed well screen, a key element in minimizing the migration of suspended solids into the well.

Prior to drilling in paved areas, a concrete saw will be used to create space for installation and completion of the wells. A 5-inch ID steel casing will be advanced in five-foot intervals to isolate the surrounding formation during the boring and well construction process. After each interval, the soil in the casing will be cleaned out with a roller bit and flushed with clean, potable water. Continuous split-spoon soil samples will be collected only from the boring for the deep well in each cluster.

Upon reaching the target depth, a 10 foot long, 2 inch diameter PVC pre-packed well screen (0.010 inch slot size) and two-inch diameter PVC riser casing will be installed and additional sand pack material placed in the annulus surrounding the pre-pack screen as the 5-inch casing is withdrawn. For hydrogeological comparability with the zones monitored during the RDI, the newly-installed performance monitoring wells will be screened in the depth intervals shown in the following table:

TABLE 3-1. ADDITIONAL MONITORING WELLS AND SCREENED INTERVALS

Monitoring Well ID	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
MW-ISS-14S	12.0	22.0
MW-ISS-14I	32.0	42.0
MW-ISS-14D	53.0	63.0
MW-ISS-15S	14.0	24.0
MW-ISS-15I	34.0	44.0
MW-ISS-15D	55.0	65.0

The remainder of monitoring well construction will include the following:

- Measurements of material depths will be made by frequently sounding the annulus with a weighted tape measure during installation. The volume of materials needed will be calculated and compared to the actual volume used.
- In monitoring wells which exhibit a water table elevation above the top of the sand pack, a layer of bentonite pellets, at least two feet thick will be placed above the sand pack to form an annular seal. The depths of the monitoring wells should allow for placement of these materials by hand.
- In monitoring wells where the top of the sand pack is above the water table, bentonite pellets will not be used to form an annular seal, since complete hydration cannot be guaranteed. In those instances, granular bentonite will be mixed with water (as thick as possible) to form a pre hydrated slurry which will be used in place of the pellets.
- Cement/bentonite grout will be placed from the top of the bentonite pellet (or slurry) seal to a point approximately two feet below existing ground surface. The grout will consist of one bag (94 pounds) of Portland cement and five pounds of bentonite mixed with six gallons of potable water.
- An 8-inch diameter heavy duty flush-mount well vault will be placed in the remaining annulus. Wells in paved areas will be completed with flush mount protective well vaults. A compression cap will be placed on the PVC riser. The protective casing will be equipped with a secure lockable cap to prevent

entry to the monitoring well. For stick-up completions, a vent hole will be cut in the casing above the grout level to allow fluids to drain.

- The protective casing will be set in place with concrete. The concrete will be set in a four foot square form at a thickness of at least four inches within the existing pavement and will fill-in areas of the pavement that were cut prior to drilling. Steel reinforcing wire will be used within the concrete.

Efforts to minimize turbidity will be undertaken during monitoring well development. Well development will be performed using the surge and evacuate method after a period of at least 24 hours following well construction. Well development will be considered complete when there is no visible increase in the clarity of the evacuated water and turbidity of the evacuated water is below 50 NTU.

The proposed monitoring well locations will be staked in the field by a New York State licensed land surveyor. Following completion of the well installations, the location and elevations (surface and casing) of each well will be surveyed. Survey accuracy will be ±0.01 feet vertically and ±0.1 feet horizontally.

The monitoring well installation and development equipment will be decontaminated before and after use in accordance with Section 3.5.5 – Decontamination Procedures.

3.5.4 Groundwater Sampling

Groundwater samples will be collected from the performance monitoring wells using the low flow groundwater procedure. All samples, including field QA/QC samples will be collected and analyzed in accordance with the QAPP (see RDR).

The low-flow purging and sample collection technique follows the technique described within the EPA documents titled “Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling”, (USEPA, Region 2, March 16, 1998) and “USEPA Ground Water Issue: Low flow (Minimal Drawdown) Ground-water Sampling Procedures” (EPA/540/S-95/504, April 1996). The general approach is to minimize the drawdown in the well during purging, thereby reducing disturbance prior to and during sampling. Typically this is accomplished by limiting the flow rate during purging and sampling to rates in the 100 to 250 milliliters per minute (mL/min) range. If well sampling or purging results do not meet the low-flow criteria (such that drawdown enters the screened zone or exceeds 0.3 feet) it will be noted in the field data sheets.

Prior to sampling, the depth to groundwater (static water level) will be measured to within the nearest 0.01 foot within at each well.

Equipment

- A submersible bladder pump.
- The discharge tubing will be laboratory- or food grade- polyethylene.
- Monitoring equipment during purging will include a flow through cell equipped with field measuring devices for pH, turbidity, specific conductance, temperature, oxidation-reduction potential (ORP), and dissolved oxygen (DO).
- Water level measuring device, accurate to ±0.01 foot.
- Flow-rate measurement supplies such as graduated cylinders and stopwatch.
- Decontamination equipment and supplies.
- Well construction data.

Preliminary Site Activities

- Remove well cap and identify the pre-established elevation reference point on top of inside well casing.

- Measure and record the depth to groundwater (static water level) to within the nearest 0.01 foot from the reference point. Take care to minimize disturbance to the water column and avoid dislodging particulates attached to the sides of the well casing.
- In no case should any well be sounded prior to sampling as this may mobilize sediment in the bottom of the well.
- If dedicated equipment such as bladder pumps are not used, consideration should be given to placing the pump in the well 24 hours prior to sampling to allow any sediments in the well to settle.

Sampling Procedure

- Install Pump - Slowly lower the pump and downhole measuring device, as applicable, into the well to a depth corresponding to the center of the screened interval. The intake should be kept within the well screen but no deeper than two feet below the top of the screen to prevent mobilization of sediment from the bottom. If less than two feet of water is present in the well prior to sampling, the intake will be centered in the water column. For problematic monitoring wells, consideration should be given to installing the pump approximately 24 hours before initiating purging.
- Re-measure Groundwater Level - Before starting the pump, measure the water level again with the pump in the well. Do not proceed until the water level has returned to within approximately 0.3 feet of the static level.
- Purging - Start pumping the well at approximately 200 to 500 milliliters per minute. The water level should be monitored as frequently as feasible immediately after the start of purging and then at least as frequently as every three to five minutes once the level has generally stabilized. Ideally, a steady flow rate should be maintained which results in a stabilized water level. The goal should be to not induce a drawdown in excess of approximately 0.3 feet (or approximately 2 percent of saturated thickness in low permeability formations). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to effect stabilization of the water level. However, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. If the recharge rate of the well is very low, care should be taken to avoid loss of pressure in the tubing line, cascading through the sand pack, or pumping the well dry. Record each adjustment made to the pumping rate, observation of changes in appearance of the water collected (e.g., increased turbidity or color) and the water level measured immediately after each adjustment.
- Monitor Indicator Parameters - During purging of the well, monitor the following field indicator parameters at the frequencies stated above; turbidity, temperature, specific conductance, pH, ORP and/or D.O. In line analyzers and continuous readout displays are recommended for all parameters so that the sample is not exposed to air prior to the measurement. However, if this is not feasible, temperature and/or ORP may be omitted from the list of in line parameters. The well is considered stabilized and ready for sample collection when three consecutive readings are within a maximum range (from minimum to maximum measurements) as follows: ±0.1 for pH, 3% for specific conductance, ±10% for D.O., ±10 mV for ORP, and ±10% for turbidity. Measurement of the indicator parameters should continue every three to five minutes until these measurements indicate stability in the water quality. If the parameters have not stabilized after about an hour, purge the well until a minimum of 3 well volumes have been removed and proceed to collect the samples. This alternate procedure should be noted on the field data sheet.
- Collect Samples - Samples should be collected at flow rates of between 100 and 250 mL/min, or under flow conditions such that drawdown of the water level within the well is not induced beyond the tolerances specified above. Sample containers should be filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. If turbidity levels are elevated (greater than 50 NTU), samples may be field filtered. In this case, an unfiltered sample will

be submitted along with the field filtered sample to enable comparison of the potential contribution of turbidity to the analytical results.

- Remove Pump and Tubing - After collection of the samples, the pump's tubing will be properly decontaminated or discarded.
- Well Depth - Measure and record well depth.
- Close Down - Secure the well.

The sampling equipment will be decontaminated between use at each well in accordance with Section 3.5.5 - Decontamination Procedures.

3.5.5 Decontamination Procedures

Downhole drilling equipment (e.g., casings, rods, etc.) will be decontaminated before beginning drilling activities at the Site, and after completion of each monitoring well. Decontamination of the drilling equipment will be conducted over a decontamination pad using a high pressure steam cleaner. Rinsate accumulated in the decontamination pad will be pumped into DOT-approved 55-gallon steel drums pending waste characterization and appropriate off Site disposal.

Sampling equipment decontamination procedures will vary depending on the field task. The various levels of decontamination to be performed between sampling locations for the various types of field activities are described below.

- Level 1 (Trowels, split spoons, etc.)
  - If Level 1 sampling equipment, has come in contact with elemental mercury, preliminary decontamination of the equipment will be conducted over a decontamination pad using a hot water pressure washer.
  - Wash/scrub with laboratory detergent/potable water; and
  - Potable water rinse.
- Level 2 (IP, Water Level Meter and Probes)
  - Rinse with laboratory detergent/distilled water solution; and
  - Rinse with distilled water.
- Level 3 (non-dedicated sampling equipment that comes in direct contact with the analytical sample media)
  - Wash/scrub with laboratory detergent/distilled water solution;
  - Distilled water rinse;
  - Laboratory-grade 10% nitric acid rinse; and
  - Final distilled water rinse.

The waste water generated from the decontamination procedures will be containerized and managed as described in Section 3.5.6.

3.5.6 Investigation-Derived Waste Management

Investigation-derived waste (IDW) generated from field activities will be containerized in labeled 55-gallon DOT-approved steel drums and staged on the MERECO property for characterization and disposal. Information contained on the label will include the drum contents, name, address and telephone number of generator; date(s) the material was placed in the drum; and a contact name/telephone number. Wastes will be separated based on type and inventoried. For example,

separate drums will be filled for contaminated soil and/or sediment, monitoring well development and purge water, decontamination wastewater, used personal protective equipment (PPE), and general trash.

Available analytical data from environmental media will be correlated with the particular contents of each IDW drum and the drums will then be classified into four categories as 1) non-hazardous (concentrations of TCLP mercury < 0.2 milligrams per liter (mg/L), 2) hazardous (concentrations of TCLP mercury >0.2 mg/L), 3) hazardous and exceeding Land Disposal Restriction (LDR) limits and therefore requiring treatment (concentrations of TCLP mercury>0.2 mg/L and total mercury concentrations >260 mg/kg), or 4) containing free elemental mercury.

Based on mercury concentrations expected in the locations of the performance monitoring wells, the IDW is expected to be classified as non-hazardous. A table displaying the comparison of analytical data, drum contents and hazardous classification will be prepared. IDW will be disposed of in accordance with applicable federal, State, and local regulations.

3.5.7 Data Validation and Reporting

Data will be collected, managed and validated in accordance with the QAPP (see RDR). Quarterly results will be submitted to the EPA and DEC in tabulated form, with a letter report describing the sampling event (including any departures from the Site Management Plan), summarizing analytical results, and presenting conclusions and recommendations. Groundwater monitoring data will be reported annually in the PRR and Certification. The PRR will present and summarize the results of the groundwater monitoring. Figures will be included that show

- sample locations,
- inferred water table/potentiometric contours and groundwater flow paths,
- isoconcentration contours of dissolved mercury (if detected), and
- graphs of mercury concentrations over time.

