Supplemental Interim Remedial Measure Work Plan

Operable Unit #1 (South Terminal)

Former AFMC Petroleum Bulk Storage & Distribution Terminal
Ambrose Street
Sackets Harbor, Jefferson County, New York
NYSDEC ERP Site Number E-623014

Prepared By:
Strategic Environmental, LLC
25 Water Street
Baldwinsville, New York 13027

SE Project No. 2009-761

May 7, 2014

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NYSDEC ERP Site Number E623014
Former AFMC Petroleum Bulk Storage and Distribution Terminal
Operable Unit #1 (South Terminal)
Ambrose Street
Sackets Harbor, Jefferson County, New York

Prepared for:
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May 7, 2014
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1.0 Introduction

The Former AFMC, Inc. Petroleum Bulk Storage Facility is located within the northwestern portion of the Village of Sackets Harbor, Town of Hounsfield, Jefferson County, New York. This facility historically operated as a petroleum bulk storage and distribution facility under several corporate ownerships from the 1920s through the late 1980s. The facility was decommissioned in 1988, and has remained vacant and idle since that time. The Village of Sackets Harbor, in association with its Local Development Corporation, purchased the property in 2000, with the intent of promoting redevelopment of this blighted property. Due to the considerable history of petroleum handling, as well as the presence of some known areas of petroleum contamination and documented historic releases, the Village applied to enter the site into the New York State Environmental Restoration Program ("ERP") in 2006. The site was subsequently deemed eligible for the ERP program, and the Village signed a State Assistance Contract with the New York State Department of Environmental Conservation (NYSDEC) in October 2008, formalizing the framework for implementing a remedial investigation to identify and quantify the extents of petroleum contamination persisting from historic operations.

The former AFMC site consists of a combined land area of 19.55 acres that is distributed across two separate parcels that are divided by Ambrose Street. Based on its geometric configuration and history of operations, the site was divided into two (2) separate operable units (OUs) for purposes of the remedial investigation work. Operable units are generally considered to be portions of a site that can be addressed separately, for technical or administrative reasons, to investigate, eliminate or mitigate a release, threat of a release, or exposure pathway resulting from site contamination. Operable Unit #1 (OU1), also referred to as "South Terminal Area", represents the portion of the site positioned on the south side of Ambrose Street, encompassing 4.75 acres of land area. Operable Unit #2 (OU2), also referred as "North Terminal Area", represents the remaining 14.80 acres of the facility that is situated north of Ambrose Street. Facility operations began on OU1 in the 1920s. In the mid 1950s, facility operations were expanded to encompass the area corresponding to OU2. Both OUs reportedly operated through the late 1980s. A Site Layout drawing, depicting the relationship of the two parcels to one another, and the relationship of each to existing streets, Lake Ontario, and neighboring development is attached as Figure 1.

Under the ERP Agreement, the objective of the remedial program was to meet Residential Use Soil Cleanup Objectives on Operable Unit 2, and Commercial Use Soil Cleanup Objectives on Operable Unit 1, as defined in 6NYCRR Part 375. Under 6NYCRR Part 375, "grossly contaminated media" is

considered to be soil, sediment, surface water, or groundwater which contains sources or substantial quantities of mobile contamination in the form of non-aqueous phase liquid (NAPL) that is identifiable either visually, through strong odor, by elevated contaminant vapor levels, or otherwise readily detectable without laboratory analysis. 6NYCRR Part 375 requires that, in addition to achieving the target soil cleanup objectives for individual contaminants established for a particular site, all source areas and grossly-contaminated media must be addressed.

A Remedial Investigation (RI) of both parcels was previously completed by Strategic Environmental, LLC (SE). The methodologies and findings of the remedial investigation were previously detailed in SE's *Remedial Investigation and Interim Remedial Measure Report, NYSDEC ERP Site Number E623014, Former AFMC Petroleum Bulk Storage Facility*, dated June 7, 2012.

