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New York State Department of Environmental Conservation

SITE MANAGEMENT PLAN

Former Hettling Farm Site, Town of Clermont, Columbia County, New York

Site No. E411015

January 2019

SITE MANAGEMENT PLAN

Former Hettling Farm Site

Prepared for:

New York State Department of Environmental Conservation

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Date:

January 2019

Site Management Plan
Former Hettling Farm Site,
Site Number E411015
Columbia County, Town of Clermont, New York
November 2018

I, Daniel J. Loewenstein, certify that I am currently a registered professional engineer in the State of New York and that this Site Management Plan was prepared in accordance with applicable statutes and regulations, and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Signature

11/26/18

Date

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Acronyms and Abbreviations

AMSL – Above Mean Sea Level

BGS – Below Ground Surface

CCA – Chromated Copper Arsenate

HDPE – High-Density Polyethylene

PFAS – Perfluoroalkyl Substances

PFAA – Perfluoroalkyl Acids

PID – Photoionization Detector

ROD – Record of Decision

SSAL – Site Specific Action Levels

SMP – Site Management Plan

1 Introduction

The Former Hettling Farm Site (Site), Site No. E411015, was identified for remediation by the New York State Department of Environmental Conservation (NYSDEC or Department), in consultation with the New York State Department of Health (NYSDOH) in March 2008 due to the presence of hazardous substances that created threats to human health and/or environment. The Site is owned by the Town of Clermont (Owner).

1.1 Purpose of the Site Management Plan

The general purpose of this Site Management Plan (SMP) is to establish protocols for managing the Site following the completion of the remedy to address inorganic pesticide residues in the form of metals, in general accordance with the Record of Decision (ROD), as issued by the NYSDEC in March 2008. More specifically, one objective of the SMP is to set guidelines for management of soil and groundwater during future activities at the Site. This plan is not intended to serve as a design document for potential construction activities related to Site redevelopment or reuse. The SMP is a portion of the overall remedy which addresses potential future disturbances or use of residually contaminated media remaining on the Site after other elements of the remedy have been implemented. This SMP addresses potential environmental concerns related to the management of Site soil and groundwater and has been reviewed and approved by the NYSDEC. This SMP has been prepared by Arcadis CE, Inc, who provided design and construction phase engineering services for the remedial activities.

A summary of previous environmental investigations has been restated in this SMP. The Owner should refer to the original approved investigation reports for additional detail, as needed. It remains the responsibility of future Site owners and potential Site developers to prepare and obtain appropriate approvals for all future engineering designs associated with the Site. Similarly, it is also their responsibility to conduct all future construction activities in a manner that incorporates and is compatible with the requirements for soil and groundwater management as set forth in this SMP.

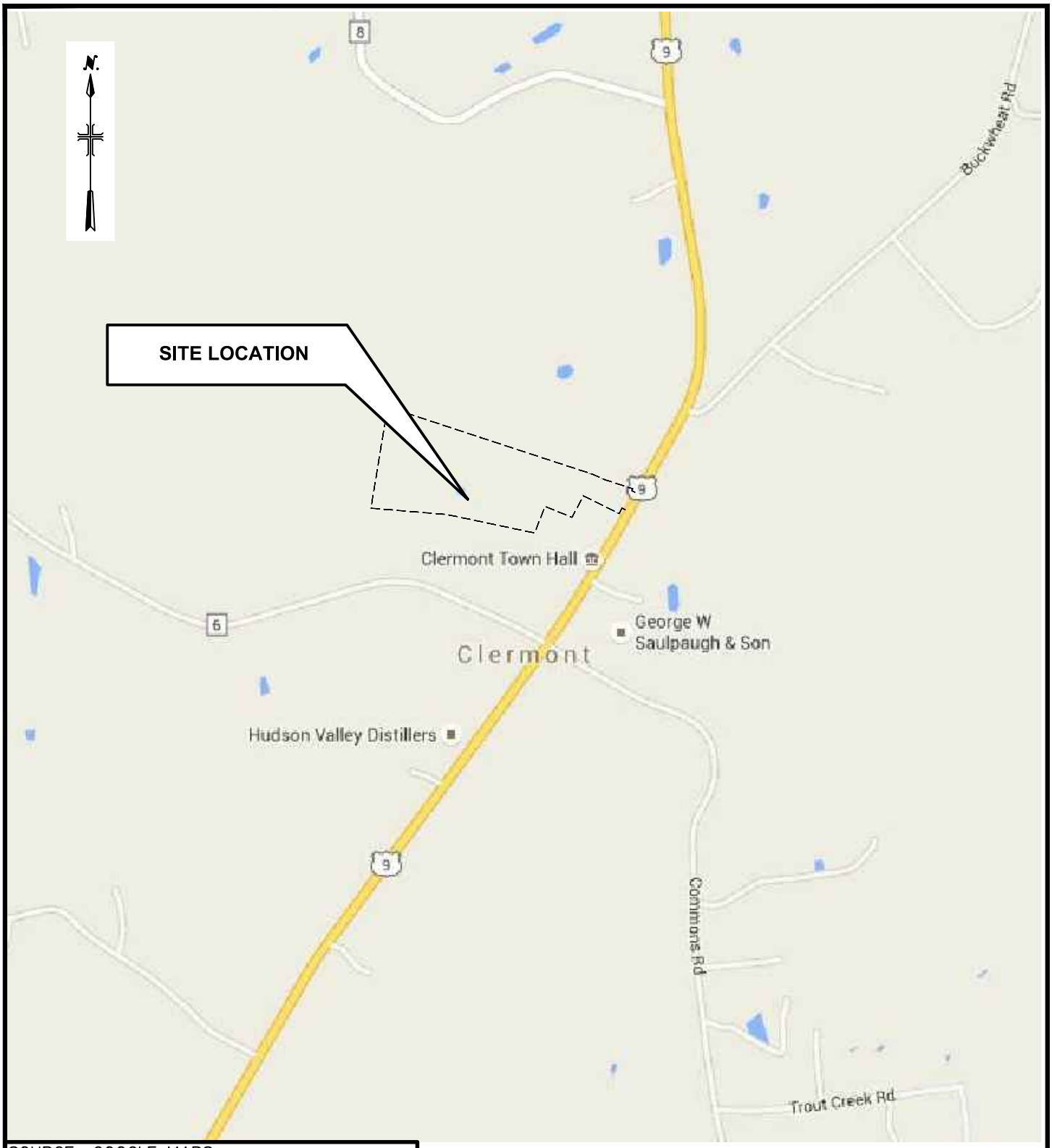
1.2 Site Description

The Former Hettling Farm Site is located in the Town of Clermont, New York, Columbia County, New York. It is located on the western side of U.S. Route 9, approximately 1,100 feet north of its intersection with County Route 6. The Site is identified as a subdivision of portions of the Hettling Farm, and was conveyed to the Town of Clermont in 2003. The location of this Site can be found on Figures 1 (Site Location) and Figure 2 (Site Map).

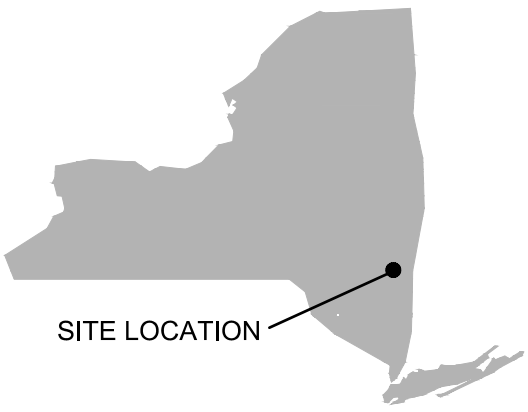
The Site, as defined by the NYSDEC, consists of approximately 20.5 acres. The Site's general location is in a rural setting, and presently consists of vacant land which has historically been utilized for agricultural purposes. The Site is bordered on the west and north by other lands of Hettling, by private property and a cemetery to the southeast, and by private and Town lands to the south.

The Site rises gradually from its eastern border with Route 9 to the property boundary on the west side. A ditch containing an intermittent stream, constructed for drainage and/or irrigation, roughly bisects the Site into eastern and western portions.

Figure 1 Site Location



SOURCE: GOOGLE MAPS



0 1000' 2000'

APPROX. SCALE

FORMER HETTLING FARM SITE
NYSDEC SITE NO. E411015
TOWN OF CLERMONT, COLUMBIA COUNTY, NEW YORK

SITE LOCATION MAP

ARCADIS

FIGURE 1

Figure 2 Site Map

SOURCE: NYS ORTHOS ONLINE IMAGE DATED APRIL 2017

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FORMER HETTLING FARM SITE
NYSDEC SITE NO. E411015
TOWN OF CLERMONT, COLUMBIA COUNTY, NEW YORK

SITE MAP

APRIL 2018

FIGURE 2

1.3 Geology and Hydrogeology

The overburden soils at the Site consist of sand, gravel and varying percentages of silt and cobbles. Distinct clay layers, consisting of greyish-brown and or blueish-grey clay of various thicknesses, were encountered at different areas around the Site. Bedrock at the Site is composed of shale and was encountered at depths ranging from ground surface on the west side of the Site, to greater than 20 feet below ground surface on the east side of the Site.

Overburden groundwater occurs at the Site at depths ranging from 3.5 to 16 feet below the ground surface. Overburden groundwater flow is generally in an east-southeasterly direction on the west side of the ditch and intermittent stream, and in an easterly direction on the eastern portion of the Site, generally following the Site's surface topography.

1.4 Site History

Most of the 20.5 acres of the Site were used historically for agricultural purposes. Generally, the lands to the west of the ditch and intermittent stream were primarily apple orchards and the lands on the eastern portion were utilized for the cultivation of row crops, vegetables and/or vineyards and orchards. The use of persistent inorganic and organic pesticides, as well as the application of fertilizers, resulted in the presence of residual chemicals in the Site media. In addition, there was evidence that waste material was disposed on the surface and in the subsurface at and adjacent to portions of the Site. A large stockpile of railroad ties and poles, which may have been treated with coal tar creosote or chromated copper arsenate (CCA) for preservation, were disposed on the surface in the north central section of the Site.