3.6 Preservation of Clay/Asphalt Cap and Stabilized Mass

The property owners will maintain and preserve the integrity of the clay and asphalt cap, including the paving and fill placed over the area of ISS to protect the stabilized mass. The southern portion of the MERECO property is covered by a single-layer clay cap which was installed after the excavation and off-Site disposal of mercury and polychlorinated biphenyl (PCB)-contaminated soils in 1985. The northeastern portion of the MERECO Property is currently covered by a concrete and asphalt cap which is a single-layer cap that was installed to reduce the infiltration of rain water and to prevent direct contact with underlying soils which are contaminated with mercury. Portions of the concrete/asphalt cap will be removed during remedial construction to enable excavation of mercury contaminated soils and implementation of ISS. These areas will be repaved upon completion of the remedial construction.

ISS conducted during remedial construction will create a stabilized mass of soil extending from surface to an average depth of approximately 65 feet bgs on both the current Mercury Refining and Allied properties. The physical integrity of the stabilized mass must be preserved because its ability to immobilize mercury depends significantly on reducing the ability of groundwater to flow through the mass and contact the mercury contained within. Upon completion of ISS, the solidified mass will be covered with a minimum of two feet of clean structural fill and paving to protect it from mechanical disturbance and reduce weathering by freeze/thaw cycles. Excavation, trenching or boring within the stabilized mass is prohibited.

3.6.1 Inspection and Maintenance

The clay cap will be maintained by regular mowing to prevent establishment of vegetation with deep root systems (i.e., shrubs, trees). The established grass cover will be watered and fertilized as necessary to maintain its viability. The clay cap will be inspected monthly to identify any new erosion of the cover. Any damage will be repaired by filling the damaged area with top soil and re-seeding. The cause of the erosion will be eliminated as soon as is practical. Temporary measures can be employed until repairs are completed. For example, storm runoff from the remaining portion of the Container Storage Building slab may be directed away from the affected area.

Concrete or asphalt pavement covering the soil that was solidified/stabilized by ISS will be inspected quarterly to identify indications of loss of integrity such as potholes, cracking, subsidence or frost heaving. Any breaches in the pavement's integrity will be repaired using permanent materials and paving as soon as is practical. If necessary, temporary patching materials will be used only until seasonal conditions are suitable for permanent repairs. Pavement seams and cracks will be filled with bitumen sealing compound. Asphalt paving will sealed at least every five years to minimize weathering and deterioration of the paving.

3.6.2 Reporting

The owners will maintain records of inspections, noting any identified deficiencies and providing details and documentation of corrective measures. Deficiencies and repairs will also be documented with photographs. Copies of these documents will be provided quarterly to the DSR responsible for preparing the PRR and Certification. Maintenance and repairs will be verified by the DSR responsible for preparing the PRR and Certification through annual on-Site inspection.

3.7 Demolition or Alteration of Buildings

The demolition or alteration of the existing buildings, if necessary in the future, will be managed in order to protect the health and safety of workers and the nearby community and to ensure proper disposal of building debris. This section of the SMP applies to the following existing structures:

- Phase 1 Building
- Remnants of Container Storage Building pad
- "Quonset Hut" structure (former Albany Pallet building)

These three structures are, or have a potential to be impacted by mercury, either from past processing and storage or mercury-containing materials, or by mercury released and transported by runoff during earlier fire fighting events, or by deposition of airborne mercury vapor from early retorting emissions.

3.7.1 Community and Worker Health and Safety

All pre-demolition sampling will be conducted in accordance with the HSCP (see RDR). Demolition activities will be conducted in accordance with the HSCP (see RDR) to protect on-Site workers, and the AAMP (see RDR) to protect the surrounding community,

3.7.2 Environmental Assessment and Pre-Demolition Survey

Prior to any disturbance or demolition of the three structures regulated by this SMP, the portions of the structures to be disturbed or demolished will be evaluated to identify and document potential environmental concerns that may need to be addressed before or during demolition, and to characterize building materials to determine the appropriate handling and disposal requirements, regulatory requirements, and worker health and safety considerations associated with the demolition work.

Environmental conditions that may impact all or portions of the three structures regulated by this SMP may include:

- The presence of mercury residues on internal and external impermeable surfaces such as steel columns and sheathing;
- The presence of mercury residues within porous materials such as wood framing, wood roof trusses and sheetrock;
- The presence of EPA Universal Wastes such as fluorescent lights, emergency exit lights, mercury switches and thermostats;
- Asbestos-containing materials (ACM) such as floor tiles, insulation, roofing and mastics;
- Polychlorinated biphenyl (PCB) residues from the historical mercury recovery operations; and
- Lead-based paint.

To evaluate potential conditions such as these, a combination environmental assessment and pre-demolition survey will be completed. The environmental assessment and pre-demolition survey will consist of the following activities:

- Review of available documentation and construction drawings (if any) to confirm the historical building use and document potential environmental concerns that may impact the demolition of the structure. Materials identified as or containing regulated materials at the time of construction will be field verified during the visual assessment and on-Site sampling activities and recorded.
- Visual assessment of the structure to include an inspection of readily visible components of the building. Assumptions will be made based on facility use for areas not accessible or visible due to obstructions. In such instances, it may be appropriate to confirm those assumptions during the demolition work as the areas become accessible for inspection and/or sampling. The objectives of the visual assessment include the following:
  - Confirm the locations of potentially impacted areas identified during the review of Site construction documents;
  - Identify and quantify potential items of environmental concern;
  - Determine the potential presence and quantity of hazardous and/or regulated materials within the building (excluding the actual building materials of construction) that will need to be addressed prior to or as part of demolition activities;
  - Investigate the nature of the materials of construction and obtain measurements to facilitate quantification of the various types of building materials;
  - Confirm potential locations for ACM, PCBs, lead-based paint, and mercury (bulk and wipe) sampling. Areas of concern will be recorded on a survey form and entered into a searchable Excel database. Each entry will have a unique identifier containing Site specific information as follows: EA<date of EA>_<Sequential Number starting at 001>. The identifier will allow for correlation between the survey results and the areas requiring remediation or abatement. The sample locations and associated sample results will be recorded; and
  - Areas reviewed and sampled during the visual assessment will be tagged with a physical tag or marking in the field, photo-documented, and identified on a Site layout drawing.
- An appropriately licensed contractor or contractors will perform an asbestos inspection, OSHA-lead-based paint assessment, PCB sampling and testing and mercury-containing devices assessment. The contractor must hold a New York State Department of Labor (DOL) Asbestos Handling License and an EPA/State License for Lead, and employ DOL Certified Asbestos Inspectors and licensed lead based paint professionals. Samples of potential asbestos-containing material (ACM) will be collected and sent to a DOH ELAP certified laboratory for asbestos analysis by Polarized Light

Microscopy (PLM) and Transmission Electron Microscopy (TEM) methods. Building materials may be tested in-situ for lead using an X-Ray Fluorescence (XRF) detector. Sampling activities will be documented on the survey form and the sampling points will be tagged. The exact number and type of samples that will be collected will be dependent upon the findings of the construction documents review and visual assessment.

- Aqueous wipe samples of interior impermeable building materials (e.g., steel columns and sheathing) and exterior impermeable materials (e.g., building siding) for analysis of total mercury by EPA Method SW 846 7471A. The number and type of samples that will be collected is dependent upon the findings of the review of available documentation and visual assessment. Samples will be collected in accordance with the QAPP (see RDR), specifically Attachment A, UFP Worksheet #19; Attachment A-2, Sampling SOPs, EPA SOP #2011. Per Worksheet No. 19, the mercury wipes will be moistened with DI water. A standard wipe sampling area is 10 cm by 10 cm (100 sq cm). Per the EPA SOP each part of the sampling area is covered by a vertical pass and a horizontal pass as follows: "Wipe the marked surface area using firm strokes. Wipe vertically, then horizontally to insure complete surface coverage." The total number of vertical passes and horizontal passes depends on what is necessary to cover the 10cm x 10cm area twice (once vertically, once horizontally).
- Collect bulk samples of porous building materials (e.g., wood framing, wood roof trusses and sheetrock) for analysis of total and TCLP mercury by EPA Method SW-846 7470A. The number and type of samples that will be collected is dependent upon the findings of the review of available documentation and visual assessment. Details concerning collection of building material samples are provided in the QAPP (UFP Worksheet No. 19) and Attachment A-2, Sampling SOPs, EPA SOP #2011. Samples of building materials will be collected in accordance with the procedures used for chip sampling, with a wood chisel, razor knife, saw blade or similar implement substituted for an ordinary chisel.
- Collect hexane wipe samples of the impermeable building materials (e.g., steel columns and sheathing) for analysis of PCBs by EPA Method SW 846 8082. Samples will be collected in accordance with the QAPP, specifically Attachment A, UFP Worksheet #19; Attachment A-2, Sampling SOPs, EPA SOP #2011. Per Worksheet No. 19, PCB wipes will be moistened with hexane. A standard wipe sampling area is 10 cm by 10 cm (100 sq cm). Per the EPA SOP, each part of the sampling area is covered by a vertical pass and a horizontal pass as follows: "Wipe the marked surface area using firm strokes. Wipe vertically, then horizontally to insure complete surface coverage." The total number of vertical passes and horizontal passes depends on what is necessary to cover the 10cm x 10cm area twice (once vertically, once horizontally).
- In the event that potentially regulated building materials other than mercury, ACM, PCBs or lead-based paint are identified, locations will be documented on the survey form, tagged in the field, and photo documented. These areas will also be recorded for tracking purposes. Representative samples of the building materials may be collected, after discussion with and approval by EPA and DEC, and submitted for analysis.
- To assist in disposal of any concrete, including the CSB slab, fragments of concrete will be collected from near the surface of the concrete and submitted for analyses of total mercury by EPA Method SW 846 7471 and TCLP Mercury by EPA Method SW 846 7470A.

An Environmental Assessment and Pre-demolition Survey Report will be prepared to summarize the activities and results of the environmental assessment and pre-demolition survey. The report will include building material quantities, areas of concern, waste types and quantities, and potential disposal options for various materials. The report will present:

- A comprehensive listing of the identified hazardous and regulated materials in an Excel tabular format organized by identifier and environmental concern;

- A photographic log of areas of environmental concern;
- The analytical results from the sampling efforts;
- Marked up copies of relevant Site drawings to indicate locations of identified hazardous and regulated materials and other pertinent field observations; and
- Recommendations for managing the identified hazardous and regulated materials.

Prior to finalizing plans for any demolition or disturbance, the Environmental Assessment and Pre-demolition Survey Report will be provided to the EPA, DEC and the DSR responsible for preparation of the annual PRR Report and Certification.

3.7.3 Demolition Requirements

Technical documents (plans and specifications) will be prepared by a New York State licensed professional engineer for use in the procurement of a qualified demolition contractor. The demolition contract will include removal of asbestos and loose lead based paints (as may be found by the Pre-Demolition Survey) as well as regulated and potentially regulated materials and other hazardous and non-hazardous materials, and demolition of the building. The demolition contractor will be required to submit to the EPA and the DSR responsible for preparing the annual PRR and Certification the following plans:

- Demolition Work Plan to describe site preparation, utility isolation/disconnection, demolition procedures, removal procedures, dust control, sequences, schedules, and debris stockpiling. In addition;
- Erosion and Sediment Control Plan;
- Asbestos and Lead Abatement Work Plan (if required);
- Waste Handling and Disposal Plan and Health & Safety Contingency Plan.

