US Army Corps of Engineers
BUILDING STRONG®
KANSAS CITY DISTRICT

Vestal Water Supply Well 1-1
Superfund Site
Operable Unit 02
Remedial Design for
In-Situ Thermal Treatment

Town of Vestal, Broome County, New York
September 2019

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SUMMARY OF WORK
08/15

PART 1 GENERAL

1.1 SITE DESCRIPTION

1.1.1 Location

The Vestal Water Supply Well 1-1 Site (Site)(see Figures) is located in the Town of Vestal, southwestern Broome County, New York, approximately 10 miles west of Binghamton, New York and includes a western portion and an eastern portion. The western portion is located between the Susquehanna River and New York State Route 17, includes a wellfield (Vestal Water District No. 1 Well 1 or Well 1-1, located on Pumphouse Road), a fire department training center, state-owned forest lands and a recreational field. Well 1-1 and contaminated groundwater impacting Well 1-1 are addressed as Operable Unit One (OU1). The eastern portion of the Site, the Stage Road Industrial Park (SRIP), is approximately 1500 feet southeast of Well 1-1 and has been designated as Operable Unit Two (OU2). The portion of the Site that is the subject of this OU2 remedy is located within the SRIP and is referred to herein as 200 Stage Road which is approximately 5.5 acres in size and is generally flat. The site is approximately 1,180 feet south of the Susquehanna River (within the 500-year flood plain).

1.1.2 Site Description

Four areas located within the SRIP, identified as Areas 1-4, were originally investigated in OU2 as potential sources of contamination to Well 1-1. The four areas (see Figures) identified are as follows:

Area 1- the part of the Vestal Asphalt property adjacent to Route 17.
Area 2- the truck parking area between Stage Road and the Erie Lackawanna railroad tracks.
Area 3- the area of 200 Stage Road between the north side of the Chenango Industries building and an existing drainage ditch.
Area 4- the area of 200 Stage Road between the south side of the Chenango Industries building and the Erie Lackawanna railroad tracks.

These four areas were suspected of being areas of contamination where volatile organic compounds (VOCs) were present in the soils and entering the groundwater, based primarily on the concentrations of VOCs found in the groundwater. 200 Stage Road is zoned for and is expected to continue to be zoned and used for commercial/light industrial activities. 200 Stage Road includes a 60,000 square foot building that was formerly used to manufacture transformers and, later, electronic circuit boards. The circuit board manufacturing operations ceased in May 2002. From 2007 through 2013, the building was used to recycle electronic equipment. Currently, the building is being used for automotive work, including repair, painting and restoration of vehicles. As shown on Figures, Area 3 and Area 4 are located adjacent to the building at 200 Stage Road and are considered to be current sources of groundwater contamination. Area 3 is located on the northeast side of the building. Area 4 is located along the entire southern perimeter of the building, primarily within the asphalt-covered parking lot areas.

The Focused Feasibility Study (FFS) divided 200 Stage Road into two separate targeted treatment zones for Area 3 and three separate zones for Area 4:

- Area 3 (outside the northeast corner of the building);
- Area 3B (under the northeast corner of the building). However, during the Pre-Design Investigation, Area 3B soil concentrations were less than the remedial goals, excluding Area 3B from treatment for this remedial action.

For Area 4, the zones are

- Area 4-1 (the south side of the building - western parking lot);
- Area 4-2 (the south side of the building - eastern parking lot;
- Area 4-2B (under the south side of the building).

1.1.3 Site Background

In November 1988, EPA conducted the OU2 RI/FS for the four areas of concern in the SRIP (Areas 1-4). The results of the RI/FS revealed significant VOC contamination in subsurface soils located in Area 2 and Area 4 and limited soil contamination in Area 1 and Area 3. Most of the subsurface contamination was determined to reside between five and 25 feet below ground surface (bgs) with the highest VOC concentrations at depths greater than 10 feet. EPA completed an OU2 risk assessment identified unacceptable risks to future construction workers exposed through ingestion and dermal contact with the contaminated soils and inhalation of VOCs in Area 2 and Area 4. In addition, the risk assessment identified unacceptable risk to residents within the entire Site area from the ingestion of groundwater contaminants which were leaching from the soils. Potential exposure pathways considered were ingestion of groundwater from directly below source Area 2 and Area 4 and from Well 1-1. Four VOCs, including trichloroethene (TCE), trichloroethane (TCA), dichloroethene (DCE), dichloroethane (DCA), and tetrachloroethene (PCE) were identified as contributing to the health risks to construction workers and to residents. The OU2 ecological risk assessment determined that it was unlikely that the soil and groundwater contamination in the study area had adversely affected any plant life in the study area, particularly in the wetlands, as a result of the considerable depths at which the higher concentrations of contaminants had been detected (i.e., below root levels). As a result, EPA considered the study area to have limited ecological significance to both flora and fauna. Based on the RI/FS and risk assessment, EPA signed a ROD for OU2 on September 27, 1990 which addressed the contaminated soils located in the two discrete source areas, Area 2 and Area 4. At that time, no action was deemed to be warranted for Area 1 and Area 3. The major components of the selected remedy included:

a. In situ vacuum extraction or soil vapor extraction (SVE) of volatile organic contamination from soil in source Area 2 and Area 4 within the SRIP followed by carbon adsorption, with subsequent treatment and disposal of contaminated carbon at a permitted off-Site facility.
b. Monitoring program to evaluate the progress of the SVE remedy.
c. Monitoring program to periodically assess inorganic contaminants in the aquifer upgradient of Well 1-1 for groundwater.
d. A contingency remedy involving additional inorganic treatment at Well 1-1, if necessary, in the future.

In January 1997, as per the OU2 1990 ROD, the SVE system, designed to remove VOCs from the unsaturated soils, began operation in Area 2. In December 1997, four additional vertical SVE wells were installed to extend the treated area to the contaminated soils in the eastern portion of Area 2. In

November 2000, the SVE was terminated in Area 2 as a result of successfully achieving the ROD soil cleanup levels. During September and October 2001, soil sampling was performed in Area 4 to further delineate the area of contamination. In June 2003, the SVE system, similar to that in Area 2, began operating in Area 4. In February, September and October 2005, as a result of low VOC contaminant removal rates, EPA conducted further soil and groundwater sampling at the Site to evaluate the progress of the SVE system in cleaning up Area 4. The results of the sampling showed that very high levels of VOCs still remained in the deep unsaturated and shallow saturated zones.

In January 2006, the SVE system was temporarily shut down in order to determine if any modifications to the SVE system could achieve OU2 soil cleanup levels. Subsequently, EPA determined that, without enhancement, the SVE system for Area 4 would be unable to address the remaining VOC contamination in the fine-textured soils at the Site.

A Focused Feasibility Study was completed in August 2016 evaluating alternatives for the remaining contaminated soils in OU2. Alternative R3 in the Focused Feasibility Study was the selected remedy, which was in-situ thermal treatment and excavation with off-site disposal. A Record of Decision Amendment was signed September 2016 including in-situ thermal remediation (ISTR) of VOC-contaminated soils, excavation of PCB-contaminated soils in Area 3, and institutional controls currently in place.

1.1.4 Project Objectives

From the 2016 ROD amendment, the revised remedial action objectives (RAOs)for OU2 are as follows:

a. Reduce or eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soils;
b. Reduce or eliminate the migration of contaminants in soils to groundwater;
c. Reduce or eliminate the uptake of contaminants in soil by biota;
d. Protect human health by preventing exposure to contaminated soil, groundwater, and soil vapor; and
e. Restore groundwater to levels that meet state and federal standards within a reasonable time frame.

The ROD Amendment selected ISTR to address contaminated soil within site source areas.

The overall project objective is to achieve soil cleanup goals outlined in Section 02 61 18 IN-SITU THERMAL REMEDIATION (ISTR).

If soil in Area 3 has concentrations of polychlorinated biphenyls above the subsurface soil cleanup goal of 10 mg/kg for total Aroclors following ISTR operation, then the Contractor will be responsible for focused excavation of that area which will be executed as a Contract Option under a fixed unit rate. The estimated extent of PCBs above cleanup goals is approximately 600 cubic yards and is driven by one sample location within one boring (sB-30 at 5 ft bgs) as depicted in the Appendices and Drawings.

All work covered under these contract documents shall be completed within three years of the notice to proceed. ISTR construction, operation, and

restoration of shall not extend beyond 18 months for Areas 3, 4-1, and 4-2, and shall not extend beyond 12 months for Area 4-2B inside the building.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1.2.1 Project Description

The work includes in situ thermal treatment of four areas spanning approximately 36,000 square feet, totaling a volume of approximately 43,000 cubic yards (cy). Treatment intervals range from ground surface to 35 ft below ground surface (bgs). The top of the saturated zone generally ranges from 12 to 13 ft bgs. Treatment zone geology includes alluvial deposits and fill overlying sand and gravel deposits. ISTR treatment volumes encompass portions of both stratigraphic units and are detailed on the project figures and drawings.

ISTR is specified for OU2 contamination in unsaturated and saturated soil. The Contractor shall be responsible for selecting the appropriate ISTR technology or combination of technologies within the Thermal Treatment Zone (TTZ) necessary to achieve the performance criteria outlined in Section 02 61 18 IN-SITU THERMAL REMEDIATION.

The 200 Stage Road building foundation includes footings which extend approximately 7 feet below the finished floor elevation of the building. The building slab itself is constructed with wire mesh reinforced concrete over a gravel base. As-built drawings are included in Appendices. Refer to the Site Preparation portion of Section 02 61 18 IN-SITU THERMAL REMEDIATION for additional information.

The impact of construction and operation of ISTR on tenant operations and quality of life (noise, odor, parking lot restrictions, dust, traffic, light, fugitive emissions) contributed to the requirements for continuous indoor air monitoring, pneumatic control infrastructure and backup generator requirements outlined in Section 02 61 18 IN-SITU THERMAL REMEDIATION (ISTR).

Site restoration includes removal of the above ground ISTR infrastructure, abandonment of below ground ISTR infrastructure, removal of the vapor cover, replacement in kind of building slab and flooring inside the building, replacement in kind of paved areas, and regrading and revegetation of the affected non-paved areas within the project limits to facilitate adequate stormwater management.

1.2.1.1 Power and Natural Gas Availability

The Contractor shall be responsible for verifying all power and fuel availability assumptions.

1.2.1.2 Treated Water Discharge

Treated water can be discharged to the stormwater conveyance to the South of the site, South of Vestal Rail Trail, eventually draining into the Susquehanna River under a State Pollutant Discharge Elimination System (SPDES) permit equivalent that the Contractor is responsible for obtaining or to the sanitary sewer system for treatment at the publicly owned

treatment works (POTW). Refer to Section 02 61 18 IN-SITU THERMAL REMEDIATION for further information and requirements for treated water discharges.

1.3 OCCUPANCY OF PREMISES

The project requires heating adjacent to and below an active commercial business, currently operating as an auto body repair shop. The 200 Stage Road building is currently occupied by a tenant provides automotive repair, painting and restoration of vehicles. The area above the ISTR heating zone or project limits for Area 4-2B includes bathrooms, locker rooms with showers, kitchen and dining area, and autobody lifts. These areas will be inaccessible to the building tenant during construction, operation, and site restoration; however, active use of the remainder of the building will continue. The Contractor shall provide trailers to replace use of these spaces as detailed in Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES.

Tenant negotiations and relocation will be performed by the government. Project work limits are presented on the Drawings. Exclusion zones and monitoring specified in Section 02 61 18 IN-SITU THERMAL REMEDIATIONIN-SITU THERMAL REMEDIATION will be used to protect the tenant during remediation.

1.4 WORK SEQUENCE

Phasing of treatment is not expected to be necessary due to power or funding limitations. However, if the Contractor elects to treat the treatment zone under a phased approach, work sequencing will need to be considered. The phasing of treatment shall occur in a manner that does not allow recontamination of a treated area and shall progress from upgradient (southeast) to downgradient (northwest).

1.4.1 Definable Features of Work

A definable feature of work (DFW) is a portion of work consisting of materials, equipment, supplies, and procedures which are closely related to each other, have the same controls, and shall be accomplished by the same work crew for completion. A DFW shall be sufficiently small so that the work is easily accomplished. DFWs for the ISTR program include, but are not limited to, the following:

a. Preparation of the Remedial Action Work Plan (RAWP) and other pre-construction submittals
b. Permitting
c. Mobilization
d. Site preparation work
f. Baseline Sampling for ISTR work
g. ISTR well-field installation according to Stage of treatment
h. Liquid and vapor recovery and treatment systems installation (above ground infrastructure)
i. System startup and testing
j. Operations
k. Confirmation soil sampling
l. Determination of whether excavation is needed in Area 3 to address PCBs
m. Equipment decontamination and residuals management

n. Demobilization
o. If needed, work plan addendum followed by focused excavation of PCBs in Area 3
n. Site Restoration
o. Preparation of the Remedial Action Report

1.4.2 Preconstruction Work

a. Develop, submit and gain approval for all required preconstruction submittals.
b. Obtain all necessary permits to complete the remedial action.
c. Coordinate with the utility companies regarding electrical, natural gas (and/or propane), and water and wastewater as required for the ISTR.

1.4.3 Site Preparation

a. Implement environmental control measures including soil erosion in accordance with these Contract Documents and applicable regulations.

b. Perform baseline monitoring, including perimeter and indoor air monitoring according to the Contractor's Remedial Action Work Plan (RAWP).

c. Abandon wells and inactive utilities, including SVE wells, piping, and treatment shed removal.

d. Provide temporary facilities for tenant use and government office as described in 01 50 00 Temporary Construction Facility and Controls.

e. Establish utility connections and supply infrastructure including the electrical power drop, water supply, sewer, and natural gas (if needed).

f. Preserve the portion of the existing sewer line beneath the building as well as the unused, six inch sewer line shown on the Drawings so as not to allow heat to adversely affect the integrity of the sewer.

1.4.4 Remedial Construction and Operation

a. Install site access control fencing, and interior exclusion zone around treatment area.

b. Install below ground ISTR well field which may include, but is not limited to: temperature monitoring points, thermal heater or electrodes, steam injection wells, multiphase extraction wells, shallow horizontal extraction wells, and vacuum monitoring points.

c. Install adequate surface/insulating cover over ISTR area to allow complete vapor capture.

d. Install above ground piping and power supply connecting well field to vapor and liquid treatment systems and power distribution equipment.

e. Install above ground air and water treatment systems.

f. Perform system commissioning and startup.

g. Begin implementation of air monitoring program.

h. Operate ISTR system to:

1. Meet minimum temperature requirements
2. Operate until ISTR soil cleanup goals have been achieved

i. Shutdown (allow for cool down), decontaminate, and remove ISTR system.

j. Conduct one round of post-operational groundwater monitoring.

k. Prepare and submit a Remedial Action Completion Report for the thermal treatment.

1.4.5 Final Restoration

a. Remove the insulating cap.

b. Abandon ISTR related process wells (heater wells, steam injection wells, multiphase extraction wells, temperature and vacuum monitoring points, and monitoring wells) in place. The top 2 feet of well materials shall be removed.

c. Building restoration shall include replacement-in-kind of building slab and floor.

d. Decommission existing SVE system including removal of the SVE equipment building and contents for final disposition.

f. Where vegetation was impacted to accommodate ISTR activities, regrade (if needed) and reestablish vegetation to manage stormwater and prevent erosion.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GREEN REMEDIATION

To the extent practicable, the Contractor shall use technologies and practices that are sustainable in accordance with EPA green remediation guidance. Refer to https://www.epa.gov/sites/production/files/2016-08/documents/region_2_clean_green_policy_metrics_touchstone_practices.pdf

-- End of Section --

SECTION 01 11 10.0023

SURVEYING
04/15

PART 1 GENERAL

1.1 SCOPE OF WORK

Contractor shall develop and make detail surveys and measurements required for construction and site restoration.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following submittals, defined by submittal descriptions below (SD) shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Pre-Construction Wellfield Survey

SD-07 Certificates

Surveyor Elevation/Location Certifications; G

Record topographic maps after final grading and site restoration. Shall include locations of any new groundwater monitoring wells selected for retention after the remedial action. This task shall be conducted after completion of all phases of ISTR treatment.

SD-11 Closeout Submittals

Surveyor Field Notes Data; G

Submit original and one copy of Surveyor's field book, calculations, and graphical layouts to the Contracting Officer upon completion of each phase of survey work. Include an accurate log of control and survey work as it progresses, all field notes, notations, and descriptions used and compiled during the field survey.

Record Drawings; G, DO

1.3 QUALITY CONTROL

Maintain responsibility for all surveying performed at the site. The surveyor shall be a qualified and Registered Land Surveyor in the State of New York. The surveyor shall have a minimum of two years of experience in construction surveying and layout and maintenance of record construction drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

Submit Surveyor Elevation/Location Certifications verifying accuracy of survey work to the Contracting Officer. Certificates signed by the Surveyor stating that elevations and locations of site construction features are in conformance, or nonconformance, with Contract Documents shall be submitted to the Contracting Officer at the completion of each phase of work requiring services of the Surveyor.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

Contractor shall provide all slope stakes, batter boards, and all other working lines, elevations and cut sheets.

Provide all material required for benchmarks, control points, batter boards, grade stakes, and structure and elevation stakes.

Contractor shall be solely responsible for all locations, dimensions and levels.

Safeguard all points, stakes, grade marks, monuments and benchmarks made or established for the work. Re-establish same if disturbed.

Keep instruments on the site as required to support the specific stage of work.

Keep professional, accurate, well organized, and legible notes of all measurements and calculations.

The Contractor shall provide and/or pay for all field engineering services required for the execution of their work including, but not limited to, the following:

1. Survey work required to execute the contract scope of work. Existing survey control points are indicated on the drawings and are to be utilized to establish base data. Field monuments are to be verified for accuracy prior to start of work.

2. Civil, structural, or other professional engineering services specified or required to execute Contractor’s chosen means and methods to complete the contract scope of work.

3. The accuracy of the survey shall be maintained horizontally to 0.1 foot and vertically to 0.01 foot.

4. All final surveys must be signed, sealed, and certified by a Land Survey licensed in the State of New York.

5. Horizontal control shall be New York State Plane Coordinate System using the 1983 North American Datum: NAD83 (NA2011) EPOCH 2010.00.

6. Vertical datum shall be North American Vertical Datum (NAVD) of 1988 (GEOID 2012A)

3.2 INSPECTION

3.2.1 Existing Conditions

Verify and define the existing conditions, contours, and location of structures within the construction limits, and as defined on the Contract Drawings.

3.2.2 Work Control Points

Establish the exact location of all work site reference and survey control points, which will be provided during the Pre-Work Conference, prior to the start of work. All work shall be in reference to and established from the control points (shown on the Contract Drawings), re-established where necessary, and maintained throughout the life of the contract. Horizontal and vertical control points shall be referenced to the permanent control monuments to an accuracy of one part in ten thousand. Any errors or apparent discrepancies found on the Contract Drawings or Specifications shall be called to the Contracting Officer's attention for interpretation prior to proceeding with the work. The Contracting Officer must be promptly notified of any discrepancies discovered. Provide control points at each location of work using closed traverse and leveling loops. Establish, place, and replace, as required, such additional stakes, markers, and other controls as may be necessary for control, intermediate checks, and guidance of construction operations.

The Contractor shall locate, verify accuracy, and protect control points located outside the limits of work prior to starting site work, and preserve the permanent reference points during construction.

1. Promptly report to the Contracting Officer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
2. Make no changes or relocations without prior written notice to the Contracting Officer.
3. Report to the Contracting Officer when any reference point is lost or destroyed, or required relocation because of necessary changes in grades or locations.
4. Replace project control points that are lost or destroyed. Establish replacements based on original survey control.

The Contractor shall establish new permanent benchmarks on the project site to be used as control points.

A description and elevation to the nearest one-hundredth foot shall be provided for benchmark set.

3.2.3 Pre-Construction Wellfield Survey

Prior to drilling, field locatation of the in situ thermal wellfield as proposed in the remedial action work plan shall be presented to the government for inspection.

3.3 RECORD TOPOGRAPHIC MAPS

Plot required survey information on a reproducible map at a scale of 1-inch = 40 feet with 1-foot elevation contours. Mapping shall conform to the National Map Accuracy Specifications and shall bear the seal of a licensed land surveyor registered in New York. The map shall contain a title block with the name and address of the Contractor and the signature of the registered surveyor. Record Drawings shall include labeled contour lines, property line locations including bearings and distances, horizontal grid systems, cross-sections and details, and any field changes of elevations, dimensions, and details. Indicate locations of physical features on site including: structures, utilities, roadways, driveways, garages, and fences. Indicate on a separate drawing excavation limits and verification of sampling points. All electronic submittal data must be compatible with Bentley MicroStation Version 8i (or newer). The Contractor may work with AutoCAD format (version 2007 or newer), or other equivalent software; however, the Contractor is responsible for ensuring the electronic data is compatible with Bentley MicroStation Version 8i prior to submittal. Provide all supporting references, attachments, and shapefiles associated with electronic submittals (e.g., eTransmit in AutoCAD). Provide submittal data on compact discs.

3.3.1 RECORD DRAWINGS

Prepare and submit within 30 days of completion of property restoration, record topographic maps showing final grading and site conditions including, but not be limited to the following:

A. Groundwater monitoring wells.

B. Abandoned ISTR infrastructure.

C. Confirmation Soil Sampling Locations.

E. Utilities, both active and abandoned.

F. Site and building restoration

3.4 COORDINATE LIST

Compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum: NAD83 (NA2011) EPOCH 2010.00.

3.5 SURVEY NOTES

Record all fieldwork in a clear, legible, and complete manner. The Surveyor Field Notes Data shall contain a complete description of the nature and location of the new and existing points. Include a sketch of the point locations and monument witness points in the Field Notes.

3.6 SURVEY REQUIREMENTS

Establish lines and levels and locate and layout, utilizing total station instrumentation or similar means, all site features to be constructed or executed. These include, but are not limited to support zone facilities

layout and areas of contamination. Re-verify layouts and volumes periodically during construction by the same means.

Prepare a Post-Treatment Survey to identify structural locations and topography for providing an as-built representation of the site.

3.7 UTILITIES

Identify existing underground utilities within the treatment area. Verify the elevations of existing piping, utilities, and all type of underground obstructions affected by remedial activities. Record the locations and elevations of all utilities.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS
11/11

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List Of Contact Personnel; G, DO

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Install temporary fencing to clearly demarcate the construction and operational exclusion zone where the tentant will not be allowed and additional PPE and training may be required for authorized personnel prior to entry.

For Area 4-2B treatment, ISTR extends to ground surface (top of soil, bottom of concrete slab) below the existing building at 200 Stage Rd as shown on the Drawings. Tenants may be occupying the building outside of the ISTR treatment area. The Contractor shall construct an exclusion zone to fully isolate the portion of the building around the treatment area and zone of thermal influence from the tenant, who will be occupying the portion of the building that can safely be occupied. Enclosure may be constructed of temporary walls, wood-framed plastic sheeting, or a Contractor proposed equivalent used to establish the exclusion zone inside the building.

Mark Contractor equipment for identification.

1.2.1.1 Noise Control

The ISTR extraction and treatment system and steam supply system, including backup generator equipment, shall not exceed 65 decibels during daytime operations from 0700 to 2300 or 57 decibels during nighttime operations from 2300 to 0700 at any point along the property boundary. In addition, operations inside the building shall not exceed 85 decibels during tenant work hours within the tenant occupied space.

1.2.1.2 Subcontractors and Personnel Contacts

Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an

emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.2.1.3 No Smoking Policy

Smoking is prohibited within the project site, except in designated smoking areas. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines.

1.2.2 Working Hours

Regular working hours must consist of an 8 1/2 hour period, between 7:30 a.m. and 5:30 p.m., Monday through Friday, excluding Government holidays.

1.2.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 7 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work must be lighted in a manner approved by the Contracting Officer.

1.2.4 Utility Cutovers and Interruptions

a. Make utility cutovers and interruptions after normal working hours as well as outside tenant working hours if affecting tenant or on Saturdays, Sundays, and Government holidays. Activities affecting tenant operations shall be communicated to Contracting Officer prior to implementation. Conform to procedures required paragraph WORK OUTSIDE REGULAR HOURS.

b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, and compressed air, are considered utility cutovers pursuant to the paragraph WORK OUTSIDE REGULAR HOURS.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
08/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Progress and Completion Pictures and Video; G, DO

Fact Sheets

1.2 VIEW LOCATION MAP

Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.3 PROGRESS AND COMPLETION PICTURES AND VIDEO

Photographically document site conditions prior to start of construction operations, including documentation of offsite excavation areas. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color 12 megapixel minimum resolution in JPEG file format showing the sequence and progress of work. During site preparation, construction phase activities, operational soil sampling events, or site restoration take a minimum of 20 digital photographs each week throughout the entire project (5 per week during strictly operational periods) from a minimum of ten views from points located by the Contracting Officer. Perform a video survey of the haul route road within City limits prior to construction and annually throughout the construction period. Submit with the monthly invoice two sets of digital photographs, each set on a separate compact disc (CD) or data versatile disc (DVD), cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Provide photographs for each month in a separate monthly directory and name each file to indicate its location on the view location sketch. Also provide the view location sketch on the CD or DVD as a digital file. Include a date designator in file names. Cross reference submittals in the appropriate daily report. Photographs provided are for unrestricted use by the Government.