1.5 Summary of Remedial Activities

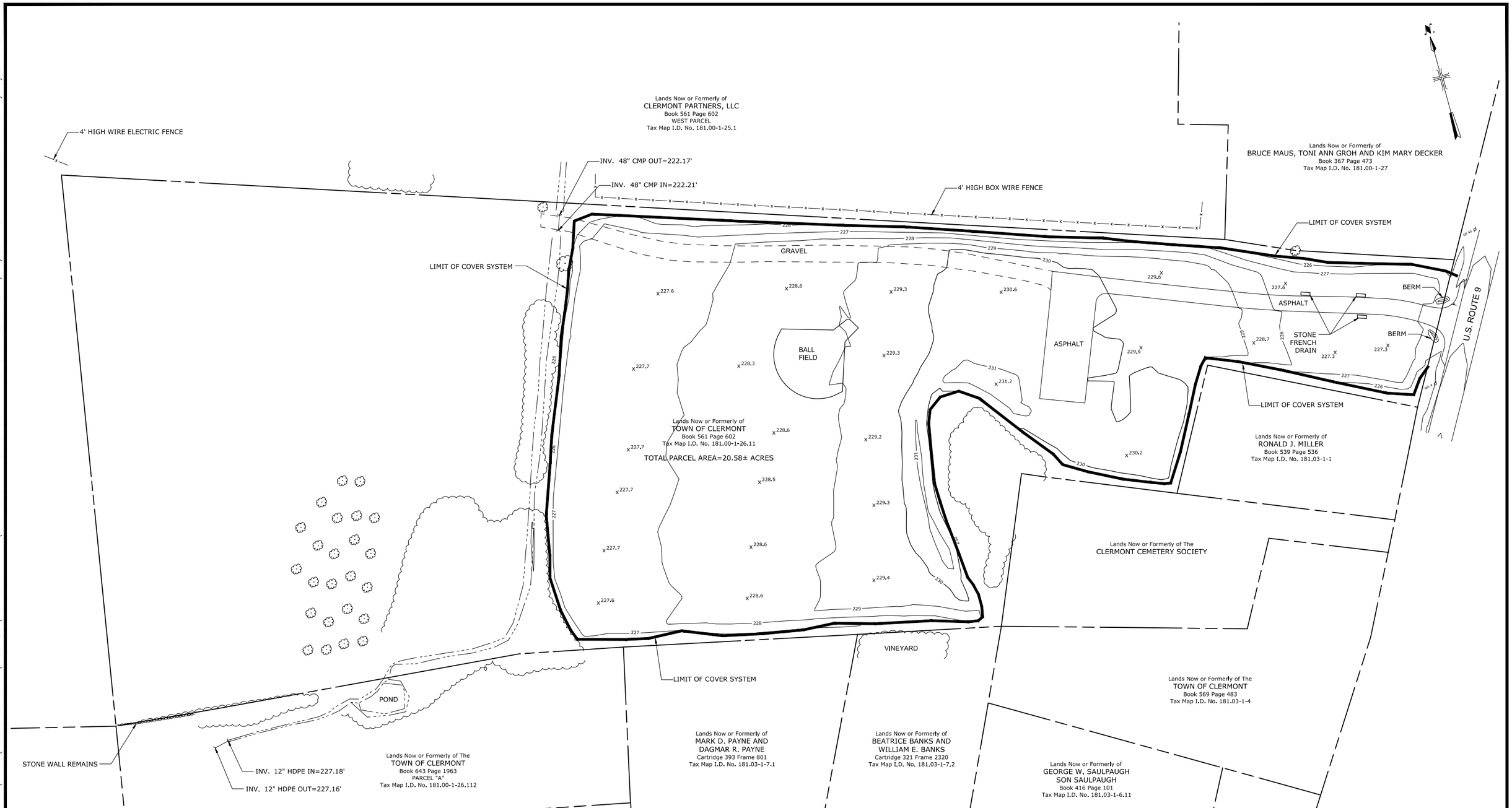
Previous investigations of the Site include a Remedial Investigation (RI), conducted between October 2006 and April 2007, that included an electromagnetic survey, test pits, soil borings, installation of monitoring wells, subsequent sampling of soil and groundwater, and laboratory analyses of the collected samples. The investigation identified SVOCs, inorganics (metals) and pesticides as the contaminants that exceeded the Site Standards, Criteria, and Guidance (SCGs).

The Site Standards, Criteria, and Guidance identified in the ROD are based on Title 6 of the New York Code of Rules and Regulations (6NYCRR) Part 375 Restricted Soil Cleanup Objectives [SCOs] for Residential Use, Table 375-6.8(b), NYSDEC's "Ambient Water Quality Standards and Guidance Values," Part 5 of the New York State Sanitary Code for Water, and the NYSDEC's "Technical Guidance for Screening Contaminated Sediments."

As part of the RI, an Interim Remedial Measure (IRM) was conducted to remove, transport, and properly dispose at an off-site location, numerous railroad ties and poles that had been deposited at the Site.

In 2016-2017, an asphalt and soil surface cover system was installed on the Site. The primary objective of the remedy was to eliminate or mitigate potential human health risks related to the presence of the identified contaminants in surface and subsurface soil by eliminating the potential for direct contact between potential receptors and contaminated soil. The limits of the cover system are shown on Figure 3.

Figure 3 Final Topography



SOURCE: MAP TITLED "FINISH GRADE TOPOGRAPHY, FORMER HETTLING FARM SITE", CREATED BY NMB LAND SURVEYING, DATED 8/8/17.

SCALE: 1"=125'

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FORMER HETTLING FARM SITE
NYSDEC SITE NO. E411015
TOWN OF CLERMONT, COLUMBIA COUNTY, NEW YORK

FINAL TOPOGRAPHY

JANUARY 2019

FIGURE 3

1.6 Summary of Contamination Remaining On-site

The RI identified SVOCs, inorganics (metals) and pesticides as the contaminants that exceeded the Site SCGs in at least one medium. No significant Site-related groundwater, surface water or sediment contamination at levels of concern was identified during the investigations. Due to the nature of the contaminants found in the on-site soils and groundwater, and their low potential for volatility, the soil vapor was also not expected to be a concern at the Site.

During the remedial construction activities, surface and subsurface soil, including some contaminated soil, was regraded to enable installation of the surface cover system and to promote positive drainage from the Site. No contaminated soil encountered during the work was removed from the Site. Thus, soil contamination remaining at the Site following installation of the cover system includes arsenic and three polynuclear aromatic hydrocarbons (PAHs), Benzo(a)anthracene, Benzo(a)pyrene, and Benzo(b)fluoranthene, which were originally identified during the RI . The preconstruction concentrations and locations of these compounds are indicated in the ROD. Pertinent portions of the ROD summarizing these data are included as Appendix A.

1.7 Contemplated Use

The Site Owner is contemplating future use of the Site for active recreation. In future development scenarios, the ROD for the Site requires that an institutional control be imposed in the form of an environmental easement that:

- Requires compliance with the approved Site Management Plan;
- Limits the use and development of the property to commercial use, which includes passive recreational use, and industrial activities, unless amended to allow for active recreational use of portions of the property; and
- Requires the periodic certification of institutional and engineering controls by the Site Owner.

2 Site Management

2.1 Surface Cover

The primary purposes of the surface cover system are to minimize the potential for:

- Human contact with contaminated surface and subsurface material; and
- Contaminated runoff from the property.

The cover system consists of the following:

- Type II Engineered Cover - Vegetated topsoil on top of general fill underlain by separation fabric. This cover system was installed in designated vegetated areas. A minimum of 24 inches of total cover system underlain by separation fabric was installed in areas planned for active recreation;
- Type III Engineered Cover - A minimum of 12 inches of gravel select fill underlain by separation fabric. This was installed under some access roads.
- Type IV Engineered Cover - Four inches of asphalt top course underlain by eight inches of subbase course select fill on top of stabilization fabric. This was installed under the parking lot and the access road east of the parking lot.

The limits of the cover system and the final Site topography are shown on Figure 3.

2.2 Management of Soils/Fill and Long-Term Maintenance of Cover System

The purpose of this section is to provide environmental guidelines for management of subsurface soils/fill and repair/replacement of the cover system during any future intrusive work which breaches the cover system.

2.2.1 Site Preparation

As part of the future development or future intrusive activities, the Site may require grading prior to cover system replacement. The fill material disturbed during intrusive activities will be graded to the surface required for redevelopment. Trees, shrubs, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences, etc. will be removed and properly disposed off-site in accordance with applicable solid waste regulations. Prior to cover system replacement, protruding material will be removed from the ground surface. Burning will not be allowed on the Site.

2.2.2 Excavation and Grading Below the Cover System

During construction activities at the Site, the excavation of soil/fill material may be necessary for the construction of foundation, utility corridors and other structures. For excavation work below the cover system, a Professional Engineer's (PE's)representative with construction/remediation experience, representing the subject property Owner or developer will monitor soil/fill excavations or disturbances. This Professional Engineer must also provide a stamped/signed certification that excavation work below

the cover system and subsequent repair/replacement of the cover system was conducted in a manner consistent with this SMP.

During excavation performed to support development activities, the soil/fill will be inspected for staining, sampled to detect and quantify the presence of metals and field screened for the presence of VOCs with a photoionization detector (PID).

Excavated soil/fill may be used on-site as fill below the cover system. Soil/fill that is excavated as part of development which cannot be used as fill below the cover system will be further characterized prior to transportation off-site for disposal at an appropriate permitted facility.

2.2.2.1 Visibly Impacted Soils

Stained soil is soil that is observed to be discolored, tinted, dyed, unnaturally mottled, or has a sheen. Excavated soil/fill that is visibly stained or produces elevated PID readings (i.e. sustained 10 ppm or greater) will be considered potentially contaminated and stockpiled on the property for further assessment. The potentially contaminated soil/fill will be stockpiled (maximum 50 cubic yard piles) on and completely covered with polyethylene sheeting to reduce the potential for contaminant migration or dispersion. Sampling and analysis will be completed in accordance with protocols delineated in 6 NYCRR Part 375 and DER-10. Visibly impacted soil/fill containing one or more constituents in excess of the Site-Specific Action Levels (SSALs) shown in 6 NYCRR Part 375 Table 375-6.8(b) for commercial or industrial use will be transported off-site to a permitted waste management facility.

2.2.2.2 Buried Debris, Drums or Tanks

If buried drums or underground storage tanks are encountered during soil excavation activities, excavation will cease and the NYSDEC will be notified immediately. All drums and/or underground storage tanks encountered will be evaluated and the contractor will submit a removal plan for NYSDEC approval. Appropriately trained personnel will excavate all of the drums and/or underground storage tanks, while following all applicable federal, state, and local regulations. Removed drums, underground storage tanks and associated materials will be properly characterized and disposed off-site. The soil/fill surrounding the buried drums or underground storage tanks will be considered to be potentially contaminated. The soil will be characterized, as necessary, stockpiled and transported to an off-site permitted waste management facility for disposal.

2.2.3 Soil/Fill Characterization

2.2.3.1 Excavated and Stockpiled Soil/Fill

Excavated soil/fill may be used on-site as fill below the cover system. Soil/fill that is excavated as part of development, which cannot be used as fill below the cover system, will be further characterized prior to transportation off-site for disposal at a permitted facility. For excavated soil/fill with visual evidence of contamination (i.e. staining or elevated PID measurements), one composite sample and a duplicate

sample will be collected for each 100 cubic yards of stockpiled soil/fill. For excavated soil/fill that does not exhibit visual evidence of contamination but must be sent for off-site disposal, one composite sample and a duplicate sample will be collected for 2,000 cubic yards of stockpiled soil, and a minimum of 1 sample will be collected for volumes less than 2,000 cubic yards.

The composite sample will be collected from five locations within each stockpile. A duplicate composite sample will also be collected. PID measurements will be recorded for each of the five individual locations. One grab sample will also be collected from one of the five individual locations. The grab sample will be collected from the individual location with the highest PID measurement. If none of the five individual sample locations exhibit PID readings, one location will be selected at random. The composite sample will be analyzed by a NYSDOH ELAP-certified laboratory for pH (EPA Method 9045C), Target Compound List (TCL) SVOCs, pesticides, PCBs, TAL metals and cyanide. The grab sample will be analyzed for TCL VOCs.

Soil samples will be composited by placing equal portions of fill/soil from each of the five composite sample locations into a pre-cleaned, stainless steel (or Pyrex glass) mixing bowl. The soil/fill will be thoroughly homogenized using a stainless-steel scoop or trowel and transferred to pre-cleaned jars provided by the laboratory. Sample jars will then be labeled, and a chain-of-custody form will be prepared.

2.2.3.2 Soil/Fill Disposal or Reuse

Visually impacted soil/fill that has been characterized and found to meet the SSALs, may be reused as subgrade or excavation subgrade backfill, if appropriate. On-site soil/fill may not be reused as backfill in landscaping berms to be used for the planting of trees and shrubs. If the analysis of the soil/fill samples reveals unacceptably high levels of any analytes, the soil may not be used as backfill on-site and additional analyses will be necessary to further classify the material for disposal purposes. The Owner or developer will be responsible for characterizing any material that is found to contain one or more constituents in excess of the SSALs. At a minimum, a duplicate sample may need to be analyzed for the toxicity characteristic using the Toxicity Characteristic Leaching Procedure (TCLP) for the particular analytes that were detected at concentrations exceeding the SSALs. The duplicate sample may also be analyzed for the other RCRA Characteristics including reactivity, corrosivity, and ignitability. If the analytical results indicate that concentrations exceed the standards for RCRA characteristics, the material will be considered a hazardous waste and must be properly disposed off-site at a permitted disposal facility within 90 days of excavation.

Additional characterization sampling for off-site disposal may be required by the disposal facility. To potentially reduce off-site disposal requirements and costs, the Owner or developer may also choose to characterize each stockpile individually. If the analytical results indicate that the soil is not a hazardous waste, the material will be properly disposed off-site at a non-hazardous waste facility. Stockpiled soil cannot be transported on or off-site until the analytical results are received.

