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August 24, 2009

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Subject: F&T Darrigo Site, Newburgh, NY
NYSDEC Site #3-36-002
Revised Remedial Work Plan
STERLING File #26020

Dear Mr. Rashak,

In response to the NYSDEC's July 28, 2009 letter regarding the above referenced project, attached please find the revised Remedial Work Plan addressing the NYSDEC's comments.

Please contact me with any remaining questions.

Very truly yours,

STERLING ENVIRONMENTAL ENGINEERING, P.C.

 (bc)

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cc: Fay Navratil, NYSDOH
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Sterling Environmental Engineering, P.C.

**REMEDIAL WORK PLAN
F&T DARRIGO SITE**

**TOWN OF NEWBURGH
ORANGE COUNTY, NEW YORK**

NYSDEC SITE #3-36-002

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Revised August 21, 2009

**REMEDIAL WORK PLAN
F&T DARRIGO SITE**

**TOWN OF NEWBURGH
ORANGE COUNTY, NEW YORK**

NYSDEC SITE #3-36-002

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EXECUTIVE SUMMARY

This document presents the Remedial Work Plan for the F&T Darrigo Site (New York State Department of Environmental Conservation (NYSDEC) Site #3-36-002), located in the Town of Newburgh, Orange County, New York. The remedial design objectives, construction sequence, project schedule and supporting Community Air Monitoring Plan (CAMP), Health and Safety Plan (HASP), and Soil Management Plan (SMP) requirements are outlined herein.

From 1948 until 1985, the Site was operated by F&T Darrigo for septage disposal. In 1984, NYSDEC collected samples of on-site soils that revealed elevated concentrations of metals. A State-funded Phase II investigation submitted to the State in 1991 confirmed the presence of metals in soil piles and two lagoons. In March 1999, NYSDEC issued an Order on Consent, which set forth requirements for a Focused Remedial Investigation (FRI) and Focused Feasibility Study (FFS).

From 1999 through 2001, remedial investigations were performed. A total of 108 soil samples were collected: 56 from the two lagoons, 18 samples from former soil pile locations, and 30 samples collected from 12 locations within the land spreading area. Four samples were also collected to establish background concentrations of metals. A report titled *Focused Remedial Investigation Report*, dated June 2002, describes field activities and findings of the FRI in detail.

Soil in the lagoons and land spreading area contains elevated concentrations of copper, chromium, lead, nickel and zinc. Elevated concentrations of cadmium, mercury, arsenic and barium were also detected in a small number of samples.

In March 2003, NYSDEC issued a Record of Decision (ROD), which provides that the selected remedy for the site consists of the following:

- *A remedial design program will be developed to provide the details necessary to implement the remedial program. This will include additional sampling of soil in the land spreading area to verify depth of contamination.*
- *Off-site disposal of stockpiled soil and soil containing chromium in excess of 1000ppm.*
- *Contaminated soil in the lagoons area will be left in place. Contaminated soil in the land spreading area will be excavated and placed in consolidation area, which will be centered over the two lagoons. The consolidation area will then be covered with two feet of clean fill. A portion of the consolidation area will then be planted with hybrid poplar trees for purposes of phytoremediation.*

In January 2008, NYSDEC agreed that phytoremediation need not be included in the remedy due to its low probability of effectiveness (see letter, attached).

- *The six monitoring wells will be monitored semi-annually.*
- *A Soils Management Plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soils that may be excavated from the consolidation area in the future; provide for the operation and maintenance of the components of the remedy; outline the groundwater monitoring program; and identify any restrictions on site development or groundwater use.*

- *An environmental easement will be recorded, which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking.*
- *The SMP will require that the property owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.*

1.0 INTRODUCTION

This Remedial Work Plan sets forth the design objectives, construction sequence, project schedule and supporting plan requirements for implementation of the selected remedy set forth in the NYSDEC ROD dated March 2003 for the F&T Darrigo Site, NYSDEC #3-36-002. The remedy is based on results of the June 2002 Focused Remedial Investigations (FRI) report and the August 2002 Focused Feasibility Study (FFS).

1.1 Site Description & Background

The F&T Darrigo property is located on Lakeside Road, immediately north of Interstate I-84 (I-84) in the Town of Newburgh, Orange County, New York (Figure 1). The Site is an 8.862-acre trapezoidal parcel that occupies the southeastern corner of the 59-acre Darrigo property (Figure 2). The Darrigo property is currently operated as a lumber and landscaping materials yard, although the Site itself is not being utilized.

From 1948 until 1985, the Site (Figure 3) was operated by F&T Darrigo for septage disposal. The operation utilized two lagoons and a land spreading area. Previous reports and studies indicate that the site received an estimated 800,000 gallons per year of liquid waste. It is suspected that the hazardous wastes including spent cleaning solution from metal finishing, furniture stripping waste, and battery containing lead were disposed of in the on-site lagoons and spread with the septage waste.

Initial Classification

In 1983 NYSDEC placed the F&T Darrigo site on the NYS registry of Inactive Hazardous Waste Disposal sites as a Class 2a site. This temporary classification is assigned to sites where there is confirmed disposal of hazardous waste but inadequate data on impacts to the environment and human health to assign them to one of the five classifications specified by law.