The demolition contractor will secure the necessary permits, including a demolition permit from the Town of Colonie Building Department. The demolition contractor will implement the required Site control measures, including but not limited to the Ambient Air Monitoring Plan (see RDR). The demolition contractor will maintain the following documentation:

- a complete record of air monitoring data (VOC, particulate, mercury, asbestos);
- waste profiles, bills of lading and manifests;
- certificates of waste destruction (if applicable);
- scale tickets from the disposal facilities;
- a photographic log of the demolition and waste load-out activities;
- copies of permits and notifications;
- copies of required certifications and licenses;
- daily reports;
- asbestos air sample analyses, data sheets and clearance letters (if applicable); and
- record drawings and survey (if applicable).

All of the above documentation will be provided to the DSR responsible for preparing the annual PRR and Certification.

3.8 Monitoring of Unnamed Tributary, Patroon Creek and I-90 Pond

Following completion of the RA, including the removal of the mercury-contaminated sediments in the Unnamed Tributary that exceed the cleanup level for mercury in sediments of 1.3 ppm, monitoring will be performed to confirm the effectiveness of the remedy. This monitoring will consist of annual sampling of the fish, surface water and sediments in the Unnamed Tributary, the Patroon Creek, and the

I-90 Pond to assess the potential impact on the biota for five years. Sampling thereafter will be based on the results of the five annual sampling rounds, as reported within the first five-year review.

The periodic sampling will be conducted and reported by the Mercury Refining Site Remedial Action Group in accordance with the Ecological Verification Sampling Plan (Attachment C).

Section 4

Reporting and Annual Certification

The owners/operators of the Site properties or other party implementing the remedy will provide periodic certification that the institutional and engineering controls are in place.

4.1 Periodic Review

Site management activities will be reported, and the necessary institutional controls/engineering controls (IC/EC) certification will be provided on an annual basis in a periodic review report (PRR), prepared in accordance with guidance contained in DEC's DER-10 (DEC, 2009). The initial periodic review will take place no more than 18 months after EPA issues the certificate of completion. Subsequent periodic reviews will be annually, unless a different certification period is approved by the EPA and DEC and set forth in the approval letter for the latest periodic review. Only one IC/EC certification will be filed each year. Since the Site is comprised of multiple properties and multiple owners, the Group and owners will arrange for one PRR and one certification.

The periodic review will gather the information needed to document the basis for the IC/EC certification. To the extent applicable, the Site monitoring data, as well as results of the inspections (Section 2.9) will be evaluated as part of the periodic review to confirm that:

1. engineering controls and institutional controls are in place, are performing properly and remain effective;
2. the monitoring plan is being implemented;
3. operation and maintenance activities are being conducted properly; and
4. based on this review, the remedy continues to be protective of public health and/or the environment and compliant with the ROD.

The periodic review will evaluate the data gathered to determine whether the ECs and/or ICs identified for the Site remain necessary for the continued effectiveness and protectiveness of the remedy. Based on this review, recommendations may be made for discontinuing an element of the SMP, an EC or the continued need for an IC.

In the event the periodic certification cannot be provided due to a failure of one or more of the institutional and/or engineering controls or other condition, the Group will provide the EPA and DEC with the following:

1. timely notification explaining the cause for such failure;
2. a work plan to implement corrective measures necessary to provide the certification; and
3. a schedule for implementing the EPA and DEC-approved corrective measures work plan and submission of the required certification.

Corrective measures will be implemented in accordance with the EPA and DEC-approved work plan and upon completion the periodic certification will be submitted.

4.2 Periodic Review Report

A Periodic Review Report (PRR) will be prepared for the certification period which summarizes the results of the inspections and monitoring undertaken in accordance with this O&M Plan. The PRR will be submitted within 45 days of the date of the end of the certification period, and include the required IC/EC certification. The PRR will include an evaluation of the Site-related data to support the required elements of the certification, including the performance and effectiveness of the institutional controls. The PPR will include the identification of any needed repairs, corrective measures or modifications. The report will also include any new conclusions or observations regarding Site contamination based on inspections and data generated by the SMP, and recommendations regarding any necessary changes to the remedy and/or monitoring plan.

For groundwater monitoring, where the O&M Plan identifies the need for quarterly reports, the PRR will include and provide a summary of the quarterly monitoring data. For each sampled medium (groundwater, sediment, surface water and biota) the PRR will include a figure showing sampling locations with tabulated significant analytical values at sampling locations. The PRR will include cumulative data summary tables and/or graphical representations of contaminants of concern, including a general listing of the compounds analyzed for along with the applicable standards. Copies of laboratory data sheets and the required laboratory data deliverables will be submitted electronically. This backup data will not be included in the PRR or as an appendix to the PRR. The PRR will be provided in an electronic format acceptable to the EPA and DEC.

4.3 Certification

The PRR provides documentation to support the necessary IC/EC certification for the Site. The DSR responsible for preparing and certifying the PRR will be a New York State licensed professional engineer. The certification will identify the IC/ECs required by the remedy and certify that the inspection of the Site was performed under the direction of the person making the certification. The IC/EC certification will be in the form provided below:

"For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

1. *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 DEC;*
2. *nothing has occurred that would impair the ability of such control to protect public health and the environment;*
3. *nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control;*
4. *access to the Site will continue to be provided to the EPA and the DEC to evaluate the remedy, including access to evaluate the continued maintenance of this control; and*
5. *if a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for their intended purpose under the document.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the New York State Penal Law. I, _____, of_____ [print business address], am certifying as owners' Designated Site Representative, that I have been authorized and designated by all Site owners to sign this certification for the Site named in the Site Details section of this form."

Section 5

References

BC, 2013. Supplemental Remedial Design Investigation Report, Mercury Refining Superfund Site, Colonie, New York. Brown and Caldwell Associates. February 2013

DEC, 2009. DER-10 Technical Guidance for Site Investigation and Remediation. New York Sate Department of Environmental Conservation, Division of Environmental Remediation. November 2009.

DEC, December 2010. DER-33 Institutional Controls: A Guide To Drafting And Recording Institutional Controls. New York Sate Department of Environmental Conservation. December 3, 2010. Attachment A.

DOH, 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York; New York State Department of Health, Center for Environmental Health, Bureau of Environmental Exposure Investigation; October 2006.

EPA, 1996. USEPA Ground Water Issue: Low flow (Minimal Drawdown) Ground-water Sampling Procedures. EPA/540/S-95/504. April 1996

EPA, 1998. Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling. USEPA, Region 2. March 16, 1998.

EPA, September 2008. Record of Decision, Mercury Refining Site, Towns of Colonie and Guilderland, Albany County, New York. United States Environmental Protection Agency, Region II. September 2008.

EPA, 2009. Administrative Settlement Agreement and Order for Remedial Design and Cost Recovery, Mercury Refining Superfund Site, Colonie, NY. September 30. Includes Statement of Work (SOW). 2009.

EPA 2012. Consent Decree for Remedial Action and Recovery of Response Costs, Mercury Refining Superfund Site. Includes Statement of Work (SOW). 2012.

EPA, 2012. USEPA Region 2 “Clean & Green” Policy
http://www.epa.gov/region02/superfund/green_remediation/policy.html (Updated March 20, 2012)