1.4 SUPERVISION

1.4.1 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the

job-site at all times during the performance of contract work. An operator may dual hat as a Site Superintendent.

1.4.2 Superintendent Duties

The project superintendent is primarily responsible for managing and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend partnering meetings, and quality control meetings. The superintendent or qualified alternative must be on-site at all times during construction activities. During strictly operational periods, the thermal treatment system operator may serve as the Site Superintendent.

1.4.3 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work must also attend.

1.6 PRECONSTRUCTION AND WORK PLAN REVIEW MEETING

After the Contractor has submitted a draft version of the Remedial Action Work Plan and other project plans, the Contractor shall plan, distribute an agenda for, and conduct a face to face meeting at EPA Region 2 to expedite review and approval of work plans. Key project management and technical staff as well as representatives of primary subcontractors shall attend. The Contractor shall prepare, circulate, and finalize meeting minutes.

1.7 PROGRESS MEETINGS

During work plan preparation, the Contractor shall plan and conduct monthly meetings via teleconference. Once construction begins the Contractor shall plan and conduct bi-weekly (twice per month) project meetings.

The progress of the work, scheduling problems, submittals, field orders, change orders and other pertinent matters will be discussed.

At the progress meetings the Contractor shall discuss:

1. All permits they have received.
2. Revised and updated schedule to show the progress of the work and effects on the construction schedule.

3. Any current test results pertaining to monitoring, backfill and the disposal of soils and liquids.
4. Contractor's daily quality control reports.
5. Upcoming work for the reporting period.
6. Any additional data pertinent to the progress of the work and record keeping for the project.
7. Discuss and finalize previous meeting minutes.
8. Contract Modifications/Field Orders.
9. Health & Safety Issues.

The Contractor shall record minutes and distribute copies for comment within three working days after the meeting.

1.8 COMMUNITY RELATIONS

The Contractor shall plan to attend periodic meetings, site visits, local briefings, and provide adequate effort and time to prepare for such meetings. A formal public meeting will be held at the outset of the project. There will also be at least one (1) health and safety meeting with local emergency response agencies after the Contractor receives notice to proceed and prior to mobilization to the site. The Project will be explained, and the Contractor's project manager will be introduced to the public. During the course of the project, one (1) or more additional public meetings may be held and require attendance by the Contractor; assume no more than three (3) public meetings will be required.

The Contractor should be prepared to present and discuss technical activities involving the construction project to a lay audience at the request of the USACE and EPA, respond to informational requests, and prepare draft fact sheets on a semi-annual basis.

1.9 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of site access conditions when emergency conditions warrant, such as hurricanes or terrorist threats. Multiple email addresses are not allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). Promptly notify the Contracting Officer, in writing, of any changes to this email address.

1.10 PROJECT WEBSITE

The Contractor shall provide a project website accessible to Government personnel to serve as a central repository for operational data, project documents, photographs, reports, and additional documents as requested by the EPA.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE
02/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Project Schedule; G, DO

Initial Project Schedule; G, DO

Periodic Schedule Update; G, DO

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative shall be experienced scheduling projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.2.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.2.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.2.3 Work Plans and Permit Activities

Work Plans and permitting activities, including necessary conferences and follow-up actions and Work Plan package submission dates, shall be integrated into the schedule.

3.2.4 Mandatory Tasks

Include the following activities/tasks for each stage of thermal treatment in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Government review periods (assume 21 calendar days, unless otherwise specified)

c. Commencement and completion of excavation activities.

d. Submission of mechanical/electrical/information systems layout drawings.

e. Long procurement activities.

f. Submission of thermal O&M manual.

g. Submission and approval of as-built drawings.

h. Submission and approval of DD1354 data and installed equipment lists.

i. Submission and approval of Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all testing and commissioning will be completed prior to submission of commissioning report and subsequent contract completion.

j. Commissioning - Performance Testing.

k. Performance Verification testing.

l. Other systems testing, if required.

m. Contractor's pre-final inspection.

n. Correction of punch list from Contractor's pre-final inspection.

o. Government's pre-final inspection.

p. Correction of punch list from Government's pre-final inspection.

q. Final inspection.

3.2.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.2.6 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	RESP	4	Responsible party
2	MODF	6	Modification Number
3	BIDI	6	Bid Item (CLIN)
4	PHAS	2	Phase of work
5	CATW	1	Category of work

Field	Activity Code	Length	Description
6	FOW	20	Feature of work*
*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.			

3.2.6.1 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code.

3.2.6.2 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.2.6.3 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.2.6.4 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.2.6.5 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to construction submittal, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.2.6.6 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00.00 10 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.2.7 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, notice to proceed for each CLIN, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.2.7.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.2.7.2 End Project Finish Milestone

The last activity in the schedule must be a finish milestone titled "End Project." The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.2.7.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.2.7.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.2.7.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.2.8 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates

assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.2.9 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.2.10 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.2.11 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.2.12 Leads, Lags, and Start to Finish Relationships

Lag durations contained in the Project Schedule shall not have a negative value. The Contractor shall not use Start to Finish relationships.

3.2.13 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.2.14 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.3.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for tracking progress and payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.3.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 45 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.

3.3.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at project progress meetings. These updates will enable the Government to assess Contractor's progress.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.4 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.4.1 Data CD/DVDs

Provide the current project schedule and all previously submitted schedules in the format of the scheduling software and PDF electronically. . Also include the Narrative Report and all required Schedule Reports. Label each

file to indicate the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.4.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government any problems, causes of change, an analysis of the schedule impact, and the plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5 PERIODIC SCHEDULE UPDATE

3.5.1 Periodic Schedule Update Meetings

Conduct periodic schedule updates at progress status meetings for the purpose of reviewing the proposed Periodic Schedule Update and Narrative Report.

3.5.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the progress status meeting.

3.6 BIWEEKLY PROGRESS MEETINGS

Conduct meeting with the Government as part of progress for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the monthly (pre-mobilization) and biweekly (post mobilization) progress meeting, address the status of RFIs, RFPs and Submittals.

3.7 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.7.1 Justification of Delay

The Project Schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Government's determination as to the number of allowable days of contract extension shall be based upon the Project Schedule updates in effect for the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the performance period, contract completion date, or other interim milestone date.

3.7.2 Time Extension

The Contracting Officer must approve the Justification of Delay before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.8 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.9 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.10 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. The receipt of a proper payment request is contingent upon the Government receiving both acceptable and approvable file copies.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to mobilization for construction:

Certificates of insurance

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices or Earned Value Report

Health and safety plan

Work plan

Quality Control (QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other

characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that the product, system, or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor. The document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods, or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved (G)

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." Government Approved submittals will be reviewed by the District Office (DO).

1.4 PREPARATION

1.4.1 Transmittal Form

1.4.2 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Only those requested by the Contractor to prepare shop drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.4.2.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source Drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.5 QUANTITY OF SUBMITTALS

1.5.1 Number of Samples SD-04 Samples

a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.6 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work;

and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.7 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

1.7.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.7.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.7.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.7.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.8 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.8.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.8.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.8.3 Warranting that Variations are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.8.4 Review Schedule Extension

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.9 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.10 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. One copy of the submittal will be retained by the

Contracting Officer and one copy of the submittal will be returned to the Contractor.

1.10.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.11 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the FAR clause entitled CHANGES, is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.12 APPROVED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.13 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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		01 11 10	SD-01 Preconstruction Submittals															
			Pre-Construction Wellfield Survey	3.2.3														
			SD-07 Certificates															
			Surveyor Elevation/Location	1.3	G													
			Certifications															
			SD-11 Closeout Submittals															
			Surveyor Field Notes Data	3.5	G													
			Record Drawings	3.3.1	G	DO												
		01 14 00	SD-01 Preconstruction Submittals															
			List Of Contact Personnel	1.2.1.2	G	DO												
		01 30 00	SD-01 Preconstruction Submittals															
			Progress and Completion	1.3	G	DO												
			Pictures and Video															
			Fact Sheets	1.8														
		01 32 01.00 10	SD-01 Preconstruction Submittals															
			Preliminary Project Schedule	3.3.1	G	DO												
			Initial Project Schedule	3.3.2	G	DO												
			Periodic Schedule Update	3.5.2	G	DO												
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.7	G													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.6	G	DO												
			SD-06 Test Reports															
			Exposure Reports	1.4														
			Notifications and Reports	1.11														
			Accident Reports	1.11.2	G	DO												

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		01 35 26	LHE Inspection Reports	1.11.3															
			SD-07 Certificates																
			Crane Operators/Riggers	1.5.1.4															
			Standard Lift Plan	1.6.2.2	G														
			Critical Lift Plan	1.6.2.3	G	DO													
			Activity Hazard Analysis (AHA)	1.7															
			Confined Space Entry Permit	1.8.1															
			Hot Work Permit	1.8.1															
			Certificate of Compliance	1.11.4															
		01 35 29.13	SD-01 Preconstruction Submittals																
			Decontamination Plan	3.10	G														
			Accident Prevention Plan/Site	1.4															
			Safety And Health Plan																
			SD-02 Shop Drawings																
			Work Zones	3.9.1	G														
			Decontamination Facilities	3.10.1	G														
			SD-03 Product Data																
			Amendments to the APP/SSHP	1.4															
			Site Control Log	3.9.2															
			SSHO's Daily Inspection Logs	1.7															
			SD-07 Certificates																
			Certificate Of Worker/Visitor	1.6															
			Acknowledgement																
		01 35 45.00 10	SD-01 Preconstruction Submittals																
			UFP-QAPP	1.4.3.1	G	DO													
			Quality Assurance Plan	3.3	G	DO													

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		01 35 45.00 10	SD-03 Product Data																
			Analytical Request Form	1.6	G	DO													
			EPA Region 2 Electronic Data	1.7.3	G														
			Deliverable																
			SD-06 Test Reports																
			Chemical Data Final Report	3.7	G														
			Quality Control Summary Reports	1.6.4															
			(QCSR)																
		01 45 00.00 10	SD-01 Preconstruction Submittals																
			Contractor Quality Control (CQC)	3.2	G														
			Plan																
			SD-06 Test Reports																
			Verification Statement	3.8.2															
		01 50 00	SD-01 Preconstruction Submittals																
			Traffic Control Plan	3.4.1	G	DO													
			Temporary Site Facilities Layout	1.3	G	DO													
			Plan																
			SD-03 Product Data																
			Backflow Preventers	1.4	G	DO													
			SD-06 Test Reports																
			Backflow Preventer Tests	2.4															
		01 57 19	SD-01 Preconstruction Submittals																
			Preconstruction Inspection	1.5.1	G	DO													
			Solid Waste Management Permit	1.9	G	DO													
			Regulatory Notifications	1.5.2	G	DO													
			Environmental Protection Plan	1.6	G	DO													

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		01 57 19	Stormwater Notice of Intent	3.2.2	G	DO												
			Dirt and Dust Control Plan	1.6.8.1	G	DO												
			Environmental Manager	1.5.4	G													
			Qualifications															
			SD-06 Test Reports															
			Laboratory Analysis	3.6.1.1.2														
			Inspection Reports	3.2.3														
			Solid Waste Management Report	3.6.2.1	G	DO												
			SD-11 Closeout Submittals															
			Stormwater Pollution Prevention	3.2.4	G													
			Plan Compliance Notebook															
			Stormwater Notice of Termination	3.2.5	G													
			Waste Determination	3.6.1	G													
			Documentation															
			Disposal Documentation for	3.6.3.3	G	DO												
			Hazardous and Regulated Waste															
			Solid Waste Management Permit	1.9	G													
			Solid Waste Management Report	3.6.2.1	G	DO												
			Hazardous Waste/Debris	3.6.3.1	G													
			Management															
			Regulatory Notifications	1.5.2	G													
			Contractor Certification	3.6.2.1														
		02 61 13	SD-06 Test Reports															
			Backfill	2.2														
			Sampling Liquid	3.7.2	G	DO												
			Topsoil	2.2														

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		02 61 13	SD-07 Certificates															
			Shipping documentation	3.10.1.2														
			Certificate of Disposal	3.10.2.1														
		02 61 18	SD-01 Preconstruction Submittals															
			Air Monitoring Plan	3.2.1	G	DO												
			Remedial Action Work Plan	1.5	G	DO												
			Video Inspection Of Sanitary	1.7.1	G	DO												
			Sewer															
			Permit Equivalency Applications	1.6.1	G	DO												
			For Air And Treated Water															
			Discharges															
			RAWP Addendum For Focused	1.5	G	DO												
			Excavation															
			SD-03 Product Data															
			Commissioning Team	3.6.1														
			Commissioning Plan	3.6	G	DO												
			Pre-Commissioning Tests	3.6.2	G	DO												
			Pre-Commissioning checks	3.6.1														
			Exposure Monitoring/Air	3.2	G	DO												
			Sampling Program															
			SD-06 Test Reports															
			Baseline Monitoring Report	3.3.4														
			Commissioning Report	3.6.2														
			Air Monitoring Data	3.2.1	G	DO												
			SD-10 Operation and Maintenance															
			Data															

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 61 18	Shutdown Memorandum	3.9.2	G	DO												
			Weekly Progress Reports	3.7.1	G	DO												
			Monthly Progress Reports	3.7.1	G	DO												
			SD-11 Closeout Submittals															
			Remedial Action Report		G	DO												

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
11/15

PART 1 GENERAL

This specification covers the requirements for safety and occupational health requirements for the protection of Contractor and Government personnel, property, and resources. Due to the site containing contaminated materials, additional safety requirements are specified in Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.22	(2007; R 2017) Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists
ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2016) The Fall Protection Code
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems

ASSE/SAFE Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2017) Safety Requirements for Lanyards and Positioning Lanyards
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSE/SAFE Z359.6	(2016) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2016) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2016) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2018; TIA 18-1) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NFPA 306	(2014) Standard for Control of Gas Hazards on Vessels
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14) National Electrical Code
NFPA 70E	(2018; TIA 18-1; TIA 81-2) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing

existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt

corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and

crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document an LHE mishap using the Crane High Hazard working group mishap reporting form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, DO

SD-06 Test Reports

Exposure Reports

Notifications and Reports

Accident Reports; G, DO

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan; G, DO

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

1.4 EXPOSURE REPORTS

Within the Interim Remedial Action Construction Report associated with each Stage of treatment, provide an exposure report detailing the number of employee-hours worked for all site workers, both Prime and subcontractor.

1.5 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times during construction activities to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. During operations, the SSHO shall visit the site at least once per week. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than one week, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to one week) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at least once per week when during operations and daily when construction is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.5.1.1.1 Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO may serve as the Quality Control Manager. The SSHO may not serve as the Superintendent.

See Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES for additional requirements and duties for the SSHO.

1.5.1.2 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection). If the specific activity is not required, then a Competent Person for the high risk activity is not required to be provided.

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the Contracting Officer for information in consultation with the Safety Office.

1.5.1.2.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space in accordance with EM 385-1-1, Section 34.

Since this work involves operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, OSHA 29 CFR 1915, Subpart B, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable, 29 CFR 1910.147 for general industry.

1.5.1.2.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.5.1.2.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04, 21.B.03, and herein.

1.5.1.3 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards, Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.5.1.4 Crane Operators/Riggers

Provide Operators, Signal Persons, and Riggers meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators and Signal Persons. Provide proof of current qualification.

1.5.2 Personnel Duties

1.5.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

This conference may be consolidated with the Preconstruction and Work Plan review meeting detailed in Section 01 30 00.

1.5.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct daily

tailgate meetings. In addition, as part of the daily tailgate meetings or as a separate briefing, the facility manager shall be updated daily on site activities. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.6 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.6.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.6.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.6.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.6.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.6.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. In addition, Critical Lift Plans are required for the following:

a. Lifts over 50 percent of the capacity of barge mounted mobile crane's hoist.

b. When working around energized power lines where the work will get closer than the minimum clearance distance in EM 385-1-1 Table 16-1.

c. For lifts with anticipated binding conditions.

d. When erecting cranes.

1.6.2.3.1 Critical Lift Plan Planning and Schedule

Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

1.6.2.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1, Section 16.H.02, for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.6.2.4 Multi-Purpose Machines, Material Handling Equipment, and Construction Equipment Lift Plan

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Written approval from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.6.2.5 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.6.2.6 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized

training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.6.2.7 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all affected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.6.2.8 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.7.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.7.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.8 DISPLAY OF SAFETY INFORMATION

1.8.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.8.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.10 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment in accordance with EM 385-1-1. Government has no responsibility to provide emergency medical treatment.

1.11 NOTIFICATIONS AND REPORTS

1.11.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, or any property damage. For LHE or rigging mishaps,

notify the Contracting Officer as soon as practical but not more than 4 hours after mishap. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; and fall from height (any level other than same surface). These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.11.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: For Army projects, report all "Near Misses" to the GDA, using local mishap reporting procedures, within 24 hrs. The Contracting Officer will provide the Contractor the required forms. Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Accident Report) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.11.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.11.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.12 HOT WORK

1.12.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the local fire department. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency fire department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DEPARTMENT IMMEDIATELY.

1.12.2 Work Around Flammable Materials

Obtain permit approval from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.13 CONFINED SPACE ENTRY REQUIREMENTS

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.13.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply

with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.13.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.13.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.13.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.14 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

See Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES for PRODUCTS and specific PPE requirements due to the site containing contaminated materials.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Coveralls or Long Pants and Shirt

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval.

3.1.3 Unforeseen Hazardous Material

If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4 Changes and FAR 52.236-2 Differing Site Conditions.

3.2 UTILITY OUTAGE REQUIREMENTS

Apply for utility outages in accordance with the requirements of the local utility provider. At a minimum, the written request must include the location of the outage, utilities being affected, duration of outage, any necessary sketches, and a description of the means to fulfill energy isolation requirements in accordance with EM 385-1-1, Section 11.A.02 (Isolation). Some examples of energy isolation devices and procedures are highlighted in EM 385-1-1, Section 12.D. In accordance with EM 385-1-1, Section 12.A.01, where outages involve Government or Utility personnel, coordinate with the Government on all activities involving the control of hazardous energy.

These activities include, but are not limited to, a review of HECP and HEC procedures, as well as applicable Activity Hazard Analyses (AHAs). In accordance with EM 385-1-1, Section 11.A.02 and NFPA 70E, work on energized

electrical circuits must not be performed without prior government authorization. Government permission is considered through the permit process and submission of a detailed AHA. Energized work permits are considered only when de-energizing introduces additonal or increased hazard or when de-energizing is infeasible.

3.3 OUTAGE COORDINATION MEETING

After the utility outage request is approved and prior to beginning work on the utility system requiring shut-down, conduct a pre-outage coordination meeting in accordance with EM 385-1-1, Section 12.A. This meeting must include the Prime Contractor, the Prime and subcontractors performing the work, the Contracting Officer, and the Public Utilities representative. All parties must fully coordinate HEC activites with one another. During the coordination meeting, all parties must discuss and coordinate on the scope of work, HEC procedures (specifically, the lock-out/tag-out procedures for worker and utility protection), the AHA, assurance of trade personnel qualifications, identification of competent persons, and compliance with HECP training in accordance with EM 385-1-1, Section 12.C. Clarify when personal protective equipment is required during switching operations, inspection, and verification.

3.4 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE A10.44, NFPA 70E, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4.1 Safety Preparatory Inspection Coordination Meeting with the Government or Utility

For electrical distribution equipment that is to be operated by Government or Utility personnel, the Prime Contractor and the subcontractor performing the work must attend the safety preparatory inspection coordination meeting, which will also be attended by the Contracting Officer's Representative, and required by EM 385-1-1, Section 12.A.02. The meeting will occur immediately preceding the start of work and following the completion of the outage coordination meeting. Both the safety preparatory inspection coordination meeting and the outage coordination meeting must occur prior to conducting the outage and commencing with lockout/tagout procedures.

3.4.2 Lockout/Tagout Isolation

Where the Government or Utility performs equipment isolation and lockout/tagout, the Contractor must place their own locks and tags on each energy-isolating device and proceed in accordance with the HECP. Before any work begins, both the Contractor and the Government or Utility must perform energy isolation verification testing while wearing required PPE detailed in the Contractor's AHA and required by EM 385-1-1, Sections 05.I and 11.B. Install personal protective grounds, with tags, to eliminate the potential for induced voltage in accordance with EM 385-1-1, Section 12.E.06.

3.4.3 Lockout/Tagout Removal

Upon completion of work, conduct lockout/tagout removal procedure in accordance with the HECP. In accordance with EM 385-1-1, Section 12.E.08, each lock and tag must be removed from each energy isolating device by the

authorized individual or systems operator who applied the device. Provide formal notification to the Government (by completing the Government form if provided by Contracting Officer's Representative), confirming that steps of de-energization and lockout/tagout removal procedure have been conducted and certified through inspection and verification. Government or Utility locks and tags used to support the Contractor's work will not be removed until the authorized Government employee receives the formal notification.

3.5 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.5.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.5.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.5.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.5.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest

attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs. in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.5.3 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.5.4 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.6 WORK PLATFORMS

3.6.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load, and provide appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.

k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.7 EQUIPMENT

3.7.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.7.2 Load Handling Equipment (LHE)

The following requirements apply. In exception, these requirements do not apply to commercial truck mounted and articulating boom cranes used solely to deliver material and supplies (not prefabricated components, structural steel, or components of a systems-engineered metal building) where the lift consists of moving materials and supplies from a truck or trailer to the ground; to cranes installed on mechanics trucks that are used solely in the repair of shore-based equipment; to crane that enter the activity but are not used for lifting; nor to other machines not used to lift loads suspended by rigging equipment. However, LHE accidents occurring during such operations must be reported.

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

f. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

g. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

h. All employees must keep clear of loads about to be lifted and of suspended loads, except for employees required to handle the load.

i. Use cribbing when performing lifts on outriggers.

j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

k. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

l. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

m. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

n. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

o. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.7.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.7.4 Base Mounted Drum Hoists

a. Operation of base mounted drum hoists must comply with EM 385-1-1 and ASSE/SAFE A10.22.

b. Rigging gear must comply with applicable ASME/OSHA standards

d. When used to hoist personnel, the AHA must include a written standard operating procedure. Operators must have a physical examination in accordance with EM 385-1-1 Section 16.B.05 and trained, at a minimum, in accordance with EM 385-1-1 Section 16.U and 16.T.

e. Material and personnel must not be hoisted simultaneously.

f. Personnel cage must be marked with the capacity (in number of persons) and load limit in pounds.

g. Construction equipment must not be used for hoisting material or personnel or with trolley/tag lines. Construction equipment may be used for towing and assisting with anchoring guy lines.

3.7.5 Use of Explosives

Explosives must not be used or brought to the project site.

3.8 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.8.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.8.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

3.8.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.9 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.9.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized.

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.9.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State and Local requirements applicable to where work is being performed.

3.9.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.9.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.9.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

/-- End of Section --

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES
11/15

PART 1 GENERAL

This specification provides additional health and safety requirements due to the presence of contaminated materials at the site. This specification supplements the requirements of Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2219	(2016) Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z358.1	(2014) American National Standard for Emergency Eyewash and Shower Equipment

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-115	(1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response

49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.2 PRECONSTRUCTION SAFETY CONFERENCE

Conduct a preconstruction safety conference prior to the start of site activities and after submission of the Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP). The objective of the meeting is to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting. The functions of the Preconstruction Safety Conference, the Preconstruction Conference in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS, and Preconstruction and Work Plan Review Meeting in Section 01 30 00 ADMINISTRATIVE REQUIREMENTS shall be fulfilled concurrently

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Decontamination Plan; G
Accident Prevention Plan/Site Safety And Health Plan

SD-02 Shop Drawings

Work Zones; G, DO
Decontamination Facilities; G, DO

SD-03 Product Data

Amendments to the APP/SSHP
Site Control Log
SSHO's Daily Inspection Logs

SD-07 Certificates

Certificate Of Worker/Visitor Acknowledgement

1.4 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN (APP/SSHP)

Develop and implement a Site Safety and Health Plan in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS, and attach to the Accident Prevention Plan (APP) as an appendix (APP/SSHP). Address all occupational safety and health hazards (traditional construction as well as

contaminant-related hazards) associated with cleanup operations within the APP/SSHP. Cover each SSHP element in sections 28.A.01 and 33.B of EM 385-1-1 and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Section 28.A.01 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each safety and occupational health (SOH) issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. Modify the APP/SSHP to address changing and previously unidentified health and safety conditions. Ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the Contracting Officer as the APP/SSHP is updated. For long duration projects resubmit the APP/SSHP to the Contracting Officer annually for review. The APP/SSHP must contain all updates.