2.2.4 Subgrade Material

Subgrade material used to backfill excavations or placed to increase Site grades or elevations shall meet the following criteria:

- Excavated on-site soil/fill which appears to be visually impacted shall be sampled and analyzed. Analytical results shall indicate that the contaminants, if any, are present at concentrations that do not exceed the SSALs.
- Off-site borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products.
- Off-site materials intended for use as Site backfill cannot otherwise be defined as a solid waste in accordance with 6 NYCRR Part 360-2(a).
- If the contractor designates a source as “virgin” soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.
- Virgin soils should be subject to collection of one representative composite sample per 500 cubic yards of material from each source area. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and cyanide. The soil will be acceptable for use as backfill provided that all parameters meet the SSALs.
- One composite sample for each 500 cubic yards of material from each source area of non-virgin soils will be collected and tested. If more than 1,000 cubic yards of soil are borrowed from a given off-site non-virgin soil source area and both samples of the first 1,000 cubic yards meet the SSALs, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample for each 5,000 cubic yards, provided that all earlier samples met the SSALs.

Should the underlying separation or stabilization fabric be breached during excavations; the area will be excavated, the damaged geotextile will be cut to provide smooth edges, and a new geotextile of equal or greater quality will be installed to replace the breached area. The new geotextile will overlap the existing fabric by a minimum of 24 inches on all sides.

2.2.5 Surface Soil Cover System

The cover soil material shall meet the following criteria:

- Excavated on-site soil/fill shall not be used as cover material.
- Off-site borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products.
- Off-site materials intended for use as Site cover cannot otherwise be defined as a solid waste in accordance with 6 NYCRR Part 360-2(a).

- If the contractor designates a source as “virgin soil,” it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.
- Virgin soils should be subject to collection of one representative composite sample per 500 cubic yards of material from each source area. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals plus cyanide. The soil will be acceptable for use as cover material provided that all parameters meet the imported soil standards included in the NYSDEC’s Division of Environmental Remediation (DER)10.
- Non-virgin soils will be tested via collection of one composite sample for each 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-site non-virgin soil source area and both samples of the first 1,000 cubic yards meet the DER 10 criteria, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soil from the same source, up to 5,000 cubic yards total. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample for each 5,000 cubic yards, provided all earlier samples meet the DER 10 criteria.
- The topsoil used for the final cover shall be fertile, friable, natural loam surface soil, capable of sustaining plant growth, and free of clods or hard earth, plants or roots, sticks or other extraneous material harmful to plant growth.
- Grassed areas will be seeded with a sustainable perennial mixture with appropriate erosion control measures taken until the perennial grasses are established.
- To reduce the disturbance of the surface cover material, uncontaminated soil berms will be constructed in areas where shallow-rooted trees and shrubs will be planted. The berms will be of sufficient thickness to allow the excavation of only uncontaminated fill deep enough to plant the tree and/or shrub, contain enough organic material and nutrients to support plant growth, and be of sufficient strength to support trees and/or shrubs at their maximum height.

2.2.5.1 Asphalt

Asphalt may be used for construction or development in areas that are or will become roads, sidewalks, and parking lots. Where asphalt will represent a cover in terms of remedial action, a minimum cross-sectional thickness of 6 inches of material (asphalt and clean subbase material) is required for protection from exposure to the underlying soil/fill material. The actual cross section of the asphalt cover (i.e. thickness of the asphalt and subbase material) will be determined based on the intended use of the area.

2.2.5.2 Concrete

Concrete may be used in areas that will become slab-on-grade structures, utilities, footings, foundations, sidewalks or signs. Concrete may also be used instead of asphalt for roads, sidewalks, and parking lots. Where concrete will be used as a cover in terms of remedial action, a minimum cross-sectional thickness of 6 inches of material (concrete and uncontaminated subbase material) is required for protection from exposure to the underlying soil/fill material. A vapor barrier consisting of polyethylene sheeting with a

minimum thickness of 8-millimeters will be installed under all structures. The type and thickness of concrete and subbase material will be determined based on the intended use of the area.

2.2.6 Erosion Control

When the development or remedial actions at the Site require the disturbance of more than five acres of land, federal and state laws require that the project obtain coverage under the NYSDEC SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity", Permit #GP-93-10 (Construction Storm Water General Permit). It should be noted that after December 9, 2002, federal and state laws require that the project obtain coverage under the NYSDEC SPDES General Permit for Storm Water Discharges from Construction Activities for certain activities disturbing between one and five acres of land. Requirements for coverage under the Construction Storm Water General Permit include the submittal of a Notice of Intent form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill all permit requirements and must be prepared in accordance with "Chapter Four: The Storm Water Management and Erosion Control Plan" in Reducing Impacts of Storm Water Runoff from New Development (NYSDEC, 1992). This Storm Water Management and Erosion Control Plan, in accordance with permit requirements, will provide the following information:

- A background discussion of the scope of the construction project.
- A statement of the storm water management objectives.
- An evaluation of post-development runoff conditions.
- A description of proposed storm water control measures.
- A description of the type and frequency of maintenance activities required to support the control measure.

The SWPPP will address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, physical Site characteristics that impact design, and Site management planning. All descriptions of proposed features and structures at the Site will include a description of structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria. The SWPPP will conform to all requirements as established by applicable regulatory agencies.

Proven soil conservation practices will be incorporated in the construction and development plans to mitigate soil erosion, off-site sediment migration, and water pollution from erosion. The use of appropriate temporary erosion control measures, such as silt fencing and/or hay bales, will be required around all soil/fill stockpiles and unvegetated soil surfaces during redevelopment activities. These methods are described below. Stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Stockpiles of soil/fill will be placed a minimum of 50 feet from the property boundaries.

Temporary Erosion and Sedimentation Control Measures

Temporary erosion and sedimentation control measures and facilities will be employed during active construction stages. Prior to any construction activity, temporary erosion and sedimentation control

measures shall be installed and maintained until such time that permanent erosion control measures are installed and effective. The following temporary measures will be incorporated into construction activities:

- Silt Fence
- Check Dams
- Hay Bales

As sediment collects along the erosion controls (silt fence, hay bales, check dams, etc.), they will be cleaned to maintain desired removal performance and prevent structural failure of the silt fence. Accumulated sediment will be removed when 10% of the storage capacity of the silt fence is full. Removed sediment will be stockpiled and characterized in accordance with Section 2. The perimeter silt fences will remain in place until construction activities in the area are completed and vegetative cover or other erosion control measures are adequately established. Silt fences will be provided and installed in accordance with the New York Guidelines for Urban Erosion and Sediment Control.

Permanent Erosion Control Measures

Permanent erosion control measures and facilities will be incorporated during cover construction and during Site redevelopment for long-term erosion protection. Permanent measures and facilities will be installed as early as possible during construction phases. Parking and building systems associated with redevelopment shall not include dry wells or other subsurface injection/disposal piping or facilities.

Permanent erosion control measures incorporate a combination of design features to limit overall erosion and sediment problems to practical design limits, and the placement of permanent facilities during Site restoration for long term erosion protection.

Design features incorporated into the construction plans to control erosion will include limiting steep slopes, routing runoff to surface water collection channels, limiting flow velocities in the collection channels to the extent practical, and lining collection channels, where appropriate. In areas where flow will be concentrated (i.e. collection channels), the channel slopes and configuration will be designed to maintain channel stability.

Any final slope greater than 33 percent will be reinforced and will have a demarcation layer under the clean cover to indicate if erosion has extended to the subgrade. Following the placement of final cover soils over regraded areas, a revegetation program will be implemented to establish permanent vegetation. Vegetation serves to reduce erosion, enhance evapotranspiration, and improve runoff water quality. The areas to be grassed will be seeded in stages as construction is completed with a seed mix and application rate that is consistent with the type of seed mix and soil conditions.

2.2.7 Dust Control

The surface of unvegetated or disturbed soil/fill areas will be wetted with water or other dust suppressive agents to control dust during construction. Any subgrade material left exposed during extended interim periods (greater than 90 days) prior to placement of final cover shall be covered with a temporary cover system (i.e. tarps, spray type cover system, etc.) or planted with vegetation to control fugitive dust to the extent practicable. Particulate monitoring will be performed along the downwind occupied perimeter of the parcel during subgrade excavation, grading, and handling activities in accordance with the Community Air

Monitoring Plan further detailed in Section 2.3 and in accordance with NYSDEC's Fugitive Dust and Particulate Monitoring Program at Inactive Hazardous Waste Sites, which is included in Appendix B.

Dust suppression techniques will be employed at the Site in accordance with NYSDEC's Fugitive Dust and Particulate Monitoring Program. This document describes guidance for dust monitoring and includes a list of effective dust suppression techniques. Dust suppression techniques that may be used at the Site include applying water on roadways, wetting equipment, spraying water on buckets during excavation and dumping, hauling material in properly covered or watertight containers, covering excavated areas and material after excavation activity ceases, establishing vegetative cover immediately after placement of cover soil, and reducing the excavation size and/or number of excavations. The use of atomizing sprays is recommended so that excessively wet areas will not be created but fugitive dust will be suppressed.

2.2.8 Construction Water Management

Pumping of water (i.e. groundwater and/or storm water that has accumulated in an excavation) from excavations, if necessary, will be done in such a manner as to prevent the migration of particulates, soil/fill, or unsolidified concrete materials, and to prevent damage to the existing subgrade. Water pumped from excavations will be managed properly in accordance with all applicable regulations to prevent endangerment of public health, property, or any portion of the construction.

In areas where groundwater may be contaminated, the ground water in excavations will be field screened for VOCs and observed for any noticeable sheens. The water pumped from the excavations will be containerized and analyzed in accordance with the Surface Water and Groundwater Quality Standards set forth in 6 NYCRR Part 703.5. If the water meets the surface and groundwater quality standards, it may be discharged to the ground surface. If the water does not meet the surface water and groundwater quality standards, it will be transported off-site for proper disposal or treated via a treatment system that has been approved by the NYSDEC.

Runoff from surface discharges shall be controlled. No discharges shall enter a surface water body without proper permits.

2.2.9 Access Controls

Access to soil/fill on the property must be controlled until the final cover is placed to prevent direct contact with subgrade materials. Excavated subgrade material that is stockpiled on-site must be temporarily covered to limit access to that material.

2.2.10 Institutional Controls

The use of the property has been restricted through an environmental easement that prevents the use of groundwater and disturbance of the final cover system. Provisions of the easement are described in detail in the March 2008 ROD. These controls include:

- Completion of a periodic certificate of institutional and engineering controls in accordance with Part 375-1.8(h)(3).

- The remedy allows the use and development of the controlled property for commercial and industrial use, unless conditionally amended to allow active recreational uses.
- Implementing a program for monitoring groundwater quality. The use of groundwater as a source of potable water is restricted without the approval of the NYSDEC, NYSDOH or County DOH.
- Prohibition of agricultural/vegetable gardens.
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the institutional control boundaries, and any potential impacts that are identified must be monitored and mitigated.
- Requires compliance with this SMP.

2.2.11 Maintenance

Overall maintenance of the Site will be the responsibility of the Owner. Impacts or damage to remedial elements remaining at the Site following remedial construction will be reported to the NYSDEC, who will determine whether corrective actions are necessary to protect the environment or preserve the integrity of the remedy. Erosion of the soil cover system will be reduced by maintaining a vegetative cover. In order to reduce the disturbance of the soil cover material, berms or mounds composed of uncontaminated soil will be constructed in areas in which trees and shrubs will be planted. Cover materials, fencing, signs, and gates will be inspected annually, and repaired as needed.

The main features of inspection are:

- Inspection procedures
- Evaluation of the final cover system (i.e. vegetated cover, roads, parking lots, etc.) for sloughing, cracks, settlement, erosion, distressed vegetation, damaged fencing, gates or signs
- Repair of deficiencies found
- Inspection reporting

2.3 Health and Safety

Invasive work performed at the property will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety.

If intrusive work is expected to breach the cover system at the Site, all contractors performing redevelopment or maintenance activities will be required to prepare a Site-specific, activity-specific Health and Safety Plan (HASP). The HASP must include certifications stating that the contractor's personnel

have been 40-Hour OSHA HAZWOPER trained. The HASP must also include provisions for protection of the community as described further in this section.