The RI identified two limited areas on the North Terminal parcel with petroleum constituents present in soil above NYSDEC Residential Use Soil Cleanup Objectives (SCOs), and two other areas where soil exhibited nuisance characteristics (petroleum-type odors, visible staining, and/or significantly elevated PID headspace screening values). Soil exhibiting such nuisance characteristics is considered to be "grossly contaminated media" under 6NYCRR Part 375. All areas were subsequently addressed through Interim Remedial Measures (IRM), and, as a result, that portion of the facility was issued a "No Further Action" Record of Decision (ROD) by the NYSDEC in March 2013, meeting "residential use" soil cleanup objectives, as defined in 6NYCRR Part 375.

The remedial investigation work performed on the South Terminal parcel identified three (3) source areas of petroleum contamination on that portion of the facility. One of the areas, located along the eastern edge of the site, exhibited petroleum constituent concentrations in soil above "commercial" soil cleanup objectives established in 6 NYCRR Part 375, and was removed through an IRM action (soil excavation and off-site disposal) in 2010.

The remaining two (2) areas of identified soil impact exhibited strong petroleum-type odors and staining characteristic of "grossly" contaminated soil, despite having target petroleum constituent concentrations below "commercial" soil cleanup objectives. As such, further remediation is required to address these areas of "grossly" impacted soil on OU1. The northern area of remaining grossly impacted soil coincides with the location of two (2) former loading racks that were used to transfer product from the on-site storage tanks to over-the-road delivery vehicles. The piping connecting the tanks to the loading racks was located above grade in the vicinity of the tanks, but was buried below grade in the immediate vicinity of the loading racks, to allow vehicle traffic around the racks. The second area of grossly impacted soil is located on the southern portion of OU1, where a valve house was located, and where two aboveground storage tanks

and the historic rail access to the facility existed. An estimated 3,600 cubic yards of such material has been identified in these two areas on OU1. Based on site conditions, it is expected that these areas can be effectively addressed through the implementation of an additional IRM action. The actions proposed to address these areas are detailed below.

1.1 Nature and Extent of Contamination

The contaminants of concern identified in the course of the investigation include volatile and semi-volatile organic compounds typical of petroleum products, as consistent with the past operations of the facility. The overburden geology at the site consists of fine-grained Glaciolacustrine silt and clay deposits, with thin discontinuous beds of glacial till present beneath the silt and clay along the bedrock surface. The bedrock beneath the site is located a depths ranging from 5 to 8 feet below grade, and consists of limestone. The bedrock in these areas is approximately 6-8 feet below grade, and the zone of contamination generally exists in the lower two (2) to three (3) feet of overburden, at the bedrock interface.

Results from analyses performed on groundwater collected at the site indicate only localized minimal groundwater contamination found in overburden groundwater within the southern area of grossly impacted soils. Overburden groundwater beyond this grossly impacted area, as well as bedrock groundwater beneath entire site, was not found to be in contravention of groundwater standards. The following is a list of all compounds reported from laboratory reports as having been identified in groundwater above groundwater standards.

Contaminant	Detected Concentration (ug/L)	GW Standard (ug/L)
Benzene	71	0.7
Toluene	20	5.0
Ethylbenzene	334	5.0
Xylene (total)	394	5.0
Isopropylbenzene	58.8	5.0
n-Propylbenzene	62	5.0
1,3,5-trimethylbenzene	114	5.0
1,2,4-Trimethylbenzene	447	5.0
n-Butylbenzene	18.4	5.0
Sec-Butylbenzene	10	5.0
p-Isopropyltoluene	17.8	5.0
Naphthalene	223	10.0

1.2 Project Goals

The remediation goal targeted for OU1 of the former AFMC facility is to select a remedy that is protective of human health and the environment by eliminating or mitigating significant threats posed by contaminants from past operations, based upon an anticipated future "commercial use" of the site. As such, the target soil cleanup objectives for the site are the "commercial" restricted use soil cleanup objectives established in Section 375-6.8 of *6NYCRR Part 375*. An additional component of satisfying the criteria of 6NYCRR Part 375 will be to address the two (2) areas of "grossly" impacted soil. The approximate boundaries of these grossly contaminated areas are identified on the attached Site Plan. Based on the data compiled in the course of the remedial investigation, it is believed that the implementation of an Interim Remedial Measure (IRM) consisting of excavation and on-site treatment of soil from the two areas of grossly impacted soil will simultaneously result in the attainment of the "commercial" soil cleanup objectives.