1.4.1 Acceptance and Modifications

Submit for review 21 days prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and must be revised to correct the deficiencies and resubmitted for acceptance. Onsite work must not begin until the plan has been accepted. Maintain a copy of the written APP/SSHP onsite. Changes and modifications to the APP/SSHP must be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Bring to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer any unforeseen hazard that becomes evident during the performance of the work, through the Site Safety and Health Officer (SSHO) for resolution as soon as possible. The APP shall describe in detail the electrical hazards at the site. In the interim, take necessary action to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP is cause for stopping work until the matter has been rectified.

1.4.2 Availability

Make available the APP/SSHP in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).If the prime and subcontractors maintain separate trailers, a copy of the current APP/SSHP shall be available in each trailer.

1.5 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

Provide hazardous waste operations and emergency response organization in accordance with EM 385-1-1, Section 33.

1.5.1 Safety and Health Manager

Safety and Health Manager, dependent upon the contaminant related hazards on the project, shall be an Industrial Hygienist certified by the American Board of Industrial Hygiene, a safety professional certified by the Board of Certified Safety Professionals, or a health physicist certified by the American Board of Health Physicists.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.01.

1.5.1.1 Additional Qualifications

The Safety and Health Manager must have the following qualifications:

a. A minimum of 3 years' experience in developing and implementing safety and occupational health programs at HTRW sites.

b. Documented experience in supervising professional and technician level personnel.

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.

d. Documented experience in managing personal protective equipment (PPE) programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on the project.

e. Working knowledge of state and Federal occupational safety and health regulations.

1.5.1.2 Responsibilities and Duties

a. Development, implementation, oversight, and enforcement of the APP/SSHP.

b. Provide onsite consultation as needed to ensure the APP/SSHP is fully implemented.

c. Conduct initial site-specific training.

d. Be available for consultation during the first 3 days of remedial activities and at the startup of each new major phase of work.

e. Visit the site as needed and at least twice per year for the duration of activities, to audit the effectiveness of the APP/SSHP.

f. Be available for emergencies. During emergencies, respond to questions from project personnel immediately and within 24 hours.

g. Coordinate any modifications to the APP/SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.

h. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

i. Provide continued support for upgrading/downgrading of the level of personal protection.

j. Serve as a member of the quality control staff.

k. Review accident reports and results of daily inspections.

l. Sign and date the APP/SSHP prior to submittal.

m. Respond to questions from project personnel in a timely manner.

1.5.2 Site Safety and Health Officer

Designate an individual and one alternate as the Site Safety and Health Officer (SSHO). Include the name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer and alternate in the APP/SSHP.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.02.

1.5.2.1 Qualifications

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

a. A minimum of 3 years' experience in implementing SOH programs at HTRW sites. If Level B or C is anticipated to be implemented, the SSHO shall have experience working on at least 3 projects where Level B or Level C personal protective equipment was required.

b. Meet 29 CFR 1910.120/29 CFR 1926.65 requirements for 40-hour initial and 8-hour supervisor training and, maintain 8-hour refresher training requirements.

c. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods including monitoring for ionizing radiation.

d. Documented experience in construction techniques and construction safety procedures.

e. Documented experience in construction with electrical hazards including arc flash

f. Working knowledge of Federal and state occupational SOH regulations.

1.5.2.2 Responsibilities and Duties

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted APP/SSHP.

b. Be assigned to the site on a full time basis for the duration of field construction activities. The SSHO can have collateral duties in addition to SOH related duties. If construction activities are performed during more than 1 work shift per day, a Site Safety and Health Officer must be present for each shift.

c. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

d. Have authority to ensure site compliance with specified SOH requirements, Federal, state and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, activity hazard analyses, air monitoring, monitoring for ionizing radiation, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, confined space entry procedures, spill containment program, and preparation of records by performing a daily SOH inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

e. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

f. Consult with and coordinate any modifications to the APP/SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.

g. Conduct daily safety inspection and document SOH findings into the Daily Safety Inspection Log. Track noted SOH deficiencies to ensure that they are corrected.

h. Conduct accident investigations and prepare accident reports.

i. Serve as a member of the quality control staff on matters relating to SOH.

1.5.3 Additional Certified Health and Safety Support Personnel

Retain safety support from a safety professional certified by the Board of Certified Safety professionals to develop written occupational safety procedures for the APP/SSHP and, when necessary, visit the site to help implement APP/SSHP requirements.

1.5.4 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency must be onsite at all times during construction. They must be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but must be immediately available to render first aid when needed. During operation-only activities, only one person onsite must be trained.

1.5.5 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, must perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They must have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and report to and be under the supervision of the SSHO.

1.5.6 Operational Safety or Buddy System

During periods of system operation that do not involve intrusive activities and are strictly operational, a lone worker may be permitted provided they check-in with offsite personnel at the beginning and end of each day and maintain emergency call-out capability. If work is being performed inside an exclusion zone, such as the in situ thermal remediation well field, then both personnel shall be trained and qualified to work in that exclusion zone.

1.6 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a certificate of worker/visitor acknowledgement must be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the Example Certificate Of Worker/Visitor Acknowledgement at the end of this section.

1.7 INSPECTIONS

Attach to and submit with the Daily Quality Control reports the SSHO's Daily Inspection Logs. Include with each entry the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special SOH issues and notes, and signature of preparer.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

Comply with EM 385-1-1, 29 CFR 1926.65, 29 CFR 1910.120, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, and state specific OSHA requirements where applicable. Submit to the Contracting Officer for resolution matters of interpretation of standards before starting work. The most stringent requirements apply where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary.

2.2 PERSONAL PROTECTIVE EQUIPMENT

2.2.1 Site Specific PPE Program

Provide onsite personnel exposed to contaminants with appropriate personal protective equipment. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Use only respirators approved by NIOSH.

Keep protective equipment and clothing clean and well maintained. Include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, cartridge change out, and storage of PPE within the PPE section of the APP/SSHP.

2.2.2 Levels of Protection

The Safety and Health Manager must establish and evaluate as the work progresses the levels of protection for each work activity. Also establish action levels for upgrade or downgrade in levels of PPE. Describe in the SSHP the protocols and the communication network for changing the level of

protection. Address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, and individual medical considerations within the PPE evaluation protocol.

2.2.2.1 Initial PPE Components

The following items constitute initial minimum protective clothing and equipment ensembles.

Level D	Hard hat, safety glasses with side shields, steel toed/steel shank and high ankle work boots
Level B	Full-facepiece self-contained breathing apparatus (SCBA) or positive pressure supplied air respirator with escape SCBA

2.2.3 PPE for Government Personnel

Two clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and Contamination Reduction Zone, must be available for use by the Contracting Officer or official visitors. The items must be cleaned, maintained and stored onsite and clearly marked: "FOR USE BY GOVERNMENT ONLY." Provide basic training in the use and limitations of the PPE provided.

2.3 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

Maintain, as a minimum, the following items onsite and available for immediate use:

a. First aid equipment and supplies approved by the consulting physician.

b. Emergency eyewashes and showers that comply with ANSI/ISEA Z358.1.

c. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

PART 3 EXECUTION

3.1 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

3.1.1 Project/Site Conditions

Refer to the following reports and information for the site description and contamination characterization. They are located at the United States Environmental Protection Agency, Region 2 - Community Relations 290 Broadway, 19th Floor, New York, NY 10007.

3.1.1.1 CERCLA Documents

Remedial Investigation, 2000, 2012

Focused Feasibility Study Report, 2001, 2012
Record of Decision Amendment, 2012.

3.2 TASK SPECIFIC HAZARDS, INITIAL PPE, HAZWOPER MEDICAL SURVEILLANCE AND TRAINING APPLICABILITY

Task specific occupational hazards, task specific HAZWOPER medical surveillance and training applicability and task specific initial PPE requirements for the project are listed on the Task Hazard and Control Sheets at the end of this section. Reevaluate occupational safety and health hazards as the work progresses and to adjust the PPE and onsite operations, if necessary, so that the work is performed safely and in compliance with occupational safety and health regulations.

3.3 TRAINING

In conjunction with EM 385-1-1, Section 33D, meet the training program requirements for workers performing cleanup operations and who will be exposed to contaminants.

3.3.1 General HTRW Operations Training

All Personnel performing duties with potential for exposure to onsite contaminants must meet and maintain the following 29 CFR 1910.120/29 CFR 1926.65 (e) training requirements:

a. 40 hours of off site HTRW instruction.

b. 3 days actual on-the-job field experience under the direct supervision of a trained, experienced supervisor.

c. 8 hours refresher training annually.

Onsite supervisors must have an additional 8 hours management and supervisor training specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4).

3.3.2 Pre-Entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, must attend a site-specific SOH training session. This session will be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Thoroughly discuss procedures and contents of the accepted APP/SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1 . Each employee must sign a training log to acknowledge attendance and understanding of the training. Notify the Contracting Officer at least 5 days prior to the initial site-specific training session so government personnel involved in the project may attend.

3.3.3 Periodic Sessions

Conduct periodic onsite training by the SSHO at least weekly for personnel assigned to work at the site during the following week. Address SOH procedures, work practices, any changes in the APP/SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Convene a meeting

prior to implementation of the change should an operational change affecting onsite field work be made, to explain SOH procedures. Conduct a site-specific training sessions for new personnel, visitors, and suppliers by the SSHO using the training curriculum outlines developed by the Safety and Health Manager. Each employee must sign a training log to acknowledge attendance and understanding of the training.

3.4 MEDICAL SURVEILLANCE PROGRAM

Meet all requirements of 29 CFR 1910.120/29 CFR 1926.65 medical surveillance program and EM 385-1-1, Section 33.G for workers performing cleanup operations and who will be exposed to contaminants. Ensure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program is without cost to the employee, without loss of pay and at a reasonable time and place.

3.5 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement by the Safety and Health Manager an exposure monitoring/air sampling program to identify and quantify SOH hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Include action levels for upgrading/downgrading PPE in the program. Submit personnel exposure monitoring/sampling results. Monitoring shall be for all site Contaminants of Concern (COC). Exposure and Air Monitoring requirements are detailed under 02 61 18 IN-SITU THERMAL REMEDIATION

3.6 HEAT STRESS MONITORING AND MANAGEMENT

Document in the APP/SSHP and implement the procedures and practices in section 06.J. in EM 385-1-1 to monitor and manage heat stress.

3.7 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures. Address radioactive wastes, shock sensitive wastes, laboratory waste packs, material handling equipment, as well as drum and container handling, opening, sampling, shipping and transport. Describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g. booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials must be appropriately bermed, diked and contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, or human health or the environment are threatened, notify the National Response Center, the state, and the Contracting Officer as soon as possible. Provide control as required by Section 01 57 19 TEMPORARY ENVIRONMENT CONTROLS.

3.8 MATERIALS TRANSFER SAFETY

Remove liquids and residues from the tanks using explosion-proof or air-driven pumps. In accordance with EM 385-1-1, Section 9, electrically bond the tank and ground pump motors and suction hoses to prevent electrostatic

ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor free. Locate the truck upwind from the tank and outside the path of probable vapor travel. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices must conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. Disconnect and drain fittings and lines of their contents after the materials have been transferred and the tanks have been exposed. Do not spill contents into the environment during cutting or disconnecting of tank fittings. Transfer materials drained into DOT-approved drums for storage and transportation. Use only non-sparking or non-heat producing tools to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand tools) used for tank preparation must be explosion-proof. Following cutting or disconnecting of the fittings, plug openings leading to the tanks.

3.9 SITE CONTROL MEASURES

Coordinate site control measures with Section 01 57 19 TEMPORARY ENVIRONMENT CONTROLS.

3.9.1 Work Zones

Initial anticipated work zone boundaries (exclusion zone, contamination reduction zone, support zone, all access points and decontamination areas) are to be clearly delineated on the site drawings. Base delineation of work zone boundaries on the contamination characterization data and the hazard/risk analysis to be performed as described in EM 385-1-1 06.A.02. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site drawings modified) with approval of the Contracting Officer. Clearly identify work zones and mark in the field (using fences, tape, or signs). Print signs indicating the boundaries of the work zones in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering. Submit and post a site map, showing work zone boundaries and locations of decontamination facilities in the onsite office. Work zones must consist of the following:

3.9.1.1 Exclusion Zone (EZ)

The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Control entry into this area and exit may only be made through the Contamination Reduction Zone (CRZ).

3.9.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

3.9.1.3 Support Zone (SZ)

The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from HTRW operations. Secure the Support Zone against active or passive contamination. Site offices, parking areas, and other support facilities must be located in the Support Zone.

3.9.2 Site Control Log

A log of personnel visiting, entering, or working on the site must be maintained. Include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable). Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and fill out a Certificate of Worker or Visitor Acknowledgment. Record this visitor information, including date, in the log.

3.9.3 Communication

Provide and install an employee alarm system that has adequate means of on and off site communication in accordance with 29 CFR 1910 Section .165. The means of communication must be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals must be distinctive and recognizable as messages to evacuate or to perform critical operations.

3.9.4 Site Security

Provide the following site security, in addition to the requirements in 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS. Print signs in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

3.10 PERSONAL HYGIENE AND DECONTAMINATION

Contaminated and possibly uncontaminated liquids are anticipated to be generated from decontamination of equipment and personnel working on-site. The Contractor shall be responsible for treatment and/or disposal of decontaminated liquids.

Sampling methods and equipment shall be chosen so as to minimize decontamination requirements and the possibility of cross contamination. Any sampling equipment used in more than one location shall be decontaminated between locations.

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the contamination reduction zone (CRZ) and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures.

Submit a detailed Decontamination Plan of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the Site Operations Plan. The Plan shall be written in accordance with 01 33 00 SUBMITTAL PROCEDURES. The Plan shall include the decontamination procedures for all equipment, including excavation and transport equipment, all personnel working on site, collection and treatment or disposal procedures for all decontamination by-products, and reference the detailed decontamination procedures for sampling equipment. Train employees in the procedures and enforce the procedures throughout site operations.

3.10.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination facilities. The Contractor shall provide equipment decontamination stations within the Contamination Reduction Zones for removing soil from all vehicles and equipment leaving the working area.

3.10.2 Decontamination Water

Water resulting from decontamination of equipment or personnel shall be collected and properly disposed of off-site or treated in accordance with applicable regulations at the expense of the Contractor.

3.10.3 Personnel Decontamination

Initially set up a decontamination line in the CRZ. Employees must exit the exclusion zone through the CRZ and implement the following decontamination procedures and techniques: hand and face wash. Showers, if needed, must comply with 29 CFR 1910, Section.141 and EM 385-1-1, 02 F, Washing Facilities. It is the Site Safety and Health Officer's responsibility to recommend techniques to improve personnel decontamination procedures, if necessary.

3.10.4 Equipment Decontamination

The Contractor shall furnish all labor, equipment, materials, supplies, power, water, and incidental required for equipment decontamination. All parts of equipment which contact potentially contaminated materials shall be cleaned of all foreign matter. Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site.

Wastewater generated from decontamination shall be disposed of in accordance with applicable laws and regulations.

3.10.4.1 Facilities for Equipment and Personnel

Provide an equipment decontamination station within the CRZ for decontaminating vehicles and equipment leaving the EZ. Construct a decontamination station pad, which meets the site decontamination needs for all vehicles and larger equipment decontamination. Construct the pad to capture decontamination water, including overspray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Provide a dry decontamination using a broom to remove dry/loose spilled materials on accessible surfaces and a steam cleaning or high pressure, low volume wash water system for use after the mud and/or site material has been cleaned from the equipment. Provide a designated "clean

area" in the CRZ for performing equipment maintenance. Use this area when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ must be decontaminated before maintenance is performed.

3.10.4.2 Procedures

Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Assume any item taken into the EZ to be contaminated and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

-- End of Section --

SECTION 01 35 45.00 23

CHEMICAL DATA QUALITY CONTROL
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-263	(1998) Engineering and Design -- Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA-505-B-04-900	(2005) Uniform Federal Policy for Quality Assurance Project Plans and 2012 Optimized Worksheet Updates

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

1.2 ACRONYMS

The definition of acronyms used by the Contractor that pertain to chemical data quality control shall be clearly defined for all contract related products and communications.

1.3 MEASUREMENT AND PAYMENT

Separate payment will not be made for providing and maintaining the chemical data quality requirements including the chemical data quality management, chemical data validation, minimum chemical data reporting requirements, and chemical data quality submittal requirements; these costs shall be included in the applicable unit prices or lump sum prices contained in the bidding schedule.

1.4 CHEMISTRY REQUIREMENTS

Chemical Data Quality Control (CDQC) shall be as defined in ER 1110-1-263. a

1.4.1 Site History

The site history is provided in Section 01 11 00 SUMMARY OF WORK

1.4.2 Data Quality Objectives (DQO)

Sample acquisition, chemical analysis and chemical parameter measurements shall be performed so that the resulting data meet and support data use requirements. The chemical data shall be acquired, documented, verified and reported to ensure that the specified precision, accuracy, representativeness, comparability, completeness and sensitivity requirements are achieved.The UFP-QAPP shall comply with the DQO process requirements as specified in EPA 240/B-06/001.

1.4.3 Sampling, Analysis, and Measurement

Sampling and analysis shall be required for ISTR process and performance monitoring, waste disposal, air monitoring, field screening, soil sampling and groundwater monitoring.

1.4.3.1 Soil and Ground Water Samples

The Contractor shall collect soil and groundwater samples to assess remedial performance. Samples shall be collected as described in Section 02 61 18 IN SITU THERMAL REMEDIATION and in accordance with the Contractor's Remedial Action Work Plan and hot soil and groundwater sampling procedures, where applicable. Samples shall be analyzed using EPA Methods that include analytes shown in Table 4 of Section 02 61 18 IN SITU THERMAL REMEDIATION. Sampling for polychlorinated biphenyls (total Aroclors) is only required in Area 3 as part of confirmation sampling following ISTR operation in order to assess the need for focused excavation of soil with PCBs above soil remediation goals. Sampling and analysis shall be described in the UFP-QAPP. If post-ISTR excavation is required, then the Contractor may elect to submit an addendum to the UFP-QAPP to identify post-excavation confirmation sampling requirements.

1.4.3.2 Process Vapor, Liquid, and Solid Samples

Process vapor, liquid, and solid samples shall be collected to assess remedy performance. Samples shall be collected as described in Section 02 61 18 and in accordance with the Contractor's Remedial Action Work Plan. Samples must also comply with water and air permit equivalent(s) requirements. Sampling and analysis shall be described in the UFP-QAPP.

1.4.3.3 Investigation Derived Waste Samples

The Contractor shall collect waste disposal samples in accordance with the waste disposal facility's requirements.

1.4.3.4 Manifesting and Waste Characterization Samples

Material shipping manifesting shall be in accordance with 40 CFR 261, 40 CFR 262, 40 CFR 268, 49 CFR 172, and 49 CFR 178 and the waste disposal facility's requirements.

1.4.3.5 Air Monitoring Samples

The Contractor shall conduct continuous field screening using a photoionization detector. Indoor air sampling shall be collected as described in Section 02 61 18 and in accordance with the Contractor's Remedial Action Work Plan. Sampling and analyses shall be described in the UFP-QAPP.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. The district office is the reviewer for submittals with a "DO" desgination.

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

UFP-QAPP; G, DO

The UFP-QAPP which includes the field sampling, analytical methodology, and quality control procedures shall be provided no later than 90 days after receipt of notice to proceed.

Quality Assurance Plan; G, DO

SD-03 Product Data

Analytical Request Form; G, DO

EPA Region 2 Electronic Data Deliverable; G

SD-06 Test Reports

Chemical Data Final Report; G

Label each report with the contract number, project name and location.

Quality Control Summary Reports (QCSR)

Label each report with the contract number, project name and location.

1.6 QUALITY ASSURANCE ELEMENTS

The procurement of analytical services shall follow the USEPA Field and Analytical Services Teaming Advisory Committee (FASTAC) process, which requires the use of the following tiered decision tree: 1) LSASD laboratory 2)Superfund Analytical Services and Contract Laboratory Program (CLP) 3) Region Specific Analytical Services (SAS) Contract Laboratories 4) Contractor, IAGs, and Field Contractor Subcontract Laboratories. When LSASD

or CLP laboratories are used, validation of data will be completed by the USEPA. For those analyses that cannot be accommodated by LSASD or CLP or for time-critical analyses (with prior approval from USEPA and USACE), the contractor shall procure a subcontracted laboratory.

For this Remedial Action project, all data are time-critical so the Contractor shall be responsible for procuring a subcontracted lab, and providing the following QA elements necessary to monitor and ensure the quality of chemical data produced. The Contractor shall submit an Analytical Request Form estimating the planned samples under the period of performance to LSASD for informational purposes. This represents a one-time submittal. Validation of data will be completed by the Contractor or Contractor's qualified designee.

1.6.1 Subcontractor Laboratory Certification

The Contractor shall identify all proposed subcontracted project laboratories no later than the coordination meeting. Environmental laboratory services are to be provided only by laboratories possessing the pertinent and appropriate current New York and NELAP accreditation for the matrix and analysis. Before testing services can be performed by the laboratory, the Contractor shall verify the candidate laboratory's acceptability by reviewing their certifications. NELAP accreditation information is to be provided annually. The laboratory shall notify the Government immediately of change in statues of laboratory operations that may affect on-going compliance with these requirements. The USACE/EPA may at any time, conduct audits (including requests for pertinent data for information) that support an environmental laboratory's self-declaration of compliance with this policy. If the USACE/EPA finds the laboratory is in non-compliance, the Contractor shall utilize alternate, compliant laboratory services until such time as compliance is again demonstrated. Before performing environmental testing, the laboratory shall have access to the approved UFP-QAPP.

1.6.2 Subcontractor Laboratory Performance

The Contractor shall provide oversight to ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality control sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the UFP-QAPP, for monitoring analytical performance and for ensuring corrective action procedures are implemented.

1.6.3 Documentation of Sample Collection and Analysis

The Contractor shall be responsible for the independent data review of the entire primary data set.

1.6.4 Validation of Data

The Contractor shall be responsible for data validation. Establish the data validation strategy at the beginning of the project to be consistent with project DQO. Validation will be in accordance with EPA Region 2 SOPs and as outlined in the approved UFP-QAPP. The following validation assumptions can be made:
a. 100% validation required for soil confirmation samples

b. 10% validation required for liquid discharge samples, vapor influent and effluent samples, and ambient air
c. No validation but verification assessed for baseline soil samples, Investigative or remediation derived waste, and groundwater samples
d. The Contractor shall submit Quality Control Summary Reports (QCSR) to summarize outputs of the validation process during ISTR activities to ensure timely evaluation of the usability of the data for decision making purposes.

1.7 QUALIFICATIONS

1.7.1 Chemical Quality Control Officer

As a minimum, the Contractor's Chemical Quality Control Officer shall have: a BA or BS degree in Chemistry; 3 years of experience related to investigations, studies, design and remedial actions at HTRW sites; and experience in calibration and operation of various field monitoring devices as well as standard analytical chemistry methods common for analyzing soil, water, air and other materials for chemical contamination assessment, including hazardous waste manifesting.

The Chemical Quality Control Officer shall ensure that all chemistry related objectives including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Chemical Quality Control officer need not be present onsite during routine sampling, but shall be available for consultation with Government and Contractor personnel.

1.7.2 Environmental Sampling Lead

As a minimum, the Contractor's Environmental Sampling Lead shall have: a degree in Chemistry, Environmental Science, Engineering, Geology, Hydrology, or a related field; 2 years of experience in the development and preparation of UFP-QAPP and work plans; 2 years of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples; 2 years of experience in operation of field screening equipment (e.g. PID, colormetric tubes, etc.); and 2 field seasons of experience with the particular field screening techniques for use on this project. The Environmental Sampling Lead shall collect or oversee collection of all onsite samples and perform all field screening tests. The Environmental Sampling lead shall review the sampling results, and provide recommendations for the Contractor's sampling program. The Environmental Sampling Lead shall be onsite during critical operational sampling and excavation activities, if required.

1.7.3 Requirements of Electronic Data Deliverables

The Contractor shall provide electronic submittal of sampling, location, and geologic data in accordance with EPA Region 2 electronic data deliverable (EDD) policies, guidelines, and formats. This includes data generated by an EPA LSASD or CLP or subcontracted laboratory. The most recent EDD Guidance and Requirements can be found at: http://www.epa.gov/region02/superfund/medd.htm.

The Contractor should consider working with the subcontracted laboratory to screen each EDD using USEPA Region 2's Electronic Data Processing checking

module to ensure the EDD is error free prior to submission to data validation/data management team.