Figures

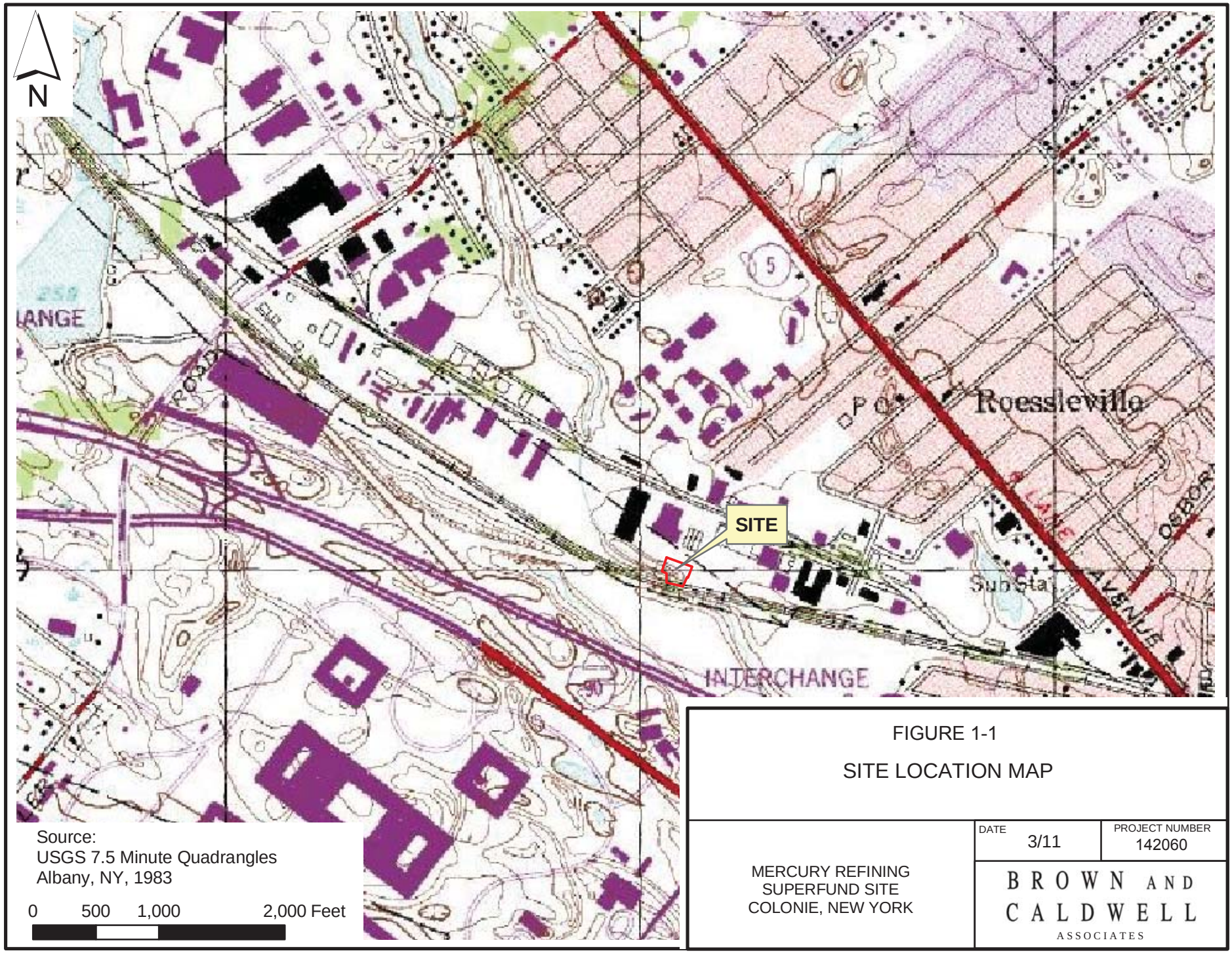


FIGURE 1-1

SITE LOCATION MAP

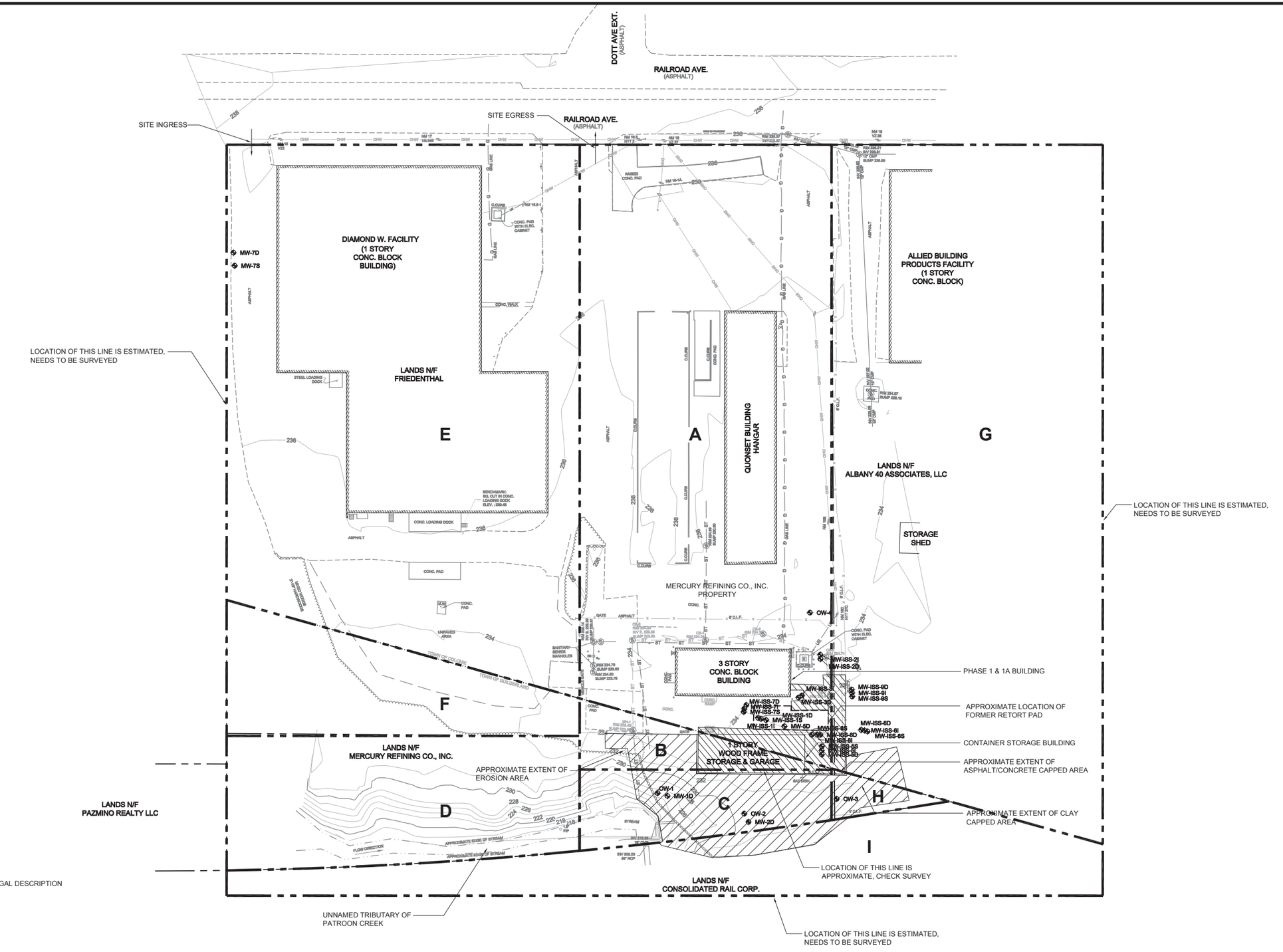
MERCURY REFINING
SUPERFUND SITE
COLONIE, NEW YORK

DATE	PROJECT NUMBER
3/11	142060

BROWN AND CALDWELL
ASSOCIATES

P:\GIS\Mercury_Refining_Superfund\RDI_Figure_1_Site_Location.mxd

0 40 80
SCALE IN FEET



LEGEND:

- SEWER MANHOLE
- MONITORING WELL
- 230 — MAJOR GRADE CONTOUR
- 228 — MINOR GRADE CONTOUR
- G — UNDERGROUND GAS
- ST — STORMWATER PIPE (DASHED WHERE INFERRED)
- UE — UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- STREAM
- ASPHALT PAVEMENT
- TOWNSHIP LINE
- PROPERTY LINE
- FORMER RETORT PAD
- ASPHALT/CONCRETE CAP (CRA, 1986)
- CLAY CAP (WITH GRASS COVER) (CRA, 1986)
- A — TAX PARCEL DESIGNATION - REFER TO SURVEY AND LEGAL DESCRIPTION
- TAX PARCEL BOUNDARY

NOTE:
1. ALL PARCELS SHOWN ON THIS DRAWING WILL BE SUBJECT TO ONE OR MORE INSTITUTIONAL CONTROLS.

Brown AND Caldwell

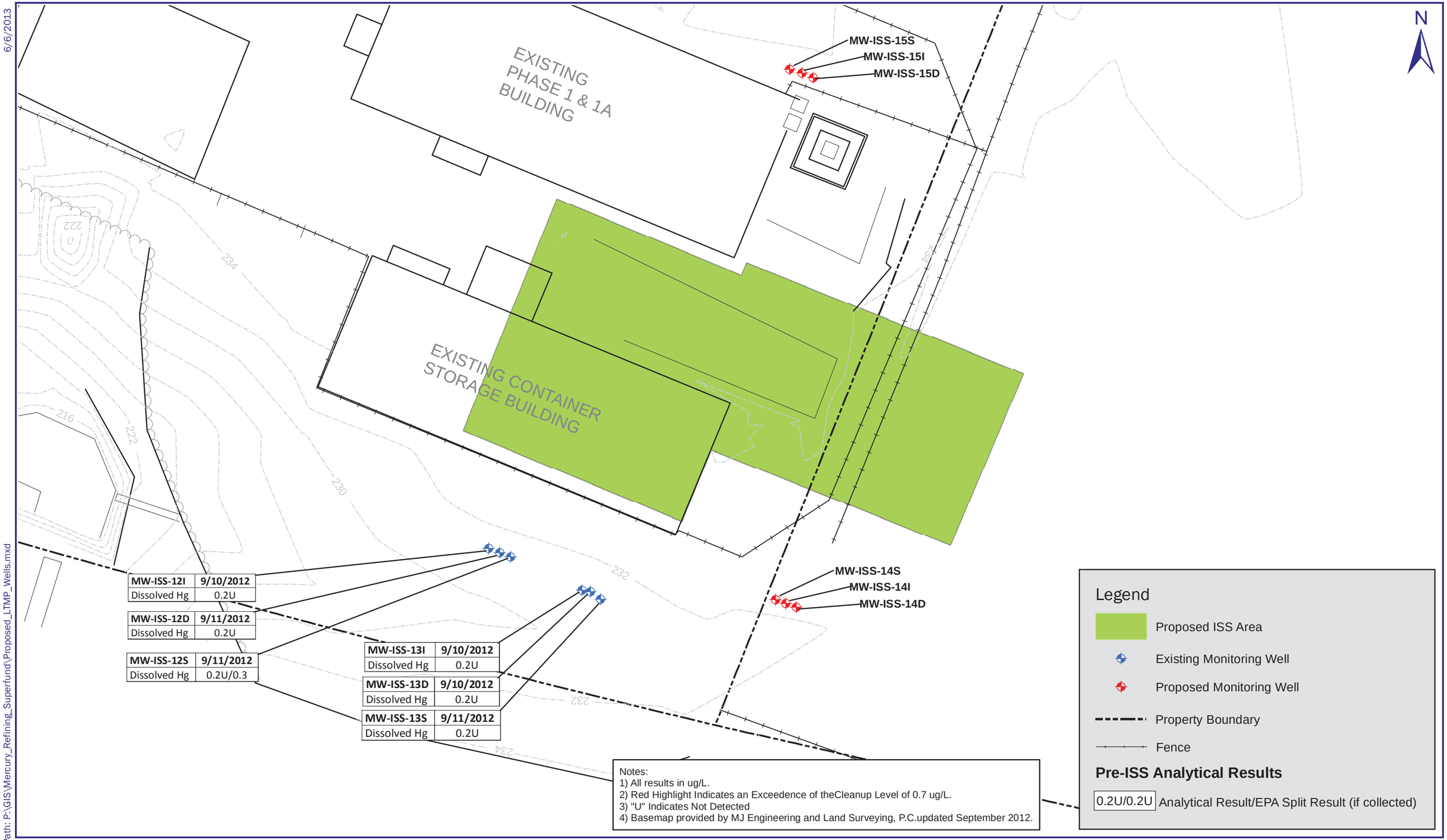
DATE: June 6, 2013

90-95%REMEDIAL DESIGN
MERCURY REFINING SUPERFUND SITE
COLONIE, NEW YORK

OPERATION AND MAINTENANCE PLAN
AREAS SUBJECT TO INSTITUTIONAL CONTROLS

FIGURE
2-1

6/6/2013



Author: CMeyn Path: P:\GIS\Mercury_Refining_Superfund\Proposed_LTMP_Wells.mxd

Brown AND Caldwell

FIGURE 3-1
PROPOSED LOCATIONS OF LONG-TERM MONITORING WELLS
MERCURY REFINING SUPERFUND SITE, COLONIE, NEW YORK

Attachment A: Legal Descriptions of Restricted Parcels

CONTAINING two and eighteen hundredths (2.18) acres of land, more or less.

Parcel 2 – Section 53.09, Block 1, Lot 10.2 recorded in the Albany County Clerk's Office at Liber 2334, Page 728, February 27, 1987:

ALL THAT PARCEL OF LAND situate in the Town of Guilderland, County of Albany and State of New York, bounded and described according to a plan of survey made by O.J. Meyer, Licensed Land Surveyor No. 30202, dated October 25, 1984 and revised July 11, 1985, as follows, VIZ:

COMMENCING at a point where the southerly line of Railroad Avenue Meets the centerline of Maplewood Avenue Extension;

THENCE extending Westwardly, along said line of Railroad Avenue, 1237 feet to a point in the Easterly line of land now or formerly of 26 Railroad Ave.; and

THENCE South 22 degrees 12 minutes 26 seconds West, along said easterly line, 417.16 feet to a point at the Southeasterly corner of said land now or formerly of 26 Railroad Ave., Inc., the true point of beginning for the parcel of land being described;

EXTENDING from said true point of beginning the following four (4) courses and distances:

(1) South 22 degrees 12 minutes 26 seconds West, along the Prolongation of said Easterly line of land now or formerly of 26 Railroad Ave., Inc., 65 feet, more or less, to a point in the Northerly line of land now or formerly of Consolidated Rail Corporation; thence

(2) Westerly, along said Northerly line, on a curve to the right Having a radius of 3779.04 feet and a central angle of 3 degrees 05 minutes 53 seconds, the arc distance of 204.34 feet to a point In the prolongation southwardly of the Westerly line of said land Now or formerly of 26 Railroad Ave., Inc.; thence

(3) North 22 degrees 29 minutes 30 seconds East, along said last mentioned prolongated line, 91.12 feet to a point at the Southerly line of the last mentioned land, 202.34 feet to the true point of beginning.