Results from analyses performed on groundwater collected at the site indicate only minimal contravention of groundwater standards for a limited number of volatile organic compounds in overburden groundwater within one of the areas of grossly impacted soils targeted for further remediation. The groundwater data does not indicate a significant and widespread impact to either overburden or bedrock groundwater. The "protection of groundwater" soil cleanup objectives of *6NYCRR Part 375* are not believed to be applicable to the site, based upon the following factors:

a) The apparent source material for this minor contravention of overburden groundwater standards is targeted for removal under the remedial program;
b) Data from sampling of overburden groundwater does not indicate the contaminated groundwater is migrating;
c) Data from sampling of bedrock groundwater beneath the site does not indicate that the bedrock groundwater regime has been significantly impacted nor is acting as a migratory pathway for the contamination;
d) The lack of migration of the contaminated groundwater in the duration of time since the cessation of facility operations (some 25 years) suggests that it is unlikely that the contamination will migrate off-site; and
e) The groundwater quality is expected to improve over time once the source material is addressed.

2.0 Proposed Interim Remedial Measures

The interim remedial measures that are proposed for the South Terminal to address these areas of concern will generally include:

a) Clearing, grubbing and grading of areas of the site where soil removal is expected to occur, and where excavated soil will be staged and mechanically processed;
b) Excavation and on-site staging of target impacted soil within each area of concern;
c) Verification sampling to confirm and document that all soil having VOC concentrations above the Residential Use SCOs or nuisance characteristics is effectively removed from the subsurface;
d) Temporary/rough grading and securing the ultimate excavations so that open excavations do not remain while the impacted soil is mechanically processed on site;
e) Mechanical mixing and aeration of excavated impacted soils, using Allu soil screening bucket, to promote biologic breakdown of organic contaminants;
f) Screening of excavated soil periodically throughout the mechanical mixing and aeration process to gauge progress and effectiveness of the technique;
g) Verification sampling of the processed soil at such time as field observations (i.e., odors, headspace screening results) suggest that mixing/aeration has reduced contaminant concentrations below Residential SCOs and removed nuisance characteristics; and
h) Implementation of a Community Air Monitoring Program (CAMP) to verify that soil excavation and handling activities performed in connection with the work do not migrate from the site and affect the surrounding community.

The specific details of each task are described in the corresponding subsections below.

2.1 Clearing and Grading of Site

Prior to undertaking the soil excavation and mechanical processing tasks, clearing of site vegetation will be conducted to facilitate efficient movement around and between the target excavation areas and designated staging and soil processing areas. Existing vegetation (primarily woody brush and shrubs) will be cut to just above grade, using a "Brush Hog" or similar mowing equipment. A moderate degree of pre-excavation site grading may also be necessary in and around the designated soil staging and processing area to promote efficient handling of soil and diversion/management of precipitation/runoff. The extent of clearing and grading will be field-determined prior to site mobilization.

2.2 *Soil Excavation and Staging*

Following site clearing and preparation, the initial task of the IRM action will be to excavate impacted soil from its in-situ position within the two (2) areas exhibiting nuisance characteristics, as identified on the attached site plan. The areas delineated on the site plan represent an approximation of the anticipated extents of excavation that will be required in each area to remove soil having the noted nuisance characteristics. The final extent of each excavation will be determined in the field as the work is conducted, through visual observations and headspace screening. Verification sampling will be conducted on soil remaining in-situ along the terminal walls and bottom (unless complete soil removal to bedrock contact is necessary) to verify, through laboratory analysis, that concentrations of individual petroleum constituents do not exceed the Commercial Use SCOs established in 6NYCRR Part 375.