All electronic data submitted by the Contractor is required to be error-free. Data files are to be delivered electronically and on a disk or approved equivalent storage device. For any subcontracted laboratory data, the disk must be submitted with a transmittal letter from the laboratory that certifies that the file is has been found to be free of errors. The subcontract laboratory, at their cost, will correct any errors identified by the Contracting Officer. The Contractor is responsible for the successful electronic transmission of field and laboratory data. Contractor's subcontracted laboratory is responsible for archiving the electronic raw data (e.g., sample login sheets and sample preparation log sheets) to completely reconstruct the analyses that were performed for a period of ten years after completion of this contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Provide chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters for chemical data quality control. An effective chemical data quality control system shall be established that meets the requirements for the chemical measurement DQO applicable to the project. The system shall cover chemical measurements pertaining to and required for Contractor and subcontractor produced chemical data. Control field screening, sampling, and testing in conjunction with remedial activities to meet all DQO and ensure completion of work within the required time.

3.2 QUALITY CONTROL PLAN

3.2.1 Additional Requirements

In addition to the quality control requirements specified in Section 01 45 00.00 10 QUALITY CONTROL, the CQC Plan shall incorporate the qualifications, authority and responsibilities of all chemical quality management and support personnel. Chemical measurements including sampling and/or chemical parameter measurement will not be permitted to begin until after production and acceptance of the CQC Plan, and Government approval of the UFP-QAPP.

3.2.2 Chemistry Elements of the CQC Plan

To cover contract related chemical measurements by the Contractor and all subcontractors, the CQC Plan shall include the following as a minimum.

3.2.2.1 Qualifications

Names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support

personnel. The CQC Plan shall contain a copy of a letter from the project QC manager designating and authorizing a Chemical Quality Control Officer and chemical quality control organization staff.

3.2.2.2 Authority and Responsibility

A diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff and the authority and responsibility of each for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, data validation, minimum data reporting requirements, and DQO for chemical parameter measurement by the Contractor and subContractors. The contents of this section of the CQC Plan shall be included in the applicable "Project Organization" elements of the FSP and the UFP-QAPP.

3.3 QUALITY ASSURANCE PLAN

Prepare the UFP-QAPP in accordance with CDQC requirements and EPA-505-B-04-900. The UFP-QAPP is a single document. The UFP-QAPP confirms the Contractor's understanding of the contract requirements for chemical data quality control, and describes procedures for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data assessment and data reporting requirements. The UFP-QAPP shall delineate the methods the Contractor intends to use to accomplish the chemical quality control items to assure accurate, precise, representative, complete, legally defensible and comparable data. The UFP-QAPP shall describe all chemical parameter measurements for all matrices for all phases of the remediation contract.

As a single interrelated document, the UFP-QAPP shall be provided to field and laboratory personnel. The UFP-QAPP shall clearly identify the Contractor obtained laboratories. The Contractor shall furnish copies of the Government approved UFP-QAPP to all laboratories and the Contractor's field sampling crew. The UFP-QAPP shall address all levels of the remediation sampling with enough detail to become a document which may be used as an audit guide for field and laboratory work.

3.4 CHEMISTRY DATA PACKAGE

Provide the chemistry data package through USACE Contracting Officer as an attachment to the CDFR.

The chemistry data package contains information to demonstrate that the project's DQOs have been fulfilled.

3.5 CONTROL OF CHEMICAL DATA QUALITY

Contractor chemical data quality control ensures that a quality control program is in place that assures sampling and analytical activities and the resulting chemical parameter measurement data comply with the DQO and the requirements of the UFP-QAPP. Utilize the three-phase control system that includes a preparatory, initial and follow-up phase for each definable feature of work. The three-phase chemical data control process must ensure The Contractor shall follow the submittal procedures in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.6 ANALYTICAL TESTING LABORATORIES

Propose the analytical laboratories to be used for the primary samples analyses. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the primary required sample analyses.

3.7 CHEMICAL DATA FINAL REPORT

The CDFR shall be produced including a summary of quality control practices employed and all chemical parameter measurement activities after project completion. As a minimum, the CDFR shall contain the following:

a. Summary of project scope and description.

b. Summary of any deviations from the design chemical parameter measurement specifications.

c. Summary of chemical parameter measurements performed as contingent measurements.

d. Summary discussion of resulting data including achieving data reporting requirements.

e. Summary of achieving project specific DQO.

f. Summary of data usability.

g. Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix.

h. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, and batch identifiers.

i. A list of the affected sample results for each analyte (indexed by method and matrix) including the appropriate data qualifier flag (J, U, R, etc.), where sample results are negatively impacted by adverse quality control criteria.

j. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality for each analysis and matrix as indicated by the laboratory QC data and any other relevant findings.

j. Conclusions and recommendations.

k. Appendices containing the Chemistry data package.

3.8 DOCUMENTATION

Documentation records shall be provided as factual evidence that required chemical data has been produced and chemical data quality has been achieved. The documentation shall comply with the requirements specified in paragraphs QUALITY ASSURANCE PLAN, CHEMISTRY DATA PACKAGE, and CHEMICAL DATA FINAL REPORT.

3.9 NOTIFICATION OF NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice.

-- End of Section --

SECTION 01 45 00.00 10

QUALITY CONTROL
11/16

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, DO

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with FAR 52.246-12 Inspection of Construction. QC consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements FAR 52.246-12 Inspection of Construction. The Government will consider an interim plan for the first 15 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all construction-operations, both onsite and offsite, including work by subcontractors fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the Contractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION CONFERENCE

Before start of construction and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. This conference may be combined with other project status calls. Submit the CQC Plan a minimum of 10 calendar days prior to the Coordination Meeting. During the conference, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Prepare meeting minutes for review and signature by both the Contractor and the Contracting Officer. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site and has complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible for maintaining these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the

authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 4 years construction experience on construction similar to this Contract. This CQC System Manager is on the site at all times during construction and is employed or subcontracted by the prime Contractor. The Site Superintendent may serve or dual hat as the CQC System Manager when appropriate. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.4 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

CQC is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain

and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the Contract drawings.

c. Check to assure that all materials and equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government needs to be notified at least 36 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government needs to be notified at least 36 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.

g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 COMPLETION INSPECTION

3.7.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in FAR 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.7.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and

any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.7.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance FAR 52.246-12 Inspection of Construction.

3.8 DOCUMENTATION

3.8.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and specifications.

3.8.2 Verification Statement

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 48 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control(CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.9 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

SECTION 01 45 00.15 10

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
11/16

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

1.2 MEASUREMENT AND PAYMENT

The work of this section is not measured for payment. The Contractor is responsible for the work of this section, without any direct compensation other than the payment received for contract items.

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents will govern, in the event of discrepancy with the electronic version.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15

Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Priced Construction Contracts; Section 01 32 01.00 10 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00.00 10 QUALITY CONTROL.

1.4 RMS SOFTWARE

RMS is a Windows-based program that can be run on a Windows-based PC meeting the requirements as specified in paragraph SYSTEM REQUIREMENTS. Download, install and be able to utilize the latest version of the RMS software within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (http://rmsdocumentation.com). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 SYSTEM REQUIREMENTS

The following is the recommended system configuration to run the Contractor Mode RMS for full utilization of all features for all types and sizes of contracts. Smaller, less complicated, projects may not require the configuration levels described below. Required configuration also noted below.

Recommended RMS System Requirements	
Hardware	
Windows-based PC	1.7 GHz i3; AMD A6 3650 GHz or higher processor (REQUIRED)
RAM	8 GB
Hard drive disk	100 GB space for sole use by RMS system
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer (REQUIRED)
Word Processing software	Viewer for MS Word 2013, MS Excel 2013 or newer (REQUIRED)

Recommended RMS System Requirements	
E-mail	MAPI compatible (REQUIRED)
Virus protection software	Regularly upgraded with all issued Manufacturer's updates and is able to detect most zero day viruses (REQUIRED)

1.6 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.7 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.7.1 Administration

1.7.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.7.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.7.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.7.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.7.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.7.2 Finances

1.7.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.7.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.7.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.7.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may

be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.7.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.7.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.7.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.7.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.7.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.7.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.7.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification Section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register

in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.7.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 13 PROJECT SCHEDULE.

1.7.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.8 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.9 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
08/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2017) Reduced-Pressure Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies
FCCCHR Manual	(10th Edition) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USASCE)

EM-385-1-1	(2014) Safety and Health Requirements Manual

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2015; Rev L) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2015) Manual on Uniform Traffic Control Devices

New York State Department of Environmental Conservation (NYSDEC)

DER-10 (2010) Technical Guidance for Site Investigation and Remediation

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic Control Plan; G, DO
Temporary Site Facilities Layout Plan; G, DO

SD-03 Product Data

Backflow Preventers; G, DO

SD-06 Test Reports

Backflow Preventer Tests

1.3 TEMPORARY SITE FACILITIES LAYOUT PLAN

The Contractor shall submit a Temporary Site Facilities Layout Plan with the project work plans. The Temporary Site Facilities Layout Plan shall indicate the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used including trailers for building tenant use, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired. The facilities shall consist of the following:

a. USACE and EPA Field Office (Contractor shall provide desk space for two)
b. Contractor's Offices
c. Temporary Facilities for Tenant Use (Paragraph 3.6.2)
c. Personal Hygiene and Decontamination Facilities
d. Equipment Storage and Lunch Areas
e. On-Site Contaminated Equipment Areas
f. Parking Area
g. Outdoor Lighting within the designated support zone to ensure adequate visibility after dark
h. Decontamination Station

1.4 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.4.1 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer.

2.1.2 Project and Safety Signs

The requirements for the signs, their content, and location will be provided by the Government. Erect signs prior to mobilization. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals. A figure showing a typical project sign for EPA Region 2 is included in the appendices.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this contract. Heavy construction truck traffic shall be routed through the site's eastern gate as shown on the drawings. Use of a flagman may be necessary for trucks entering and existing the eastern gate due to limited site distance from the railroad bridge and merging of Batavia and South Main Street. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic are be avoided. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. The

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.2.3 Fencing

Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people.

a. The safety fencing must be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 48 inches high and maximum mesh size of 2 inches, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Install fencing to be able to restrain a force of at least 250 pounds against it.

2.3 TEMPORARY WIRING

Provide temporary wiring in accordance with NFPA 241 and NFPA 70. Include frequent inspection of all equipment and apparatus.

2.4 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. For potable water connections to City water, provide backflow preventers complete with flanged cast iron or brass mounted gate valve 304 stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed must be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and be accompanied by a Certificate of Full Approval from FCCCHR List. After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Contractor employees will park privately owned vehicles in an area coordinated with EPA and the facility owner and/or tenant. This area will be within reasonable walking distance of the construction site. Contractor employee parking must not interfere with existing and established parking requirements of the neighborhood.

3.2 TEMPORARY BULLETIN BOARD

Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

3.3 AVAILABILITY AND USE OF UTILITY SERVICES

3.3.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.3.2 Payment for Utility Services

The Contractor shall be responsible for providing all utilities to the site necessary to do the work. The Contractor shall be responsible for the operation of all systems, including maintenance, to assure that necessary services are provided. All electric power shall be purchased directly by the

Contractor. Utility requirements are further specified in Section 02 61 18 IN-SITU THERMAL REMEDIATION (ISTR).

3.3.3 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.3.4 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.3.5 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.3.6 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials weekly to minimize potential hazards.

3.4 TRAFFIC PROVISIONS

3.4.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with pedestrian, vehicular, or rail traffic on railways, roadways, or pedestrian trails except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the authority having jurisdiction.

3.4.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of damage to roads caused by construction activities.

The Contractor shall ensure vehicles exiting the site are not tracking mud or soil offsite or onto public roads. Equipment coming into contact with contaminated soil shall be decontaminated prior to leaving the site.

3.4.3 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment. For work conducted inside of the building, separation of the work zone from tenant occupied space shall be adequate for dust control in the tenant occupied space. For work conducted in areas of contaminated soil, Contractor shall comply with fugitive dust and particulate monitoring requirements outlined in NYSDEC DER-10 Technical Guidance for Site investigation and Remediation.

3.5 HOUSEKEEPING

The Contractor shall practice good housekeeping at the site through management of equipment and material storage in an organized, workman like manner, regular debris cleanup, clearing walkways of slip, trip, and fall hazards and regular enforcement of these practices.

3.6 CONTRACTOR'S TEMPORARY FACILITIES

3.6.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must obtain prior approval from the Contracting Officer. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.6.2 Tenant Temporary Facilities

Provide and maintain temporary facilities for building tenant use during construction, operation, and restoration of Area 4-2B ISTR. Temporary facilities shall provide the following functions: kitchen and dining, office space, and restrooms with showers. Provide utilities to support each temporary facility's function and the requirements below. Final layout and location will be negotiated with the government and tenant following contract award.

a. Kitchen and dining space with total area of 600 square feet, kitchen sink, microwave, refrigerator, tables and chairs, and two washrooms.
b. Office space with two work spaces, plan room table, storage closet, internet connection, and at least 400 square feet.
c. Locker rooms that include six individual stalls with locking door. Individual stalls shall include one toilet, sink, and shower.

At completion of the project, the office will remain the property of the Contractor and be removed from the site. Utilities will be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.

3.6.3 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site.

3.6.4 Storage Area

Construct a temporary 6 foot high chain link fence around the treatment area. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the site area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site. Do not stockpile materials outside the site in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the site area at the end of each work day.

3.6.5 Decontamination Pad

The Contractor shall be responsible for constructing a decontamination pad.

a. The decontamination station shall be equipped with a drain system and holding tank on a properly graded area that has no deleterious material.
b. Dimensions of the pad shall be adequate to contain wash waters and debris from the largest vehicle to be used at this site.
c. Prior to constructing the pad the Contractor shall obtain and analyze a minimum of one soil sample at a depth between 0-6" in the area sited for construction of the pad with the sampling results provided to the Contracting Officer Representative.
d. Upon dismantling the pad one soil sample at a depth between 0-6" in the area shall be obtained and analyzed.

e. Water collected during decontamination operations shall be collected and disposed of or treated.

3.6.6 Appearance of Trailers

a. Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on installation property.

b. Paint using suitable paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.6.7 Maintenance of Storage Area

a. Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers will be edged or trimmed neatly. Mowing shall occur at a frequency to ensure vegetation does not exceed 4-inches in height.

3.6.8 New Building

New buildings shall not be constructed on the site.

3.6.9 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment.

To help guard public safety, the Contractor shall provide either manned security patrols during nights and weekends when personnel are offsite or site security cameras mounted along the property boundary and capable of alerting security personnel remotely if an intruder is detected. In addition, the Contractor will notify the City law enforcement agency to request periodic security checks. .

3.6.10 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.6.10.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.7 GOVERNMENT FIELD OFFICE

3.7.1 Government Representative's Office

Provide the Government with an office, approximately 400 square feet in floor area, with climate control, located where directed and providing space heat, electric light and power, and toilet facilities consisting of one restroom. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Include a 4 by 8 foot plan table, two separate computer work spaces with standard size office desk and chair, printer, and internet connection. At completion of the project, the office will remain the property of the Contractor and be removed from the site. Utilities will be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer. The Government's Office may be a shared space with the Contractor, but shall include a minimum of the above requirements for computer work spaces and electronic equipment.

3.7.2 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds.

3.8 SNOW REMOVAL AND MOWING

Maintain the grounds within the Contractor's project limits (see Drawings), as required to maintain compliance with Town of Vestal Municipal Code and maintain a safe working environment to support project activities.

3.9 COMMUNICATION

Whenever the Contractor has the individual elements of its system so located that operation by normal voice between these elements is not satisfactory, the Contractor must provide a satisfactory means of communication, such as telephone, walkie-talkie, or other suitable devices and made available for use by Government personnel.

3.10 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, will become the property of the Contractor and be removed from the work site.

3.11 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store any salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

3.12 RESTORATION OF TREATMENT AREA AND SITE

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. Restore areas used by the Contractor for the storage of equipment or material, or other use to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
11/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

New York State Department of Environmental Conservation (NYSDEC)

DER-10	(2010) Technical Guidance for Site Investigation and Remediation

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846	(Third Edition; Update IV) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 262.31	Standards Applicable to Generators of Hazardous Waste-Labeling

40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.2 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.3 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.4 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.5 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.6 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibits a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.7 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by a local municipality to obtain NPDES permit coverage for their stormwater discharges.

1.2.8 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.9 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.11 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.12 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.12.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.12.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.2.12.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.12.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.12.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.12.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.12.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.12.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.13 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.14 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.14.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.15 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.16 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.17 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

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SD-01 Preconstruction Submittals

Preconstruction Inspection; G, DO

Solid Waste Management Permit; G, DO

Regulatory Notifications; G, DO

Environmental Protection Plan; G, DO

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G, DO

Dirt and Dust Control Plan; G, DO

Environmental Manager Qualifications; G

SD-06 Test Reports

Laboratory Analysis

Inspection Reports

Solid Waste Management Report; G, DO

SD-11 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook; G

Stormwater Notice of Termination (for NPDES coverage under the general permit for construction activities); G

Waste Determination Documentation; G

Disposal Documentation for Hazardous and Regulated Waste; G, DO

Solid Waste Management Permit; G

Solid Waste Management Report; G, DO

Hazardous Waste/Debris Management; G

Regulatory Notifications; G

Contractor Certification

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Inspection of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.5.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer at least 30 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the site; and types and quantities of

wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state, local, and site specific requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.5.5 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.6 ENVIRONMENTAL PROTECTION PLAN

The purpose of the Envirionmental Protection Plan (EPP) is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the local EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other

measures to be taken. Submit the EPP within 90 days after notice to proceed and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.6.1 General Overview and Purpose

1.6.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, traffic control plan, Hazardous, Toxic and Radioactive Waste (HTRW) Plan, Non-Hazardous Solid Waste Disposal Plan.

1.6.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.6.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.6.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.6.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.6.2 General Site Information

1.6.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.6.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.6.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.6.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

d. Temporary construction

e. Stream crossings

f. Fish and wildlife resources

g. Wetland areas

1.6.4 Stormwater Management and Control

a. Ground cover

b. Erodible soils

c. Temporary measures

(1) Structural Practices

(2) Temporary and permanent stabilization

d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

1.6.5 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consists of the management procedures for hazardous waste to be generated. As a minimum, include the following:

a. List of the types of hazardous wastes expected to be generated

b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated

c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications

d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures

i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.6.6 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.6.7 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.6.8 Clean Air Act Compliance

1.6.8.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on roadways. At a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.6.8.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act.

1.6.8.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.6.8.4 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.6.8.5 Monitoring

For the protection of public health, monitor and control contaminant emissions to the air from Hazardous, Toxic, and Radioactive Waste remedial action area sources to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with the Air Monitoring Plan required under Section 02 61 18 IN-SITU THERMAL REMEDIATION (ISTR).

1.6.8.6 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet local or state permit requirements for emissions.

1.7 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7 Permits and Responsibilities and New York Codes, Rules and Regulations, Title 10. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7 Permits and Responsibilities.

1.7.1 Well Drilling Permit

A New York water well drilling permit shall be obtained prior to the installation of each heating element, groundwater, multi-phase, or vapor extraction well, temperature/pressure monitoring points, or other monitoring well. Drilling permit(s) shall also be obtained prior to completion of soil borings, as applicable. The permit application shall be submitted by a licensed New York well drilling contractor. Site-wide permit equivalencies for groupings of similar equipment shall be obtained to the extent practicable.

1.7.2 Well Sealing and Abandonment Permits

Local and state permits or licenses required for sealing and abandonment of the wells shall be obtained by the Contractor prior to abandonment work. The Contractor shall follow State of New York and any other applicable requirements for abandoning or removing the wells and providing an accurate written record of all well decommissioning operations to the New York Bureau of Water Resource Management.

1.7.3 Air Permit Equivalent for Emissions and Off-Gas Treatment

The Contractor shall obtain an air permit equivalent from the NYSDEC for discharging off-gas from the vapor recovery system after treatment, and any other vents associated with the thermal treatment equipment. This includes support equipment such as emergency and supplemental generators. The Contractor shall comply with the discharge criteria in the permit equivalent. Air sampling and monitoring shall be completed at locations and at frequencies in compliance with the air permit equivalent. Contractor shall work on obtaining the air permit equivalent from NYSDEC concurrently with development of the RAWP. The air permit application shall be provided to the Government for review and approval prior to submittal to NYSDEC.

1.7.4 Wastewater Discharge Permit Equivalent

The Contractor shall obtain a process water discharge permit equivalent, sanitary sewer and/or State Pollutant Discharge Elimination System (SPDES) as necessary. The Contractor shall comply with the discharge criteria in the permit equivalent. All contact and non-contact discharge streams shall be identified in the permit. Sampling and monitoring shall be completed at locations and at frequencies in compliance with the wastewater discharge permit equivalent. Contractor shall obtain discharge permit equivalent(s) concurrently with the development of the Remedial Action Work Plan. The Contractor shall submit permit applications for government review and approval prior to submitting to the State or city.

In addition, the Contractor shall be responsible for obtaining an approval equivalency based on the Contractor's selected ISTR wastewater treatment technical approach and equipment specifications, including required design drawings and design report prepared by a New York-licensed Professional Engineer.

If required by the permit equivalent, the Contractor shall also supply properly licensed operators for the wastewater treatment system operations, based on the treatment plant complexity rating.

1.7.5 Construction General Permit

Provide a Construction General Permit as required by 40 CFR 122.26 or EPA General Permit. Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

As a result of this project occurring on a Superfund Site, building permits and fees will not be required for construction of a treatment shed or use of

a pre-fabricated treatment system. The local, State, or Federal authorities with jurisdiction will be able to request construction documents and perform inspections. All construction documents must be prepared by a professional engineer licensed in the state of New York, as well as New York licensed plumbers or electricians, as required based on the nature of the specific building permit required.

1.7.6 Stormwater

Contractor shall evaluate applicability and obtain all permit equivalents as required for stormwater management as it relates to construction and operation of the ISTR system.

1.8 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit in hard copy and electronic format at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.9 SOLID WASTE MANAGEMENT PERMIT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Government, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the local municipality or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.2 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Contracting Officer for any release of contaminated water.

3.2.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval, prior to the commencement of work. The SWPPP must meet the requirements of 40 CFR 122.26 and the New York State General Permit for stormwater discharges from construction sites.

Include the following:

a. Comply with terms of the EPA general permit for stormwater discharges from construction activities. Prepare SWPPP in accordance with EPA requirements. Use EPA guide Developing your Stormwater Pollution Prevention Plan located at https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=60000FNM.TXT to prepare the SWPPP.

b. Select applicable BMPs from EPA Fact Sheets located at https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu or in accordance with applicable state or local requirements.

c. Include a completed copy of the Notice of Intent, BMP Inspection Report Template, and Stormwater Notice of Termination, except for the effective date.

3.2.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for NPDES coverage under the general permit for construction activities to the Contracting Officer for review and approval.

Submit the approved NOI and appropriate permit fees onto the appropriate federal or state agency for approval. No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at

the onsite construction office, and continually update as regulations require, reflecting current site conditions.

3.2.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with EPA Construction General Permit.

3.2.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Construction General Permit. Include a copy of the permit Notice of Intent, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, copies of correspondence with the EPA, and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.5 Stormwater Notice of Termination for Construction Activities

Submit a Notice of Termination to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the appropriate state or federal agency. Prepare information required by the permitting agency for certification of the stormwater management system, and provide to the Contracting Officer.

3.2.6 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.7 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.8 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.9 Municipal Separate Storm Sewer System (MS4) Management

Comply with the local MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States.

3.4 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards including DER-10, NYSDEC Remediation Technical Guidance for Site Investigation and Remediation.

3.4.1 Dust Control

Keep dust down at all times, including during nonworking periods. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.4.1.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, local air pollution standards, or that would cause a hazard or a nuisance. Monitor in compliance with NYSDEC DER-10 Appendix 1B guidance on particulate monitoring at contaminated sites. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.4.2 Odors

Control odors from construction and operational activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.5 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.5.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6 WASTE MANAGEMENT AND DISPOSAL

3.6.1 Waste Determination Documentation

Complete a Waste Determination form for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.6.1.1 Sampling and Analysis of Waste

3.6.1.1.1 Waste Sampling

Sample waste in accordance with EPA SW-846. Clearly mark each sampled drum or container with the Contractor's identification number, and cross reference to the chemical analysis performed.

3.6.1.1.2 Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. Provide analytical results and reports performed to the Contracting Officer.