The Site is located near residential areas that are supplied by both municipal and private water. Residential properties are located to the north, east and west of the site. There are no perennial surface waters on the Site and the nearest body of water is an unnamed creek located approximately 875 feet west of the site.

Within the Site, an area of approximately 2.5 acres is known to be contaminated with heavy metals (Figure 4). The contaminated acreage can be divided into three areas, as follows:

Lagoons: The East Lagoon (1.33 acres) and West Lagoon (0.67 acres) comprise a total area of approximately 2.0 acres. The lagoon areas were previously used for the storage of septic waste to be spread to the area south of the West Lagoon. The lagoons have been cleared of large diameter trees (trunks larger than 2-inch diameter), brush and thistle.

Former Soil Piles: Soil piles were previously located adjacent to the unpaved access road, northeast of the lagoons (Figure 3). The soil piles were associated with historic sludge disposal activities and consisted of soil with blue-green coloring. The soil piles and a contaminated area of the access road were excavated during the FRI, and staged on site.

Land Spreading Area: The land spreading area is located south of the West Lagoon, directly north of I-84. The area occupies approximately 0.5 acre and was historically used for the spreading of dried septic waste.

Phase II Investigation

In March 1984, the NYSDEC collected samples of on-site soils that revealed elevated concentrations of metals. In 1986, a State-funded Phase II investigation was conducted, the results of which were reported to NYSDEC in January 1991. This investigation confirmed the presence of metals at hazardous concentrations in soil piles and the two lagoons. Groundwater samples collected during the Phase II investigation indicated that groundwater had not been affected by site operations. The Phase II Investigation concluded that further investigation was necessary to determine the extent of the contamination at the site and to select appropriate remedial measures.

Focused Remedial Investigation (FRI)

In March 1999, NYSDEC issued an Order on Consent, which set forth requirements for the respondents to voluntarily undertake a Focused Remedial Investigation (FRI) and Focused Feasibility Study (FFS). The Order on Consent was effective in March 1999.

From 1999 through 2001, remedial investigations were performed. The FRI was conducted in three phases. The first phase was between July 1999 and October 1999, the second phase was in February 2000, and the third phase between June 2001 and October 2001. A report entitled Focused Remedial Investigation Report, dated June 2002, describes field activities and findings of the FRI in detail.

The FRI included the following activities:

- Survey of site features, including lagoons, access roads, and soil piles.
- Installation of four monitoring wells for analysis of groundwater samples and hydrogeologic conditions.
- Collection of 108 soil samples for analysis of metals concentrations.
- Excavation and on-site staging of soil piles consisting of sewage and industrial waste sludge, and excavation of an adjacent portion of the access road that contained elevated concentrations of metals.

The FRI analytical data were compared to environmental standards criteria and guidance values (SCGs). Groundwater, drinking water and surface water SCGs for the F&T Darrigo site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of the New York Sanitary Code. For soil, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 provides soil cleanup guidelines for the protection of groundwater, background concentrations, and health-based exposure scenarios. In addition, for soil, site-specific background concentrations can be considered for certain classes of contaminants.

The results of the FRI, compared to SCGs and potential public health and environmental exposure routes, demonstrated that certain media and areas of the site require remediation. As described in the FRI report, the main category of contaminants that exceed SCGs is metals. The metals of concern are chromium, copper, lead, nickel and zinc. Cadmium, mercury, arsenic and barium were also detected above SCGs in a much smaller number of samples. Following is a summary of the results:

- A total of 108 soil samples were collected: 56 from the two lagoons, 18 samples from former soil

pile locations, 30 samples from the land spreading area, and four samples from two locations north of the lagoons in a wooded area to establish background concentrations.

- Each of the lagoons exhibited fairly uniform contamination throughout. Elevated concentrations of metals were mainly confined to surface soils to a depth of 2 feet below ground surface.
- Maximum concentrations of the five metals of concern within the lagoons were 1,520 ppm copper; 2,250 ppm chromium; 663 ppm lead; 219 ppm nickel; and 1,040 ppm zinc. The SCGs for these compounds are 25 ppm for copper, 10 ppm for chromium, site background for lead, 13 ppm for nickel, and 20 ppm zinc.
- Exceedances of SCGs were also detected in a limited number of samples for other metals, including cadmium, mercury, arsenic and barium. These metals were detected at maximum concentrations of 14.1 ppm, 2.2 ppm, 29.1 ppm and 777 ppm, respectively. The SCGs for these metals are 1 ppm for cadmium, 0.1 ppm for mercury, 7.5 ppm for arsenic and 300 ppm for barium.
- Low concentrations of PCBs were detected in some samples from the East Lagoon, with all concentrations less than 1 ppm.
- One sample contained elevated concentrations of SVOCs.
- No pesticides or VOCs were detected in any of the samples.
- Thirteen samples within the lagoons were analyzed to determine if the soil should be classified as hazardous waste. None of the samples exceeded the threshold for classification as hazardous waste.
- Samples were collected from the soil piles and analyzed for the contaminants of concern. Sample results indicated that the five primary metals were present at concentrations in excess of 100,000 ppm.
- The two soil piles and an area of contamination along the access road located south of the West Lagoon were excavated and staged on site. Two rounds of excavation and confirmatory soil sampling were conducted. A total of 450 tons of soil were excavated from these areas and staged on site.
- Samples were collected from six locations in the Land Spreading Area and analyzed for the five primary metals of concern. Maximum concentrations were: 1,410 ppm copper, 2,210 ppm chromium, 1,560 ppm lead, 253 ppm nickel and 983 ppm zinc.
- Background samples were collected from the ground surface and from 12 inches below grade at two locations. The four samples were analyzed for the five metals of concern. Only zinc exceeded the SCG of 20 ppm, with concentrations of 55.6 ppm and 114 ppm.
- Four groundwater monitoring wells were installed. No metals of concern were detected above SCGs in the groundwater samples. Iron and manganese were detected above SCGs, with a maximum iron concentration of 7,430 ppb and a maximum manganese concentration of 518 ppb. The SCG for the sum of iron and manganese is 500 ppb. Aluminum was also detected above the SCG value of 100 ppb at 5,460 ppb. These results were determined to be representative of