In each designated excavation area, soil removal will begin in an area of known or expected soil contamination, near the outer edge of the area delineated on the site plan. Excavation will proceed vertically and laterally in each direction until soil no longer exhibits field-detectable nuisance characteristics (strong odors, visible staining) or headspace VOC readings above 10 parts-per-million (ppm), as measured with the portable PID.

As soil is excavated, overburden, if any, that does not exhibit the identifiable nuisance characteristics or PID headspace screening values above 10 ppm will be segregated for use as backfill, subject to suitable laboratory analysis results. Soil having PID headspace screening values above 5 ppm or exhibiting identifiable nuisance characteristics will be moved to the designated on-site soil staging and processing area for subsequent mechanical mixing and aeration.

2.3 *Verification Soil Sampling-Excavation Walls and Floor*

Post-excavation verification soil samples will be collected from depths corresponding to the contaminated soil horizon in each area at the limits of the excavation. These verification samples will serve to document concentrations of individual volatile and semi-volatile petroleum constituents remaining in the subsurface environment in these areas.

Soil samples will be collected at a frequency of one sample for every 30 feet of excavation sidewall. Based on the conditions observed in previous soil borings and test pits in these areas, it is anticipated that the impacted soil extends to the bedrock/overburden contact and that related soil excavation will therefore remove all overburden to the bedrock surface. If such is the case, no soil samples will be collected from the excavation floor. If excavation is terminated prior to reaching the bedrock surface, soil samples from the excavation floor will be collected on a frequency of one sample per 900 square feet of floor area. Sampling on the walls and bottom will be biased toward areas with

higher PID readings, if any.

Soil samples will be submitted for laboratory analysis of volatile organic compounds (VOCs) by EPA Method 8260, and semi-volatile organic compounds by EPA Method 8270 (SVOCs). Samples will be submitted to a NYSDOH certified laboratory. NYSDEC ASP Category B deliverables will be provided.

2.4 Mechanical Mixing and Aeration of Excavated Soil

Impacted soil removed from the two (2) target excavation areas and placed in the on-site staging and processing area will be subjected to mechanical mixing and aeration, using an Allu soil screening bucket attached to an hydraulic excavator. The screening will serve to periodically aerate the staged soil to promote growth of naturally-occurring/indigenous aerobic microorganisms that will metabolize organics and hydrocarbons in the soil, and to re-distribute microbe populations and hydrocarbons to promote efficient and effective treatment of soil throughout the piles.

Soil processing will occur at a minimum frequency of once every two (2) weeks. Depending upon the amount of time required to complete a single processing of all soil, as well as an evaluation of costs for remobilization of required equipment between processing events, the soil mixing and aeration may be performed continuously by cycling from one end of the staged material to the other.

Processing will continue until such time as field observations indicate that nuisance characteristics (i.e., strong petroleum odors) no longer persist, and PID headspace screening of soil from representative points throughout the staged material reveals no VOC detections above 25 ppm.

2.5 Verification Sampling of Processed Soil

Once field observations and PID headspace screening results suggest that the conditions described in the foregoing paragraph have been achieved, a verification sampling event will be performed to document concentrations of volatile and semi-volatile petroleum constituents in the processed material. One grab sample for each approximately 500 cubic yards of staged material will be collected for laboratory analysis. The sample locations will be evenly distributed throughout the soil piles, and will be accessed using a hydraulic excavator or backhoe with a conventional excavation bucket. The collected samples will be submitted for laboratory analysis of volatile organic compounds (VOCs) by EPA Method 8260, and semi-volatile organic compounds by EPA Method 8270 (SVOCs). Samples will be submitted to a NYSDOH certified laboratory. NYSDEC ASP Category B deliverables will be provided.

In the event that laboratory analysis confirms that concentrations of all volatile and semi-volatile petroleum constituents are below the corresponding Commercial Use SCOs established in 6NYCRR

Part 375, the soil treatment program will be deemed complete, and the piles of staged soil will be placed back into the original excavations to bring the elevation back to original grade.