2.3.1 Construction Personnel Protection

Contractors engaged in subsurface construction or maintenance activities (e.g., excavation, foundation and 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, contractors shall provide safe and healthful working conditions. The contractor shall comply with all 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 the 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. Contractors shall insure that all work performed is in accordance with recognized safe work practices.
- Contractors shall be responsible for the safety of the contractor's employees and the public. Contractors shall be solely responsible for the adequacy and safety of all construction methods, materials, equipment and the safe prosecution of the work.
- Contractors are responsible for ensuring that all project personnel have been trained in accordance with 29 CFR 1910.120.
- Contractors shall 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 shall 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.
- All personnel employed by a contractor, their subcontractors or any visitors whenever entering the job Site, shall be required to wear appropriate personal protection equipment required for that area.

2.3.2 Community Air Monitoring Program

Air monitoring will be performed during redevelopment activities in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan, which is included in Appendix C. All air monitoring readings will be recorded in a logbook and will be available for review by the NYSDEC and NYSDOH.

2.4 Notification and Reporting

There shall be no construction, use or occupancy of the property that results in the disturbance or excavation of soil which threatens the integrity of the cover system or which would result in human exposure to contaminated soils, unless prior written approval by the NYSDEC is obtained. Therefore, notification of the NYSDEC at the address below should precede any such work by at least 60 days, to allow for review and any necessary revisions of a work plan.

The following minimum notification and reporting requirements shall be followed by the property owner prior to and following Site development, as appropriate:

- If buried drums or underground storage tanks are encountered during soil excavation activities, excavation will cease and the NYSDEC will be notified immediately.
- The Owner shall complete an Annual Report containing documentation that the institutional controls put in place, pursuant to the ROD, are still in place, have not been altered and are still effective; that the remedy and protective cover have been maintained; and that the conditions at the Site are fully protective of public health and the environment.

If the cover system has been breached during the year, the Owner shall provide the following to the NYSDEC for inclusion in the corresponding annual report:

- A certification that all work was performed in accordance with this SMP.
- Plans showing areas and depth of fill removal.
- Copies of daily inspection reports for soil-related construction.
- Description of erosion control measures.
- A text narrative describing the excavation activities performed, health and safety monitoring performed (both Site-specific and Community Air Monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any problems encountered, location and acceptability test results for backfill sources, and other pertinent information necessary to document that the Site activities were carried out properly.

If the disturbed area exceeds one acre, the following must also be reported to the NYSDEC:

- Plans showing the before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system.

The notification contact is:
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7011

3 Site Monitoring Plan

3.1 Introduction

3.1.1 General

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

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of groundwater and stormwater;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria;
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

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

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

Annual monitoring of the performance of the remedy and overall reduction in contamination on-site and off-site will be conducted for the first five years following the completion of remedial construction. Based on a review by the NYSDEC of data generated during the five years of monitoring, the frequency of monitoring thereafter will be determined. Trends in contaminant levels in groundwater and stormwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 3.1 and outlined in detail in Sections 3.2 and 3.3.

Table 3.1 Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Annual monitoring for five years	Groundwater from the monitoring wells shown on Figure 4	TAL Metals Field Parameters 1,4-Dioxane PFAS
Stormwater	Annual monitoring for five years	Stormwater from drainage ditch discharge point at north end of property	TAL Metals 1,4-Dioxane PFAS
Cover System	Inspection during each groundwater monitoring event	Soil, Asphalt and Gravel Cover	Visual Inspection

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

Figure 4 Monitoring Well Locations

MONITORING WELL COORDINATES

(NYS Plane Coordinate System, East Zone, NAD83/2011)

MW-1 N 1186375.18 E 675495.77	MW-4 N 1186771.03 E 674454.33	MW-7 N 1186458.55 E 673805.15
MW-2 N 1186618.63 E 674883.05	MW-5 N 1186525.83 E 674213.52	
MW-3 N 1186335.52 E 674290.24	MW-6 N 1186777.38 E 674361.95	

Lands Now or Formerly of
CLERMONT PARTNERS, LLC
Book 561 Page 602
WEST PARCEL
Tax Map I.D. No. 181.00-1-25.1

Lands Now or Formerly of
BRUCE MAUS, TONI ANN GROH AND KIM MARY DECKER
Book 367 Page 473
Tax Map I.D. No. 181.00-1-27

Lands Now or Formerly of
TOWN OF CLERMONT
Book 561 Page 602
Tax Map I.D. No. 181.00-1-26.11

TOTAL PARCEL AREA=20.58± ACRES

Lands Now or Formerly of
RONALD J. MILLER
Book 539 Page 536
Tax Map I.D. No. 181.03-1-1

Lands Now or Formerly of The
CLERMONT CEMETERY SOCIETY

Lands Now or Formerly of The
TOWN OF CLERMONT
Book 569 Page 483
Tax Map I.D. No. 181.03-1-4

Lands Now or Formerly of
MARK D. PAYNE AND
DAGMAR R. PAYNE
Cartridge 393 Frame 801
Tax Map I.D. No. 181.03-1-7.1

Lands Now or Formerly of
BEATRICE BANKS AND
WILLIAM E. BANKS
Cartridge 321 Frame 2320
Tax Map I.D. No. 181.03-1-7.2

Lands Now or Formerly of The
TOWN OF CLERMONT
Book 643 Page 1963
PARCEL "A"
Tax Map I.D. No. 181.00-1-26.112

Lands Now or Formerly of
GEORGE W. SAULPAUGH
SON SAULPAUGH
Book 416 Page 101
Tax Map I.D. No. 181.03-1-6.11

4' HIGH WIRE ELECTRIC FENCE
4' HIGH BOX WIRE FENCE
INV. 48" CMP OUT=222.17'
INV. 48" CMP IN=222.21'
LIMIT OF COVER SYSTEM
GRAVEL
ASPHALT
BALL FIELD
STONE FRENCH DRAIN
BERM
U.S. ROUTE 9
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
POND
VINEYARD
STONE WALL REMAINS
INV. 12" HDPE IN=227.18'
INV. 12" HDPE OUT=227.16'

SOURCE: MAP TITLED "FINISH GRADE TOPOGRAPHY, FORMER HETTLING FARM SITE", CREATED BY NMB LAND SURVEYING, DATED 8/8/17.

0 125' 250'

SCALE: 1"=125'

ARCADIS

FORMER HETTLING FARM SITE
NYSDEC SITE NO. E411015
TOWN OF CLERMONT, COLUMBIA COUNTY, NEW YORK

MONITORING WELL LOCATIONS

JANUARY 2019

FIGURE 4

3.2 Cover Monitoring

During remedial implementation, a soil, asphalt and gravel cover was installed on surface of the Site. Prior to placement, a geotextile separation fabric was installed as a demarcation layer between the regraded soil and the cover system. On most of the Site, the cover consists of topsoil overlying general fill, which is underlain by separation fabric. For a portion of the access road in the north and west, gravel surface material is on top of gravel subbase material and separation fabric. In the paved parking area and the paved access road in the north and the east, the asphalt cover overlies a stone subbase, which is above subgrade stabilization fabric. A visual inspection of the cover system shall be conducted at the time of each groundwater monitoring event described in this SMP. The purpose of the visual inspection is to identify any changes, such as damage or erosion to the surficial media, which could compromise the functionality of the cover system. Since such changes could potentially increase the likelihood of exposure to subsurface contamination remaining at the Site, the specific nature of the change shall be documented in accordance with the reporting requirements contained in this SMP. A sample inspection report form for the Site is included in Appendix D.

3.3 Media Monitoring Program

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. The network of monitoring wells has been maintained to monitor groundwater conditions at the Site. A total of seven monitoring wells have been installed throughout the site's history. The existing monitoring well network is shown in Figure 4 and well characteristics are listed in Table 3.2.

Table 3.2 Monitoring Well Construction Details

Well ID	Northing	Easting	Status	Total Depth (ft. bgs)
MW-1	1186375.18	675495.77	Existing	Unknown
MW-2	1186618.63	674883.05	Existing	Unknown
MW-3	1186335.52	674290.24	Existing	Unknown
MW-4	1186771.03	674454.33	Existing	Unknown
MW-5	1186525.83	674213.52	Existing	Unknown
MW-6	1186777.38	674361.95	Existing	Unknown
MW-7	1186458.55	673805.15	Existing	Unknown

The entire monitoring well network will be sampled once during each of the first five years of monitoring. A list of wells to be sampled is included in Table 3.3. The sampling frequency may be modified thereafter, following approval by the NYSDEC, based upon review of the collected data. This SMP may also be modified at that time to reflect changes in the sampling plan which are approved by the NYSDEC.

Table 3.3 Wells to be Sampled

Well ID	
MW-1	MW-5
MW-2	MW-6
MW-3	MW-7
MW-4	

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and on a groundwater-sampling log presented in Appendix E. Other observations (e.g. well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

In addition to standard sampling procedures listed in this SMP, additional measures must be observed due to the sensitivity of 1,4-Dioxane and Perfluoroalkyl Substances (PFAS) sampling. Samplers should not use products such as soaps, cosmetics, moisturizers, hand creams, etc. that may contain PFAS the day of sampling. Insect repellents and sun-blocks must contain 100% natural ingredients, any other such products may contain PFAS and are not permitted on the Site. Coated Tyvek clothing should be worn on the Site during sampling and long hair should be tied back. All clothing must be well-laundered with minimal use of soap and zero use of fabric softener. All footwear should be made with polyurethane and polyvinyl chloride, and clothing or boots with Gore-Tex material are not permitted on the Site. Seats of the field vehicle used during the sampling event must be covered with a well-laundered cotton blanket to avoid cross contamination between any latent materials on the vehicle seats and the groundwater samples being collected. Should sampling take place during wet weather, samplers should wear the appropriate clothing that will not risk cross contamination, such as avoiding synthetic gear that has been treated with a water repellant finish containing PFAS. Only gear made from wax-coated materials is acceptable.

3.3.1.2 Groundwater Level Measurements

Prior to groundwater sampling, the depth to groundwater will be measured in each well and the groundwater elevation above mean sea level will be determined for each monitoring point. Water level measurements will be used in conjunction with horizontal and vertical ground survey data to evaluate

horizontal and vertical components of groundwater flow. Water level measurements will also be used to determine the volume of standing water in wells for purging activities.

The following equipment will be used for the measurement of water levels:

- Electronic water level indicator;
- Field log book and pen; and
- Photoionization Detector (PID).

At each monitoring well, the cap and internal riser cover will be removed. The headspace and breathing zone air quality will be monitored with the PID. This step may be omitted in subsequent rounds of water level measurements in those wells that yielded no detectable amounts of vapors or gases from prior sampling rounds.

The battery of the electronic water level indicator will be checked by pushing the battery check button and waiting for the audible signal to sound or the instrument light to come on. The water level indicator will be decontaminated before use in each well by using an Alconox wash and laboratory certified PFAS-free water rinse. The instrument will then be turned on and the probe will be slowly lowered into the well, until the audible signal is heard, or the instrument light goes on, indicating that the sensor in the probe has made contact with the water surface in the well.

The depth to water will be recorded to the nearest one-hundredth of a foot, from the top of the measuring mark on the well riser. The date, time, well number, and depth to water will be recorded in the field logbook in indelible ink.

3.3.2 Monitoring Well Inspection

Prior to collecting groundwater samples, each monitoring well will be inspected for the following:

- Damage to the cover or protective casing, if visible above the ground surface;
- Erosion of soil in the area immediately surrounding the casing;
- Operable lock, if appropriate; and
- Damage to the monitoring well surface seal.

3.3.2.1 Monitoring Well Sampling Procedures

The following equipment will be needed to collect groundwater samples for analysis:

- Electric water level indicator;
- Peristaltic pump;
- High-density polyethylene (HDPE) tubing;
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters;
- Photoionization Detector;
- Field logbook and field logs (must be loose paper);
- Laboratory prepared sample containers (polypropylene or HDPE sample bottles);
- Roll of polyethylene sheeting; and
- Decontamination equipment.

Groundwater sampling will be conducted in accordance with the USEPA Low-Flow Sampling Protocol (USEPA 1998). A piece of high-density polyethylene sheeting will be fitted over the monitoring well and laid on the ground. The sampling equipment will be placed on the HDPE sheeting. The expansion cap will be removed and the headspace at the top of the monitoring well will be measured with a PID. This step may be omitted in those monitoring wells which have already demonstrated in the previous rounds of water level measurements that they contain no or insignificant amounts of vapors or gases. The PID will be calibrated before the start of each sampling event.