natural groundwater quality in this area.

Focused Feasibility Study (FFS)

The FFS evaluated various remedial options and technologies. Remedial alternatives were developed and evaluated in terms of protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; short-term effectiveness; implementability; and cost, as more fully described in Section 3.2.

Alternatives were then ranked. The FFS and the selected remedy are the foundation for the Record of Decision (ROD).

1.2 Program Status

In March 2003, NYSDEC issued its Record of Decision (ROD), setting forth the selected remedy for the site, as follows:

- Excavation and off-site disposal of soil with chromium concentrations in excess of 1,000 ppm.
- Excavation and transfer of remaining impacted soil to the Consolidation Area centered over the Eastern Lagoon.
- Excavation and off-site disposal of previously stockpiled material.
- The consolidation area will be covered with 2 feet of clean fill. An erosion control program in the form of grass or other vegetative cover will be developed to stabilize soil across the consolidation area.
- Poplar trees would be planted in the Lagoon Consolidation Area to extract metals via phytoremediation.
- A Soils Management Plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soils that may be excavated from the consolidation area in the future; provide for operation and maintenance of the components of the remedy; monitor groundwater; and identify any restrictions on site development or groundwater use.
- A chain-link fence would be installed around the perimeter of the Site.
- An environmental easement will be recorded which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking.
- The SMP will require that the property owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.
- The 2003 ROD was amended to remove phytoremediation from the selected remedy. Correspondence pertaining to this modification is provided in Appendix A.

A copy of the ROD is provided as Appendix A.

1.3 Remedial Design Program

Implementation of the selected remedy will be in accordance with the ROD, as subsequently modified, as stated above.

The ROD and associated Consent Order provides the detailed requirements for submission of this Remedial Work Plan, a Citizen Participation Plan, and the associated project schedule. The ROD requires submittal of the following:

- Proposed Remedial Work Plan (this document) – Must provide for the development and implementation of a Remedial Program for the contamination that has been documented within the boundaries of the site. The NYSDEC must use best efforts to approve, modify, or reject a proposed Work Plan within 45 days of receipt or within 15 days from the close of a comment period, if applicable, whichever is later. The Proposed Remedial Work Plan must contain a schedule of implementation and this schedule will contain a schedule for development and implementation of a Remedial Design.
- Department-Approved Remedial Work Plan – This document is incorporated into and becomes an enforceable part of the Consent Order.
- Remedial Design – The Remedial Design is a component document of the Remedial Work Plan and will include the detailed plans, specifications and contract documents which will be utilized to procure contractors and to manage the project.
- Progress Reports – Required the 10th day of each month commencing with approval of the Remedial Work Plan.
- Environmental Easement – Must be submitted within 30 days after the NYSDEC approval of the Remedial Work Plan.
- Final Engineering Report – Prepared by the Professional Engineer with primary responsibility for the day to day performance of the activities under the ROD at the conclusion of all activities required by the Remedial Work Plan.
- OM&M Work Plan – Operating, Maintenance & Monitoring (OM&M) Work Plan that must be submitted as part of the Remedial Work Plan.
- Annual Reports – may be required if the OM&M Work Plan requires ongoing operation, maintenance, and monitoring or institutional controls. If required, is due on the 1st day of the month following the anniversary of the start of the OM&M Work Plan.

2.0 SUMMARY OF SITE CONDITIONS

Field investigations associated with the Focused Remedial Investigation/Focused Feasibility Study (FRI/FFS) were conducted from 1999 through 2001. The June 2002 *Focused Remedial Investigation Report* and August 2002 *Focused Feasibility Study* describe the field activities and findings in detail.

During the FRI/FFS, four new monitoring wells were installed, and a total of six monitoring wells were sampled. Monitoring Well M-3 is located in the Land Spreading Area, and M-4 is located west of the

Land Spreading Area. Monitoring Well M-5 is located in the West Lagoon. Monitoring Wells M-6 and GWFT-2 are located in the East Lagoon, and GWFT-1 is located up-gradient of the former soil piles, north of the East Lagoon (Figure 5). Sampling conducted during the FRI/FFS investigation revealed no metals of concern above SCGs in groundwater.