2.6 Community Air Monitoring Program

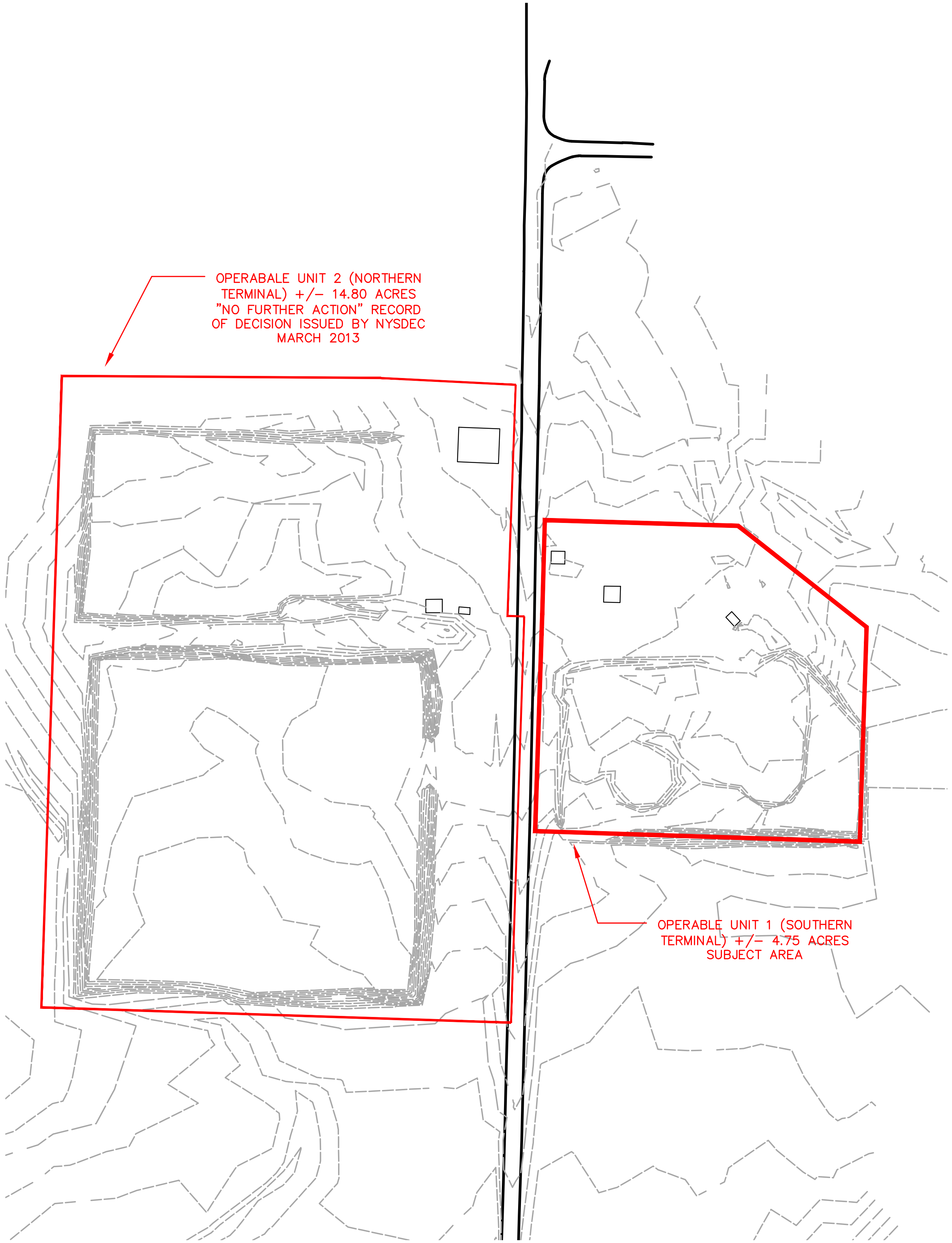
During all excavation, soil handling, and mechanical mixing/aeration operations, air monitoring will be performed on-site and at the downwind perimeter of the site, in accordance with the Community Air Monitoring Plan (CAMP) contained in Appendix B of this work plan.