3.6.2 Solid Waste Management

3.6.2.1 Solid Waste Management Report

Provide copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. On a monthly basis, submit a solid waste disposal report to the Contracting Officer. For each waste, the

report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste. In lieu of sales documentation, a statement indicating the disposal location for the solid waste that is signed by an employee authorized to legally obligate or bind the firm may be submitted. The sales documentation Contractor certification must include the receiver's tax identification number and business, EPA or state registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained for the Contractor's own use, submit the information within the solid waste disposal report. Prices paid or received do not have to be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.6.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill is the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.6.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.6.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Government. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste

determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.6.3.2 Hazardous Waste Disposal

3.6.3.2.1 Responsibilities for Contractor's Disposal

Provide hazardous waste manifest to the designated Government Waste Manifest signature for review, approval, and signature prior to shipping waste off Government property.

Generators are encouraged, but not required to register for e-Manifest or use the e-Manifest system: https://www.epa.gov/e-manifest/e-manifest-user-registration. The Contractor may continue to use paper manifests, e-manifests, or use hybrid of paper and electronic.

3.6.3.2.1.1 Services

Provide service necessary for the final treatment or disposal of the hazardous material or waste in accordance with 40 CFR 260, local, and state, laws and regulations, and the terms and conditions of the Contract within 60 days after the materials have been generated. These services include necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal or transportation, include manifesting or complete waste profile sheets, equipment, and compile documentation).

3.6.3.2.1.2 Samples

Obtain a representative sample of the material generated for each job done to provide waste stream determination.

3.6.3.2.1.3 Analysis

Analyze each sample taken and provide analytical results to the Contracting Officer. See paragraph WASTE DETERMINATION DOCUMENTATION.

3.6.3.2.1.4 Labeling

Determine the Department of Transportation's (DOT's) proper shipping names for waste (each container requiring disposal) and demonstrate to the Contracting Officer how this determination is developed and supported by the sampling and analysis requirements contained herein. Label all containers of hazardous waste with the words "Hazardous Waste" or other words to describe the contents of the container in accordance with 40 CFR 262.31 and applicable state or local regulations.

3.6.3.3 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste.

The Contractor shall sign all waste profiles, shipping records, and other supporting documents on behalf of the USEPA in connection with the management and disposal of non-hazardous waste. Manifests requiring a shipper's certification number shall be signed by a USEPA Region 2 representative.

3.6.4 Releases/Spills of Oil and Hazardous Substances

3.6.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the local Fire Department, Contracting Officer, and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.6.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.6.5 Mercury Materials

Immediately report to the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.7 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the site. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.8 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.9 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.9.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.9.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that

no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the site for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.10 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.11 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the noise restrictions outlined in Section 01 14 00 WORK RESTRICTIONS.

3.12 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 02 61 13

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL
02/10

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work consists of excavation that may be required to support installation of the in situ thermal remediation (ISTR) areas (e.g., trenching for installation of vapor recovery trenches) or excavation that may be required for installation of temporary utilities.

Polychlorinated biphenyls (PCBs) are present in Area 3 ISTR treatment zone above soil remediation goals at one of the sample locations. Thermal treatment is not intended to remove PCBs beyond incidental recovery. If confirmation soil sample results collected following ISTR operations in Area 3 indicate PCBs (total Aroclors) are present above soil remediation goals (1 mg/kg between 0-1 ft bgs and 10 mg/kg between >1 ft bgs), then focused excavation of PCBs will be executed as a Contract Option assuming a fixed unit rate. The total estimated in place volume of soil targeted for excavation is 600 cubic yards based on one sample exceedance at 5 ft bgs at one boring location, sB-30, as detailed on the figures and drawings. The estimated in-place volume does not account for bulking that may occur post excavation. Subsurface conditions are shown on the figures and drawings and in the Appendices. Excavation and disposal methods shall be included in an addendum to the Remedial Action Work Plan specified in Section 02 61 18 IN-SITU THERMAL REMEDIATION in the event excavation is needed.

The estimated depth of excavation at Area 3 has been defined as 10 ft based on soil data collected from sB-30. Backfill material is not available onsite. Groundwater varies across the site and is approximately 12-14 feet below pre-excavation ground surface. Required sampling and chemical analysis shall be conducted in accordance with Section 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL.

1.1.1 Scheduling

Notify the Contracting Officer 7 calendar days prior to the start of excavation of contaminated material. The Contractor shall be responsible for contacting regulatory agencies in accordance with the applicable reporting requirements.

1.1.2 Work Plan

No work at the site, with the exception of site inspections and surveys, shall be performed until the Remedial Action Work Plan Addendum is approved. At a minimum, the excavation requirements under the Remedial Action Work Plan Addendum shall include:

a. Schedule of activities.

b. Method of excavation and equipment to be used.

c. Shoring or side-wall slopes proposed.

d. Dewatering plan (if needed).

e. Storage methods and locations for liquid and solid contaminated material.

f. Borrow sources and haul routes.

g. Decontamination procedures.

h. Spill contingency plan.

i. Disposal of treated soil offsite.

1.1.3 Other Submittal Requirements

Submit separate cross-sections of each excavation area before and after excavation and after backfilling, as well as test results.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Backfill
Sampling Liquid; G, DO
Topsoil

SD-07 Certificates

Shipping documentation
Certificate of Disposal

1.3 REGULATORY REQUIREMENTS

1.3.1 Permits and Licenses

Obtain required federal, state, and local permits for excavation and storage of contaminated material. Permits shall be obtained at no additional cost to the Government.

1.3.2 Air Emissions

Air emissions shall be monitored and controlled in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS and Section 02 61 18 IN-SITU THERMAL REMEDIATION.

PART 2 PRODUCTS

2.1 SPILL RESPONSE MATERIALS

Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.

2.2 BACKFILL AND TOPSOIL

Backfill material and topsoil shall be obtained from offsite sources approved by the Contracting Officer. Backfill shall be classified in accordance with ASTM D2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML, MH, CL, or CH. Topsoil shall be natural, friable soil that is representative of soils in the vicinity capable of producing heavy growths of crops, grass, or other vegetation and that is reasonably free from underlying subsoil, clay clumps, brush, weeds, litter, matted roots, stumps, stones, toxic substances, or any other material that may be harmful to plant growth. Topsoil shall be capable of establishing vegetative growth with consideration given to particle size, organic content, and pH. Backfill shall be free from roots and other organic matter, trash, debris, snow, ice or frozen materials. Backfill material and topsoil shall be certified as clean as compared to New York State soil cleanup objectives (SCOs). Backfill shall not exceed the lower of the protection of groundwater or the protection of public health for residential SCOs as set forth in 6 NYCRR Part 375 Table 375-6.8(b). Laboratory tests shall be performed for the parameters listed below at a frequency of once per 1,000 cubic yards. A minimum of one set of tests shall be performed per borrow source.

Chemical Parameter	Test Frequency	Method
SVOC	once per 1000 cubic yards	SW 846 Method 8270C
VOC	once per 1000 cubic yards	SW 846 Method 8260
PCBs/Pesticides	once per 1000 cubic yards	SW 846 Method 8081/8151
Metals/Mercury	once per 1000 cubic yards	SW 846 Method 6020/7470
Radium 226	once per 1000 cubic yards	EPA Method 903.1

Do not use material for backfill or topsoil until borrow source chemical test results have been submitted and approved by the Contracting Officer.

PART 3 EXECUTION

3.1 SURVEYS

Perform surveys immediately after excavation of contaminated material and immediately after backfill of each excavation. Provide cross-sections on 2 foot intervals and at break points for all excavated areas. Locations of confirmation samples (collected by Others and provided to the Contractor by the government) shall also be surveyed and shown on the figures anddrawings.

Perform surveys in accordance with Section 01 11 10 SURVEYING. Drawings showing final excavation extents, depths, and confirmation sampling results shall be included in the Remedial Action Report discussed in Section 02 61 18.

3.2 EXISTING STRUCTURES AND UTILITIES

No excavation shall be performed until site utilities have been field located. Take the necessary precautions to ensure no damage occurs to existing structures and active utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Government. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Contracting Officer.

3.3 CLEARING

Limited clearing is expected during execution of this contract. If required,woody material such as trees and brush may be chipped and stored onsite or disposed of offsite as specified in the Contractor's Waste Management Plan or Remedial Action Work Plan.

3.4 CONTAMINATED MATERIAL REMOVAL

3.4.1 Excavation

Areas of contamination shall be excavated to the depth and extents proposed in the Remedial Action Work Plan Addendum as determined by pre-excavation confirmation sampling results. Soils above PCB cleanup goals (Table 4 of Section 02 61 18 In Situ Thermal Remediation) shall be excavated. Estimated extents, depths, and in-place volumes are shown on the figures anddrawings for the purposes of establishing a fixed unit rate. Excavation shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. An excavation log describing visible signs of contamination encountered shall be maintained. Excavation logs shall be prepared in accordance with ASTM D5434. All excavated contaminated material shall be disposed offsite.

3.4.2 Shoring

If workers must enter the excavation, it shall be evaluated, shored, sloped or braced as required by EM 385-1-1 and 29 CFR 1926 section 650.

3.4.3 Dewatering

Surface water shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to perform a safe excavation, prevent the spread of contamination, and to ensure that compaction requirements can be met.

3.5 CONFIRMATION SAMPLING AND ANALYSIS

Pre-excavation confirmation soil sampling shall be completed as part of the ISTR soil confirmation sampling event and supplemented by additional sampling to meet excavation sampling requirements detailed in NYSDEC Technical Guidance for Site Investigation and Remediation or DER-10. Results will be used to pre-define the horizontal and vertical extent of excavation

and minimize the duration of an open excavation area. The Contracting Officer shall be present to inspect the removal of contaminated material. After all material suspected of being contaminated has been removed, the excavation shall be examined for evidence of contamination.

Final excavation extents and depths will be provided to the Contractor Officer. Excavation shall not occur outside of property boundaries. Additional excavation shall be subject to approval by the Contracting Officer. Locations of samples shall be documented on the record drawings.

3.6 CONTAMINATED MATERIAL STORAGE

3.6.1 Stockpiles

Stockpiles shall be constructed to isolate stored contaminated material from the environment. The maximum stockpile size shall be 500 cubic yards. Stockpiles shall be constructed to include:

a. A chemically resistant geomembrane liner free of holes and other damage. Non-reinforced geomembrane liners shall have a minimum thickness of 20 mils. Scrim reinforced geomembrane liners shall have a minimum weight of 40 lbs/1000 square feet. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.

b. Geomembrane cover free of holes or other damage to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have a minimum thickness of 10 mils. Scrim reinforced geomembrane covers shall have a minimum weight of 26 lbs/1000 square feet. The cover material shall be extended over the berms and anchored or ballasted to prevent it from being removed or damaged by wind.

c. Berms surrounding the stockpile, a minimum of 12 inches in height. Vehicle access points shall also be bermed.

d. The liner system shall be sloped to allow collection of any liquids within the stockpiles. Storage and removal of liquid which collects in the stockpile, in accordance with paragraph Liquid Storage.

Following removal of the stockpiled soil and containment system, the underlying membrane shall be inspected for damage. If damage is observed, then the Contracting Officer may request additional sampling to ensure underlying soils were not impacted by the stockpiled soil.

3.6.2 Roll-Off Units

Roll-off units used to temporarily store contaminated material shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. Liquid which collects inside the units shall be removed and stored in accordance with paragraph Liquid Storage.

3.6.3 Liquid Storage

Liquid collected from excavations and stockpiles shall be temporarily stored in approved tanks as proposed in the Remedial Action Work Plan Addendum.

Liquid storage containers shall be water-tight and located within secondary containment of sufficient size to contain 110% of the volume of the largest tank within the containment area.

3.7 SAMPLING

3.7.1 Sampling of Stored Soil

Stored material with contaminant levels that exceed the soil remediation goals shall be characterized and disposed offsite. Analyses for contaminated soil to be taken to an offsite disposal facility shall conform to local, state, and federal criteria as well as to the requirements of the disposal facility. Documentation of all analyses performed shall be furnished to the Contracting Officer. Additional sampling and analysis to the extent required by the approved disposal facility receiving the material shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Provide the Contracting Officer with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Remedial Action Work Plan Addendum and shall be approved by the Contracting Officer prior to waste disposal.

3.7.2 Sampling Liquid

Liquid collected from excavations and decontamination facilities shall be sampled at a frequency of once for every 5000 gal of liquid collected, unless this waste is discharged with the Contractor's onsite ISTR treatment system process water and is otherwise approved as a discharge stream. Samples shall be tested for all site COCs and parameters necessary to meet discharge or offsite disposal requirements. The UFP-QAPP shall detail sampling methods.

Liquid with contaminant levels that exceed action levels shall be treated offsite or through the Contractor's onsite treatment system. Analyses for contaminated liquid to be taken to an offsite treatment facility shall conform to local, state, and federal criteria as well as to the requirements of the treatment facility. Documentation of all analyses performed shall be furnished to the Contracting Officer. Additional sampling and analysis to the extent required by the approved offsite treatment, storage or disposal (TSD) facility receiving the material shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Provide the Contracting Officer with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Remedial Action Work Plan and shall be approved by the Contracting Officer prior to waste disposal.

3.8 SPILLS

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), notify the Contracting Officer immediately. If the spill exceeds the reporting threshold, follow the pre-established procedures as described in the Remedial Action Work Plan for immediate reporting and containment. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As

directed by the Contracting Officer, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Government.

3.9 BACKFILLING

3.9.1 Confirmation Test Results

Excavations shall be backfilled immediately after all contaminated materials have been removed, pre-defined excavation extents have been confirmed and approved by the Contracting Officer. Backfill shall be placed and compacted to match existing grades and sloped to provide drainage.

3.9.2 Compaction

Place approved backfill in lifts with a maximum loose thickness of 12 inches and machine compact each lift with a minimum of 3 passes by compaction equipment. Compaction shall be sufficient to prevent surface depressions and ponding of water. The Contractor is responsible for achieving sufficient compaction of soils. If initial compaction efforts are inadequate to prevent settling and ponding of water during duration of the contract, then Contractor shall add fill to promote adequate drainage.

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibrating compactors, or other approved equipment. Compact soil and subgrade to not less than the following percentages of maximum dry unit weight and optimum moisture according to ASTM D1557:

a. Under structures and building slabs, compact each layer of backfill at 95 percent
b. Under steps and pavements, compact each layer of backfill or engineering fill at 95 percent
c. Under walkways and within a distance of 10 feet from all structures, building slabs, pavements and pipes, compact each layer of backfill or engineering fill at 90 percent
d. Under lawn or unpaved areas, compact each layer of backfill at 85 percent. Do not over compact lawn areas
e. Granular pipe embedment material, compact each layer of backfill at 95 percent
f. Trench backfill above pipe, compact each layer of backfill at 95 percent
g. Plus or minus 2.5 percent of optimum moisture
h. If a moisture content of plus or minus 2.5 percent falls outside the compaction curve for achieving 95 percent degree of compaction, then the allowable moisture range shall be reduced such that it falls within the compaction curve specific to the material being compacted

3.9.3 Erosion Control

The Contractor shall control erosion of newly backfilled areas through erosion matting, revegetation, and other means as specified in their Environmental Protection Plan and RAWP. In areas with steep slopes, the Contractor shall be responsible for stabilizing the slope until vegetation can be established.

3.10 TRANSPORTATION AND DISPOSAL

Furnish labor, materials, and equipment necessary to store, transport, and dispose of PCB contaminated material in accordance with Federal, State, and local requirements. Prepare and maintain waste shipment records and manifests required by the Resource Conservation and Recovery Act (RCRA), U.S. Federal Department of Transportation (DOT), and State transportation department.

The Contractor shall dispose of excavated and characterized soils offsite in accordance with their approved Waste Management Plan.

3.10.1 Transportation

49 CFR 171, 49 CFR 172, 49 CFR 173, 49 CFR 174, 49 CFR 176, 49 CFR 177, 49 CFR 178 49 CFR 179. Transport PCB contaminated soils in vehicles designed to carry PCB contaminated soils in accordance with Federal and State requirements. Transport PCB contaminated solid material, articles, or equipment in DOT Specification 5, 5B, or 17C containers with removable heads. Store liquid PCBs in DOT Specification 17E containers. In addition to those requirements:

a. Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.

b. Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

c. Perform and document decontamination procedures prior to leaving the worksite and again before leaving the disposal site.

3.10.1.1 Weight Certification

Weigh vehicles transporting PCB contaminated materials at a State-certified weigh scale within 20 miles of the project site.

3.10.1.2 Shipping Documentation

40 CFR 761. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities and EPA identification numbers. Within 35 days from shipment date, the transporter shall provide a copy of the manifest signed and dated by the disposer.

3.10.1.3 Payment Upon Furnishing Certificate of Disposal of PCBs

Payment will not be made until the certificate of disposal has been furnished to the Contracting Officer.

3.10.2 Disposal

Dispose of PCB contaminated soils in accordance with 40 CFR 761 at a TSCA regulated landfill meeting the requirements of 40 CFR 761.75. The disposer shall forward a copy of the manifest to the Contracting Officer within 30 days of receipt of PCBs.

3.10.2.1 Certificate of Disposal

Submit certificate of disposal to the Government within 30 calendar days of the date that the disposal of the PCB waste identified on the manifest was completed. Include:

a. The identity of the disposal facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761, Section 3.

-- End of Section --

SECTION 02 61 18

IN-SITU THERMAL REMEDIATION (ISTR)
02/10

PART 1 GENERAL

1.1 SUMMARY

Provide all personnel, equipment, facilities, materials, utility connections, and other items necessary to perform *In Situ* Thermal Remediation (ISTR) at the Site.

The Contractor shall be responsible for selecting the appropriate ISTR technology or combination of technologies necessary to achieve performance criteria within the thermal treatment zones (TTZ).

The ISTR system shall be capable of treating the TTZ soils and groundwater. The Contractor shall be responsible for design and implementation of its selected ISTR approach, associated means and methods (e.g., heater well spacing and equipment), and overall schedule suitable for achieving the performance criteria within the period of performance and tenant relocation timeframe for Area 4-2B.

All project data collected shall be made available through the project website, as required under Section 01 30 00 ADMINISTRATIVE REQUIREMENTS.

1.1.1 Thermal Treatment Zone

In situ thermal remediation is divided across four different areas (Area 3, Area 4-1, Area 4-2, and Area 4-2B) as shown on the figures and drawings. The thermal treatment areas include 35,992 square feet. Table 2 includes areas and volumes for each treatment area.

1.1.2 Potential Focused Excavation of PCBs in Area 3

Polychlorinated biphenyls (PCBs) are present in the ISTR treatment areas, predominantly in Area 3 and co-located with LNAPL. PCBs are present also in low levels in Area 4 at concentrations below soil remediation goals as summarized in the Appendices. Thermal treatment is not intended to remove PCBs beyond incidental recovery. If confirmation soil sample results collected following ISTR operations in Area 3 indicate PCBs (total Aroclors) are present above soil remediation goals (1 mg/kg between 0-1 ft bgs and 10 mg/kg between >1 ft bgs), then focused excavation of PCBs will be executed as a Contract Option assuming a fixed unit rate. The total estimated in place volume of soil targeted for excavation is 600 cubic yards based on one sample exceedance at 5 ft bgs at one boring location, as detailed on the figures and drawings.

1.1.3 Mass Estimates

A government estimate of mass within the ISTR TTZ is included in the Appendices for reference. Approximately 970 pounds of constituents of

concern (Table 4) are present within the ISTR TTZ based on volumes, soil concentration, and calculations derived from the Earth Volumetric Studio (EVS) 3-dimensional model. The presence of volatile organic compounds that are not COCs and that are expected to be recovered during ISTR was estimated to be 50 lbs. Mass is summarized by constituent, treatment area, and geological unit (fill and alluvium vs. sand and gravel). For the purpose of equipment sizing and treatment train selection, the mass present within each treatment area, including PCBs and LNAPL, will need to be assessed independently by the Contractor and summarized within the Remedial Action Work Plan.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D5092	(2016) Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SESDPROC-105-R2	(2013) Groundwater Level and Well Depth Measurement

1.3 GENERAL REQUIREMENTS

1.3.1 Chemical Testing

Chemical sampling and analysis required in this section shall be conducted in accordance with SECTION 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL.

1.3.2 Submittal Requirements

Pre-construction and closeout submittals shall be provided in both hard copy and electronic files via file transfer or on disc. Other project submittals may be provided via electronic file transfer. Electronic files shall be compatible with the following software: Microsoft Office 2013, Adobe PDF, Bentley Microstation V8i or AutoCADD 2016 equivalent. If a part of a submittal is not available in electronic format, include a note describing which items were not provided in electronic format and explaining why the items could not be provided in electronic format.

1.3.3 Sequencing and Scheduling

Following the notice to proceed, the Contractor shall prepare pre-construction submittals, obtain permit equivalencies, mobilize to the site, and conduct site preparation activities.

The sequence of work shall be as follows: site preparation, construction, system commissioning, system operations, confirmation sampling to support shutdown, post-shutdown cool down period, focused excavation for PCBs (if required), and site restoration. Baseline monitoring shall be completed prior to initiating commissioning. Commissioning of the full-scale system

shall not be initiated until after receiving approval from the Contracting Officer.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Air Monitoring Plan; G, DO
Remedial Action Work Plan; G, DO
Video Inspection Of Sanitary Sewer; G, DO
Permit Equivalency Applications For Air And Treated Water Discharges; G, DO
RAWP Addendum For Focused Excavation; G, DO

SD-03 Product Data

Commissioning Team
Commissioning Plan; G, DO
Pre-Commissioning Tests; G, DO
Pre-Commissioning checks
Exposure Monitoring/Air Sampling Program; G, DO

SD-06 Test Reports

Baseline Monitoring Report
Commissioning Report
Air Monitoring Data; G, DO

SD-10 Operation and Maintenance Data

Shutdown Memorandum; G, DO

SD-10 Operation and Maintenance Data

Weekly Progress Reports; G, DO
Monthly Progress Reports; G, DO

SD-11 Closeout Submittals

Remedial Action Report; G, DO

1.5 REMEDIAL ACTION WORK PLAN (RAWP)

The Contractor shall prepare and submit for approval a RAWP within 90 calendar days of receiving the notice to proceed. The RAWP shall address all items as discussed in this specification and other relevant specifications, and shall include a project schedule in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE. See Table 1 for Monitoring Requirements to be included in the RAWP. The RAWP shall include, but is not limited to, the following information:

Site Preparation Components

a. Site preparation activities, including drawings to support utility connections such as sanitary sewer tie-in and surface water discharge piping, water supply vault and piping, power drop/transformer and primary and secondary lines, and natural gas piping and meter.
b. Drawings depicting the site layout: temporary facilities, equipment staging, utilities, treatment system layout
c. Evaluation of existing sub-slab depressurization system constructed by ERT within the Building and plans for abandonment or use during operations.
d. Other information as required to demonstrate that the design, construction, and operational approach meets the Contract Documents.

ISTR Approach Components

a. Basis of design for the ISTR well field and vapor and liquid treatment equipment including equipment sizing
    - COC mass calculations
    - Mass and energy balance
b. Onsite thermal treatment approach
c. Sequencing of work including modeled estimates of energy input needed to reach target temperature and duration necessary to achieve performance criteria
d. Vapor and thermal cover design
e. Plan and profile drawings depicting well field layout and construction (number, spacing, well construction diagrams, mechanical depiction of surface completion, above ground piping layout)
f. Process controls description
g. Process drawings for in-situ equipment as well as above ground treatment system equipment: process flow diagrams, piping and instrumentation diagrams
    - System data collection and monitoring summary: type, locations, and frequency
h. Electrical one-line diagrams
i. Summary of permit equivalence requirements
j. Generator sizing and operational plan (e.g., supplemental, backup, etc.)
k. Steam design and delivery: piping layout and P&ID including boiler, boiler specifications, flow monitoring systems, steam supply valving at each well head, design pressure and design flow leaving boiler, design injection pressure and flow per well and rationale, description of piping insulation and labeling, and a summary of New York State boiler regulation
l. Area Classification Assessment to evaluate potential for flammable or explosive conditions, identify NFPA classification, and specify appropriate equipment

Implementation Planning Components

a. The estimated amount of energy, water, fuel, and other consumable materials (e.g., granular activated carbon) to operate the ISTR system throughout the duration of the treatment period.
b. Contingency Plan with Hazards Analysis: to include screening level exceedance for indoor and outdoor air monitoring, voltage monitoring exceedance, loss of hydraulic control, observed positive pressure, observed settlement, process water spill, and loss of utility power.
c. Baseline Monitoring
d. Noise Monitoring

e. Utility Protection, including sanitary sewer video inspection of portions that are affected by ISTR, sewer protection details, roof drain protection
f. Settlement Monitoring: monitoring for potential settlement that could affect the building near Areas 3, 4-1, and 4-2B.
g. Waste Management
h. Stormwater Management
i. Traffic Control
j. Air Monitoring
k. Hot soil and hot groundwater sampling standard operating procedures
l. Settlement Monitoring: monitoring for potential settlement that could affect the building near Areas 3, 4-1, and 4-2B.
m. Site Restoration

Following submittal of the Draft RAWP, the Contractor shall schedule a Preconstruction and Work Plan Review meeting at EPA Region 2 according to Section 01 30 00 ADMINISTRATIVE REQUIREMENTS. Assume a 30 day government review period for the remedial action work plan and submittal of a Draft and Final version.