Soil samples contained elevated concentrations of copper, chromium, lead, nickel and zinc, and defined the extent of soil contamination in the lagoons and land spreading area.

A total of 108 soil samples were analyzed during the FRI. Thirty-eight soil samples were collected from the East Lagoon, 18 were collected from the West Lagoon, 30 were collected from the Land Spreading Area, and four background samples were collected from the woods north of the lagoons. In background samples, only zinc exceeded the SCG, with concentrations in two samples at 55.6 ppm and 114 ppm. No other metals of concern were detected above SCGs in background samples.

In the lagoons, elevated concentrations of metals were mainly confined to surface soils to a depth of 2 feet below ground surface (bgs). In isolated areas, elevated metal concentrations extended to 5 feet bgs. Maximum concentrations of the five metals of concern in the lagoons were: copper (1,520 ppm); chromium (2,250 ppm); lead (663 ppm); nickel (219 ppm); and zinc (1,040 ppm). These concentrations exceed SCG values.

Soil samples were also collected from the lagoons to determine if the soil was classified as hazardous waste. Twelve samples from the lagoons were analyzed using the EP Toxicity test and 1 sample was analyzed using the Toxicity Characteristics Leaching Procedure (TCLP). The sample results were below regulatory standards and the tested soil is not classified as hazardous waste.

Samples collected from the three former soil piles (Figure 3) contained the five metals of concern at concentrations exceeding 100,000 ppm. Approximately 200 tons of contaminated soil were excavated from these three areas, and post-excavation soil samples confirmed elevated residual metals. In a second phase of soil removal, approximately 250 additional tons of contaminated soil were excavated. Post-excavation soil samples indicated that the contaminated areas now comply with SCGs. The previously excavated soils are currently staged on the F&T Darrigo property, and will be disposed of off-site.

In the Land Spreading Area, elevated concentrations of metals were mainly confined to shallow soils to a depth of 2 feet bgs. Maximum concentrations of the five metals of concern in the Land Spreading Area were: copper (1,410 ppm); chromium (2,210 ppm); lead (1,560 ppm); nickel (253 ppm); and zinc (983 ppm). These concentrations exceed SCGs.

3.0 SELECTION OF REMEDY

The regulatory goal specified in 6 NYCRR Part 375 is to return the site to predisposal conditions, to the extent feasible. Remedial action objectives developed for the F&T Darrigo site reflect results of the FRI and ARARs and SCGs. Remedial objectives were selected that will be protective of human health and the environment.

3.1 Remedial Goals

The remedial action objectives for the F&T Darrigo site are established by the March 2003 ROD. The overall remedial goal is to meet all SCGs and be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of

scientific and engineering principles. Specifically, Section 6 of the ROD identifies that the remedial goals for the site are to:

- 1) Eliminate or reduce exposure (inhalation, ingestion, and dermal contact) to soils containing unacceptable levels of copper, chromium, lead, nickel and zinc.
- 2) Eliminate or reduce the migration of contaminants into the groundwater.

An initial screening was performed to develop a list of potentially applicable remedial technologies applicable to site conditions, contaminants, and contaminated media. Applicable technologies undergo a detailed analysis of alternatives.

3.2 Identification & Screening of Technologies

The screening of technology types and process options is discussed below. This screening was based on the criteria of effectiveness for treating impacted soils, and implementability.

The FFS comprehensively evaluated:

- No Action;
- Institutional Controls;
- Excavation and Off-Site Disposal of Contaminated Soil in the Lagoons and Land Spreading Area;
- Caution Tape and Deed Restrictions;
- Phytoremediation; and
- Impermeable Barrier and Deed Restrictions.

These remedial alternatives were then evaluated as specified in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375), and are as follows:

- Compliance with New York State SCGs;
- Protection of Human Health and the Environment;
- Short-Term Effectiveness;
- Long-Term Effectiveness and Permanence;
- Reduction of Toxicity, Mobility or Volume;
- Implementability;
- Cost; and
- Community Acceptance.

Based on the results of the FRI/FFS and the evaluation of remedial alternatives, the selected remedy for the F&T Darrigo site is phytoremediation, modified to include soil management, consolidation and capping of contaminated soil, and institutional controls. Soil management controls will be addressed in the remedial design. The remedial design will verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program.

With the exception of soil to be removed for off-site disposal, soil from the Land Spreading Area and Lagoons will remain on-site in the designated consolidation area (Figures 6A, 6B, and 6C). In addition to capping, institutional controls and deed restrictions will also be employed. Periodic groundwater monitoring will be conducted to demonstrate compliance with SCGs. Groundwater monitoring will consist of quarterly monitoring all on-site wells for a period of one year, and semi-annual sampling

thereafter.

4.0 IMPLEMENTATION OF THE REMEDY

Implementation of the remedy will necessitate a range of pre-construction and construction related activities.