Clean, new HDPE tubing will be attached to the peristaltic pump. The tubing will be lowered into the water column to a maximum depth of two feet above the bottom of the well. The well will be purged at a rate suitable to minimize drawdown. Field parameters, consisting of pH, specific conductance, temperature, dissolved oxygen, reduction potential, turbidity, and water level will be measured in each monitoring well prior to, during, and after purging (just before sampling) through the use of a flow-through cell. Both the pH and the specific conductivity meters will be calibrated for water temperature before each sampling event.

The volume of water removed from each monitoring well will be dependent upon the amount of time required for stabilization of the field parameters. In general, the well will be considered stabilized for sample collection when field parameters have stabilized for three consecutive readings as follows:

- pH: +/- 0.1 standard units
- Specific Conductance: +/- 3%
- Reduction Potential: +/- 10 millivolts
- Dissolved Oxygen: +/- 10%
- Turbidity: +/- 10%

When the field parameters have stabilized, the volume of water purged will be recorded, and groundwater in the monitoring well will be sampled through the pump at the same flow rate used to purge the well. Groundwater that is purged from monitoring wells or discharged during drilling activities may be disposed of at the Site and allowed to infiltrate into the ground based on the following conditions:

1. There is a defined Site which is the source of the groundwater contamination;
2. There is no free product observed such as LNAPLs and DNAPLs;
3. Recharge pits are used to preclude run-off from the Site and the pits are covered with clean soil when no longer needed; and
4. The infiltrating groundwater is being returned to the same water-bearing zone from which it is being purged.

If the above criteria are not met, the materials will be containerized in U.N.-approved, 55-gallon steel drums. The contents will be identified on weather-resistant labels attached to drum exteriors.

Upon completion of sampling, the sample bottles will be immediately placed in a cooler held at 4^{o}C, using sealable plastic/polyethylene bags to hold the ice. Cooler ice must not be chemical or “blue” ice. Sample containers collected for perfluoroalkyl substances (PFAS) must be kept in a separate cooler, if sampling to detect contaminants other than PFAS are collected during the same event.

Non-powdered nitrile disposable gloves will be worn by the sampling personnel and changed frequently in the following circumstances:

- Prior to decontamination of equipment;
- After contact with any non-decontaminated surface;
- Prior to contact with sample bottles;
- Between putting labels on sample bottles and sample collection;
- Before and after handling water quality meters;
- Before and after insertion of equipment into the monitoring wells (i.e. tubing, interface probe); and
- Before and after handling of any quality control/assurance samples.

Groundwater samples will be sent to a NYSDOH ELAP and NYSDEC ASP-approved analytical laboratory under chain-of-custody procedures for analysis of 1,4-Dioxane by USEPA Method 8270 SIM, PFAS (linear and non-linear branch isomers) by USEPA Method 537, and Target Analyte List (TAL) metals by USEPA Method 6010B, as shown on Table 3.4.

Table 3.4 Analyte List

Analytes		
Aluminum	Iron	Sodium
Antimony	Lead	Thallium
Arsenic	Magnesium	Tin
Barium	Manganese	Titanium
Beryllium	Mercury	Vanadium
Cadmium	Molybdenum	Zinc
Calcium	Nickel	1,4-Dioxane
Chromium	Potassium	Perfluorinated Alkyl Acids*
Cobalt	Selenium	
Copper	Silver	

*Laboratory should be notified to perform analysis for both linear and non-linear branch isomers.

If the turbidity of the groundwater samples is greater than 50 Nephelometric Turbidity Units (NTUs) at the conclusion of well purging, total (unfiltered) and dissolved (filtered) fraction groundwater will be collected. The dissolved fraction groundwater samples will be filtered using a 0.45 micron in-line disposable filter.

In the event a spill occurs while sampling, liquids should be absorbed with inert material, such as vermiculite or sand. That material should then be placed in a suitable closed container. Spark-proof tools and explosion-proof equipment should be used during clean up. Any solids should be collected with an electrically protected vacuum cleaner or by wet-brushing.

3.3.3 Field Quality Control Samples

Quality control procedures will be employed to ensure that sampling, transportation and laboratory activities do not bias sample analytical quality. Duplicate samples, matrix spike samples and matrix spike duplicates will provide a quantitative basis for validating the analytical data. A summary of the anticipated QA/QC samples for each media is included in Tables 3.5 and 3.6.

Table 3.5 QA/QC Samples – Groundwater

QA/QC Sample Type	Number of QA/QC Samples
Duplicate	1 duplicate for every 20 samples collected or 1 duplicate for every 7 calendar days of sampling
MS/MSD	1 MS/MSD for every 20 samples collected or 1 MS/MSD for every 7 calendar days of sampling

Table 3.6 QA/QC Samples – Stormwater

QA/QC Sample Type	Number of QA/QC Samples
Duplicate	1 duplicate for every 20 samples collected or 1 duplicate for every 7 calendar days of sampling
MS/MSD	1 MS/MSD for every 20 samples collected or 1 MS/MSD for every 7 calendar days of sampling

3.3.3.1 Matrix Spike/Matrix Spike Duplicates

For each sample matrix, a field duplicate sample will be collected at a rate of one sample per 20 environmental samples per media. The duplicate sample is collected at the same location as the environmental sample. The field duplicate sample is identified using the sample designation system described in this Section. The identity of the field duplicate is not revealed to the laboratory. The analytical results of the environmental samples will be compared to the field duplicate sample, to evaluate field sampling precision.

3.3.3.2 Sample Designation

A sample numbering system will be used to identify each sample. This system will provide a tracking procedure to allow retrieval of information about a particular sample and will assure that each sample is uniquely numbered. The sample identification will consist of at least four components as follows:

- **Project Identification:** The first component consists of a three-letter designation, which identifies the project Site. For this project, the three-letter designation will be FHS for Former Hettling Site.
- **Sample Type:** The second component, which identifies sample type, will consist of a two-letter code as follows:
    - **MW** – Monitoring Well (Groundwater sample, determined by existing well ID)
    - **SW** – Stormwater (Stormwater sample from drainage discharge point)
- **Sample Identification:** The third component will be used to uniquely identify each sample for NYSDEC EQuIS EDD purposes. The sampling date will be used and will be provided in the following format:
    - MMDDYYYY (i.e. April 12, 2017 would be 04122017)
- **Quality Assurance/Quality Control Samples**: The samples will be labeled with the following suffixes:
    - **MS** – Matrix Spike
    - **MSD** – Matrix Spike Duplicate

Duplicate samples will be numbered uniquely as if they were samples.

A record of identification for duplicate samples will be maintained.

Examples of identification numbers are given below:

FHS-MW-01-04122017: Monitoring well groundwater sample, monitoring well ID MW-01, location one, collected on April 12, 2017.

FHS-MW-01-04122017-MS: Monitoring well groundwater sample, monitoring well ID MW-01, location one, collected on April 12, 2017, matrix spike.

3.3.4 Field Documentation – General

Documentation of an investigative team's field activities often provides the basis for technical Site evaluations and other such related written reports. All records and notes generated in the field will be considered controlled evidentiary documents and may be subject to scrutiny in litigation.

Personnel designated as being responsible for documenting field activities must be aware that all notes may provide the basis for preparing responses for legal interrogatories. Field documentation must provide sufficient information and data to enable reconstruction of field activities. The following information must be provided on the inside cover of each field logbook:

- Project Name (Site Name);
- Site Location;
- Site Manager; and
- Date of Issue.

Control and maintenance of field logbooks are the responsibilities of the Field Team Leader.

3.3.5 Documentation of Field Activities

Field logbook entries must be legibly written and provide an unbiased, concise, detailed picture of all field activities. Use of preformatted data reporting forms must be identifiable and referenced to field notebook entries.

Step-by-step instructions and procedures for documenting field activities are provided below and in following sub-sections. Instruction and procedures relating to the format and technique in which field logbook entries are made are as follows:

- All logging taken in the field must be documented on loose paper, waterproof paper must not be used. Should a clip board be used, Masonite or Aluminum clip boards are applicable.
- Leave the first two pages blank. They will provide space for a table of contents to be added when the field logbook is complete.
- The first written page for each day identifies the date, time, Site name, location, personnel and their responsibilities, other non-personnel present, and observed weather conditions. Additionally, during the course of Site activities, deviations from the work plan must also be documented.
- All photos taken must be traceable to field logbook entries. It is recommended to reference photo locations to the Site sketch or map.
- All entries must be made in ink.
- All entries must be accompanied by the appropriate military time (such as 1530 instead of 3:30).
- Errors must be lined through and initialed. No erroneous notes are to be made illegible.
- The person documenting must sign and date each page as it is completed.
- Isolated logbook entries made by a team leader, other than the team member designated responsible for field documentation, must be signed and dated by the person making the entry.
- Additions, clarifications, or corrections made after completion of field activities must be dated and signed.

3.3.6 General Site Information

General Site characteristics must be recorded. Information may include:

- Type of access into facility (locked gates, etc.).

- Anything that is unexpected on the Site (e.g. appearance of drums that have not been previously recorded).
- Information obtained from interview with Site personnel (if applicable), or other interested party contact at the Site.
- Names of any community contacts at the Site.
- A Site map or sketch. It can be sketched into the logbook or attached to the book.

3.3.7 Sample Activities

A chronological record of each sampling activity must be kept.

- Explanation of sampling at the location identified in the sampling plan (e.g., discolored soil, stressed vegetation).
- Exact sample location, using permanent recognizable landmarks and reproducible measurements.
- Sample matrix.
- Sample descriptions, i.e., color, texture, odor (e.g. soil type, murky water) and any other important distinguishing features.
- Decontamination procedures, if used.

As part of chain-of-custody procedures, recorded Site sampling information must include sample number, date, time, sampling personnel, sample type, designation of sample as grab or composite, and identify any preservative used. Sample locations should be referenced by sample number on the Site sketch or map. The offer and/or act of providing sample splits to a third party (e.g. the responsible party representative; state, county, municipal environmental and/or health agency, etc.) must be documented. Sample tracking and custody will be documented between sample collection and laboratories.

3.3.7.1 Sample Dispatch Information

When sampling is complete, all sample documentation, such as chain-of-custody forms, shall be copied and copies placed in the project files. A notation of the number of coolers shipped, carrier and time delivered to pick-up point should be made in a field notebook.

3.3.7.2 Monitoring Well Repairs, Replacement and Decommissioning

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

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

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with the NYSDEC's "Groundwater Monitoring Well

Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.8 Stormwater Monitoring

In order to maintain proper drainage at the Site, the western section of the Site, the drainage ditch, the three stormwater infiltration stone French drains, and the areas adjacent to U.S. Route 9 will be visually inspected for damage and debris build up, and the inspection documented in the field book.

3.3.8.1 Stormwater Sampling Procedures

The following equipment will be needed to collect a stormwater sample for analysis:

- Peristaltic pump.
- HDPE tubing.
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters.
- Field logbook and field logs (must be loose paper).
- Laboratory prepared sample containers (polypropylene or HDPE sample bottles).

If water is present in the drainage ditch that bisects the Site, a grab sample will be collected from it approximately where it crosses the adjacent property line to the north. A single set of field parameters, consisting of pH, specific conductance, temperature, dissolved oxygen, reduction potential, turbidity, and water level will be measured once prior to sampling. Both the pH and the specific conductivity meters will be calibrated for water temperature before each sampling event. If the turbidity of the stormwater samples is greater than 50 NTUs, total (unfiltered) and dissolved (filtered) fraction stormwater samples will be collected. The dissolved fraction stormwater samples will be filtered using a 0.45 micron in-line disposable filter. To obtain a filtered sample, the stormwater will need to be collected with a peristaltic pump, in order for the water to be pumped through the filter.

The stormwater sampling frequency may be modified based on review of collected data by the NYSDEC. The SMP will be modified to reflect future changes in sampling plans approved by the NYSDEC.

Upon completion of sampling, the sample bottles will be immediately placed in a cooler held at 4°C. Disposable non-powdered nitrile gloves will be worn by the sampling personnel and changed at a frequency consistent with the groundwater sampling procedures listed in Section 3.3.2.1 of this SMP.

Stormwater samples will be sent to a NYSDOH ELAP and NYSDEC ASP-approved analytical laboratory under chain-of-custody procedures for analysis of 1,4-Dioxane by USEPA Method 8270 SIM, PFAS (linear and non-linear branch isomers) by USEPA Method 537, and Target Analyte List (TAL) metals by USEPA Method 6010B.