If focused excavation is required in Area 3, submit a RAWP Addendum for Focused Excavation describing the excavation methods necessary to achieve requirements detailed in 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.6 REGULATORY REQUIREMENTS

1.6.1 Permits and Licenses

Commence remedial construction onsite only after the relevant permit equivalency steps are met, other project approvals are obtained and documentation submitted to the Contracting Officer. All remedial activities shall comply with federal, state, and local regulations and patent requirements. Permit equivalency applications for air and treated water discharges shall be submitted to the government as a pre-construction submittal to ensure an accurate portrayal of site conditions. The Contractor shall comply with any additional permit equivalent requirements as necessary. 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS contains permit equivalents that may be required.

1.6.2 Air Emissions

Air emissions shall be monitored, controlled, and reported in accordance with all local, state, and Federal regulatory requirements. Vapor treatment equipment shall achieve at least a 90 percent destruction and removal efficiency of COC mass, as calculated by monthly analytical samples obtained at the influent and effluent of the vapor treatment system as described in Tables as well as meet permit equivalent requirements. Supplemental generators used onsite for non-emergency purposes shall be EPA Tier 4 Final certified.

1.6.3 Noise Control

The Contractor shall provide details in the RAWP identifying how noise levels will be monitored and managed to ensure maximum noise thresholds for the project are not exceeded. Maximum noise levels are detailed in section 01 14 00 WORK RESTRICTIONS

1.7 UTILITIES

The Contractor shall be responsible for all utility costs, including but not limited to usage, distribution, and other fees associated with energy, water, fuel, and other consumable materials to meet project objectives.

The Contractor shall be responsible for the design, permitting, furnishing, and installation of all utilities required to support the Contractor's operations.

The Contractor shall locate subsurface utilities such as water, gas, and sewer lines prior to establishing connections and tie-ins. Existing conditions are shown on Drawings and represent a compilation of recent and historical survey and building owner supplied information.

1.7.1 Utility Protection

The Contractor shall protect the following utilities or repair or replace-in-kind if damaged during construction or operation.

According to the building tenant, the existing 6-inch sanitary sewer line to the south of the building that was installed as part of the building addition in the 1980s is not currently in use and may have been abandoned. The material, exact depths (western most lateral near Stage Road is estimated at 4.5 ft below finished grade), and condition of this line are currently unknown. The cleanouts shown on the drawings were observed to be covered by asphalt during a 2019 site inspection. The portion of the sanitary sewer beneath the building in Area 4-2B is PVC as shown on the Drawings and as described in a March 2019 site inspection memo included in Appendix E.

The Contractor shall conduct a video inspection of sanitary sewer to document sewer condition, material, depths, layout and determine the extent and method of in-place protection needed to preserve the sewer for future use. The sanitary sewer in Area 4-2B will not be receiving flow during ISTR operations. Because the material of the sanitary sewer to the south of the building is unknown, the Contractor should assume the portion of the sewer affected by ISTR operations will require in-place protection through either a resin coating, installation of a cure-in place pipe, or approved equivalent.

Subsurface building roof drains shown near Area 4-1 and Area 4-2 and shown on the drawings are constructed with corrugated metal pipe. As part of the RAWP, the Contractor shall detail plans to re-route drainage during ISTR operations and restore drainage during site restoration.

1.7.2 Electrical

Overhead power lines are available along Stage Road to the North and West of the Site. Power lines also continue along the Southern border of the Site along the edge of the paved lot. The Contractor shall be responsible for the design, procurement, and installation of the primary power service drop to supply all required power for operations, including all required coordination with the local power utility company and all engineering support required to evaluate the adequacy of the existing overhead service lines to support the Contractor's power needs. The primary service lines

connecting the power drop to the transformer shall be buried, unless approved by the Town of Vestal and allowed by local electrical codes.

The power service drop shall include all infrastructure required to connect to the existing overhead power service and to bring the required power to the Contractor's electrical distribution equipment and trailers.

The power service drop shall include separate service metering to allow for tracking of the Contractor's power usage and costs. The design, permitting, procurement, and installation of the power service drop shall be incorporated into the pre-construction period in the Contractor's project schedule.

1.7.3 Natural Gas

A natural gas line runs along the west side of Stage Road to the west of the site, as shown on the drawings. If natural gas is utilized within the ISTR system, the Contractor shall be responsible for its design, procurement, and installation to support the Contractor's selected operations, including all required coordination and submittals to the natural gas utility company. The natural gas connection shall include service metering to allow for tracking of the Contractor's usage and costs. The design, permitting, procurement, and installation of a new tap or an upgrade to the existing line shall be incorporated into the pre-construction period in the Contractor's project schedule.

1.7.4 Water Supply

The Contractor's water service design shall include all coordination required with local water utility representatives to evaluate the adequacy of the existing water service for supporting the Contractor's needs. A 6-inch water line runs north-south along Stage Road on the west side of the property and continues along the north side of the building as shown on the drawings. The water service installation shall include all infrastructure required to connect the existing water service to the Contractor's ISTR infrastructure, which may include including furnishing and installing a new water main tap, a backflow preventer and vault, and if necessary, trench work to convey water to the ISTR system. The Contractor shall propose the appropriate water line construction and method for protecting against freezing. Water connection details are subject to approval by the Town of Vestal prior to construction. The water service shall include separate service metering to allow tracking of the Contractor's water usage and costs.

1.7.5 Treated Water Discharges

For all water discharge, the Contractor is responsible for coordinating with applicable entities to secure discharge to either stormwater or sewer systems. Treated water can be discharged to the stormwater under a new State Pollutant Discharge Elimination System (SPDES) permit equivalency to be obtained by the Contractor. Preliminary evaluation of surface discharge locations identified the drainage ditch to the South of the Vestal Rail Trail which eventually drains to the Susquehanna River as a viable candidate as the drainage ditch to the north of the site, according to inspections, drains to the east and into the wetlands residing on the east side of the property.To discharge to the South of the Vestal Rail Trail, the Contractor shall install a pipe with ramp suitable for pedestrian and bicycle traffic.

Discharges to surface water under a SPDES permit equivalency shall also meet New York State ambient water quality standards and Federal National Primary Drinking Water Regulations.

Treated process water may also be discharged to the sanitary sewer subject to approval from the Town of Vestal. The government held planning level discussions with the Town of Vestal water and wastewater department regarding expected discharge flows, tie-in requirements, and potential VOC treatment limits. The 200 Stage Road sewer connection is at the northwestern corner of the site with a 24-inch sanitary sewer manhole. An eight inch sewer line runs north-south along Stage Road. During these discussions, one suggested tie-in option included discharging through an existing cleanout associated with the unused 6-inch sewer line on the south side of the building (shown on the Drawings). The Town indicated a typical total VOC concentration limit of 2.1 mg/L for these types of discharges. The Town also did not anticipate infrastructure issues receiving a flow of 50 gallons per minute, a planning level flow rate provided during discussions. However, permit equivalent concentration and flow requirements will be determined during the Contractor's application process.

The Contractor shall design, furnish, install, test, and operate all equipment and facilities required to treat its wastewater discharges. In the event of a permit exceedance, the Contracting Officer shall be notified immediately and a corrective action plan implemented. The Contractor shall be solely responsible for any permit/discharge violations resulting from their operations. For discharge to surface water, all treated contact process water shall meet NYDEC ambient water quality standards in accordance with NYDEC TOGOS Series 1.1.1 regardless of state permit limits. If the treated groundwater being discharged to the POTW contains concentrations of constituents above New York ambient water quality standards TOGOS Series 1.1.1 , then above ground piping shall be dual walled with a leak detection system in place. A manual lockable valve shall also be installed on discharge lines to either the sanitary sewer or surface water.

During startup and commissioning, analytical results demonstrating achievement of permit limits shall be available prior to discharging. In the event of a permit exceedance, the Contractor shall provide analytical results and sufficient lines of evidence demonstrating treated water is within permit limits prior to discharging.

1.8 QUALITY ASSURANCE

The Contractor shall be responsible for project quality control and establish and maintain an effective quality control system in accordance with 01 45 00.00 10 QUALITY CONTROL and 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL. The Quality Control (QC) system shall include plans, procedures, and organization necessary to complete the work. Documentation shall be maintained to provide evidence that the required quality control activities and tests were performed as required by the RAWP, UFP-QAPP, and CQCP. Documentation records shall also include work performed by subcontractors.

The Contractor shall photographically record the ISTR process, in accordance with Section 01 30 00 ADMINISTRATIVE REQUIREMENTS.

Onsite audits and inspections by the Government shall be permitted throughout all phases of the remedial construction and operation.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 EQUIPMENT

The following equipment are common components of ISTR systems. The Contractor may propose alternative components in the RAWP based on their approach. Any additional equipment not specified below shall be included in the RAWP. All equipment and components proposed in the RAWP shall be described in detail. The components utilized shall be designed, installed, constructed, operated, controlled, and monitored as one complete, compatible unit. All components utilized at the site shall be constructed of materials that are thermally and chemically compatible with the contaminants and temperatures of the vapors and liquids recovered. All equipment shall be properly rated for the environment and location where it will be operating, to include the potential for being in contact with hazardous materials as well as extreme weather. Equipment shall conform to pertinent local and national codes.

3.1.1 Above Ground Treatment Systems

3.1.1.1 Knock-out Tank and Moisture Separators

Provide knock-out tank and moisture separator with capabilities to separate, demist and condense significant moisture from the influent soil vapor and groundwater being recovered. The separator shall have sufficient holding capacity to allow constant operation without shutdowns of the overall system. Equipment shall be constructed of suitable material for its intended purpose and incorporate the necessary gauges, piping, valves, sensors, and level control switches, or equivalent, to allow its effective and continuous functioning.

3.1.1.2 Vacuum Blower

Provide vacuum blower(s) with motors properly sized and sheaved to accommodate sufficient vacuum and air flow rate (plus a safety factor) for recovering soil gas and steam from the subsurface. The blower(s) shall be engineered for continuous long-life operation in an equivalent soil vapor extraction mode. The blower(s) shall be equipped with motor starters, variable speed drives, inlet filters, check valves, silencers, relief valves, or equivalent and other components recommended by the manufacturer for its intended use. Contractor shall provide soundproofing, as necessary, to comply with local or county noise ordinances and noise requirements identified in 01 14 00 WORK RESTRICTIONS.

3.1.1.3 Heat Exchangers and Cooling Towers

Provide heat exchangers and cooling towers necessary to provide proper heat exchange, condensing and cooling needs for the recovered vapors and other process and treatment components of the ISTR system. System blowdown and any process treatment (e.g., water softener) additives shall be adequately quantified and described during permit application process and monitored in compliance with wastewater discharge standards, including temperature.

3.1.1.4 Liquid Treatment Equipment

Provide liquid equalization, separation, handling and treatment equipment shall be properly sized to accommodate the range of expected flows and contaminants in order to meet applicable discharge limitations for the duration of the ISTR and post-treatment operating period. Redundancies or provisions of spare equipment shall be incorporated to avoid unplanned shutdown of the ISTR system due to equipment failure. Emergency contingency storage for untreated wastewater shall be planned in the event of temporary shutdown of any equipment.

3.1.1.5 Vapor Treatment Equipment

Vapor handling and treatment equipment shall be properly sized to accommodate the range of expected flows and contaminants in order to meet applicable vapor emission limitations for the duration of the ISTR and post-treatment operating period. Contractor shall incorporate redundancy or provisions for spare equipment to avoid unplanned shutdown of the ISTR system due to equipment failure. Discharge stacks shall be properly sized with sufficient height to meet applicable dispersion requirements, and secured for stability. Condensate accumulating in carbon vessels or the discharge stack shall be containerized and routed into the liquid treatment system. If a thermal oxidizer is used, sacrificial activated carbon vessels shall be staged onsite for immediate use in the event the thermal oxidizer is taken offline for maintenance.

3.1.1.6 Steam Generator or Boiler

Boiler shall be sized according to the RAWP. Boiler inspections shall be completed by a certified competent boiler inspector or a duly authorized insurance company and reported to the commissioner along with the required fee as specified in the New York State Labor Law Section 204.

3.1.1.7 Instrumentation

Provide instrumentation and controls (indicators, sensors, transmitters, recorders, alarms, autodialers, etc.) necessary to monitor and operate the equipment continuously, remotely, and safely. Such equipment shall detect, monitor, record, and control key operating parameters such as liquid levels, equipment and air temperatures, gas and liquid flow rates, pressures, etc. Emergency stop switches shall be incorporated into the design to immediately shutdown power to all equipment. At a minimum, e-stops shall be placed at one location outside the inner fence and easily accessible to a first responder and near the ISTR well field and above ground treatment area.

The system control panel shall contain at a minimum all local control devices, circuit breakers, power control transformers, system disconnect switches, and alarm components, as necessary to operate the system effectively and safely. The control system shall provide all functions required for complete automatic and manual operation of the system, including but not limited to the following:

1. System shutdown and alarm on high high liquid level conditions in moisture separator, other liquid handling equipment, and discharge locations,
2. Manual start and stop for blowers,
3. System shutdown in the event that the secondary containment around critical process vessels indicates a spill,

4. System alarm on low and no flow in system,
5. Automatic call-out and notification in the event of an alarm,
6. Automatic shutdown when an emergency stop is engaged.

The control system shall also be furnished with a means to allow for remote, real-time access to monitoring data and data retrieval.

3.1.1.8 Generator

The Contractor shall provide a back-up power source capable of operating the ISTR vapor and liquid extraction and treatment equipment as well as monitoring and controls to maintain pneumatic and hydraulic control if the primary power source is lost. The backup power source shall be capable of maintaining pneumatic and hydraulic control without refueling for at least 24 hours. Backup power shall engage automatically upon loss of primary power (e.g., automatic transfer switch). The RAWP shall detail the Contractor's quality control methods to ensure the integrity of the backup power system is maintained.

Supplemental generators used onsite for non-emergency purposes shall be EPA Tier 4 Final certified.

3.1.1.9 Weather-proofing

All outdoor installation shall be weather-proof and all installations in hazardous locations shall meet NEC, NFPA, UL, NEMA, and OSHA requirements. The ISTR system shall be winterized to allow operation during subfreezing conditions. Winterization may include, but is not limited to, insulation and heat trace around piping and liquid vessels, insertion heaters and recirculation within liquid storage vessels. The Contractor may elect to seek a waiver for winterization requirements if the projected period of operation occurs during non-winter months.

3.1.2 ISTR Wellfield Requirements

The following minimum requirements apply to select elements of the ISTR well field extraction and monitoring system.

3.1.2.1 Shallow Horizontal Extraction Wells

Horizontal extraction wells or trenches shall be installed along the perimeter of the Area 4-2B TTZ as well as along the portion of the Area 3 and Area 4-1 TTZ's adjacent to the building to intercept fugitive emissions. This requirement may fulfilled if the ISTR approach detailed in the RAWP integrates shallow vapor extraction into the overall well field.

3.1.2.2 Performance Monitoring and Hydraulic Control Wells

Sampling frequency is detailed in Table 1. Construct and seal monitoring wells using materials, fittings, and surface completions compatible with chemicals, temperatures, and pressures expected during ISTR operations. Pumps shall be deployed prior to startup and sample ports and valving configured to prevent the need to open a monitoring well during operations. Hot water sampling methods shall be detailed in the project work plans. Well construction details for performance and hydraulic monitoring wells shall be specified in the RAWP.

3.1.2.2.1 Performance Monitoring Wells

Within the ISTR TTZ, samples collected from performance monitoring well pairs will support evaluation of treatment progress. One of the wells in the pair will be constructed to monitor the alluvium and the other constructed to evaluate the sand and gravel. Multiphase extraction wells may be substituted for monitoring wells if the screen intervals represent either the alluvium or sand and gravel unit. The Contractor shall place the following number of well pairs in each area which will be reviewed and approved by the government as part of the RAWP: Area 3 (3 well pairs), Area 4-1 (2 well pairs), Area 4-2 (3 well pairs), Area 4-2B (2 well pairs).

3.1.2.2.2 Hydraulic Control Wells

To demonstrate hydraulic control, install downgradient monitoring well pairs including one well constructed in the lower sand/gravel and the other in the fill/alluvium in locations shown on the Drawings. Deeper wells in sand/gravel downgradient of the TTZ shall be constructed with a screen and casing a minimum of 4-inch in diameter to allow groundwater extraction in the event hydraulic control is lost.

3.1.2.3 Shallow Vacuum Monitoring

Vacuum monitoring points shall be installed and monitored to confirm that the extraction system is adequately capturing steam and vapors throughout the TTZ. Shallow vacuum monitoring points shall be screened within the top 2 to 3 ft around the TTZ perimeter that is adjacent to or inside a building, placed up to 5-ft outside of TTZ perimeter and spaced every 50 feet. Vacuum monitoring points shall be installed every 2,000 square feet within the TTZ and screened according to the RAWP.

3.1.3 Temperature Monitoring Points

Temperature monitoring locations shall occur every 2,000 sq ft across the TTZ, in general, located at the centroid of the heating elements, extend across the entire vertical treatment interval with sensors placed every 3 vertical feet. Final locations are subject to Contracting Officer approval.

3.2 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement an exposure monitoring/air sampling program to identify and quantify SOH hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Include action levels for upgrading and downgrading PPE in the program. Submit personnel exposure monitoring and sampling results. Monitoring shall be for all site Contaminants of Concern (COC) as well as any other compounds that may be generated during thermal treatment or construction activities (e.g., dust, drill rig exhaust) that may pose an exposure hazard.

3.2.1 Air Monitoring

In conjunction with the air sampling program, the Contractor shall develop and implement an Air Monitoring Plan to address air monitoring for building occupant and employee protection purposes. The Contractor shall report all field data sheets relating to the work zone and indoor air monitoring. Air

monitoring data shall be submitted in an electronic format on a weekly and as needed basis. The Air Monitoring Plan may be submitted as an appendix to the RAWP. A verified exceedance of an action level shall be reported immediately to Contracting Officer. Implement and communicate corrective actions to the Contracting Officer.

3.2.1.1 Equipment

Monitoring of work zone via photoionization detector (PID) shall be performed in accordance with the approved Air Monitoring Plan. During operations, Contractor shall continuously monitor concentrations of site COCs quantitatively via field deployed analytical equipment at up to 5 indoor air locations in and around Area 4-2B and within the building. A figure showing the proposed locations shall be provided to the Contracting Officer for approval prior to commencement of construction activities.

Indoor air monitoring in the building in the vicinity of Areas 3 and 4-1 shall include monitoring of at least two sampling locations per area. Each sampling location shall be identified in the Air Monitoring Plan. These locations will be quantitatively monitored via analytical equipment during baseline air monitoring and monthly during operation. In addition, daily PID measurements shall be recorded during operation.

3.2.1.2 Work Zone Monitoring

Air monitoring shall be conducted with a PID for Volatile Organic Compounds (VOCs)during construction and operations. All air monitoring data shall be made available to the Contracting Officer. This data will also be submitted with the field sampling report. The Contractor shall complete hourly checks of the air monitoring device during intrusive activities to verify action levels identified in the Contractors health and safety plan are not exceeded. Increased monitoring frequency may be required during intrusive activities that have the potential to generate more emissions, such as trenching and/or drilling activities.

3.2.1.3 Indoor Air Monitoring

During ISTR operation of Area 4-2B continuous, quantitative monitoring of site COCs via field deployed analytical equipment shall be conducted at up to 5 locations. Monitoring data shall be available in real-time, logged continuously, and remotely accessible. Data shall be stored to allow users to assess trends immediately in the event of an odor, loss of pneumatic control, or public complaint. Data shall also be stored in a manner that allows retrieval for trend analysis. Indoor air COC concentrations shall be compared to USEPA and NYSDEC vapor intrusion screening levels.

3.2.1.4 Perimeter Air Monitoring

During intrusive activities, collect PID readings along the property boundary or site perimeter once daily. During ISTR operations, collect PID readings along the property boundary or site perimeter weekly. If an action level associated with PID or dust monitoring is exceeded in a work zone, collect additional perimeter readings hourly until action levels are no longer exceeded.

3.3 BASELINE MONITORING

Baseline monitoring may be initiated after written approval of the RAWP has been provided by the Contracting Officer. Notify the Contracting Officer at least 14 calendar days before starting baseline monitoring.

3.3.1 Temperature and Precipitation

Ambient temperature readings shall be recorded at least daily during baseline monitoring. Temperature readings shall be recorded to the nearest 1.0 degree F. Precipitation shall be measured daily during baseline monitoring activities. Precipitation readings shall be recorded to the nearest 0.1 inch.

3.3.2 Groundwater Sampling

Groundwater monitoring shall be performed in accordance with Table 1. Water levels shall be recorded for each of the groundwater monitoring wells. Water level measurements for all designated wells shall be completed in less than than 48 hours, from start to finish. Water level measurement shall be performed in accordance with EPA SESDPROC-105-R2 and groundwater sampling in accordance with the approved UFP-QAPP. Water level readings shall be recorded to the nearest 0.01 foot and the tape and probe decontaminated after each measurement.

3.3.3 Baseline Soil Sampling

For the ISTR treatment areas, conduct baseline soil sampling at borings every 1,000 square feet, including samples collected from each 5-foot interval throughout the thermal treatment zone based on either field screening or pre-set intervals. All soil cores shall be continuously logged by a geologist. Contractor proposed sample locations in the RAWP will be subject to Contracting Officer approval. Sampling locations may be co-located with other ISTR infrastructure such as temperature monitoring points where possible. Contractor shall use a New York State licensed driller and obtain permits for the soil boring work as required. Upon completion of sampling, all borings shall be properly abandoned with steam tolerant grout and in accordance with applicable agency requirements. All soil boring abandonment methods shall be compatible with the ISTR system's operational pressures and temperatures.

3.3.4 Baseline Monitoring Report

Submit a baseline monitoring report. A period of 21 calendar days shall be allotted in the schedule for Government review. Results of Baseline Monitoring shall be organized according to category, and shown chronologically within each category. The report shall include monitoring locations (and depths, if applicable), and sample identification numbers. Separate plan view maps shall also be prepared, showing monitoring locations and depths, and the results of groundwater monitoring, groundwater levels, and soil boring sampling.

3.4 SITE PREPARATION

The following are site preparation activities which require improvement or action prior to installation of the ISTR System:

1. Set-up trailers for building occupant use as specified in 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

2. Set-up construction fencing outside and full floor to ceiling barriers within the building where walls are not present to demarcate project work limits
3. Install power drop, utility tie-ins, meters, and supply infrastructure according to RAWP
4. Abandon existing wells that are not compatible with ISTR. All wells within the area of thermal influence which are not compatible with the proposed ISTR shall be abandoned in accordance with NYSDEC's Groundwater Monitoring Well Decommissioning Policy and in a manner that is compatible with ISTR system operational pressures and temperatures. A list of wells and their construction details proposed for abandonment is included in Tables. Well locations are shown on the Drawings.
5. Abandon existing Area 4 Soil Vapor Extraction system, including removal of two treatment sheds, and in place abandonment of subsurface piping and extraction wells detailed in SVE System As-builts included in the Appendices. All wells within the area of thermal influence shall be abandoned in accordance with local and state requirements and in a manner that is compatible with ISTR system operational pressures and temperatures.
6. Determine infrastructure needs for the interior of the building and locations and access needed for each.
7. Determine imported fill requirements and certify that any fill meets clean fill requirements outlined in 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL prior to onsite use.

The approach for addressing each of the above items shall be included in the RAWP. The RAWP shall also include the details and approach for any other site preparation required based on the Contractor's proposed ISTR implementation approach.

3.5 ISTR SYSTEM INSTALLATION

3.5.1 Well Field

Perform a review of current site conditions, available utility maps, and other available site information prior to conducting invasive site activities. Complete all required utility clearances prior to conducting any intrusive site activities.

Field locate well field infrastructure and ISTR treatment control points for each area. Surveying shall be completed in accordance with Section 01 11 10 SURVEYING.

ISTR components shall be constructed and installed in accordance with New York Administrative Codes, EPA Region 2 Quality Assurance Manual, ASTM D5092, and other applicable local, state, and federal requirements. Permits and permit equivalents required to perform the work shall be obtained prior to commencement of drilling and well installation operations.

Provide and install all required subsurface and surface components of the ISTR energy delivery infrastructure. Heating elements, wells, and monitoring points shall be suitable for the Contractor's selected thermal treatment approach.