4.1 Initial Activities

Implementation of the remedy will necessitate preparation of the Remedial Design, which will include the following:

1. Site Survey

The existing site survey of the project site will be field verified in order to produce current site topographic mapping suitable for producing construction drawings and Construction Contract Documents. It is anticipated that drawings will be prepared reflecting existing conditions, demolition plans, excavation plans, temporary and permanent storm water management plans, soil stockpile and management plans, construction details, etc. Drawings will be produced at a scale of 1":50' with a one (1) foot contour interval. The mapping activities will include appropriate control surveys necessary to produce accurate, construction quality mapping. Pre-construction surveying will also include the establishment of appropriate survey benchmarks at the property for use during construction.

2. Community Air Monitoring Plan (CAMP)

Site activities involving the management of impacted soils have the potential to generate dust which could migrate from the site. A CAMP will be developed prior to construction as outlined in more detail in Section 6.0. The CAMP will be reviewed and approved by the NYSDEC and New York State Department of Health (NYSDOH) prior to commencement of construction activities. The CAMP will include real time monitoring for total particulate with a mechanism for immediate reporting to the site where activities are causing an off-site impact.

3. Soil Management Plan (SMP)

The Soil Management Plan (SMP) is to be prepared in accordance with Section 6.0.

4. Health and Safety Plan (HASP)

Because the project involves the remediation of a regulated site, all construction/remedial activity must be carried out in accordance with a site specific Health and Safety Plan (HASP). Such a plan must satisfy the requirements of 40 CFR 1910 and 1926. The required elements of the HASP are presented in Section 6.0.

4.2 Construction Activity

All construction will be in accordance with an approved Remedial Design (RD) to be developed pursuant to this Remedial Work Plan. The RD will include the detailed plans, specifications and contract documents which will be utilized to procure contractors and to manage the project.

It is anticipated that pre-qualified contractors will be invited to submit proposals. The site owner will then select one or more contractors to undertake elements of the work as follows:

1. Site Work

Certain preliminary site work will be needed in order to implement the remedy including security measures, construct temporary haul roads, drainage improvements, etc. Prior to the commencement of construction, the selected contractor will be required to make a series of “shop submittals” including but not limited to Project Schedule, Soils Management Plan (SMP), Construction HASP, CAMP, etc.

2. Excavation and Grading

Impacted soils will be excavated and relocated for on-site consolidation in accordance with a Soils Management Plan (SMP) to be prepared in accordance with Section 6.0.

3. Soils Management

Strict controls for on-site hauling and management of soils are required to minimize dust generation, storm water runoff and address health and safety concerns. The management of soil must also adhere to the industry standard Best Management Practices (BMPs) to minimize runoff and dust.

The measures will be presented in detail in the Soils Management Plan (SMP) to be prepared in accordance with Section 6.0.

A chain-link fence will be installed around the perimeter of the Site (completed in 2004, but will be modified post-construction).

4.3 Post-Construction Activity

1. Modification of Site Boundary/Deed Restriction

As of June 2009, the “Site” consists of the Land Spreading Area (LSA), Western Lagoon (WL) and Eastern Lagoon (EL), and occupies approximately 9 acres. As described elsewhere in this document, soils in the LSA will be transferred into the consolidation area and a 101,000 square-foot Soil Cover/Consolidation Area will be constructed over the WL and EL. Following final construction activities, the Soil Cover/Consolidation Area will be approximately 2.3-acres (Figure 7). All soil exceeding Unrestricted Use Soil Cleanup Objectives (UUCOs) will be removed from the LSA. Details pertaining to post excavation soil sampling to demonstrate soil quality are provided in Section 6.4. The remaining 6.7 acres not dedicated to the Soil Cover/ Consolidation Area will meet all other State requirements and have no restrictions.

A Final Engineering Report will be prepared pursuant to DER-10 and 6NYCRR Part 375-1.6(c), for submittal to NYSDEC. This report will include a site survey, documenting the 2.3-acre Soil Cover/Consolidation Area and set forth the conditions for the deed restriction. A deed restriction will be recorded with the County Clerks office documenting and addressing the restrictions associated with contaminants at the site (See Section 6.3 for additional details). A Site Management Plan will be prepared, consistent with NYSDEC guidance.

2. Consolidation Area Maintenance

The consolidation area will require annual inspection and maintenance, including mowing inspection and maintenance of the soil cover and inspection of the chain-link fence. Additional details pertaining to site maintenance are provided in Section 6.4. The soil cover will be inspected for any exposure of the caution tape (used to demarcate the boundary between lifts of soil from the LSA and the Soil Cover) and will be repaired and maintained as necessary. Annual certification will be submitted to NYSDEC documenting that institutional controls are in place.

3. Groundwater Monitoring

Periodic groundwater monitoring will be conducted as follows:

- Quarterly sampling and analysis of six stipulated groundwater monitoring wells (MW-3, MW-4, MW-5, MW-6, GWFT-1 and GWFT-2) for four quarters;
- Semi-annual sampling and analysis of the stipulated wells for one (1) year for the metals of concern. Sampling events will be scheduled to coincide with the season during which samples demonstrate the highest total concentration of dissolved metals (the sum of detectable concentrations of all dissolved metals). If groundwater samples do not contain detectable metals, samples will be collected during the second and fourth quarters of the calendar year;
- Annual sampling and analysis of the stipulated wells for three years and continued until groundwater standards are met, as per 6NYCRR Part 700-705, Class GA groundwater standards. Sampling events will be scheduled to coincide with the season during which samples demonstrate the highest total concentration of dissolved metals (the sum of detectable concentrations of all dissolved metals). If groundwater samples do not contain detectable metals, samples will be collected during the second quarter of the calendar year.