Sample designation and field documentation are identical to groundwater monitoring methods as previously described.

3.4 Site-Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once each year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection report form will be completed (Appendix D). The form will compile sufficient information to assess the following:

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

3.5 Monitoring Quality Assurance/Quality Control

Not applicable to the monitoring phase at the Former Hettling Farm Site. Site-specific QA/QC can be found in Section 3.3.1.1 of this SMP.

3.6 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file by the NYSDEC. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be prepared in accordance with the NYSDEC's standards and as specified in this SMP.

Monitoring results will be submitted to the NYSDEC on an annual basis for the first five years following completion of the remedial construction.

The results will include the following information:

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

Data will be reported in hard copy or digital format as determined by the NYSDEC. A summary of the monitoring program deliverables is summarized in Table 3.7.

Table 3.7 Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater and Stormwater Monitoring and Site Inspection Report	**Annually for first five years**

***The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

4 Operation and Maintenance Plan

4.1 Introduction

The Site remedy does not rely on any mechanical systems. Therefore, the operation and maintenance of such components is not included in this SMP.

5 Inspections, Reporting and Certifications

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 of this SMP. Inspections of remedial components will be conducted annually for the first five years following completion of remedial construction, or whenever a severe weather event has taken place, such as an erosion or flooding event that may affect the engineering controls.

5.1.2 Inspection Forms, Sample Data and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate section of the inspection report form for their respective system. The inspection report form is contained in Appendix D. Additionally, a general Site-wide inspection form will be completed during the Site-wide inspection. These forms are subject to NYSDEC revision.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and Site monitoring data will be evaluated as part of the EC/IC certification, demonstrating that the:

- Engineering controls/institutional controls are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and
- The Site remedy continues to be protective of public health and the environment and is performing as designed in the Remedial Design (RD).

5.2 Certification of Institutional Controls

For each institutional control identified for the Site, it shall be determined that all of the following statements are true:

- The institutional control employed at this Site is unchanged from the date the control was put in place, or last approved by the NYSDEC;
- The engineering control systems are performing as designed and are effective;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control;
- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the environmental easement;
- The information presented in this report is accurate and complete;

- Every five years, the following certification will be added “The assumptions made in the qualitative exposure assessment remain valid”; and
- The Owner’s representative shall certify that all information and statements in the certification form are true. A false statement made is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law.

5.3 Periodic Review Report

A Periodic Review Report will be prepared and submitted to the NYSDEC every year, beginning twelve months after the Certificate of Completion is issued. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site depicted and described in Appendix F, including the metes and bounds of the environmental easements. The report will be prepared in accordance with NYSDEC DER-10 and will include:

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

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be prepared and submitted to the NYSDEC. This plan will explain the failure and provide the details and schedule for performing the work necessary to correct the failure.

Appendix A

Remaining Site Contamination

SECTION 5: SITE CONTAMINATION

The Town of Clermont has recently completed a remedial investigation/alternatives analysis report (RI/AAR) to determine the nature and extent of any contamination by hazardous substances at this environmental restoration site.

5.1: Summary of the Site Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between October 2006 and April 2007. The field activities and findings of the investigation are described in the RI report.

The initial phase of the RI involved an Interim Remedial Measure (IRM) to remove and dispose of treated railroad ties and poles that were stockpiled on-site. Subsequent phases of the RI included an electromagnetic (EM) survey, exploratory test pitting, test borings and monitoring well installations, the collection and analysis of; subsurface and surface soils, groundwater, surface water and sediment samples. In addition a private well survey, Fish and Wildlife Impact Analysis and a site survey were conducted.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, surface water and sediments contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Soil Cleanup Objectives ("6NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6").

- Sediment SCGs are based on the Department's "Technical Guidance for Screening Contaminated Sediments."

Based on the SI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the SI report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

As described in the SI report, many soil, groundwater, surface water and sediment samples were collected to characterize the nature and extent of contamination. As seen in Figure 3 the main categories of contaminants that exceed their SCGs are inorganic pesticide residues in the form of metals. For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for soil, and sediment.

Figures 3 through 6 summarize the degree of contamination for the contaminants of concern and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

Waste materials in the form of scattered railroad ties and poles, reportedly part of a former dock structure were present on the site. These material were consolidated into a stockpile by the Town. These stockpiled wastes identified prior to the RI/AAR were addressed during the IRM described in Section 5.2.

An electromagnetic (EM) survey was performed in order to detect and delineate potentially buried waste containers, underground storage tanks (USTs), or other metallic structures beneath the site. The EM survey detected eight anomalous areas that displayed response values characteristic of buried metallic materials, which corresponded to drum-size or larger items. These eight areas and two additional areas where smaller anomalies were detected, were further investigated through the use of test pits. At four of the ten locations investigated, no buried objects were found. Buried metallic items were found at all of the other six locations. These items ranged from a 3 foot metal fence stake, to barbed wire, and a buried washing machine. None of the subsurface anomalies investigated were found to include the presence of hazardous substances. Figure 2 shows the extent of the electromagnetic survey and the numbered locations of the detected anomalies.

Surface Soil

Surface soil samples on-site were collected from grade to 2 inches deep, if the area was not vegetated and from a depth of 0 to 2 inches below the root zone in those areas where vegetation existed. Ten of twenty-eight surface soil samples and both IRM near-surface soil samples exceeded the Part 375, Soil Cleanup Objective (SCO) for arsenic of 16 ppm for the Protection of Public Health - Restricted Use Commercial. One of the two IRM near-surface soil samples exceeded the Part 375, SCO for three individual polynuclear aromatic hydrocarbon (PAHs) compounds. The primary contaminant of concern at the site in the surface and near-surface soils is arsenic. The surface soil contamination area of concern (AOC) encompasses approximately 7.5 acres on the eastern side of the site.

Figure 3 shows the locations of the surface and IRM near-surface soil samples, along with the corresponding arsenic concentrations for those samples which exceeded the SCO.

Surface soil contamination identified during the RI/AAR will be addressed in the remedy selection process.

Subsurface Soil

Subsurface soil samples were collected from test pits excavated at specific locations where metallic anomalies were detected during the electromagnetic survey and from soil borings completed during the installation of the groundwater monitoring wells. Three of the fifteen subsurface soil samples exceeded

the Part 375, Soil Cleanup Objective (SCO) for arsenic of 16 ppm for the Protection of Public Health - Restricted Use Commercial.

Figure 3 shows the locations of the subsurface soil samples along with the corresponding arsenic concentrations and the sampling depth for those samples which exceeded the SCO.

Subsurface soil contamination identified during the RI/AAR will be addressed in the remedy selection process.

Groundwater

Seven groundwater monitoring wells were installed, developed and sampled during the RI. Groundwater flow at the site is generally in a easterly direction. The contaminant of concern, arsenic was not detected in any of the groundwater samples indicating that it most likely exists in the arsenate, As(V) form, in the site soils, as opposed to the more soluble arsenite, As(III). Arsenate is typically fixed to the soils, especially in the presence of iron and is relatively immobile. Iron was detected above SCGs in five of the seven groundwater samples collected and appears to represent naturally occurring levels, considering the concentrations found in the site soils. Sodium was detected above SCGs in one monitoring well located along Route 9. The sodium is most likely attributable to the use of road salt. Five semi-volatile organic compounds (SVOCs), in the form of individual polynuclear aromatic hydrocarbons (PAHs) were detected above SCGs in one well (MW-4), located in the north central portion of the site, next to the manmade bridge over the drainage ditch. These compounds were not detected in the soils collected from the same boring during monitoring well construction and were not detected in the downgradient wells. Figure 4 shows the location of the on-site monitoring wells.

No significant site-related groundwater contamination at levels of concern was identified during the SI/AAR. Therefore, no remedial alternatives need to be evaluated for the overburden groundwater.

Surface Water

Surface water collects in a drainage swale off-site to the southwest and flows into an artificial farm pond located just to the south of the central part of the site. Surface water then flows on-site into the manmade drainage/irrigation ditch (artificial intermittent stream) which roughly bisects the site. Surface water exits the site through a culvert on the north side. One surface water sample was collected from the farm pond and two were collected from the on-site drainage ditch. Figure 5 shows the locations of the surface water sampling points and the contaminants found.

Two related SVOCs, methylphenol (creosols) and phenol, along with five metals were detected in the pond upgradient and off-site. Creosols may have been utilized in the pond impoundment structure and phenol may be a breakdown product of these. These componds were not detected on-site. The metals concentrations found in the on-site surface water samples are comparable to those detected in the off-site pond. This along with the Fish and Wildlife Impact Analysis, indicates that the site has had minimal impact on the artificial stream.

No significant site-related surface water contamination at levels of concern was identified during the SI/AAR. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

The SCGs for sediments are divided into two categories, Lowest Effect Level (LEL) and the Severe Effect level (SEL). The LEL represents the level of contamination that can be tolerated by the majority of benthic organisms and the SEL represents the concentrations at which pronounced disturbance to the sediment dwelling community can occur.

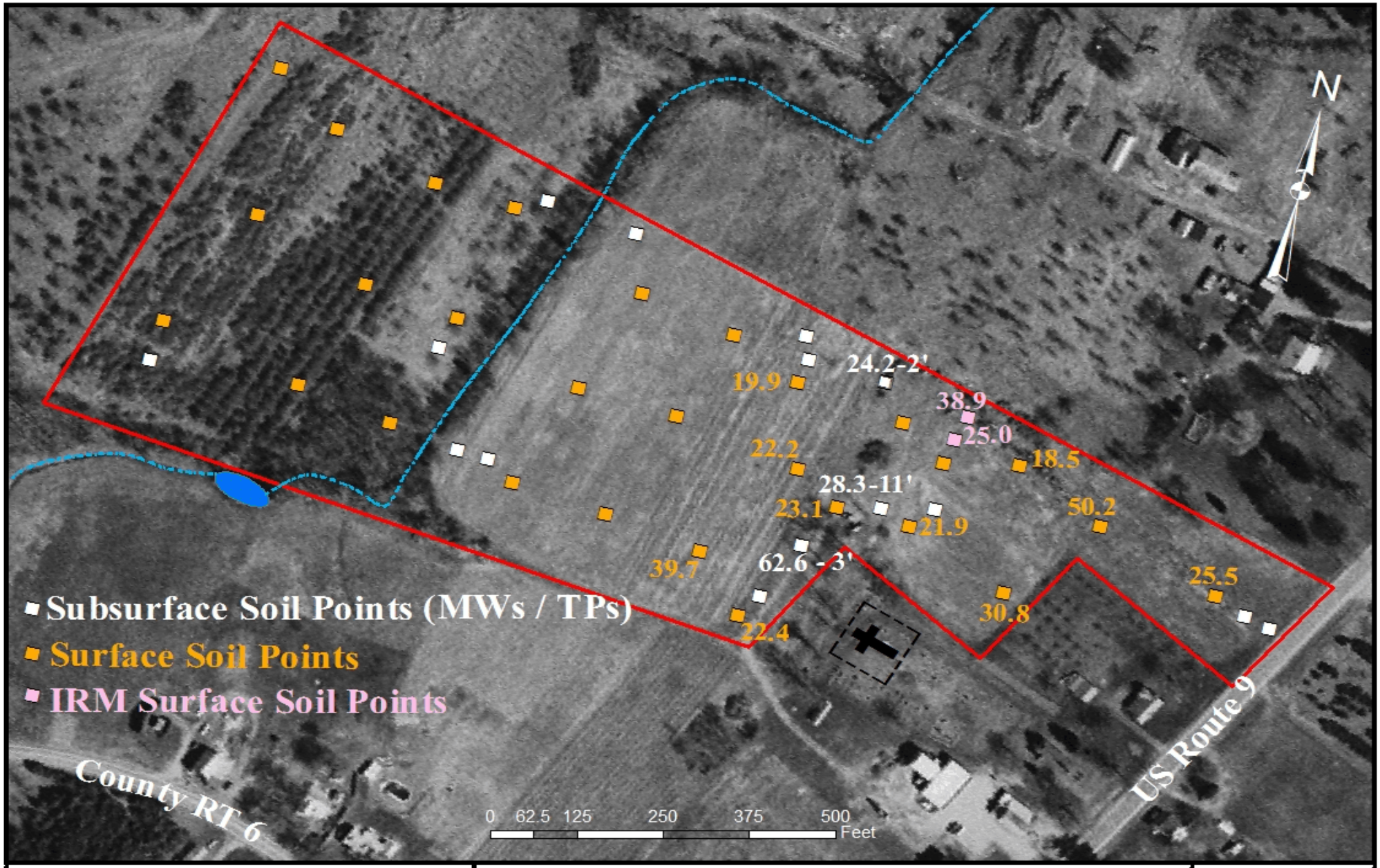
Five sediment samples were collected at the site and surrounding area. Two from the off-site farm pond (inlet and outlet) and three from the on-site drainage ditch. Metals were detected in all five of the sediments samples collected. Sediment metals contamination levels in the upstream off-site pond are generally comparable to those found in the ditch, with the exception of one location. Nickel and zinc were detected above the SEL in the sediment sample located at the point where the drainage ditch exits the north side of the site. Comparing the nickel and zinc results here to the upstream results seems to indicate a localized impact possibly associated with the bridge/culvert area.