Drill cuttings and other waste generated during installation shall be containerized and disposed of in accordance with waste management procedures

described in the UFP-QAPP and Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.5.2 Indoor Installation Requirements

During the installation of infrastructure inside the building, the Contractor shall give preference to locations and technologies that limit effects to the building and/or tentant. No major structural modifications to the building are permitted, including removal or destruction of interior walls. Trenching and drilling through flooring and the building slab will be required with restoration including in-kind repair or replacement.

3.5.3 Equipment

Prepare the site for equipment installation prior to delivery and off-loading of equipment and system components. Stage equipment in accordance with the RAWP.

Provide inspection certificates for the drill rig, heavy equipment, and other installation equipment prior to the start of drilling activities. It is the Contractor's responsibility to properly construct the ISTR wellfield in accordance with the RAWP. All equipment shall be decontaminated prior to leaving the site.

3.5.4 Thermal Cover

The Contractor shall install an insulating cap capable of achieving a minimum R value of 20 in areas where the TTZ extends to ground surface (top of soil, bottom of concrete slab).

The insulating cover shall be graded and sloped as necessary to prevent ponding on the cap for outdoor treatment areas. The cover shall be regularly inspected and cracks sealed to prevent fugitive emissions.

Provide safe and stable access for sampling equipment (e.g., drilling rigs) to enter the ISTR wellfield for purposes of collecting soil and groundwater samples to evaluate performance objectives.

The impact that the footprint of the thermal cover has on stormwater runoff shall be considered within the construction and stormwater permits detailed in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.5.5 Utilities

All work outdoors and in wet conditions shall be weatherproof. All material, equipment, and incidentals in hazardous locations shall meet National Electrical Code (NEC), National Fire Protection Association (NFPA), UL, NEMA, and Occupational Safety and Health Association (OSHA) requirements for hazardous locations. Proper electrical grounding shall be installed for all equipment as applicable.

The Contractor is responsible for furnishing and installing all components necessary to connect the ISTR system to existing utilities. All utility work shall be performed in accordance with state, local, and National Codes and requirements for the relevant utility.

3.5.5.1 Stormwater Management

Stormwater collection and conveyance systems shall be designed as necessary to prevent interference with the ISTR system. The Contractor is responsible for identifying the locations and impact of existing features on their operations. Roof drains present in Area 4 (see Drawings) shall be re-routed as needed as described in Section 1.7.1. If required, upgrades to stormwater drainage features shall implemented as detailed in the RAWP. The Contractor shall design the ISTR to account for possible infiltration of surface water, including the wetlands located to the east of the property.

3.5.6 Process Piping

All vapor and liquid recovery, steam distribution, and treatment piping shall be properly constructed to prevent media from condensing or collecting where it would not be recovered or otherwise interfere with effective operations. All piping and materials of construction shall be compatible with the temperatures and chemicals expected to be present. The Contractor shall ensure that the installed piping, hoses, and orifices are of sufficient size to transmit soil vapor, groundwater and process water, blow-down, treated air, steam, and other media without any significant pressure drop or restriction to the system. All piping and connections shall be installed, properly supported, and maintained in a neat and workmanlike manner. The Contractor shall also account for heavy snowfall and the full range of ambient temperatures expected as to minimize impact of climate on ISTR operations. Piping that carries hot or pressurized fluids shall be insulated and labeled.

3.5.7 Electrical Cables

The layout of electrical supply lines and cables between power distribution equipment and the well field and treatment system shall consider use of conduit, ramps, and cable bundling to minimize slip, trip, and fall hazards and exposure to vehicle traffic. All cables and conductor shall be rated for electrical loading specified in the RAWP and constructed with materials compatible with its designated environment.

3.6 COMMISSIONING

Commissioning shall not be initiated until written approval by the Contracting Officer of the Commissioning Plan has been provided. Notify the Contracting Officer at least 14 calendar days before starting commissioning.

3.6.1 Commissioning Team and Checklists

Designate team members to participate in the pre-commissioning checks and the functional performance testing. Pre-commissioning check lists shall detail the critical system interlocks including type of alarm (shutdown or warning), instrument involved, and equipment affected by the alarms. The Government will be represented by a representative of the Contracting Officer, the Design Agent's Representative, and the Using Agency. The same team representative may serve multiple discipline functions if qualified. Discipline Representatives include:

Designation	Function
Q	Contractor's Chief Quality Control Representative
M	Contractor's Mechanical Representative
E	Contractor's Electrical Representative
T	Contractor's Testing, Adjusting, and Balancing Representative
C	Contractor's Controls Representative
O	Contracting Officer's Representative

Include commissioning checklists with the Commissioning Plan. Commissioning team shall complete each checklist. Each commissioning team member shall sign and date each functional performance test checklist to indicate acceptance.

3.6.2 Tests

The pre-commissioning checks and functional performance tests shall be performed in a manner that essentially duplicates the checking, testing, and inspection methods established in the related Sections. Where checking, testing, and inspection methods are not specified in other Sections, methods shall be established and documented which will provide the information required. Testing and verification required by this section shall be performed during the Commissioning phase. Requirements in related Sections are independent from the requirements of this Section and shall not be used to satisfy any of the requirements specified in this Section. Provide all materials, services, and labor required to perform the pre-commissioning checks and functional performance tests. A pre-commissioning check or functional performance test shall be aborted if any system deficiency prevents the successful completion of the test or if any participating non-Government commissioning team member of which participation is specified is not present for the test.

a. Pre-commissioning Tests: Pre-commissioning checks shall be performed for the items indicated on the checklists. Deficiencies discovered during these checks shall be corrected and re-tested in accordance with the applicable contract requirements.

b. Functional Performance Tests: Functional performance tests shall be done for the items indicated on the checklists. Functional performance tests shall begin only after all pre-commissioning checks have been successfully completed. Tests shall prove all modes of the sequences of operation, and shall verify all other relevant contract requirements. Tests shall begin with equipment or components and shall progress through subsystems to complete systems. Upon failure of any functional performance test checklist item, correct all deficiencies in accordance with the applicable contract requirements. The checklist shall then be repeated until it has been completed with no errors. Submit a Commissioning Report as specified in the Submittals paragraph.

3.7 ISTR SYSTEM OPERATION

3.7.1 Operations

The Contractor shall operate the ISTR system to attain ISTR performance criteria (Tables 2 and 3), including achievement of minimum temperatures and soil cleanup goals outlined in Table 4.

ISTR system uptime is defined as operation of the well field heating and extraction system and above ground vapor and liquid treatment system. If a portion of the system is down for scheduled maintenance, sampling, or due to a loss of utility supplied power, this duration will not be considered downtime. The vapor extraction and treatment system shall continue to operate during loss of power in a manner that maintains pneumatic and hydraulic control.

Following achievement of the temperature, the Contractor may elect to initiate confirmation sampling based on professional judgment and performance monitoring. The Contractor shall provide notification of a confirmation sampling event to the Contracting Officer 14 days prior to mobilization. The Contractor shall be responsible for any subsequent sampling costs if soil goals are not met during the initial confirmation sampling event.

Based on the results of these data, the Contractor shall propose ISTR shutdown if criteria have been achieved or continued operation. The Contractor may also propose shutdown of portions of the TTZ that meet ISTR soil cleanup goals following confirmation sampling, as long as shutdown does not adversely affect treatment in adjacent or newly treated areas and hydraulic and pneumatic control is maintained. In the unlikely event that performance criteria have been achieved but significant mass continues to be recovered, the Government will negotiate with the Contractor for extended operation in accordance with the changes clause.

Weekly progress reports shall be submitted within 7 days of the reporting period. Weekly reports shall consist of all routine operational data.

Monthly progress reports shall be submitted within 14 days of the reporting period. Monthly reports shall include all cumulative routine operational data, any available analytical data collected, and a summary of progress towards meeting the performance criteria.

3.7.2 VOC and SVOC Removal and Emissions

Recover vapor throughout the heating operations and during the post-shutdown cool down period. Treat recovered vapors to achieve 90-percent removal and destruction of VOCs in addition to requirements outlined in the air permit equivalent obtained from NYSDEC. Permit requirements are discussed in Part 1.6. Emission rates, monitoring, and reporting requirements shall be consistent with the Contractor's air permit equivalent or as otherwise required. Provide the method of vapor treatment as detailed in the RAWP.

3.7.3 Process Monitoring

Perform process monitoring to evaluate progress toward meeting the ISTR performance criteria described in Tables 2 and 3. Minimum monitoring

requirements and collection frequencies during remediation activities are detailed in Table 1. Evaluate mass recovery from each of the four thermal treatment Areas and combined influent streams by monitoring vapor and liquid recovery flow rates and concentrations according to Table 1. The Contractor shall provide real-time access to temperatures and key process parameters through a project website.

3.7.4 Combustible Organic Vapor Monitoring

Perform combustible vapor monitoring during startup and at least once weekly during operations. Perform monitoring at locations within the ISTR treatment system where combustible organic vapors may be present (excluding enclosed vessels where combustible vapors are expected to be present). If the monitoring device indicates that the vapor stream has reached levels which may present a safety hazard, then system adjustments shall be made immediately.

3.8 PERFORMANCE CRITERIA

ISTR performance criteria shall be evaluated individually for each of the treatment areas (Area 3, Area 4-1, Area 4-2, and Area 4-2B). Primary ISTR Performance Criteria are summarized in Tables.

Criteria	Description	Evaluation
Pneumatic Control	Monitors for sustained pressures within and outside of the TTZ, and for fugitive emissions	a. Sustained or reoccurring positive pressures at shallow vacuum monitoring points along the TTZ perimeter or under or around the building shall require mitigation, including operational adjustments and more frequent monitoring. b. Shallow vacuum monitoring points shall be screened within the top 2 to 3 ft of the TTZ and placed every 50 feet along the TTZ perimeter, up to 5 ft outside the perimeter within or adjacent to a building. Vacuum monitoring points shall be installed every 2,000 square feet within the TTZ. c. Visual and PID inspections for steam within and around the well field. d. Indoor air monitoring near Areas 3, 4-1, and 4-2B.

Criteria	Description	Evaluation
Hydraulic Control	Contaminated groundwater or non-aqueous phase liquid within the TTZ is not migrating outside of the TTZ	a. Monitoring of groundwater COCs and weekly temperature at downgradient wells at frequencies detailed in Table 1. b. Monitoring wells locations and construction requirements specified in Table 1 and Figures. c. A combination of trends in groundwater COCs and temperatures paired with ISTR operational data shall be used to assess hydraulic control. d. Downgradient monitoring wells constructed in the sand/gravel shall be constructed to accommodate pumping if hydraulic control cannot be maintained.
ISTR System Uptime	a. 90 percent or greater uptime outside of scheduled maintenance b. 100 percent uptime for steam and vapor extraction system operated to maintain pneumatic control during power loss	a. Tracked as metric on weekly operational reports
ISTR Vapor Treatment Efficiency	90% vapor destruction or removal; comply with permit equivalent	a. Tracked using influent and effluent analytical and PID results. Metric reported within progress reports

3.9 CONFIRMATORY SAMPLING, SYSTEM SHUTDOWN, REPORTING

3.9.1 Confirmation Sampling

Collect confirmation samples from borings spaced approximately every 900 square feet within the TTZ and from each 5-foot interval based on either field screening or pre-set intervals. The final confirmation sampling event may exclude sample locations that already meet cleanup goals based on confirmation soil results (not baseline sampling). Analyze for all site COCs in accordance with the UFP-QAPP. The locations shall be adjusted to ensure representative samples are collected at the midpoint between heater elements and at locations of previous elevated concentrations, or as

otherwise directed by the Contracting Officer. All sample locations shall be approved by the Contracting Officer.

Collect samples in accordance with by a hot soil sampling protocol as specified in the UFP-QAPP. The sampling protocol shall be based on ISTR industry best practices and tailored for the anticipated method(s) of drilling and sampling. Vendor and technology specific health and safety protocols shall be included in the Activity Hazard Analyses.

Contractor shall use a New York State licensed driller and obtain permits for the soil boring work as required. All borings shall be properly grouted or otherwise abandoned in accordance with applicable agency requirements upon completion of sampling.

3.9.2 Shutdown

The Contractor may cease heating operations upon achievement of the performance criteria and approval by the Contracting Officer. A Shutdown Memorandum shall be submitted containing the effectiveness monitoring results and the Contractor's evaluation of the performance criteria. The Contracting Officer shall provide approval within 14 days of receipt of the submittal.

Individual heating elements or portions of the ISTR heating zone may be terminated early if recommended by the Contractor and approved by the Contracting Officer. This determination will be based on evidence provided by the Contractor that a portion of the treatment zone has met performance criteria, and continued operation is unwarranted and does not impact the heating of other areas.

The Contractor shall propose the additional operating period needed to ensure effective capture of vapors and steam after system shutdown. The proposed post-shutdown operating period shall be no less than 2 weeks in duration.

3.9.3 Remedial Action Report

Following completion of all thermal treatment, a Remedial Action Report, compliant with EPA's 2011 guidance: Close Out Procedures for National Priorities List Sites, shall be submitted. The interim remedial action report shall include, but is not be limited to the following:

a. Description of field operations including power and energy applied, duration of treatment, temperature data,
b. Evaluation of ISTR effectiveness relative to treatment objectives,
c. All sampling results, including process monitoring, groundwater monitoring, soil sampling, and air monitoring results
d. Any deviations from the approved RAWP, UFP-QAPP, and rationale/justification for each,
e. Any site restoration activities,
f. As-built drawings which are to detail well field infrastructure locations, all sampling locations, air monitoring locations, monitoring well locations, and depict post restoration site conditions,
h. Wastes generated and disposition (including characterization analysis of wastes),
i. Chemical data final report,

j. Lessons Learned as an appendix
k. Total Contract Costs

3.10 SYSTEM DECOMMISSIONING

3.10.1 Demobilization

Upon receiving approval from the Contracting Officer that contractual obligations have been met, demobilize and remove all equipment, materials, temporary facilities, trash, and supplies from the site. Clean the area. Disconnect and abandon all utility connections in accordance with City requirements.

3.10.2 Site Restoration

Remove all components of the thermal cap. ISTR related process wells (heater wells, vapor collection wells, vapor monitoring points, and temperature monitoring points) shall be abandoned in place according to New York state regulations. The top 2 feet of any ISTR well casing and well field infrastructure shall be removed to facilitate final site restoration activities . A subset of wells may be retained for long term monitoring. The government will provide a final schedule of wells for retention no later than 30 days prior to field work. The site shall be restored to the condition that existed before commencement of the ISTR (except for the items discussed above), graded to ensure proper drainage, and revegetated to prevent erosion until final site restoration. Concrete slab and asphalt paving and restoration requirements will be negotiated following remedial action contract award and finalized in the RAWP.

Decomission existing SVE system including abandonment of any remaining SVE piping, removal of treatment system building, and removal of SVE equipment for final disposition.

-- End of Section --

Tables

List of Tables

Vestal Water Supply Well 1 - 1 Superfund Site, Operable Unit 02, Remedial Design for In-Situ Thermal Treatment
Section 02 61 18 Table 1. ISTR Minimum Performance Monitoring Requirements

Type	Location(s)	Minimum Quantity	Matrix	Parameter	Frequency
Temperature	Temperature Monitoring Points, sensors vertically every 3-ft across TTZ	Every 2,000 sq ft	Soil and groundwater	Temperature	Daily
Vapor Recovery	Area 4-1, Area 4-2, Area 4-2B, Area 3	--	Vapor	COC Concentrations (Analytical)	Biweekly [must also meet permit equivalent(s)[1]]
				PID	Daily (during work week)
				Vacuum, Flow, Temp	Daily
	Influent	--	Vapor	COC Concentrations (Analytical)	Biweekly [must also meet permit equivalent(s)[1]]
				PID	Daily (during work week)
				Vacuum, Flow, Temp	Daily
	Effluent	--	Vapor	COC Concentrations (Analytical)	Monthly [must also meet permit equivalent(s)[1]]
				PID	Daily (during work week)
				Vacuum, Flow, Temp	Daily
Liquid Treatment (contact water only)	Knock Out Tanks	--	Condensate	Volume-flow rate	Daily
	Area 4-1, Area 4-2, Area 4-2B, Area 3	--	Condensate, Extracted Groundwater, etc.	Volume-flow rate	Continuous
				COC Concentrations (Analytical)	As needed
	Influent	--		Volume-flow rate	Continuous
				COC Concentrations (Analytical)	Biweekly
	Effluent	--		Volume-flow rate	Continuous
				COC Concentrations (Analytical)	Biweekly
NAPL	NAPL Collection Tank	--	NAPL	Level / Volume	Determined during RAWP
				COC Concentrations + parameters needed for characterization and disposal	As needed for characterization
Liquid Discharge (Contact + Non-Contact Water)	Liquid Treatment System Discharge Sample Port	--	Liquid	Volume-flow rate	Continuous
				COC Concentrations + Other Parameters in Permit (Analytical)	Every other week and meets permit equivalents
Groundwater Monitoring (Treatment Performance)	Multiphase Extraction Wells or Performance Monitoring Wells	Area 3: 3 well pairs; Area 4-1: 2 well pairs; Area 4-2: 3 well pairs; Area 4-2B: 2 well pairs	Groundwater	COC Concentrations (Analytical)	Baseline, 4 events during operations, one post-operation event
				Temperature and Pressure	During sampling events
Baseline and Confirmation Soil Sampling	Soil Borings - samples vertically every 5 ft across treatment zone. Locations subject to Government approval. Locations may be biased towards areas with heating performance concerns or potentially higher mass present based on baseline or operational data.	Baseline - boring every 900 sq ft Confirmation[2] - boring every 900 sq ft	Soil	COC Concentrations (Analytical)	Baseline, Confirmation (additional confirmation sampling events if needed to meet performance criteria)
Energy and Power	Well field, Treatment Equipment, Total	--	Energy and Power	Utility measurements	Weekly

Vestal Water Supply Well 1 - 1 Superfund Site, Operable Unit 02, Remedial Design for In-Situ Thermal Treatment
Section 02 61 18 Table 1. ISTR Minimum Performance Monitoring Requirements

Type	Location(s)	Minimum Quantity	Matrix	Parameter	Frequency
Pneumatic Control	Shallow Vapor Monitoring Points	Every 2,000 sq ft within TTZ, Every 50-ft around TTZ perimeter that is adjacent to or inside a building and up to 5-ft outside the perimeter	Soil Gas	Vacuum (PID or analytical if sustained pressure demonstrated)	Weekly (increased frequency if reoccurring pressure is recorded along perimeter)
	ISTR Well Field and Cover	--	Air	Visual indication of steam emissions	Daily (during work week)
Hydraulic Control	Downgradient Monitoring Wells (see figure for proposed approximate placement)	Area 3: 2 well pairs; Area 4-1: 2 well pairs; Area 4-2: 1 well pair; Area 4-2B: 2 well pairs	Groundwater	COC Concentrations (Analytical)	Baseline, monthly during operations, one post-operation event
				Temperature and Pressure	Weekly
Air Monitoring (ISTR construction)	Indoor air within and near Area 4-2B	Near construction and near building occupants	Ambient Air	PID, 4-gas meter to measure exhaust byproducts	Continuously during indoor construction
	Treatment Areas	ISTR Well field and Treatment Area	Ambient Air	PID	Hourly
				Dust	Hourly
Air Monitoring (ISTR operations)	Indoor air within and near Area 4-2B	Up to 5 Locations	Ambient Air	COC Concentrations (Analytical)	Continuous samples from field deployed gas chromatography
	Indoor air near Area 3 and Area 4-1	2 locations in Area 3; 2 locations in Area 4-1	Ambient Air	PID; COC Concentrations (Analytical)	PID daily during work week; quantitative data: baseline, and monthly during operations
	Treatment Areas	ISTR Well field and Treatment Area	Ambient Air	PID	Daily (during work week)
				4-Gas (Combustible gases)	Weekly (unless otherwise approved in RAWP)
				Odors (significant changes noted)	Daily (during work week)
Noise	Property perimeter	--	Noise	Noise - dBA	Monthly and after new sources of noise are introduced
	Tenant occupied space	--	Noise	Noise- dBA	Monthly and after new sources of noise are introduced
Settlement Monitoring[3]	Area 4-1, Area 4-2B, and Area 3	Up to 8 locations for elevation monitoring in each area with heating under or adjacent to the building (Area 3, Area 4-1, and Area 4-2B.)	Settlement	Elevation (feet)	Pre-construction and post-operation surveys with monthly elevation monitoring and inspections during operation

[1]Contractor shall obtain necessary permit equivalent(s).
[2]Confirmation soil sampling density based on NYSDEC DER-10.
[3]Subject to Settlement Monitoring Plan submitted with Remedial Action Work Plan
TTZ: thermal treatment zone

Vestal Water Supply Well 1 - 1 Superfund Site, Operable Unit 02, Remedial Design for In-Situ Thermal Treatment
Section 02 61 18 Table 2. Primary ISTR Performance Criteria

Treatment Area		Geology	Depth Extents	Approximate Depth Interval (feet bgs)	Area (square feet)	Volume (cubic yards)	Total Volume (cubic yards)	Applicable Primary Performance Criteria	Treatment Duration
Area 3	Upper Zone	Fill/Alluvium	From ground surface to top of sand/gravel.	0- 23		9,954		Temperature: 90% of sensors shall reach 90° C, no sensor shall be below 80° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Lower Zone	Sand/Gravel	From top of sand/gravel to 30 ft bgs.	23-30	11,633	2,972	12,925	Temperature: 90% of sensors shall reach 90° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until Area 3 Upper Zone meets primary performance criteria or soil concentration criteria are met in Area 3 Lower Zone, whichever occurs first.
Area 4-1	Upper Zone	Fill/Alluvium	From ground surface to shallowest known soil goal exceedance (5 feet for entire area).	0-5		1,046		Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Middle Zone	Fill/Alluvium	From shallowest known soil goal exceedance (5 feet) to top of sand/gravel.	5-20		2,766		Temperature: 90% of sensors shall reach 90° C, no sensor shall be below 80° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Lower Zone	Sand/Gravel	From top of sand/gravel to 35 ft bgs.	20-35	5,647	3,443	7,255	Temperature: 90% of sensors reach 90° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until Area 4-1 Upper and Middle Zones meet primary performance criteria or soil concentration criteria are met in Area 4-1 Lower Zone, whichever occurs first.
Area 4-2	Upper Zone	Fill/Alluvium	From ground surface to shallowest known soil goal exceedance (10 feet for entire area).	0-10		4,303		Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Middle Zone	Fill/Alluvium	From shallowest known soil goal exceedance (10 feet) to top of sand/gravel	10-23		4,589		Temperature: 90% of sensors shall reach 90° C, no sensor shall be below 80° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Lower Zone	Sand/Gravel	From top of sand/gravel to 35 ft bgs.	23-35	11,617	6,107	14,999	Temperature: 90% of sensors reach 90° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until Area 4-2 Upper and Middle Zones meet primary performance criteria or soil concentration criteria are met in Area 4-2 Lower Zone, whichever occurs first.
Area 4-2B	Upper Zone	Fill/Alluvium	From ground surface to top of sand/gravel.	0-23		5,373		Temperature: 90% of sensors shall reach 90° C, no sensor shall be below 80° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until primary performance criteria are met.
	Lower Zone	Sand/Gravel	From top of sand/gravel to 30 ft bgs.	23-30	7,095	2,510	7,883	Temperature: 90% of sensors reach 90° C. Soil Concentrations: 100% of soil samples shall meet soil goals shown on Table 4.	Until Area 4-2B Upper Zone meets primary performance criteria or soil concentration criteria are met in Area 4-2B Lower Zone; whichever occurs first.

Notes:

1. See Figures and Drawings for areal extent of each Treatment Area and depth below ground surface to fill/alluvium and sand/gravel contact.