CONTAINING 15,798.6 square feet, more or less, or 0.360 of an acre, more or less.

APPENDIX A – DESCRIPTION

The Property consists of the following two parcels:

Parcel 1 – Section 53.10, Block 4, Lot 4 and Section 53.09, Block 1, Lot 9 recorded in the Albany County Clerk's Office at Liber 2234, Page 471, January 13, 1983:

> THAT CERTAIN PIECE OR PARCEL OF LAND situate partly in the Town of Colonie and partly in the Town of Guilderland, County of Albany, State of New York, bounded and described as follows:
>
> BEGINNING at a point in the southwesterly line of Railroad Avenue, Distant northwesterly one thousand two hundred thirty-seven and no hundredths (1,237.00) feet, measured along said southwesterly line of Railroad Avenue from its intersection with the prolongation southwesterly of the center line of Maplewood Avenue Extension, as said Avenues are laid down on a map entitled "N.Y.C.R.R., Buffalo & East, Main Line, Land Proposed to be deeded to the Towns of Colonie and Guilderland for Highway purposes, West Albany", Dated October 9, 1939, and filed in the office of the Clerk of said County of Albany on October 11, 1939, as Map Number 789, Drawer Number 102, said point of beginning being the northwesterly Corner of the premises conveyed to Carl G. Grimm; and running Thence northwesterly, along said southwesterly line of Railroad Avenue, two hundred and no hundredths (200.00) feet; thence Southwesterly, at right angles to said southwesterly line of Railroad Avenue, four hundred and seventy and ninety-four hundredths (470.94) feet, more or less, to a point in the southwesterly line of the premises conveyed by the New York Central Railroad Company to New York State Realty and Terminal Company by deed dated October 26, 1939, recorded in the office of the Clerk of said County of Albany in Book 911 of Deeds, at page 362; thence southeasterly, along said southwesterly line of said premises conveyed by the New York Central Railroad Company to said New York State Realty and Terminal Company by deed as aforesaid, two hundred and two and eighty-eight hundredths (202.88) feet, more or less, to a corner or angle in said southwesterly line, said corner or angle being the southwesterly corner of said premises conveyed to Carl G. Grimm; thence northeasterly, along the northwesterly line of said premises conveyed to Carl J. Grimm, four hundred seventy-one and seventeen hundredths (471.17) feet, more or less, to the point and place of beginning.

Lawyers Title
Insurance Corporation

Issued by
SNEERINGER PROVOST REDGRAVE TITLE AGENCY, INC.

All that certain tract, piece or parcel of land situate, lying and being in the Town of Colonie, Town of Guilderland and City of Albany, County of Albany, New York, and lying generally Southwesterly of Railroad Avenue, and being more particularly bounded and described as follows:

BEGINNING at the point of intersection of the common line between the lands herein described on the West and the lands now or formerly of Six Stars Associates as described in Book 2429 of Deeds at Page 646 on the East with the Southwesterly margin of Railroad Avenue, said point also being Northwesterly 837 feet as measured along said Southwesterly margin from its intersection with the Southwesterly prolongation of the centerline of Maplewood Avenue Extension and runs thence from said point of beginning along said common line South 22 deg. 28 min. 34 sec. West, distance of 408.18 feet to a point; thence along the common line between the lands herein described on the South and the lands of said Six Stars Associates on the North, South 76 deg. 30 min. 00 sec. East, a distance of 211.84 feet to a point; thence along the common line between the lands herein described on the Southwest and the lands reputed to be owned by Owasco River Railway, Inc. on the Northeast the following two (2) courses: 1) South 67 deg. 30 min. 05 sec. East, a distance of 278.86 feet to a point; and 2) Southeasterly along a curve to the right of radius 594.26 feet, an arc distance of 85.84 feet to a point, the chord for the above described curve being South 63 deg. 21 min. 48 sec. East 85.76 feet; thence along the common line between the lands herein described on the North and the lands now or formerly of Consolidated Rail Corporation on the

South the following three courses: 1) North 76 deg. 38 min. 06 sec. West, a distance of 380.50 feet to a point; 2) North 76 deg. 31 min. 00 sec. West, a distance of 593.98 feet to a point; and 3) Westerly along a curve to the right of radius 3,779.04 feet, an arc distance of 9.82 feet to a point, the chord for the above described curve being North 76 deg. 26 min. 32 sec. West 9.82 feet; thence along the common line between the lands herein described on the East and the lands now or formerly of 26 Railroad Avenue, Inc. as described in Book 2234 of Deeds at Page 471 on the West the following two (2) courses: 1) North 22 deg. 11 min. 26 sec. East, a distance of 64.90 feet to a point; and 2) North 22 deg. 19 min. 33 sec. East, a distance of 471.17 feet to a point on the aforementioned Southwesterly margin of Railroad Avenue; thence along said Southwesterly margin South 67 deg. 31 min. 26 sec. East, a distance of 400.00 feet to the point or place of beginning, containing 5.23± acres of land.

Legal description of railroad property subject to Institutional Controls to be provided by CSX Transportation, Inc.

Legal Description
SealMaster Facility

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Towns of Colonie and Guilderland, County of Albany and State of New York, and being more particularly bounded as described as follows:

Beginning at a point in the southerly line of Railroad Avenue where the same intersects the westerly line of lands now or formerly of 26 Railroad Avenue, Inc., said point of beginning also being located 1437 +/- feet westerly measured along the southerly line of said Railroad Avenue from its intersection with the center line of Maplewood Avenue Extension; running from thence along the westerly line of lands of said 26 Railroad Avenue, Inc. South 37 deg. 46 min. 20 sec. West, 470.94 feet to a point in the northerly line of the other lands of party of the first part; thence along the same North 52 deg. 09 min. 50 sec. West, 280.00 feet to a point in the easterly line of lands now or formerly of Park Warehouse Associates; thence along the same North 37 deg. 46 min. 20 sec. East, 470.63 feet to a point in the southerly line of Railroad Avenue; thence along the same South 52 deg. 13 min. 40 sec. East, 280.00 feet to the point or place of beginning, containing 3.026 acres be the same, more or less.

Attachment B: New York Guidance on Implementing Institutional Controls

DER-33 / INSTITUTIONAL CONTROLS: A GUIDE TO DRAFTING AND RECORDING INSTITUTIONAL CONTROLS

New York State Department of Environmental Conservation

DEC Program Policy

Issuing Authority: Val Washington	**Title:** Deputy Commissioner, Office of Remediation and Materials Management
Date Issued: December 3, 2010	**Latest Date Revised:**

I. Summary

"Institutional controls" (ICs) are any non-physical means of enforcing a restriction on the use of real property that limits human or environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of site management activities at or pertaining to a remedial site. [*also see 6 NYCRR 375-1.2(aa)*]

ICs accomplish their goal by limiting land or resource use and/or by providing information that helps modify or guide human behavior at the site. This guidance provides an overview of the drafting and recording of ICs for remedial programs managed by the New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER). Specifically, this policy applies to the Inactive Hazardous Waste Disposal Site Remedial Program, known as the State Superfund Program (SSF); Brownfield Cleanup Program (BCP); Voluntary Cleanup Program (VCP); Environmental Restoration Program (ERP); Spill Response Program (SRP - Navigation Law (NL) section 178); and the Resource Conservation and Recovery Act (RCRA) Program.

II. Policy

Contaminated site remedial programs are an important and necessary component of the state's policy of restoring and revitalizing real property located throughout the state. When an environmental remediation leaves contaminants at levels that have been determined to be safe for a specific use, but not all uses, or includes engineered structures or controls that must be maintained or protected against damage to be effective, it is necessary to provide an effective and enforceable means of ensuring the performance of maintenance, monitoring and operation requirements, and the restriction on future uses of the land, including restrictions on excavating soils or using groundwater.

DEC has used deed restrictions and, where appropriate, environmental notices to address these sites for nearly three decades. In 2004 the legislature provided for the granting of environmental easements restricting the use of land to conform to constraints placed on sites in any of DEC's remedial programs (Environmental Conservation Law [ECL] Article 71, Title 36). Collectively, these ICs are necessary for the protection of public health and the environment and to achieve the requirements for remediation established at certain contaminated sites.

It is DEC's policy, consistent with applicable statutes and regulations, that all remedies will be protective of public health and the environment**.** DEC's preference is that remedial programs be designed such that the performance standard results in the implementation of a permanent remedy resulting in no future land use restrictions. However, some of DEC's remedial program objectives are predicated on future site use when return to a condition where no restrictions are required is not feasible, or when a remedial party agrees to restrict future use of a site resulting in reduced opportunity for human exposure. Where a remedy will limit future use, ICs play an important role in minimizing the potential for exposure, protecting engineered remedies and providing appropriate notice to potentially impacted individuals.

The use of ICs is not an alternative to an active remedy, but rather part of a balanced, practical approach to site cleanup that relies on both engineered and non-engineered remedies. Remedies in New York State are not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP emphasizes that ICs are meant to supplement engineering controls during all phases of cleanup and may be a necessary component of the completed remedy. The NCP cautions against the use of ICs as the sole remedy unless active response measures are determined to be impractical. These same principles apply to remedies in New York State.

Procedures set forth in this policy document are intended for the use by and guidance of both DEC personnel and remedial parties. The policy is not intended to create any substantive or procedural rights enforceable by any party in administrative or judicial litigation. DEC reserves the right to vary these procedures to address site-specific circumstances, and to revise them as it deems appropriate based on changes in law or its experience in implementing the policy.

III. Purpose and Background

ICs have been employed for nearly three decades in DEC's various environmental remediation programs. ICs are used to ensure the protectiveness of the remedy where unrestricted conditions are not achieved by the site remedial program (except as provided in DER-10 1.12(b)(1)(iii) for residential properties under certain conditions). Further, to the extent that an engineering control is necessary, ICs must always be imposed to ensure that the engineering controls are properly monitored and maintained, and that DEC has access to inspect the engineering control.

The types of the ICs, and the specificity provided in the decision documents identifying the site remedy, have changed over the years. Most recently, the legislature passed the environmental easement statute to provide for a new form of IC. With the addition of the environmental easement, the most common ICs employed by DEC are:

- Environmental Easements
- Deed Restrictions
- Environmental Notices

Each of these documents must be properly drafted and recorded with the appropriate county's land records to ensure proper notice and effectiveness of the control. The purpose of this guidance is to provide direction on how to develop and properly record ICs as part of a cleanup decision.

IV. Responsibility

The responsibility for maintaining and updating this policy lies with Remedial Bureau C in DER. DER and Office of General Counsel (OGC) staffs are responsible for interpreting and implementing this policy.

V. Procedure

1. Overview

The common forms of ICs employed in DER remedial programs are Environmental Easements in accordance with ECL Article 71, Title 36 (see subdivision 2(a) below), Deed Restrictions (see subdivision 2(b) below), and Environmental Notices (see subdivision 2(c) below). The various documents referenced by and attached to the IC, such as the Site Management Plan, survey and title commitment, should be prepared concurrently to the extent possible. Therefore, once a Decision Document is issued, work should commence to develop the IC/ECs specified, as well as the Site Management Plan. Assuming all remedial requirements have been met, once the IC is recorded and distributed in accordance with this guidance, the Final Engineering Report may be approved and a Certificate of Completion (COC) or other form of closure letter can be issued.

2. Types of Institutional Controls

(a) Environmental Easement.