Results from each sampling event will be reported to NYSDEC.

4. Institutional Controls

Institutional controls will be presented in Remedial Design documents, the Final Engineers Report, Site Management Plan and the future deed restriction. These documents will provide institutional controls in the form of an environmental easement that will:

- Require compliance with the approved SMP;
- Limit the use of the property;
- Restrict the use of groundwater as a source of potable water, without necessary water quality treatment as determined by NYSDEC, and;
- Require the property owner to complete and submit to the NYSDEC a periodic certification.

5.0 REMEDIATION SCHEDULE

It is anticipated the project will follow the following general sequence although a number of site activities are expected to overlap:

- Pre-Construction:

Permits and Approvals. All necessary permits and approvals will be applied for and obtained to authorize the work. The following summarizes the anticipated approvals and permits.

NYSDEC	<ul style="list-style-type: none"> • Remedial Design • Soil Management Plan
NYSDOH	<ul style="list-style-type: none"> • CAMP

Under prevailing NYSDEC policy, a General Permit for a Construction Activity General Permit (State Pollutant Discharge Elimination System (SPDES) Permit) is not required. The authority to implement the remedy is contained in NYSDEC's approval of the remedial Work Plan and RD.

- Construction:

Active management of the soil will commence following pre-construction activities.

Active Soil Management:

Tentative Start: September 15, 2009*
 Duration: 15 field days

*Pending receipt of written NYSDEC approval

Includes excavation and disposal of soil containing chromium in excess of 1,000 ppm; disposal of previously stockpiled soil; excavation and placement of impacted (less than 1000 ppm) soil from the land spreading area into the consolidation area. Includes pre-characterization of the source material for the cover to be placed on the Soil Consolidation Area so that the 24-inch-thick cover meets the 'restricted residential' Soil Cleanup Objectives listed in Table 375-6.8(b) of 6 NYCRR Part 375 (as per Section 6.4).

Completion of Soil Cover/Consolidation Area:

Tentative Start: October 5, 2009
 Duration: 15 field days

Confirmatory sampling of the soil remaining in the Land Spreading Area according to the requirements of Section 5.4 of Technical Guidance Document DER-10 so that the soil remaining outside of the Soil Cover Area shown in Figure 6A meets the 'unrestricted use' Soil Cleanup Objectives listed in Table 375-6.8(a) of 6 NYCRR Part 375. Includes placement of the 2-foot clean fill cover on the consolidation area, regrading the land spreading area, and final grading in the consolidation area.

Site Restoration:

Tentative Start: October 23, 2009
Duration: 10 field days

Includes installation of the site fence around the perimeter of the consolidation area and completion of the final site survey by a New York State licensed land surveyor.

Commensurate with the remediation activities described herein is the implementation of the Citizen Participation Plan. A copy of the plan is provided as Appendix B.

- Post-construction:

The first groundwater monitoring event will commence immediately preceding consolidation and capping activities. Groundwater monitoring will occur quarterly for the first year, semi-annually the following year, and annually thereafter. Annual sampling and analysis of the stipulated wells will be conducted for a minimum of 3 years and continue until groundwater standards are achieved as per 6NYCRR Part 700-705, Class GA groundwater standards.

6.0 PLAN SUBMITTALS

6.1 Remedial Design

The Remedial Design is anticipated to include preparation of the following deliverables:

- Plans:

Construction drawing will be prepared at a scale of 1":50' with one (1) foot contours. The following list of drawings is anticipated:

- Plate 1 Existing Conditions
- Plate 2 Site Preparation
- Plate 3 Drainage Improvements and Erosion Control Details
- Plate 4 Excavation Plan
- Plate 5 Soil Consolidation Fill
- Plate 6 Backfill/Finish Grading Plan
- Plate 7 Miscellaneous Construction Details

- Specifications:

Construction specifications will be prepared including:

Contract No. 1 – Division 1 - General Requirements

01010	Summary of Work
01030	Progress Meetings
01041	Coordination
01050	Field Engineering
01150	Measurement and Payment
01210	Preconstruction Conference

01310	Construction Schedules
01340	Shop Drawings, Product Data and Samples
01370	Schedule of Values
01410	Testing Laboratory Services
01501	Contractor's Field Office
01540	Security
01560	Temporary Controls
01570	Maintenance and Protection of Traffic
01600	Transportation and Handling of Materials and Equipment
01620	Storage and Protection
01720	Project Record Documents

Contract No. 1 – Division 2 – Site Work

02110	Site Preparation/Clearing and Grubbing
02222	Rough Grading, Excavation and Backfill
02233	Sub-base Preparation
02290	Storm Water Drainage
02293	Soil Placement and Compaction
02923	Topsoil Placement
02936	Seed and Mulch
02949	Erosion Control
03000	Mobilization/Demobilization

- Contract Documents

Standard construction contract document will be developed for the purpose of retaining qualified remediation contractors. At a minimum, the documents are anticipated to consist of:

1. Notice To Bidders
2. Instructions To Bidders
3. Bid Forms
4. Standard Form of Agreement
5. Change Order
6. Application For Payment
7. Construction Performance Bond
8. Construction Payment Bond
9. Certificate of Substantial Completion
10. Standard General Conditions
11. Supplementary Conditions
12. Construction Specifications
13. Appendices (HASP, CAMP, Soils Management Plan)
14. Drawings

Additionally, the Remedial Design will include the following supporting plans.