2.7 IRM Report

Upon completion of the SE will prepare an IRM Report documenting soil excavation activities; post-excavation verification sampling; soil staging, handling and mechanical mixing and aeration; progress monitoring observations; and final verification sampling results for the staged soil.

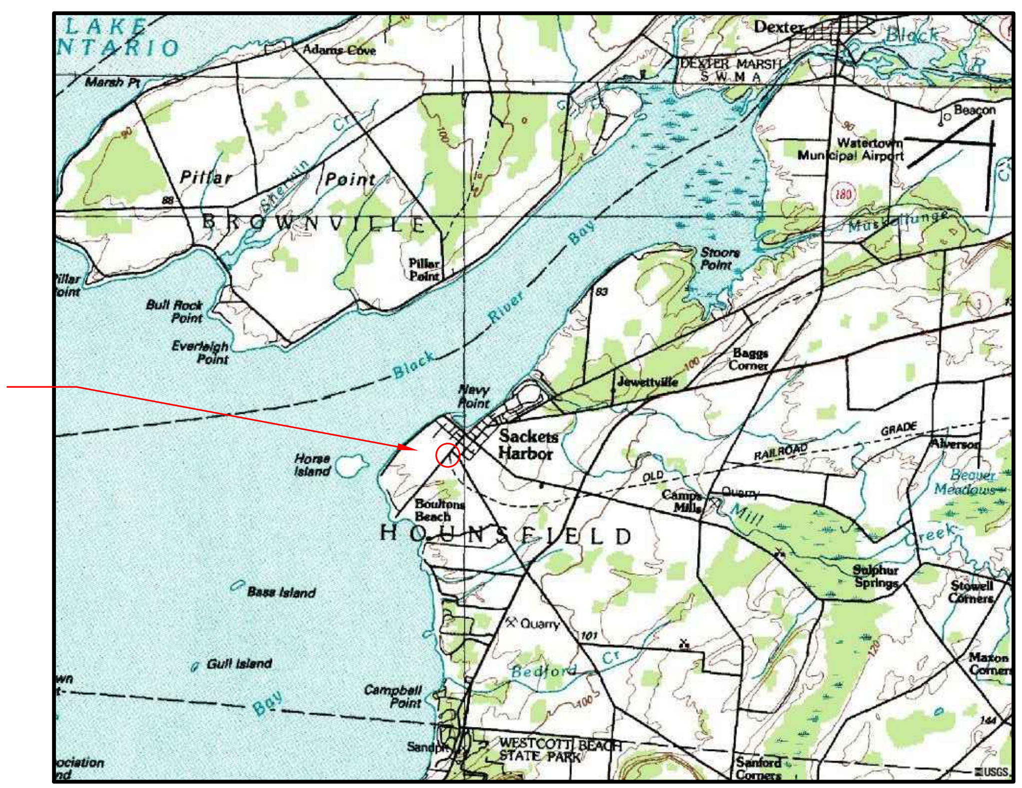
Figure 1

Overall Site Layout



TOPOGRAPHIC MAP - SITE

SITE AERIAL



TOPOGRAPHIC MAP - SACKETS HARBOR, NY

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IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145 SECTION 7209 FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A NEW YORK STATE LICENSED ENGINEER, TO ALTER THE DRAWING IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX HIS/HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS/HER SIGNATURE AND TEH DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

FIGURE 1

DATE:	April 24, 2013
SCALE:	NTS
DRAWN BY:	JRP
REVISIONS:	
PROJECT NO:	09-761

OVERALL SITE LAYOUT

2013 REMEDIAL ALTERNATIVES ANALYSIS
FORMER AFMC PETROLEUM BULK STORAGE FACILITY
OPERABLE UNIT 1 - SOUTH TERMINAL

Figure 2

Approximate Excavation and Soil Staging/Processing Areas

WOODED AREA

PROPERTY BOUNDARY

AN ESTIMATED 1200 CUBIC YARDS TO BE EXCAVATED TO MEET "COMMERCIAL" SCO.