1. Where EEs are employed, unless specifically precluded by statute, such as on Forest Preserve Lands, an environmental easement (EE) is the required instrument for memorializing land use restrictions on:

(i) all BCP remedial projects;

(ii) SSF or a non-registry sites subject to an Article 27 Title 13 remediation, where:

(1) the consent order, or applicable oversight document, was signed after October 7, 2003: or

(2) regardless of the date of the order, where a Record of Decision, or other applicable decision document, was issued for the site or an operable unit of the site after October 7, 2003;

(iii) ERP sites where:

(1) the state assistance contract (SAC) was signed after October 7, 2003: or

(2) regardless of the date of the SAC, where an ERP Record of Decision was issued for the site or an operable unit of the site after October 7, 2003; and

(iv) VCP sites when the decision document calls for an EE.

2. The EE runs with the land in favor of the State, subject to the provisions of ECL Article 71, Title 36, and contains the use restriction(s) and/or any prohibition(s) on the use of land in a manner inconsistent with engineering controls. The emplacement of an EE provides an effective and enforceable means of encouraging the reuse and redevelopment of a controlled property in a manner that is consistent with the remedial program and ensuring the performance of operation, maintenance, and/or monitoring requirements.

3. Other interests in the property subject to the EE. To ensure an EE is properly executed, it is the obligation of the remedial party to conduct a sufficient search of the real estate records to identify all legal and equitable interest in the property and ensure the EE and any supporting documents are properly prepared and executed. Without clearance of title issues and the willingness of the title company to insure the title under an owner's policy, DEC will not accept an EE on behalf of the State. It is in the remedial party's best interest to make sure the EE is valid and enforceable since any subsequent challenge to the validity, enforceability or effectiveness of such control to ensure the protectiveness of the remedy would be a basis for voiding any COC and/or releases issued for the site and lead to reopening the remedy for the site. DEC has prepared two checklists detailing the requirements and attachments that must be submitted with the EE to address these issues, one completed by the site owner and the other by the attorney preparing the easement. Parties are encouraged, but not required, to use the services of an attorney licensed in New York State and with experience in real property law to prepare and execute the required documentation. This documentation must be submitted to OGC with a copy to the DER Project Manager (PM) as described in subdivision (d) below.

4. EE package. The remedial party starts the process for execution of an EE by providing the PM with the following elements of a complete EE package:

(i) a proposed EE, using the latest version of the model EE document provided by DEC, which can be downloaded from DEC's website at http://www.dec.ny.gov/chemical/48236.html;

(1) a modified form of the EE may be proposed, but any revisions to the model form must be explained and specifically identified in a cover letter. Any proposed modifications to the model will require additional time for DEC to review, process and approve. Accordingly, parties should evaluate the importance of such changes in conjunction with any timing concerns;

(ii) an updated title report (current within 6 months) along with copies of any encumbrances (e.g., mortgages, judgments, easements, leases, liens, etc.), and the following other Title information:

(1) A "Certification Page, Schedule A and Schedule B" for each title report;

(A) An indication on the Certification Page as to who has the right to convey or mortgage the property that is subject to the EE;
(B) Schedule A, providing the legal description of the property; and
(C) Schedule B, listing the exceptions to the title or issues which require clearance or amplification before the title company is willing to issue its policy. The remedial party's attorney must ensure that the title report includes a copy of every encumbrance that affects title (i.e., mortgages, judgments, easements, leases, subleases, assigned leases);

(2) a copy of the tax map attached to each report;

(3) a proposed title insurance policy to be underwritten by a New York State licensed title insurance company. The policy should be in the amount of $35,000 with the State (The People of the State of New York acting through their Commissioner of the Department of Environmental Conservation) listed as the insured; and

(4) a certification from the title company that:

(A) sufficient title and lien research has been conducted to identify all necessary legal and equitable interests. This would include at a minimum all fee title owners by deed, contract sellers, buyers and assignees, mortgagees, lessees and other consensual lien-holders; and

(B) the signatures of the identified grantors on the EE satisfy legal requirements necessary to provide the State with an interest in the property superior to all other interests or to provide notice to those other parties. The title company should insure the boundaries of the encumbered property as it appears on the final survey;

(iii) if an exception to Schedule "B" is necessary, any exception supporting documents (prior easements, rights of way, liens, encumbrances etc., affecting the property);

(iv) in lieu of subordinations, a notice form may be sent to all interested parties identified in Schedule B, as well as any existing tenants on the property. Where such notice is required it shall include a list of those parties with the names and address. The notice and list will be returned to the remedial party's attorney along with the fully executed EE for mailing;

(v) the current deed(s);

(vi) a survey, to include a graphic scale; legend; section, block and lot; and physical address, that:

(1) clearly identifies the property as described in the current deed, or area(s) of the site to be addressed by the EE, with corresponding metes and bounds description; and

(2) includes other information, as addressed by the survey requirements indentified in Section 3 and included as Attachment "A";

(vii) a commitment letter and a proposed final policy from the title company stating that it will issue the proposed title insurance policy upon recording of the EE;

(viii) organizational documents and partnership agreements with evidence of successors in interest such as LLC Documents/Certificate of Incorporation papers/Limited Partnership papers, etc. of the owners of the property, where applicable; and

(ix) completed and signed EE attorney and site owner checklists and certifications. The remedial party can download the latest versions of these checklists from DEC's website.

Please note: The foregoing list is not exhaustive and is subject to change. Additional information may be required on a case by case basis.

5. Execution of the EE. After review of the EE package by the OGC attorney and any necessary revisions to the documentation, the site owner signs the easement form and provides all documents in a final form for execution by DEC. The DER Division Director has been delegated the authority by the Commissioner to execute Environmental Easements.

6. Recording the EE. After the EE has been executed, the remedial party must:

(i) have the EE recorded at the office of the appropriate county clerk (or Registrar in New York City). A receipt (typically, this is a copy of the EE that is stamped with the book and page number in the upper right hand corner of every page of the document including attachments/exhibits), indicating where and when the EE was recorded, must be provided to DEC; and

(ii) serve the notices of the easement on the required parties (see subparagraph 2(a)4(iv) above). These notices must be served on all parties identified in the title report within 60 days of filing, and the proof of service and notices must be provided to DEC within 90 days of filing. In addition, a copy of the notice and certification of service on the parties will be filed in the County Clerk's office, or Registrar in New York City.

(b) Deed Restrictions.

1. A deed restriction (DR) may be the required institutional control for:

(i) VCP sites;

(ii) those SSF class 2, 3 4 or 5 sites, or a non-registry sites subject to an Article 27 Title 13 order, provided the consent order was executed, and the record of decision (ROD) was issued, prior to October 7, 2003;

(iii) ERP sites, provided the SAC was signed and the ERP ROD was issued prior to October 7, 2003; and

(iv) sites for which an EE is statutorily precluded, such as Forest Preserve Lands.

2. For any of the above, the remedial party may request DER approval to utilize an environmental easement in place a deed restriction.

3. DRs are encumbrances on the property that control the use of the property. The restriction runs with the land in favor of the State and contains the use restriction(s) and/or any prohibition(s) on the use of land in a manner inconsistent with engineering controls. The restriction provides an effective and enforceable means of encouraging the reuse and redevelopment of a controlled property in a manner that is consistent with the remedial program, ensuring the performance of operation, maintenance and/or monitoring requirements of the approved site management plan.

4. DRs must be approved by the property owner and must be recorded in the land records of the county where the property is located. The DRs travel with the deed, and cannot be removed by new

owners without DEC's written consent. DRs have been used by DEC as a form of institutional control in enforcement cases for several decades. DRs require that the background information and documentation described below be provided to DEC's PM.

5. To ensure the DR is properly executed, it is the obligation of the remedial party to conduct a sufficient review of the real estate records to identify all legal and equitable interest in the property and ensure that the DR and any supporting documents are properly prepared and executed.

6. It is in the remedial party's best interest to make sure the DR is valid and enforceable, since any subsequent challenge to the validity, enforceability or effectiveness of such control in ensuring the protectiveness of the remedy would be a basis for voiding any certificate of completion and/or releases and reopening the remedy for the site. Parties are encouraged, but not required, to use the services of an attorney licensed in New York State and with experience in real property law to prepare and execute required documentation.

7. DEC, at its sole discretion, may elect to use the approach set forth above for Environmental Easements or the following DR process:

(i) the PM commences the process by selecting the appropriate DR template (groundwater use restriction, no groundwater use restriction or no engineering controls), the latest version of which can be downloaded from DEC's website at http://www.dec.ny.gov/chemical/48236.html;

(ii) the PM will fill in the blanks in the fourth paragraph of the "Whereas" section of the template, selecting the appropriate use from the restricted uses identified in 6 NYCRR 375-1.8(g)(2). The PM should verify that the use specified in the IC is consistent with local zoning and the Record of Decision or Decision Document for the site, and compliant with 6 NYCRR 375-1.8(g)(5). Note that approved zoning variances and historic uses, such as closed landfills, may be considered as reasonably anticipated future uses;

(iii) the PM transmits the partially completed DR to the remedial party and requests that the remedial party complete the remaining fields (site owner name, address, etc.) in the template, along with the following:

(1) a copy of the current deed;

(2) a tax map of the site to which the restrictions apply; and

(3) a survey that meets DEC's requirements of the area(s) to be addressed by the DR, with corresponding metes and bounds description. The survey should include a graphic scale; legend; section, block and lot; and physical address. The survey should also include other information, as addressed by the Survey Requirements (Section 3. and Attachment "A");

(iv) DEC contracts with a title company to handle the deed restriction. The costs associated with the deed restriction are recoverable from the remedial party. DEC's PM will notify the remedial party of the name of title company retained by DEC ("title company") to finalize the DR. This title company will contact the remedial party concerning the deed restriction;

(v) the remedial party completes the DR and provides it electronically unsigned to DEC's title company. A modified form of the DR may be proposed, but any proposed revision to the DR must be explained and specifically identified in a cover letter. Any proposed modifications to the DR will require additional time to review, process and approve. Accordingly, the remedial party should evaluate the importance of such changes in conjunction with any timing concerns. The unsigned, completed DR must include the metes and bounds description and a map of the site;

(vi) the title company works directly with the remedial party to correct any errors or omissions to produce the final DR to be filed;

(vii) once the title company has a final DR, it is provided electronically to the PM with a letter recommending that this document be finalized by the remedial party. Upon receipt of the letter from the title company, DEC's PM transmits a copy of the approved DR to the remedial party and requests that the DR be signed by the property owner, notarized and returned to the title company for filing; and

(viii) after the signed, notarized DR has been received by the title company, the title company will have the DR recorded at the office of the appropriate county clerk (or Registrar in New York City). A receipt (typically, this is a copy of the DR that is stamped with the book and page number in the upper right hand corner of every page of the document including attachments/exhibits) indicating where and when the DR was recorded must be provided to DEC and the remedial party. The PM may elect to have the remedial party file the deed restriction and provide the required receipt.

(c) Environmental Notice.

1. Environmental notices (EN) are informational documents filed in the public land records that inform prospective purchasers of an interest in the property that:

(i) contamination exists on the property;

(ii) a cleanup is required to occur or has occurred at the property to a level that restricts certain uses of all or part of that property; and

(iii) A DEC-approved Site Management Plan is or will be in place setting forth requirements relative to the use of such property.

2. Generally, the EN is used where a property owner cannot be located or refuses or is unable to grant an easement or place a deed restriction on the subject property. The latest version of the EN is available on DEC's web site.