6.2 Health and Safety Plan (HASP)

A Health and Safety Plan (HASP) must be developed in accordance with the Occupational Safety & Health Administration (OSHA) and other regulations pertaining to working in the vicinity of contaminated materials. The HASP must include:

- Site History and Setting
- Site Concerns and Suspected Safety Hazards
- Chemical Hazard Assessment and Controls
- Personal Protective Equipment (PPE)
- Site Controls
- Site Work Zones
- Air Monitoring at Work Locations
- Exclusion Zone
- Excavator and Drill Rig Operations
- Decontamination Procedures and Zone
- Support Zone
- Physical Hazards and Controls
- Natural Hazards
- Noise Hazards
- Slip, Trip and Fall Hazards
- Confined Space Entry
- Adverse Weather
- Equipment Failure
- Safety Inspections and Record Keeping
- Emergency Action Plan for Spills, Fires and Explosions
- Medical Monitoring
- Training
- Modifications to this Plan.

6.3 Community Air Monitoring Plan (CAMP)

The Community Air Monitoring Plan (CAMP) must be prepared and implemented in conformance with the NYSDOH Generic Community Air Monitoring Plan as contained in Appendix 1A of the DRAFT DER-10 TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION, December 2002 (12/25/02); and TAGM 4031. The particulate monitoring at the perimeter of the exclusion zone will be with a MIE PDM-3 MiniRam or equivalent. The CAMP will be submitted to the appropriate agencies for approval, including the NYSDEC and NYSDOH. In particular, the following section of the NYSDOH Generic Community Air Monitoring Plan must be followed:

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the up-wind and down-wind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m³) greater than background (up-wind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that down-wind PM-10 particulate levels are not observed at concentrations exceeding 150 ug/m³ greater than the up-wind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are more than 150 ug/m³ greater than the up-wind 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 down-wind PM-10 particulate concentration to within 150 ug/m³ of the up-wind level and in preventing visible dust migration.

All readings must be recorded and be available for NYSDEC and NYSDOH personnel to review.

6.4 Soil Excavation and Consolidation Plan (Soil Management Plan (SMP))

This SMP will identify the intended sequence to excavate, transport and consolidate impacted soil. Generally, the soils most distant from the consolidation area will be excavated first. The excavation will be progressed in a logical sequence to minimize the extent of open disturbed soil at the site. Strict erosion control measures will be employed as set forth in the detailed specifications.

The SMP will identify the methods and means for soil excavation, equipment to be used, haul routes, loading and unloading methods, temporary stockpiling if needed, and the ultimate placement and compaction in the consolidation area. No excavation below the water table will occur. Therefore, no construction dewatering is proposed.

The SMP will identify the capping procedure for placement of the required 2 feet of clean fill.

The SMP will also address residual contaminated soils that may be excavated from the site during future redevelopment. The SMP will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations.

Most important, the plan will identify the schedule and anticipated sequencing for soils management.

Phase I: Excavation of Soil Containing Chromium in Excess of 1,000 ppm

The proposed remedy includes excavation and off-site disposal of soil in the Land Spreading Area (LSA) and Western Lagoon (WL) that contains chromium in excess of 1,000 ppm. Soil borings were conducted in April 2008 to refine the estimate of the volume of soil requiring off-site disposal and to evaluate the extent of the contaminants of concern, as defined by the 2003 Record of Decision (ROD). Samples were collected from Geoprobe borings at regularly spaced intervals, and submitted to Paradigm Environmental Services for analysis of chromium, copper, nickel, lead and zinc (the ROD-defined contaminants of concern).

Soil sample results are summarized in Appendix E of the Remedial Action Work Plan. None of the samples contained concentrations of chromium in excess of 1,000 ppm. Total chromium concentrations ranged from 15.8 to 865 ppm. The deepest interval analyzed was 1.5-2.5 feet bls in all of the borings. Of the 19 samples at this depth some metals exceeded the "unrestricted use" soil cleanup objectives

(UUSCOs) specified in 6NYCRR Part 375-6.8(a). Based on these results, soil beyond the vicinity of borings LSA-4, LSA-7, and WL-5/6, do not contain chromium in excess of 1,000 ppm.

Soil within a 10-foot radius of borings LSA-4, LSA-7 and WL-5/6 will be excavated to a depth of 3 feet below grade and stockpiled with the 450 cubic yards of previously stockpiled soil. Prior to any site activities, the State-approved Community Air Monitoring Plan (CAMP) will be implemented. Post-excavation soil samples will be collected from these areas in accordance with the frequency outlined in DER-10 to ensure native soil remaining does not contain chromium in excess of 1,000 ppm. Samples will be retained in appropriate containers, shipped via overnight delivery to a NYSDOH ELAP-approved laboratory for analysis. Post-excavation sampling results will be reviewed with the NYSDEC Project Manager to determine if additional excavation and post-excavation sampling is needed.