All of the other sediment results greater than the SCGs were typically just above the LEL. These sediment results are in the same concentration ranges for the metals, which exist in the surrounding soils. Thus it appears that an equilibrium between the metals concentrations in the site soils and sediments has been established. These items, along with the Fish and Wildlife Impact Analysis, indicates that the site has had minimal impact on the sediments. Figure 6 shows the locations of the sediment sampling points and the contaminants found.

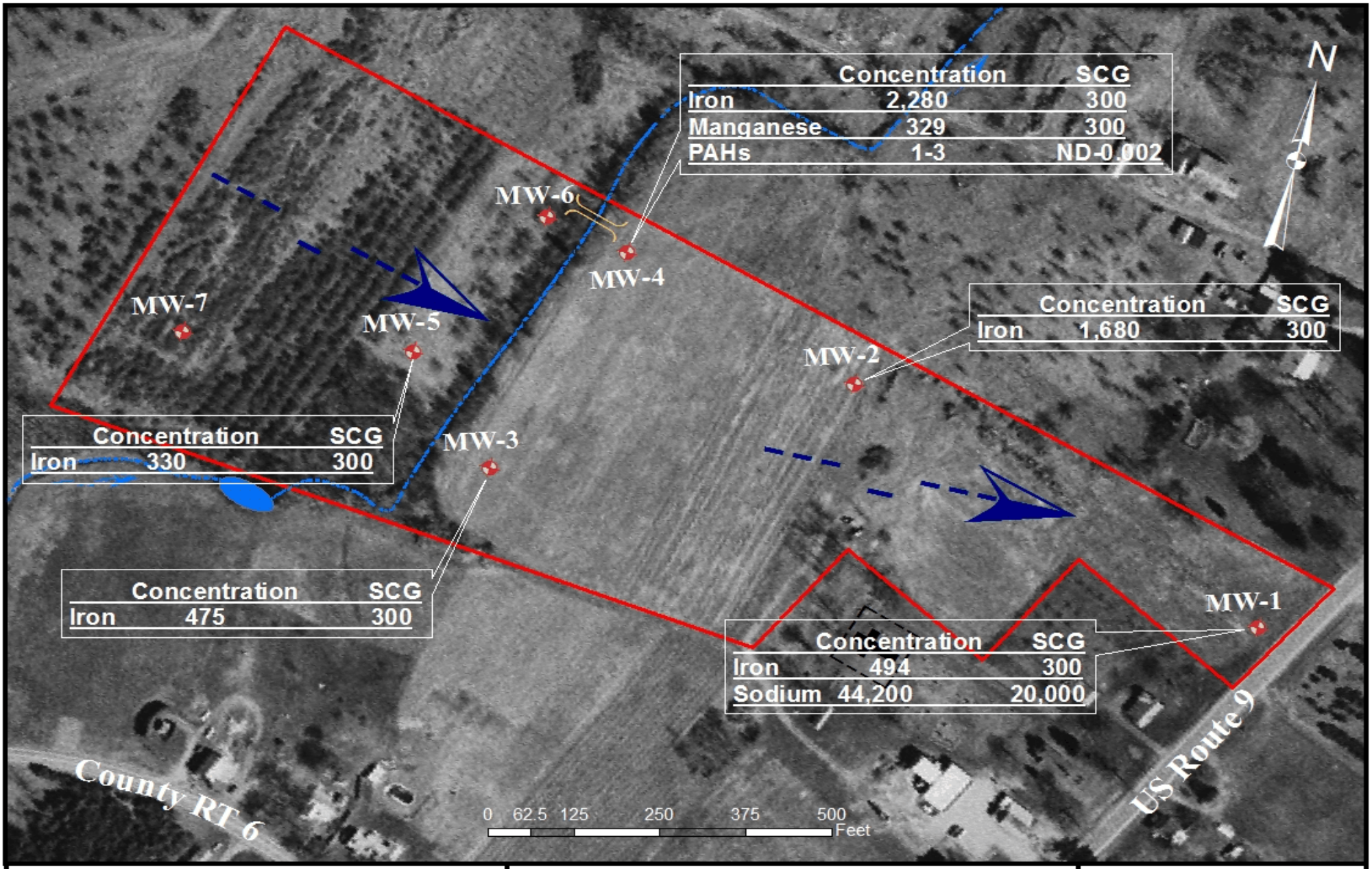
No significant site-related sediment contamination at levels of concern was identified during the SI/RAR. Therefore, no remedial alternatives need to be evaluated for sediment.

Soil Vapor

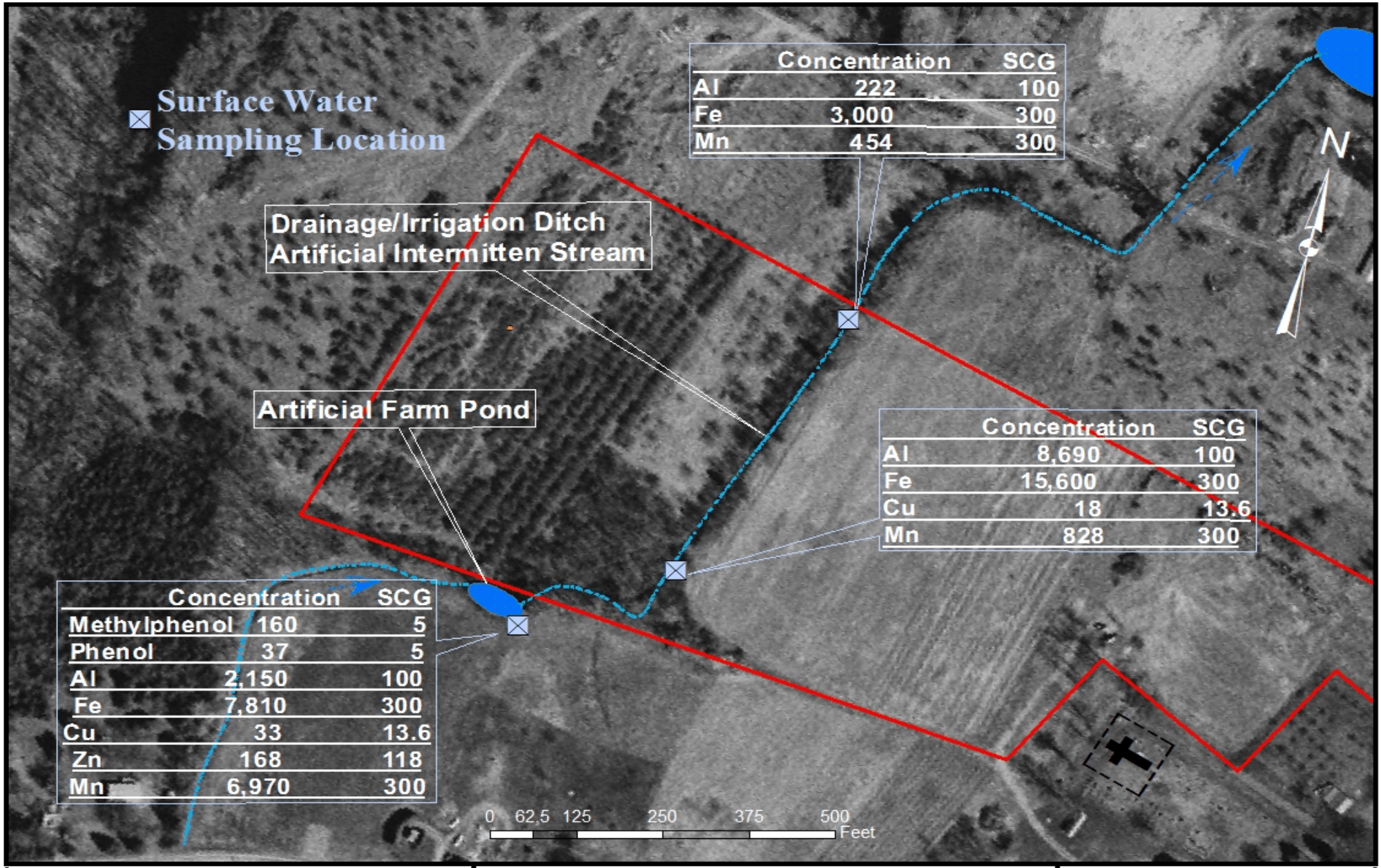
Due to the nature of the contaminants found in the on-site soils and groundwater, and their low potential for volatility, the soil vapor media is not expected to be a concern at this site.



Former Hettling Farm Site E411015	Nature and Extent of Contamination Arsenic in Surface and Subsurface Soils (ppm - mg/kg) SCO = 16 ppm	**Figure 3**



Former Hettling Farm Site E411015	Nature and Extent of Contamination Groundwater (ppb-ug/l)	Figure 4

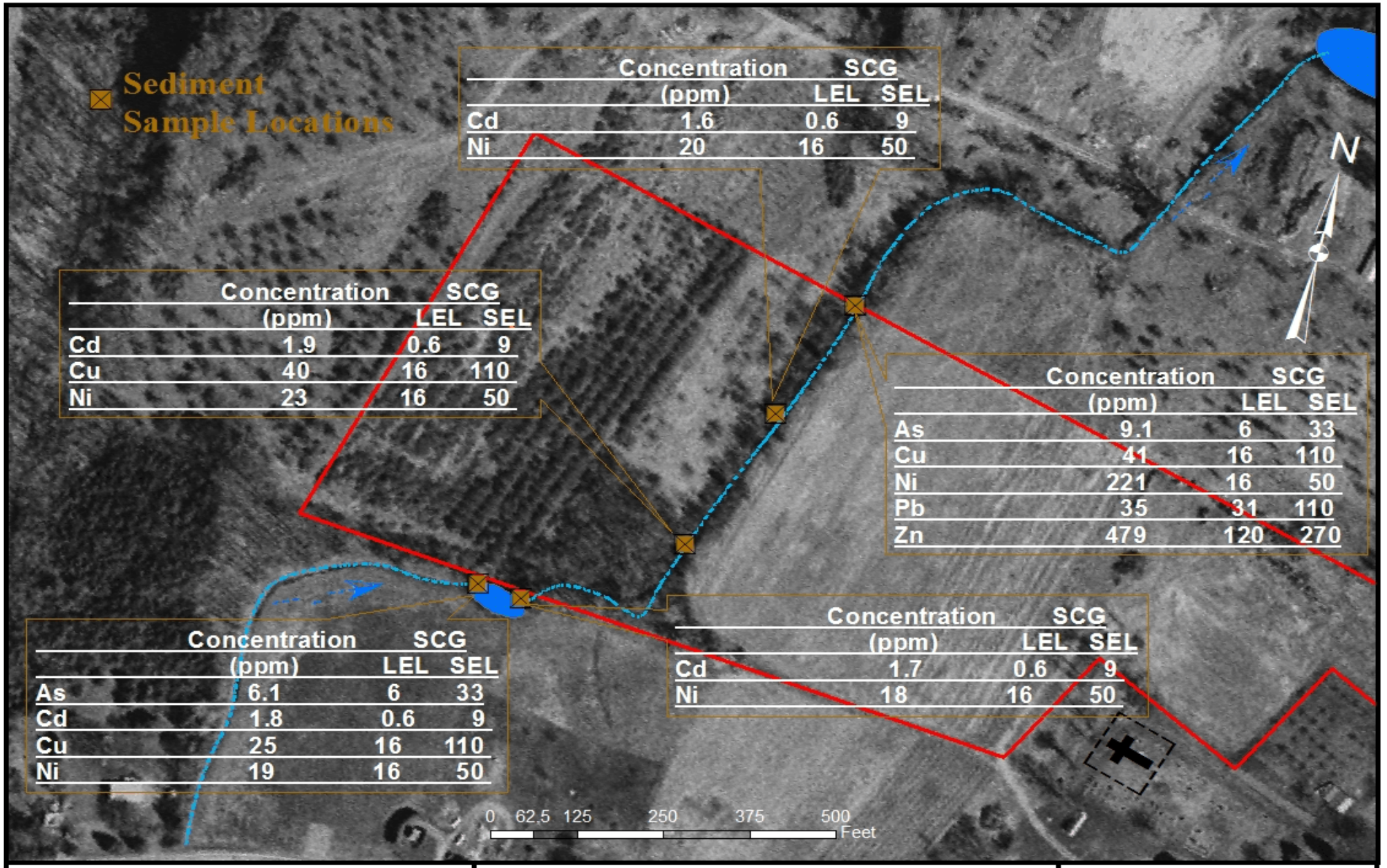


	Concentration	SCG
Al	222	100
Fe	3,000	300
Mn	454	300

	Concentration	SCG
Al	8,690	100
Fe	15,600	300
Cu	18	13.6
Mn	828	300

	Concentration	SCG
Methylphenol	160	5
Phenol	37	5
Al	2,150	100
Fe	7,810	300
Cu	33	13.6
Zn	168	118
Mn	6,970	300