3. The property owner does not need to approve or sign the EN. The DER Division Director signs the ENs on behalf of DEC.

4. After the EN has been prepared and signed by DEC, the remedial party or DEC's contractor must have the EN recorded at the office of the appropriate county clerk (or Registrar in New York City). A receipt (typically, this is a copy of the EN that is stamped with the book and page number

in the upper right hand corner of every page of the document including attachments/exhibits) indicating where and when the EN was recorded must be provided to DEC**.**

3. Post-recording Actions for all ICs

(a) For EEs and DRs, the remedial party must submit a copy of any recorded EE or DR restricting land use to the highest official in the local government (e.g., mayor or town supervisor) and the Code Enforcement Officer where the contaminated property is located. Proof must be provided to DEC within 30 days of providing the local government with a copy.

(b) For ENs, DEC will submit a copy of an EN to the local government where the contaminated property is located.

(c) All reports referenced in the institutional control must be maintained and NOT destroyed pursuant to any other recordkeeping guidelines so long as the control is in place. EEs are listed on an EE registry on DEC's website.

4. Surveys

All survey work must be performed under the supervision of an individual who is licensed to practice land surveying in the State of New York. An ALTA survey is preferred; however, it is not required. The minimum requirements that must be shown on the survey are included on Attachment "A". However, when preparing a survey, the latest listing of minimum requirements should be downloaded from DEC's website. Additional information may be required on a case-by-case basis.

5. Modification or Termination of ICs

(a) It may be necessary to replace, modify, or extinguish ICs due to changes in conditions existing at a site over time, or changes in the ICs themselves. The Site Management Plan (SMP) for each site should establish procedures to modify or terminate ICs when warranted. These procedures should clearly delineate criteria to assist in determining whether it is appropriate to modify or terminate ICs, and should be documented.

(b) To remove or modify an IC, the current property owner must submit a written request to DER that the control be removed or modified.

1. Acceptable reasons to remove or modify a control include: the site's contamination no longer exceeds the unrestricted SCOs or groundwater standards, a municipal prohibition on groundwater extraction is enacted, or one form of an IC is replaced with another.

2. When DEC approves the removal or modification of an IC, a document in the same form as the original document and filed in the same manner with the county land records office must be recorded, which states that DEC and the property owner agree to remove the control and briefly states the reason for removing the institutional control.

3. Once recorded, a copy of the document must be provided to the same governments that were notified of the filing of the original.

VI. Related References

- Environmental Conservation Law, Article 27, Titles 13 and 14
- Environmental Conservation Law, Article 56, Title 5
- Environmental Conservation Law, Article 71, Title 36
- 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006
- Model Environmental Easement
- Model Deed Restriction
- Model Environmental Notice
- Minimum Survey Requirements (Attachment "A")

ATTACHMENT "A"

MINIMUM SURVEY REQUIREMENTS

The survey must:

1. bear the name, address, telephone number, signature and certification of the professional land surveyor who performed the survey, his or her official seal and registration number, the date the survey was completed, and the dates of all the surveyor's revisions;
2. be certified to the New York State Department of Environmental Conservation;
3. show boundaries drawn to a convenient scale, with that scale clearly indicated. A graphic scale, shown in feet and meters, must be included;
4. identify the symbols and abbreviations that are used on the survey by the use of a legend;
5. accurately present diagrams;
6. show the point of beginning of the legal description;
7. include a correct legal description;
8. include a statement of the acreage in the legal description;
9. indicate both the measured bearings/angles/distances and the deed(s) description, if they differ;
10. provide the identifying titles of all recorded/filed maps and deeds with their appropriate recording data, filing dates and map numbers;
11. provide the section, block and lot/ tax map/ section numbers/letters of the surveyed premises;
12. show the location of all buildings/monuments/overlaps/encroachments upon the surveyed property with their locations defined by measurement perpendicular to the nearest perimeter boundaries;
13. show all observable evidence of easements and or servitudes and underground easements and or servitudes with their recording information (such as those created by roads, right-of-way, water courses, drains, telephone, telegraph, or electric lines, water sewer, gas cable lines or oil or gas pipelines) on or across the surveyed property and on adjoining properties if they appear to affect the surveyed property, or any easements of record which may, based upon their location or use, impair or otherwise limit proposed development;
14. show any "blanket floating" easements;
15. depict the location of visible improvements within five feet of each side of boundary lines.
16. show a path of legal access for ingress and egress to and from the site for the Grantee, its agents, employees or other representative of the State to use to access the Site;
17. show ponds, lakes, springs, rivers or a natural water boundary bordering on or running through the surveyed property; the survey must measure the location of the natural water boundary and note on the survey the date of the measurement;
18. depict the area(s) of wetlands; restricted use zones;
19. depict the environmental easement area with corresponding metes & bounds description and acreage;
20. depict the area affected by engineering controls with corresponding metes and bounds with acreage, measurements with description of the engineering control (for example OU 1, OU 2 or Soil Management Plan Area and Sub-Slab Depressurization Systems);
21. show Methane/VOC system, Site Cap, Clean fill, Concrete, Demarcation Layer, area not under environmental control, Asphalt or building structures, footprint of future buildings (where known), and other site features, remedial equipment or structures;
22. clearly state "Environmental Easement Description" or Deed Restriction", with the DEC Site Number next to it;

23. include the following statement: "*The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@gw.dec.state.ny.us".* This reference must be located in a prominent place on the face of the survey and be in at least 15-point type;
24. show the sheet number and total number of sheets on each sheet if the survey consists of more than one sheet; and
25. show the record title description of the surveyed tract and any new description prepared by the surveyor on the face of the survey.

Additional information may be required on a case by case basis.

Attachment C: Ecological Verification Sampling Plan

Ecological Verification Sampling Plan
Mercury Refining Superfund Site
Colonie, New York

Prepared for
Mercury Refining Site Remedial Action Group

July 2013

Project Number: 144439.150.001

Brown and Caldwell Associates
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Upper Saddle River, New Jersey 07458

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Section 1

Introduction

This Ecological Verification Sampling Plan (EVSP) addresses the post-remediation verification sampling and analysis of surface water, sediment, and fish within the Unnamed Tributary, Patroon Creek, and the I-90 Pond located downstream of the Mercury Refining Superfund Site ("the Site"). The locations of these features are shown on Figure 1. This ESVP (June 2013) was prepared to satisfy the requirements of the Statement of Work (SOW; Appendix A of the Settlement Agreement), and the Record of Decision (ROD) issued by the USEPA in September 2008. This ESVP provides the approach for sampling fish, surface water and sediments in the Patroon Creek, the Unnamed Tributary as well as the I-90 Pond to assess impacts on biota following the implementation of the Selected Remedy, on an annual basis for five years. Furthermore, the plan indicates how the five years of data will be evaluated to determine whether continued monitoring is necessary.

The data objectives for the specific components of the ecological verification sampling program are:

- Sediment: to confirm that surface concentrations stay below the 1.3 ppm cleanup objective;
- Surface water: to monitor dissolved mercury concentrations over time and;
- Fish: to monitor mercury bioaccumulation in biota over time.

Section 2

Selected Remedy

As presented in the ROD, the selected remedy for the Site is based on the excavation and off-site disposal of mercury-contaminated soils above the water table; in-situ solidification/stabilization (ISS) of mercury-contaminated soils which constitute a source of ground water contamination; and excavation and off-site disposal of mercury-contaminated sediments from the Unnamed Tributary of the Patroon Creek (Unnamed Tributary).

Section 3

Impacts to Sediments in the Unnamed Tributary

Per the requirements of the ROD, as part of the Selected Remedy, sediments with mercury concentrations above the cleanup level of 1.3 ppm will be removed, dewatered and disposed off site. Delineation sampling was conducted during the Remedial Design Investigation (RDI). A total of 30 samples were obtained from eight locations as part of the sediment RDI. Mercury concentrations in sediments ranged from below detection limits to 2.4 ppm at SD-DL-03 located in the vicinity of the replacement storm sewer outfall. This sample was collected from a depth of 0.5 to 1.0 foot below the sediment surface and was the only location where an exceedance of the cleanup objective was noted. Vertical delineation was completed at this location to a depth of 2.0 feet below the sediment surface. The two subsequent intervals revealed mercury concentrations below the sediment cleanup objective.

The USEPA, via email dated July 20, 2011, noted that the sediment interval where the exceedance of the sediment cleanup objective was identified is located within a zone that they deem to be biologically active. Therefore, a risk to aquatic receptors evaluation was required to be performed and the impacted sediment removed from the creek. USEPA requested that a post-removal verification sample be collected between sample locations SD-DL-02 and SD-DL-03.

Section 4

Baseline Ecological Sampling

An initial round of sampling and analysis was conducted in November 2010 as part of the RDI to establish a baseline for comparison with the results of future sampling events. A total of 11 samples were obtained as part of the sampling activities. The 11 samples consisted of five sediment samples, three surface water samples and three fish tissue samples. The locations of the 11 samples are shown on Figure 1. These same locations will be used, to the extent practicable, for the collection of the post-remediation verification samples to provide consistent and comparable analyses. The results of the baseline sampling are summarized in the following subsections of this EVSP.

4.1 Sediments

A total of five sediment samples were obtained as part of the baseline sampling program. Two samples were obtained from the Unnamed Tributary, two samples were obtained from the Patroon Creek and one sample was obtained from the I-90 Pond. An attempt was made to take a second sediment sample at the eastern end of the I-90 Pond (MR-SD-11), but the armored slope of the dam at this end of the pond was too steep to permit safe entry with the sediment sampling equipment. One corresponding sample will be obtained from each of the five baseline sample locations during the post-remedial verification sampling.

Analytical results of the baseline sediment sampling have been summarized and tabulated and are presented in Table 1. Sampling location MR-SD-06, which is located closest to the outfall and was specified by the USEPA as a required location (see Section 1.2 above), had the highest mercury concentration of 1.13 mg/kg. This concentration is below the cleanup objective of 1.3 ppm specified in the ROD. Mercury was not detected in the downstream Unnamed Tributary sample (MR SD 07) and the more upstream of the two Patroon Creek sampling locations (MR-SD-08), at detection limits of 0.026 mg/kg and 0.023 mg/kg, respectively. The more downstream Patroon Creek sample (MR-SD-09) and the I-90 Pond sample (MR-SD-10) both had detectable mercury concentrations, but both were below the sediment cleanup objective.

Methyl mercury concentrations in sediments ranged from 0.083 ppb at location MR-SD-08 to 1.6 ppb at location MR-SD-10. N-propyl mercury was not detected in any of the sediment samples. There are currently no NYSDEC or USEPA criteria for methyl mercury or n-propyl mercury in sediment.

There does not appear to be a correlation between mercury concentrations and Total Organic Carbon (TOC) in the sediment. The sediment at each of the five sample locations consisted predominantly of fine sand, with the exception of MR SD-10, which consisted mostly of silt and fine sand. This is consistent with its location in the relatively quiet water of the I-90 Pond. MR-SD-08 and MR-SD-09 had a notable gravel component (26.9% and 18.7%, respectively) along with the fine sand.

4.2 Surface Water

A total of three surface water samples were obtained during the baseline ecological evaluation; one sample from each, the Unnamed Tributary, the Patroon Creek and the I-90 Pond. Analytical results for the baseline surface water sampling are shown in Table 1. Mercury was not detected at any of the surface water sampling locations.