Phase II: Excavation of Soil from Land Spreading Area

Based on data assembled from the borings conducted in 2008, we estimate approximately 1,500 cubic yards of soil will be excavated from the LSA and placed in a soil consolidation area to be constructed on top of the Eastern Lagoon (EL). Figures 6A, 6B and 6C depict the areas to be excavated, a schematic cross-section of the consolidation area, and site plan, respectively. We estimate that soil will be excavated to an average depth of 2 feet below grade from the LSA.

Post-excavation soil samples will be collected from areas where soil excavation has been performed, at the frequency described in DER-10, and in accordance with standard operating procedures. Samples will be retained in appropriate containers, shipped via overnight delivery to a NYSDOH ELAP-approved laboratory for analysis volatile organic compounds, semi-volatile organic compounds, metals, PCBs and pesticides as summarized in 6NYCRR Part 375-6.8(a). Analytical results will be reviewed, tabulated, compared to UUSCOs and forwarded to NYSDEC as part of the normal periodic progress reporting. Results will be reviewed with the NYSDEC Project Manager to determine if additional excavation and post-excavation sampling is needed. Excavation below the water table (approximately 7 feet below grade) is not proposed.

Upon completion of excavation activities, the perimeter of the area will be re-graded to meet existing topography. The area will be raked and seeded to prevent surface erosion.

Phase III: Construction of Consolidation Area and Soil Cover.

Soil excavated from the LSA will be stockpiled on the EL using standard earth moving equipment (concurrent with Phase II). Access points and haulroads will be established to prevent the spread of contaminants beyond the limits of the proposed consolidation area. Truck speeds will be monitored and roads will be wetted as needed to minimize the generation of dust (and the State-approved CAMP will be in effect). Strict erosion control measures will be employed to prevent transportation of contaminants beyond the limits of the consolidation area (Erosion Control Plan to be submitted with design documents).

Contaminated soil will be placed in one two-foot lift in the EL, and will be covered with 18 inches of clean fill and 6 inches of top soil, creating the Soil Cover. Prior to completing the cover, surface soil from the haul road will be removed at the end of construction activities and placed in the consolidation area, and the Soil Cover completed.

As depicted in Figure 6A, contaminated soil from the LSA will cover approximately 28,000 ft². The area encompassing the entire WL and EL (Soil Cover/Consolidation Area) is approximately 101,250 ft². The

expected volume of material required for the Soil Cover is approximately 7,500 yd³. Material will be supplied from NYSDEC-permitted mines or other sources demonstrated to meet the applicable standards, and/or from the Darrigo property, outside the limits of any of the previous disposal area operations. The Soil Cover material will be sampled according to the following sampling plan, dependant on the source:

Soil Imported from NYSDEC-permitted Mines: No sampling

Soil Imported from other Off-Site Sources (non-DEC Mines):

Frequency of Sampling: In accordance with draft DER-10 guidance (see below).

Analytical Methods: 13 Priority Pollutant Metals via EPA 6010B/7400; Volatile Organic compounds via EPA 8260; Semi-volatile Organic Compounds via EPA 8270; PCBs/Pesticides via EPA 8082/8081.

Acceptance Criteria: Restricted residential standards as defined in 6NYCRR Part 375-6.8 (b).

Soil from the Darrigo property, outside the current site boundary:

Frequency of Sampling: In accordance with draft DER-10 guidance, we propose the sampling protocol below.

Analytical Methods: 13 Priority Pollutant Metals via EPA 6010B/7400; Volatile Organic compounds via EPA 8260; Semi-volatile Organic Compounds via EPA 8270; PCBs/Pesticides via EPA 8082/8081.

Sampling Protocol for Fill Material								
Soil Quantity (yd ³)	Semivolatiles		Volatiles		Inorganics		PCB/Pesticides	
	Grab	Composite	Grab	Composite	Grab	Composite	Grab	Composite
First 1,000	2	7	7	-	2	7	2	7
1,001 – 2,000	1	4	4	-	1	4	1	4
Each additional 1,000 yards	1	1	2	-	1	1	1	1

Acceptance Criteria: Restricted residential standards as defined in 6NYCRR Part 375-6.8 (b)

Phase IV: Site Restoration and Maintenance

Upon completion of excavation activities, the Soil Cover/Consolidation area will be graded and seeded. The perimeter of the fill area will be fenced and signs placed to notify visitors that access to the area is strictly forbidden. Upon completion of the remedy, a Final Engineering Report will be prepared documenting the implementation of the remedy. The Soil Cover will be maintained to prevent woody vegetation from growing on the cover surface. The cover area will be inspected annually to document maintenance of the soil cover and condition of the chain-link fence. The soil cover will be inspected for any exposure of the caution tape used to demarcate the boundary between soil from the LSA and the Soil Cover. Annual certification will be submitted to NYSDEC, documenting that these institutional controls

are in place.