Former Hettling Farm Site E411015	Nature and Extent of Contamination Surface Water (ppb - ug/l)	Figure 5



	Concentration (ppm)	SCG LEL	SCG SEL
Cd	1.6	0.6	9
Ni	20	16	50

	Concentration (ppm)	SCG LEL	SCG SEL
Cd	1.9	0.6	9
Cu	40	16	110
Ni	23	16	50

	Concentration (ppm)	SCG LEL	SCG SEL
As	9.1	6	33
Cu	41	16	110
Ni	221	16	50
Pb	35	31	110
Zn	479	120	270

	Concentration (ppm)	SCG LEL	SCG SEL
As	6.1	6	33
Cd	1.8	0.6	9
Cu	25	16	110
Ni	19	16	50

	Concentration (ppm)	SCG LEL	SCG SEL
Cd	1.7	0.6	9
Ni	18	16	50

Former Hettling Farm Site
E411015

Nature and Extent of Contamination
Sediments (ppm - mg/kg)

Figure 6

Appendix B

Fugitive Dust and Particulate Monitoring

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix C

Community Air Monitoring Program

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix D

Inspection Report

New York Works
Former Hettling Farm Site
NYSDEC Site Number E411015
Cover Inspection Form

Time: _____

Date: _____

Weather Conditions: _____

Were Photographs Taken ?: _____

Inspection Checklist:

A. Soil Cover:

The soil surface of the Site shall be inspected by traversing the area and examining it for the following:

		Yes	No
1.	Is there bare ground, or dead or damaged vegetation?	___	___
2.	Are there cracks, subsidence, or holes in the ground surface?	___	___
3.	Is there evidence of burrowing by animals?	___	___
4.	Is there disturbance of the surface material?	___	___
5.	Is there any erosion damage to vegetated or cleared areas?	___	___
6.	Is there discoloration or evidence of spills on the surface?	___	___
7.	Is there other evidence of disturbance to the area?	___	___
8.	Is there debris or trash present?	___	___

Comments *(Explanation required for each Yes answer in Section A):*

B. Asphalt and Gravel Cover:

The asphalt and gravel portions of the cover shall be inspected by traversing them and examining them for the following:

		Yes	No
1.	Are there cracks or holes in, or subsidence of the surface?	___	___
2.	Is there evidence of burrowing by animals?	___	___
3.	Is there any erosion or other damage to the surface?	___	___
4.	Is there discoloration or evidence of spills on the surface?	___	___
5.	Is there debris or trash present?	___	___
6.	Is there other evidence of disturbance to the area?	___	___

Comments (*Explanation required for each Yes answer in Section B):*

C. Site Drainage

The perimeter of the Site near adjacent properties and in the intermittent ditch shall be inspected by traversing the area and examining it for the following:

		Yes	No
1.	Is there any erosion damage?	___	___
2.	Is there debris blocking drainage pathways?	___	___
3.	Is there evidence of ponding or puddling of water?	___	___

Comments *(Explanation required for each Yes answer in Section C):*

General Comments, Site Notes and Observations of Activities on Adjacent Parcels Which Could Interact With the Work:

Signature:

_____	_____	_____
Inspector	Date	Organization

GROUNDWATER MONITORING WELL INSPECTION

SITE/PROJECT NAME: _____ PROJECT NUMBER: _____

DATE OF INSPECTION: _____ INSPECTOR: _____

WELL DESIGNATION: _____

WELL LOCATION: _____

Outward Appearance

Flushmount Diameter	_____ inches	N/A [ ]	
Approximate Stickup Height	_____ feet	N/A [ ]	
Integrity of Protective Casing	Describe: _____		
Protective Casing Material	Steel [ ]	Stainless Steel [ ]	Other _____
Protective Casing Width or Dia.	_____ inches		
Weep Hole in Protective Casing	Yes [ ]	No [ ]	
Surface Seal/Apron Material	Cement [ ]	Bentonite [ ]	Not apparent [ ] Other _____
Integrity of Surface Seal/Apron	Describe: _____		
Surface Drainage	Away from Wellhead [ ]	Toward Wellhead [ ]	
Bollards Present?	Yes [ ]	No [ ]	Describe: _____
Well ID. Visible?	Yes [ ]	No [ ]	Describe: _____
Lock Present and Functional?	Yes [ ]	No [ ]	Describe: _____
Photograph Taken? Photo #	Yes [ ]	No [ ]	Describe: _____

Inner Appearance

Integrity of Well Casing	Describe: _____			
Integrity of Cap Seal	Describe: _____			
Surface Water in Casing?	Yes [ ]	No [ ]	Describe: _____	
Well Casing Diameter	_____ inches			
Well Casing Material	PVC [ ]	Steel [ ]	Stainless Steel [ ]	
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [ ]	None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [ ]	None [ ]	
Evidence of Double Casing?	Yes [ ]	No [ ]	Describe: _____	

Downhole

Odor	Yes [ ]	No [ ]	Describe: _____
PID Reading	_____ ppm		
Depth to Water (to top of casing)	_____ feet (nearest 0.01)	Depth to LNAPL	_____ feet (nearest 0.01) N/A [ ]
Total Well Depth (to top of casing)	_____ feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: _____		

Additional Comments:

_____

_____

_____

_____

_____

Appendix E

Groundwater Sampling Log

ARCADIS Design & Consultancy for natural and built assets

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: _____ DATE: _____

PROJECT NAME: _____

PROJECT NUMBER: _____

SAMPLERS: _____

A: Total Casing and Screen Length: _____

B: Casing Internal Diameter: _____

C: Water Level Below Top of Casing: _____

D: Volume of Water in Casing: _____

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

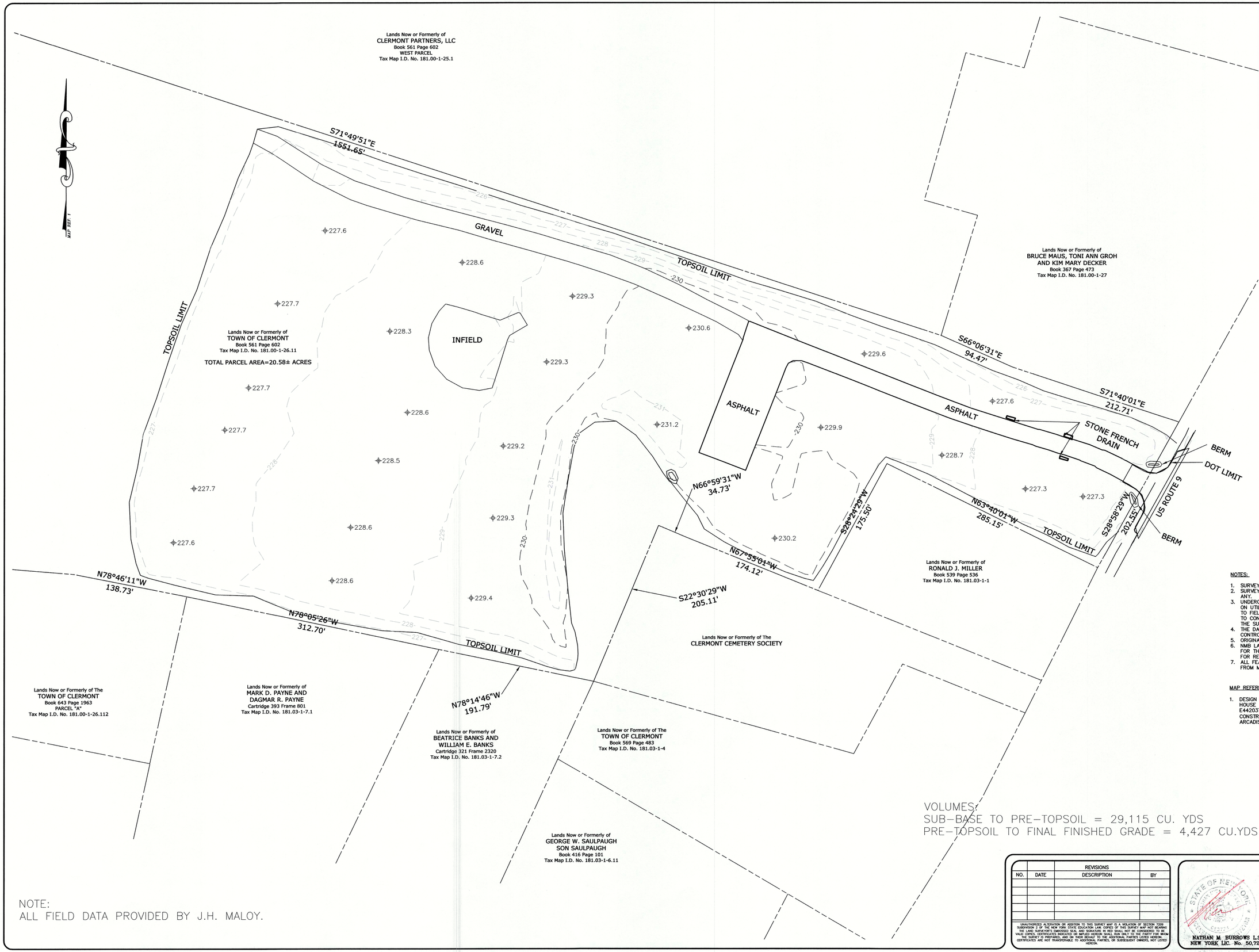
$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ _____ gal.

PARAMETER	ACCUMULATED VOLUME PURGED												
Time													
Gallons													
Depth to Water													
Temperature (^oC)													
pH													
Redox (mV)													
Conductivity (mohm/cm													
Turbidity (ntu)													
Disolved Oxygen (mg/l)													
TDS													
Salinity													

Notes: _____

Appendix F

Environmental Easement and Final Site Survey



NMB
LAND SURVEYING
PLLC
20 TROY AVE. WYNANTSKILL NY, 12198
518-376-4630

REVISIONS			
NO.	DATE	DESCRIPTION	BY

NATHAN M. BURROWS L.S.
NEW YORK LIC. No. 50,724

MAP OF SURVEY

FINISH GRADE TOPOGRAPHY
FORMER HETTLING FARM SITE

TOWN OF CLERMONT
COUNTY OF COLUMBIA — STATE OF NEW YORK

SURVEYED BY: MALOY	CHECKED BY: NMB	DATE: 8-8-2017
DRAWN BY: DEJ	JOB No. 1796	DWG No. FINISHED GRADE
SCALE: 1"=50'	SHEET 1 OF 1	

Arcadis CE, Inc.

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