The NYSDEC chronic water quality criterion for mercury for the protection of aquatic life is 0.77 ppb. Methyl mercury was detected at a concentration of 0.039 ng/L (ppt) at the Unnamed Tributary sampling location (MR-SW-07), 0.03 ng/L (ppt) at the Patroon Creek sampling location (MR-SW-09) and 0.054 ng/L (ppt) at the I-90 Pond sampling location (MR-SW-10). There is currently no NYSDEC water quality criterion for methyl mercury. The USEPA Tier II Secondary Acute Value for freshwater is 0.0028 µg/L (2.8 ng/L). Concentrations of methyl mercury detected in the two surface water sampling locations are well below this concentration.

4.3 Biota

A total of three fish samples were collected from the Unnamed Tributary (one sample), the Patroon Creek (one sample) and the I-90 Pond (one sample) using a Smith Root LR24 electroshocker. Fish collected at the upstream sample location (MR-FT-08) included white suckers (*Catostomus commersoni*) and crayfish (family *Cambaridae*). The white suckers ranged in size from 4.1 to 30.2 centimeters (cm) and the crayfish ranged from 6.4 to 7.0 cm in length; all appeared healthy with the exception of one crayfish that was missing a claw. While most of the fish were released, 13 of the white suckers were retained for chemical analysis.

Since the study area water bodies are small and have limited fish species, one sample from each water body is considered to be appropriately representative. Also, the electroshocking was done in a reach of each stream as well as in an area of the pond, not just in one small location at each sampling point. Since the flow characteristics and habitat type were different between each of the sampling locations, sampling each location is representative of each habitat type.

At the midstream sample location (MR-FT-09), 10 white suckers (5.2 to 16 cm), two blacknosed dace [*Rhinichthys atratulus*,(5.5 and 6.2 cm)] and one bluegill sunfish [*Lepomis macrochirus*, (4.5 cm)] were captured; all appeared healthy with the exception of one white sucker that was missing a gill plate. The one sunfish, two blacknosed dace, and seven white suckers were retained for chemical analysis.

At the downstream-most sample location (MR-FT-10, the I-90 Pond), six pumpkinseed [*Lepomis gibbosus*, (3.4 – 6.2 cm)] and seven bluegill sunfish (2.1 to 4.9 cm) were captured; all appeared healthy. All of the fish captured were retained for chemical analysis.

Results of the composite fish tissue analysis at each location are summarized on Table 1. Mercury concentrations in fish tissue samples were 0.022 ppm at MR-FT-08 and 0.039 ppm at MR-FT-09. Mercury was not detected in the MR FT 10 sample. These concentrations are well below the USEPA target fish tissue concentration of 0.3 ppm for methyl mercury and the NYSDEC fish tissue concentration of 1.0 mg/kg used as part of the basis for developing fish consumption advisories. Percent lipids and percent moisture were comparable between the three samples.

Section 5

Ecological Verification Sampling Plan

To assess future impacts on biota after the implementation of the Selected Remedy, a monitoring program will be implemented for a period of five years following the completion of that component of the remedy. This monitoring program will include sampling and analysis of sediment, surface water, and fish tissue in the Patroon Creek, the Unnamed Tributary to Patroon Creek, and the I-90 Pond.

5.1 Sediment Verification Sampling

Post-remediation sediment samples will be collected at the same locations as the baseline analyses. Two sediment samples will be collected in the Unnamed tributary at sample locations MR-SD-06 and MR-SD-07; two sediment samples will be collected from Patroon Creek sample location MR-SD-08 (just downstream from the confluence with the unnamed Tributary) and MR-SD-09; and one sediment sample will be collected from the I-90 pond as well, at sample location MR-SD-10. Sampling will be completed to a depth of approximately six inches below the sediment surface. Sediment samples will be collected in a "downstream" to "upstream" direction (i.e., in a direction opposite the flow) to minimize the chance of spreading disturbed sediment to unsampled locations.

Sediment sampling will be conducted using either a dedicated or a decontaminated stainless steel sampling scoop. Sediment samples will be collected with minimum disturbance and exposure to air. Samples will be screened and logged in the field as described in Section 5.3 of the Quality Assurance Project Plan (QAPP), June 2013, which is appended to the RDR. Using the dedicated/decontaminated scoop, the sediment will be transferred directly to the laboratory supplied sampling containers and stored and handled according to procedures outlined in the QAPP. Sampling equipment will be decontaminated after the collection of each sample in accordance with the procedures outlined in the QAPP.

Sediment samples will be analyzed for mercury by USEPA Method SW-846 7471A, methyl mercury by USEPA Method 1630, Total Organic Carbon (TOC) by the Lloyd-Khan Method and particle size by ASTM D422-63. All samples will be analyzed by a laboratory approved under the New York State Department of Health, Environmental Laboratory Accreditation Program.

5.2 Surface Water Verification Sampling

Post-remediation surface water samples will be collected from the Unnamed Tributary, Patroon Creek and the I-90 Pond. One sample will be collected from each water body at sample locations MR-SW-07, MR-SW-08, and MR-SW-10 (same locations used for the baseline), as shown on Figure 1. The following procedure will be used to collect surface water samples directly from the water bodies using sample containers provided by the project laboratory:

- Don a clean pair of latex gloves;
- Estimate sampling depth by visual observation (for shallow samples) or measure depth using a weighted, flexible measuring tape or a rigid gage;

- Invert the laboratory-supplied sample container (without preservatives), insert the sample container into the water to the desired level, and then turn the mouth of the sample container up and towards the upstream direction thus allowing the container to fill;
- Cap sample container while container is still underwater;
- Remove sample container from water body;
- Rinse the exterior of the sample container thoroughly with deionized water and label container;
- Add preservatives and check for appropriate pH; and
- Record all appropriate data (including sampling location, sampling depth, time of sampling, and description of sample) in field logbook or the Surface Water Sampling Log.

Surface water samples will be analyzed for mercury by USEPA Method SW-846 7471A, methyl mercury by USEPA Method 1630, alkalinity by USEPA Method 310.2, hardness by USEPA Method 130.2 and Total Dissolved Solids (TDS) by USEPA Method 160.1 and SM 2540C, by a laboratory approved under the New York State Department of Health, Environmental Laboratory Accreditation Program.

5.3 Fish Tissue Verification Sampling

Post-remediation fish tissue samples will be collected from the same three locations used for the baseline analyses. One composite sample will be taken at each location (MR-FT-08, MR-FT-09, and MR-FT-10). These sampling locations are co-located with the sediment and surface water samples discussed above. Fish will be captured by electroshocking (e.g., Model Smith Root LR24, 300 volts).

It is important to time the collection of fish samples to avoid disturbing and impacting the fish spawning cycle. Periods of low to moderate stream flow (typically late summer) are best for sampling fish. Sampling at this time also minimizes disturbance to the nests of fish as most young are mobile and are free swimmers. The verification samples for this project will be taken in late summer/early autumn.

Standard water quality measurements (temperature, dissolved oxygen) will be made at each location prior to sample collection. A habitat evaluation sheet, which identifies physical and biological features of each habitat, will also be completed for each location. These data sheets document the field variables and habitat features for later comparison of species composition, abundance, and general health. The following parameters will be noted for each individual fish during sample collection:

- Water body/location/depth;
- Species;
- Length, in cm, measured from snout to lower part of tail;
- Weight, in grams;
- General appearance, special attention will be given to physical malformations; and
- Age and physiological state of the fish, where possible.

Whole bodies of specimen fish will be included in the samples. An attempt will be made to collect species similar to those collected at each sampling location during the Baseline Ecological Investigation, in order to more closely correlate the verification samples with the baseline samples. Once collected, fish samples will be put on ice and shipped to the laboratory overnight. Fish tissue samples will be analyzed for mercury by USEPA Method SW-846 7471A, percent lipid and percent solid, by a laboratory approved under the New York State Department of Health, Environmental Laboratory Accreditation Program.

5.4 Evaluation of Data

Following the first annual round of ecological sampling, the resulting data will be compared with the results obtained during the Baseline Ecological Evaluation. The data from four subsequent years will be compared with both the Baseline Ecological Evaluation data, and the data from each preceding year. With the small number of sampling points (six, including baseline), there are insufficient samples to support statistical analysis of the data. Therefore, a simple trend analysis will be completed and presented in tabular and graphic format. At the end of the five-year monitoring period, if the concentrations of mercury in sediment, surface water and fish tissue samples decrease or remain constant, further annual sampling will no longer be conducted. However, if there appears to be any significant and/or consistent increase in mercury concentrations in any of the affected media over time, or if standards/benchmark values are exceeded, further monitoring may be needed, and will be re-evaluated at that time. The USEPA will make the final decision for discontinuing the ecological verification sampling.

Section 6

Sampling Schedule

Per the Remedial Action Schedule presented in the Remedial Design Report (RDR), implementation of the remedial action is anticipated to occur between late 2013 and mid-2014. As indicated previously, ecological sampling should be conducted in late summer or early autumn, in order not to affect the spawning cycle of the fish. It should be noted that the sediment and surface water sampling will take place at the same time as the fish sampling. Based on that, and on the anticipated Remedial Action Schedule, the first round of annual verification sampling will occur in late summer/early autumn of 2014. Subsequent rounds will take place in the four consecutive late summer/early autumn seasons of 2015, 2016, 2017, and 2018. As required by ROD, after the completion of five sampling events and the evaluation of the data, the need for further sampling will be evaluated. The schedule for further sampling, if required, will be developed at that point.

Tables

TABLE 1
BASELINE ECOLOGICAL INVESTIGATION SAMPLING RESULTS
MERCURY REFINING SUPERFUND SITE
COLONIE, NEW YORK

Sediment:

Analyte	Units	MR-SD-06	MR-SD-07	MR-SD-08	MR-SD-09	MR-SD-10
Mercury	mg/kg	1.13	ND (0.0264)	ND (0.023)	0.421	0.362
Methyl Mercury	µg/kg	0.76	0.21	0.083	0.1	1.6
n-Propyl Mercury	µg/kg	ND (0.47)	ND (0.64)	ND (0.47)	ND (0.57)	ND (1.1)
Total Organic Carbon	mg/kg	9110	20900	2190	3060	49200

Surface Water:

Analyte	Units	MR-SW-07	MR-SW-09	MR-SW-10
Mercury	µg/L	ND (0.1)	ND (0.1)	ND (0.1)
Methyl Mercury	ng/L	0.039	0.03	0.054

Fish Tissue:

Analyte	Units	MR-FT-08	MR-FT-09	MR-FT-10
Mercury	mg/kg	0.022 J	0.039	ND (0.03)
Lipids	%	2.4	2.1	2.8
Moisture	%	76.1	78.4	76.7

ND = Not Detected
NA = Not Analyzed

Figures

5/16/2013

N

MERCURY REFINING SITE

I-90 POND

UNNAMED TRIBUTARY

PATROON CREEK

Legend:

- MR-SD-04 Sediment Sample
- MR-SW-04 Surface Water Sample
- MR-FT-01 Fish Tissue Sample

Brown AND Caldwell

FIGURE 1
PROPOSED ECOLOGICAL SAMPLE LOCATIONS
MERCURY REFINING SUPERFUND SITE
COLONIE, NY

0 500 1,000
Feet

Author: tcaputi Path: P:\GIS\Mercury_Refining_Superfund\Eco_Samples_050813.mxd