APPROXIMATE LOCATION OF 2010 EXCAVATION ACTIVITIES

WOODED AREA

AMBROSE STREET

AN ESTIMATED 2400 CUBIC YARDS TO BE EXCAVATED TO MEET "COMMERCIAL" SCO.

PROPOSED STAGING & PROCESSING AREA

AGRICULTURAL AREA

LEGEND

- ANTICIPATED AREAS OF EXCAVATION
- APPROXIMATE EXTENTS OF 2010 EXCAVATION
- BOUNDARIES OF HISTORIC FEATURES
- ELEVATION CONTOURS
- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- FORMER RAILROAD LINE

50 25 0 50

1"=50'

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FIGURE 5

PROPOSED SOIL REMOVAL TO MEET "COMMERCIAL" USE SCO

2013 REMEDIAL ALTERNATIVES ANALYSIS
FORMER AFMC PETROLEUM BULK STORAGE FACILITY
OPERABLE UNIT 1 - SOUTH TERMINAL

DATE:	May 6, 2014
SCALE:	1"=50'
DRAWN BY:	CTB
REVISIONS:	
PROJECT NO:	2009-701

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Appendix A

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN
INTERIM REMEDIAL MEASURES
FORMER AFMC, INC. PETROLEUM BULK STORAGE FACILITY
AMBROSE STREET, SACKETS HARBOR, NEW YORK

NYSDEC ENVIRONMENTAL RESTORATION PROJECT
SITE NUMBER E-623014

The following establishes the air monitoring and action levels that are proposed to be incorporated into Strategic Environmental, LLC's Interim Remedial Measures (IRM) activities at the former AFMC, Inc. petroleum bulk storage terminal facilities located on Ambrose Street in the Village of Sackets Harbor, Jefferson County, New York. These provisions are intended to monitor and document concentrations of target contaminants in air within and downwind of the work site during IRM activities, and are intended to be incorporated into the Proposed Remedial Work Plan by reference.

Although it is not expected that the proposed IRM activities will create a significant threat of exposure to the local community, given the minimal degree of contamination documented during the remedial investigation; the limited nature of proposed excavation activities; and the considerable distance between the proposed work area and neighboring receptors; monitoring of air quality at the downwind perimeter of the work zones will be conducted, to confirm and document that the investigation activities do not result in migration of target airborne contaminants to the off-site downwind community.

A. IRM Excavations and On-Site Soil Processing

During excavation and on-site mechanical mixing and aeration activities, the worker breathing zones will be continuously monitored for airborne VOC and particulate matter, using a portable PID equipped with a 10.6 lamp (VOC) and a real-time aerosol monitoring (particulates). Concentrations of these analytes will also be recorded at an upwind location prior to and at periodic times during the excavation work, to establish local background levels.

In the event that VOC concentrations in the breathing zones are recorded to be sustained at or above 5 ppm for a period of 5 minutes or more, if measurable airborne particulates less than 10 microns in size are recorded at average concentrations at or above 100 micrograms per cubic meter (mg/m^3) more than upwind background levels over a fifteen (15) minute period, or if visible airborne dust is observed leaving the work area, work will be discontinued and provisions for upgrades of personal protective equipment and/or other site controls will be evaluated and implemented, as warranted.

In addition to worker breathing zone monitoring, VOC and particulate concentrations at the downwind fringe of the work zone, will be performed on a real-time basis throughout the work periods. VOC monitoring will be conducted with the portable PID, and particulate monitoring will be performed using a real-time aerosol monitor.

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind 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 greater than 150 (mcg/m^3) above the upwind level, work will be stopped and a re-evaluation of activities will be initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 (mcg/m^3) of the upwind level and in preventing visible dust migration.