Vestal Water Supply Well 1-1 Superfund Site, Operable Unit 02, Remedial Design for In-Situ Thermal Treatment

Section 02 61 18 Table 4. Soil Remediation Goals for OU2 Areas 3, 4-1, 4-2, and 4-2B

Contaminants of Concern in Soil	Remediation Goal (µg/kg)
1,1,1-trichloroethane (TCA)	680
trichloroethene (TCE)	470
cis-1,2-dichloroethene (DCE)	250
1,2,4-trimethylbenzene (1,2,4-TMB)	3,600
1,3,5-trimethylbenzene (1,3,5-TMB)	8,400
Total PCBs 0-1 ft bgs	1,000
Total PCBs >1 ft bgs	10,000

Soil Remediation Goals for VOCs are consistent with New York State Part 375 Soil Cleanup Objectives for Unrestricted Use. Soil Remediation Goals for PCBs are consistent with New York State CP-51 Soil Cleanup Guidance.
bgs: below ground surface
ft: feet
Total PCB: Polychlorinated biphenyls defined as Total Aroclors

Vestal Water Supply Well 1-1 Superfund Site, Operable Unit 02, Remedial Design for In-Situ Thermal Treatment

Section 02 61 18 Table 5. Well Construction Summary and ISTR Abandonment List

WELL ID	Within Thermal Treatment Zone?	Date Installed	Surface Completion	Survey Coordinates (NAD83)		Elevation (NAVD 88)			Well Diameter (inches)	Well Material	Screened Interval (ft, bgs)		Screened Interval (ft, amsl)		Comments
				Northing	Easting	Ground Surface (ft amsl)	Outer Casing (ft amsl)	Inner Casing (ft amsl)			Top	Bottom	Top	Bottom	
ERT-1D	Y	2008	Flush Mount	761746.10	965369.89	824.34	824.34	824.03	2	PVC	45	50	779.34	774.34	Compression plug was not secured with a lock.
ERT-1I	Y	2008	Flush Mount	761742.04	965367.78	824.50	824.59	824.18	2	PVC	25	30	799.50	794.50	Cover gasket damaged, missing bolts, no lock
ERT-1S	Y	2008	Flush Mount	761745.34	965366.31	824.36	824.42	824.16	2	PVC	15	20	809.36	804.36	Cover gasket missing, 1 missing bolt
ERT-2D	Y	2008	Flush Mount	761503.52	965287.54	824.53	824.55	824.15	2	PVC	45	50	779.53	774.53	Casing damaged, no cover, gasket or bolts
ERT-2I	Y	2008	Flush Mount	761508.10	965286.42	824.63	824.60	824.21	2	PVC	25	30	799.63	794.63	Casing damaged, no cover, gasket or bolts
ERT-2S	Y	2008	Flush Mount	761505.26	965282.61	824.50	824.54	824.33	2	PVC	12	17	812.50	807.50	Cover gasket and bolts missing
ERT-3D	Y	2008	Flush Mount	761541.55	965272.46	824.91	824.92	824.33	2	PVC	45	50	779.91	774.91	Cover gasket and bolts missing
ERT-3I	Y	2008	Flush Mount	761542.13	965276.55	824.94	825.01	824.38	2	PVC	25	30	799.94	794.94	Cover gasket and bolts missing
ERT-3S	Y	2008	Flush Mount	761538.24	965275.08	824.98	825.05	824.53	2	PVC	12	17	813.48	808.48	Cover gasket and bolts missing
ERT-4D	Y	2008	Flush Mount	761526.62	965084.09	824.16	824.16	823.74	2	PVC	45	50	779.16	774.16	Pad failing, cover gasket missing bolts stripped
ERT-4I	Y	2008	Flush Mount	761521.53	965084.68	824.05	824.09	823.56	2	PVC	25	30	799.05	794.05	Casing and pad cracked, cover gasket and bolts missing
ERT-4S	Y	2008	Flush Mount	761524.33	965081.30	824.17	824.15	823.70	2	PVC	9	14	815.17	810.17	Pad failing, cover gasket missing bolts stripped
ERT-5	N	2009	Flush Mount	761569.23	965436.23	824.68	824.77	824.37	2	PVC	60	65	764.68	759.68	1 bolt missing
ERT-6	Y	2009	Flush Mount	761513.01	965283.21	824.64	824.72	824.43	2	PVC	60	65	764.64	759.64	Cover gasket and bolts stripped
ERT-7	Y	2009	Flush Mount	761527.33	965072.55	824.69	824.37	824.08	2	PVC	60	65	764.69	759.69	Cover gasket and bolts missing
ERT-8	N	2010	Flush Mount	761663.71	964987.90	825.19	825.59	824.84	2	PVC	59	69	766.19	756.19	
HMW-A	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	15.2*	--	--	Historical monitoring well; no construction details.
HMW-B	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	15.3*	--	--	Historical monitoring well; no construction details.
HMW-D	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	6*	--	--	Historical monitoring well; no construction details.
HMW-UNK	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	--	--	--	Historical monitoring well; no construction details.
HMW-OW	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	--	--	--	Historical monitoring well; no construction details.
MW-43/44	Y	<2006	Flush Mount	--	--	--	--	--	--	--	--	30*	--	--	Historical monitoring well; no construction details.
4009-25S/D	N	--	Flush Mount	--	--	--	--	--	--	--	--	--	--	--	Historical monitoring well; no construction details.
MW-A	Y	2009	Flush Mount	761793.17	965346.10	824.07	824.22	823.82	1.5	PVC	8	18	816.07	806.07	
MW-B	Y	2009	Flush Mount	761770.36	965380.44	823.50	823.66	823.30	1.5	PVC	8	18	815.50	805.50	
MW-C	Y	2009	Flush Mount	761752.82	965411.64	823.82	823.87	823.61	1.5	PVC	8	18	815.82	805.82	
MW-D	Y	2009	Flush Mount	761775.95	965430.31	823.08	823.19	822.89	1.5	PVC	8	18	815.08	805.08	1 bolt missing
MW-E	Y	2009	Flush Mount	761798.46	965404.67	824.65	824.83	824.47	1.5	PVC	8	18	816.65	806.65	
MW-F	Y	2010	Flush Mount	761747.27	965367.32	824.24	824.41	823.95	2	SS	5	20	819.24	804.24	
MW-G	Y	2010	Flush Mount	761726.52	965367.77	824.69	824.85	824.32	2	SS	5	20	819.69	804.69	
MW-H	Y	2010	Flush Mount	761742.38	965390.07	824.52	824.46	824.08	2	SS	5	20	819.52	804.52	
MW-I	Y	2010	Flush Mount	761753.51	965343.00	824.15	824.34	823.78	2	SS	5	20	819.15	804.15	
OW-1	N	2018	Flush Mount	761499.88	965367.11	824.42	--	824.06	2	PVC	25	30	799.42	794.42	
OW-2	N	2018	Flush Mount	761515.00	965369.32	824.53	--	846.26	2	PVC	25	30	799.53	794.53	
OW-3	N	2018	Flush Mount	761527.01	965353.70	824.67	--	824.41	2	PVC	25	30	799.67	794.67	
OW-4	Y	2018	Flush Mount	761524.00	965336.29	824.78	--	824.38	2	PVC	25	30	799.78	794.78	
PW-1	N	2018	Flush Mount	761530.34	965369.26	824.80	--	824.32	6	CS	25	30	799.80	794.80	Schedule 40 carbon steel casing with stainless steel screen. Slot size 0.03"

Notes:

amsl - above mean sea level bgs - below ground surface btoc - below top of casing DTW - depth to water

ft - feet * - Measured total depth, screen interval unknown.

CS - carbon steel PVC - polyvinylchloride SS - stainless steel

-- Unknown

Figures and Drawings

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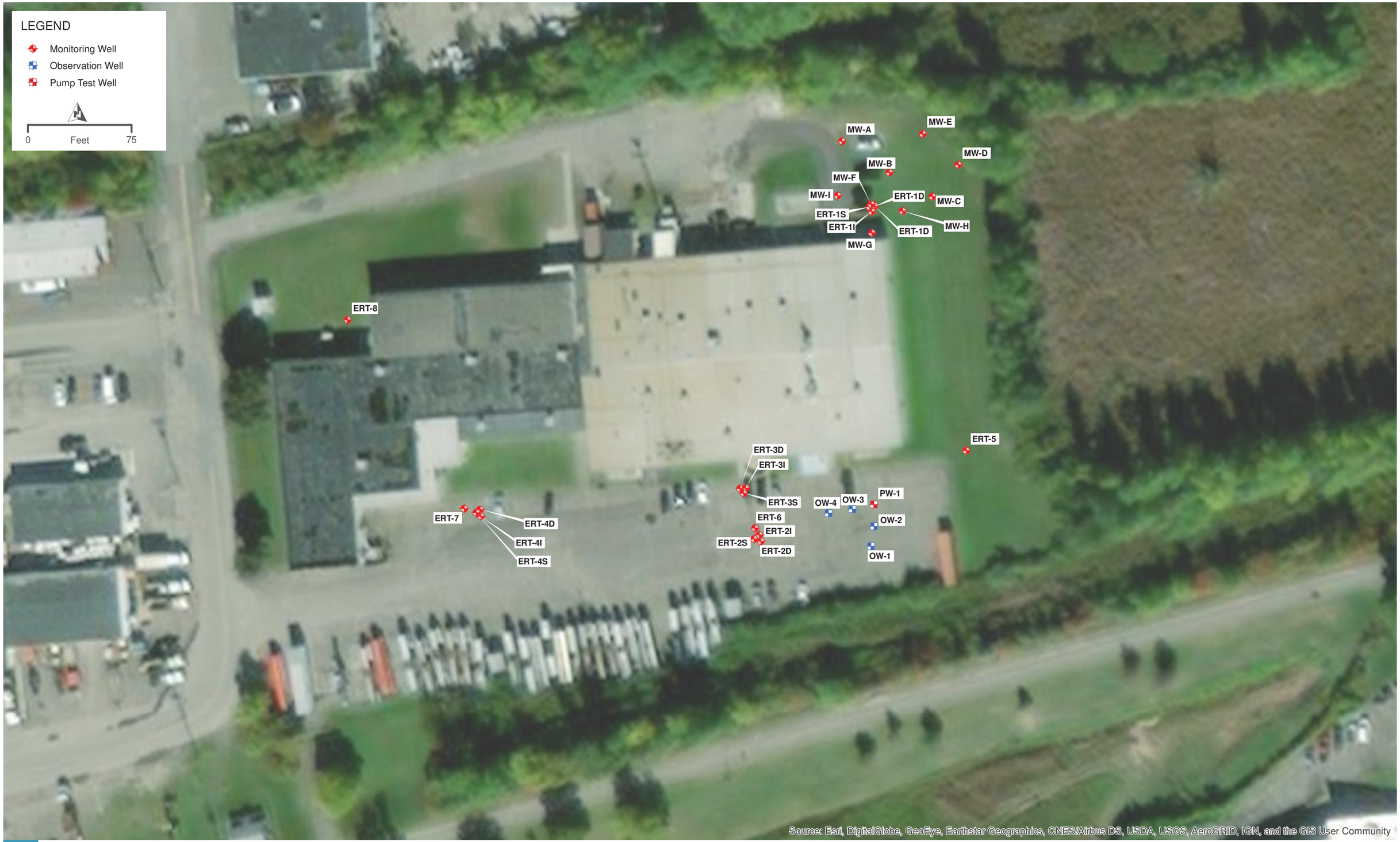
List of Drawings

SITE LOCATION

VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE

FIGURE 1

PATH: \\MAHPI-FILE01\OFFICESHARE\SECTIONFOLDERS\WASTE MGMT & INDUSTRIAL\EDMT\EDMT_PROJECTS\VESTAL\GIS\SITELOCATION.MXD - USER: CWEAVER - DATE: 6/12/2018



EXISTING WELL LOCATIONS

VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE

FIGURE 2

PATH: \\MAHPI-FILE01\OFFICESHARE\SECTIONFOLDERS\WASTE MGMT & INDUSTRIAL\EDMT\EDMT_PROJECTS\VESTAL\GIS\EXISTING_BORING_LOCATIONS.MXD - USER: CWEAVER - DATE: 6/13/2018

DATUM NAD 83 NAVD 88

Stage Road

BLOCK 1
LOT 6
N/F 200 STAGE ROAD ASSOCIATES, LLC.
DB. 02371 PG. 0507

BLOCK 1
LOT 31
N/F 200 STAGE ROAD
ASSOCIATES, LLC.
DB. 02295 PG. 0153

Vestal Rail Trail

MOBIL OIL CORPORATION
GAS LINE 40' EASEMENT

6" BURIED MOBIL OIL
CORPORATION GAS LINE
(MINIMUM DEPTH 80")

LEGEND (ADDITIONAL UTILITIES):

- STORM DRAIN
- FLOOR DRAIN PIPING
- SVE SYSTEM SUBSURFACE PIPING
- SANITARY SEWER
- WATER
- GAS
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- POTENTIAL UNKNOWN UTILITY
- FLOOR DRAIN
- ASB-2 ADDITIONAL BORING
- 1 CONTROL POINT

NOTES:

1. WATER, SANITARY, AND HVAC RUN OVERHEAD INSIDE OF BUILDING.
2. UTILITY LOCATIONS WERE NOT SURVEYED BY A LICENSED SURVEYOR AND SHOULD BE CONSIDERED APPROXIMATE.
3. CONTROL POINTS PROVIDED BY GEOD AND POSTED BY HDR.

Survey Control Points

ID	Northing	Easting	Elevation
1	761694.8	964878.1	821.902
2	761811.3	965359.4	824.387
3	761520.3	965461.2	824.604
101	761470.3	965233	824.552
102	761627.9	965175.5	825.225
103	761635.1	965295.9	825.257
110	761453.5	965083	823.767
111	761430.3	964899.5	824.157
112	761686.5	964830.7	822.516
113	761804.1	965153.7	821.091
114	761699.6	964935.6	824.538
115	761629	965178.8	825.205

LEGEND

- Wood Utility Pole
- Wood Utility Pole With Street light
- GuyWire
- Sign
- Protective Post
- Gas Marker
- Gas Meter
- Stand Pipe
- Fire Hydrant
- Water Valve
- Electrical Box
- Soil Boring
- Monitor Well
- Unknown Type Manhole
- Unknown Type Valve or Cleanout
- Benchmark
- MON FOUND Existing Boundary Monument Found
- REBAR FND Existing Boundary Pin Found
- Deciduous Tree
- C.L.F. Chain Link Fence
- E.O.P. Edge Of Pavement
- (D) Deed
- (S) Survey
- ×823.54 Spot Elevation
- Treeline
- 825 Major Contour Line
- 825 Minor Contour Line

Notes:

Address of site is 200 & 201 Stage Road, Vestal N.Y., 13851

Datums are NAD 83 (Horizontal) NAVD 88 (Vertical).

Graphic Scale

60 0 30 60 120

(In Feet)

1 inch = 60 ft.

Legend

- Proposed shallow downgradient monitoring well
- Proposed sand/gravel downgradient monitoring well
- Well within treatment zone, requiring abandonment

Date:	By:	Description
00/00/00	---	------

Revisions

GEOD CORPORATION
PHOTOGRAMMETRIC SCIENCES - SURVEY TECHNOLOGIES
CORPORATE OFFICE:
24 Kanouse Rd., Newfoundland, N.J. 07435 - (973) 697-2122 FAX: (973) 838-6433

Existing Site Conditions Of Vestal Chlorinated Solvent Site

Prepared For:
HDR
Located In:
Vestal N.Y.

Drawn By:A.J.H.
Checked: B.R.B.
Scale: 1" = 60'
Date: 4/25/2018
Proj. No. 4097
Page: 1 of 1

Figure 3.
Proposed Well Abandonment and Downgadient Hydraulic Control Well Locations

PAUL J. EMILIUS Jr.
N.Y. Professional Land Surveyor Lic. No 050203

Y:\Mapping\Projects\241242\9 Vestal\MXD\June2018 update\Figure 3-3 Fine Sand and Silt Alluvium Isopach Map.mxd 6/21/2018 12:27:52 PM cushmatd

SB-124 20-ft
SB-121 24-ft
SB-122 22.5-ft
SB-123 24-ft
RA-029 24.5-ft
RA-031 24.7-ft
RA-032 24.8-ft
HPT-002 22-ft
RA-034 24-ft
MW-I 22.6-ft
RA-036 24.5-ft
ERT-1D 20-ft
MW-F 21.8-ft
MW-H 22.2-ft
RA-040 24-ft
SB-120 22.5-ft
MW-G 22.3-ft
HPT-001 24-ft
RA-038 24-ft
AREA 3
SB-126 17-ft
SB-097 19.9-ft
SB-125 20-ft
AREA 3B
SB-085 18.5-ft
SB-087 19-ft
ERT-8 19.75-ft
SB-096 19.5-ft
HPT-005 20-ft
HPT-004 20-ft
SB-001 24-ft
AREA 4-2B
SB-107 19.9-ft
HPT-006 20-ft
RA-001 23-ft
SB-016 19-ft
RA-002 23.5-ft
SB-070 19.9-ft
AREA 4-1
SB-103 19.9-ft
RA-015 19.5-ft
RA-016 19.5-ft
SB-006 19-ft
RA-017 24-ft
ERT-5 20-ft
SB-062 23-ft
RA-100 24-ft
SB-081 19-ft
HPT-010 16-ft
SB-014 18.5-ft
RA-006 19.5-ft
RA-014 21.5-ft
HPT-003 18-ft
SB-007 19.2-ft
AREA 4-2
SB-029 20-ft
RA-003 22.5-ft
RA-004 18.5-ft
RA-005 19-ft
ERT-3D 19-ft
RA-021 23.5-ft
RA-101 23.5-ft
SB-077 14.9-ft
SB-011 15-ft
SB-069 18-ft
RA-020 20-ft
SB-059 23-ft
ERT-4D 19-ft
SB-068 19.9-ft
SB-055 19-ft
RA-019 19.5-ft
SB-082 18.5-ft
SB-009 18.5-ft
HPT-009 17-ft
SB-051 19.5-ft
ERT-2I 20-ft
SB-037 20-ft
ERT-7 19-ft
HPT-007 17-ft
SB-049 20-ft
SB-060 22.5-ft
RA-007 19-ft
SB-023 15-ft
RA-009 19-ft
RA-018 19.5-ft
ERT-6 20-ft
SB-039 19-ft
SB-073 14.5-ft
SB-021 15-ft
RA-008 18-ft
RA-023 20-ft
RA-024 23.5-ft
RA-102 24.5-ft
SB-064 19.5-ft
SB-053 19.5-ft
ERT-2D 20-ft
SB-057 22-ft
SB-075 14.5-ft
SB-072 15-ft
RA-012 18.5-ft
RA-010 19-ft
RA-022 23.5-ft
HPT-008 20-ft
RA-011 19-ft
SB-071 13-ft
RA-013 18.5-ft
RA-025 23-ft
RA-026 24.5-ft
SB-044 20-ft
SB-067 20-ft
SB-043 20.5-ft

N

0 30 60
FEET

- SOIL BORING LOCATION
- ISTR AREA BOUNDARIES
- APPROXIMATE PROPERTY BOUNDARY

THICKNESS OF FILL / FINE SAND AND SILT ALLUVIUM (FT)

14.1 - 16
16.1 - 18
18.1 - 20
20.1 - 22
22.1 - 24
24.1 - 26

ISOPACH MAP - FILL/FINE SAND AND SILT ALLUVIUM

VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE

FIGURE 4

PATH: \\MAHPI-FILE01\OFFICESHARE\SECTIONFOLDERS\WASTE MGMT & INDUSTRIAL\EDMT\EDMT_PROJECTS\VESTAL\GIS\FIG4-3_ISOPACH_MAP_FINE_SAND_AND_SILT_ALLUVIUM.MXD - USER: KMARKOWI - DATE: 6/26/2018

Y:\Mapping\Projects\24\2429_VestalMXD\June2018_update\Figure 3-4_Sand and Gravel Glacial Outwash Deposits Isopach Map.mxd 6/21/2018 12:17:57 PM cushmatd

HPT-002
23-ft

ERT-1D
20-ft

HPT-001
25-ft

AREA 3

AREA 3B

ERT-8
13-ft

HPT-005
25-ft

HPT-004
23-ft

AREA 4-2B

HPT-006
23-ft

ERT-5
20-ft

AREA 4-1

HPT-003
21-ft

ERT-3D
21-ft

AREA 4-2

HPT-010
24-ft

ERT-7
21-ft

ERT-4D
21-ft

HPT-009
18-ft

ERT-6
20-ft

HPT-007
23-ft

ERT-2D
20-ft

HPT-008
21-ft

N

0 30 60
FEET

- SOIL BORING LOCATION
- ISTR AREA BOUNDARIES
- APPROXIMATE PROPERTY BOUNDARY

THICKNESS OF SAND AND GRAVEL GLACIAL OUTWASH DEPOSITS (FT)

3.1 - 14 | 14.1 - 16 | 16.1 - 18 | 18.1 - 20 | 20.1 - 22 | 22.1 - 24 | 24.1 - 26

ISOPACH MAP - GLACIOFLUVIAL SAND AND GRAVEL

VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE

FIGURE 5

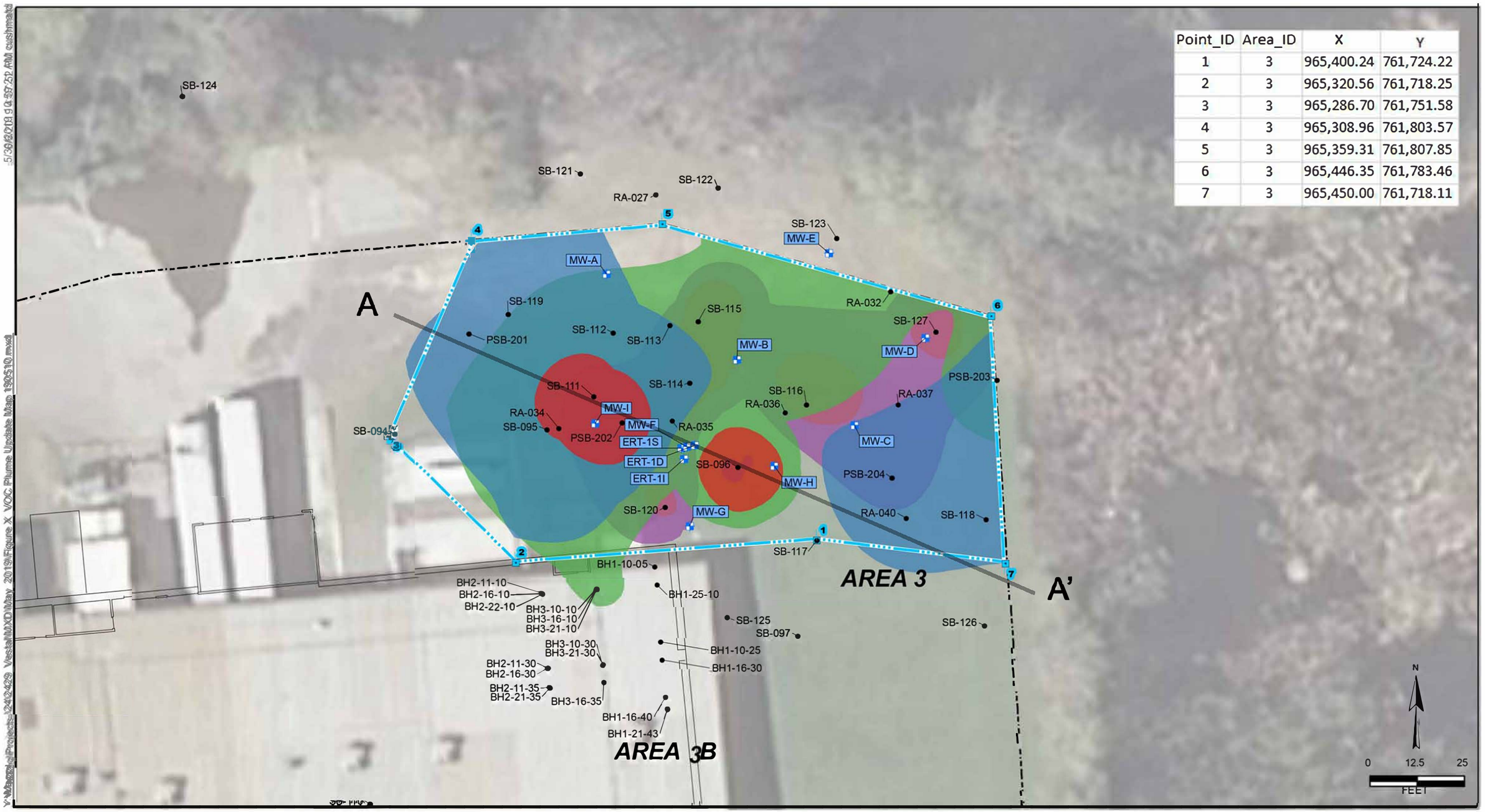
● VOC SOIL SAMPLE LOCATION (1)
APPROXIMATE PROPERTY BOUNDARY (3)
PRELIMINARY THERMAL TREATMENT ZONE

VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE

EXTENT OF THERMAL TREATMENT ZONES

FIGURE 6

Point_ID	Area_ID	X	Y
1	3	965,400.24	761,724.22
2	3	965,320.56	761,718.25
3	3	965,286.70	761,751.58
4	3	965,308.96	761,803.57
5	3	965,359.31	761,807.85
6	3	965,446.35	761,783.46
7	3	965,450.00	761,718.11



MONITORING WELL LOCATION
VOC SOIL SAMPLE LOCATION
THERMAL TREATMENT ZONE
APPROXIMATE PROPERTY BOUNDARY
ISTT AREA BOUNDARIES

LATERAL EXTENT OF 1,1,1-TCA AT 0.68 MG/KG
LATERAL EXTENT OF TCE AT 0.47 MG/KG
LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG
LATERAL EXTENT OF 1,2,4-TMB AT 3.6 MG/KG
LATERAL EXTENT OF 1,3,5-TMB AT 8.4 MG/KG

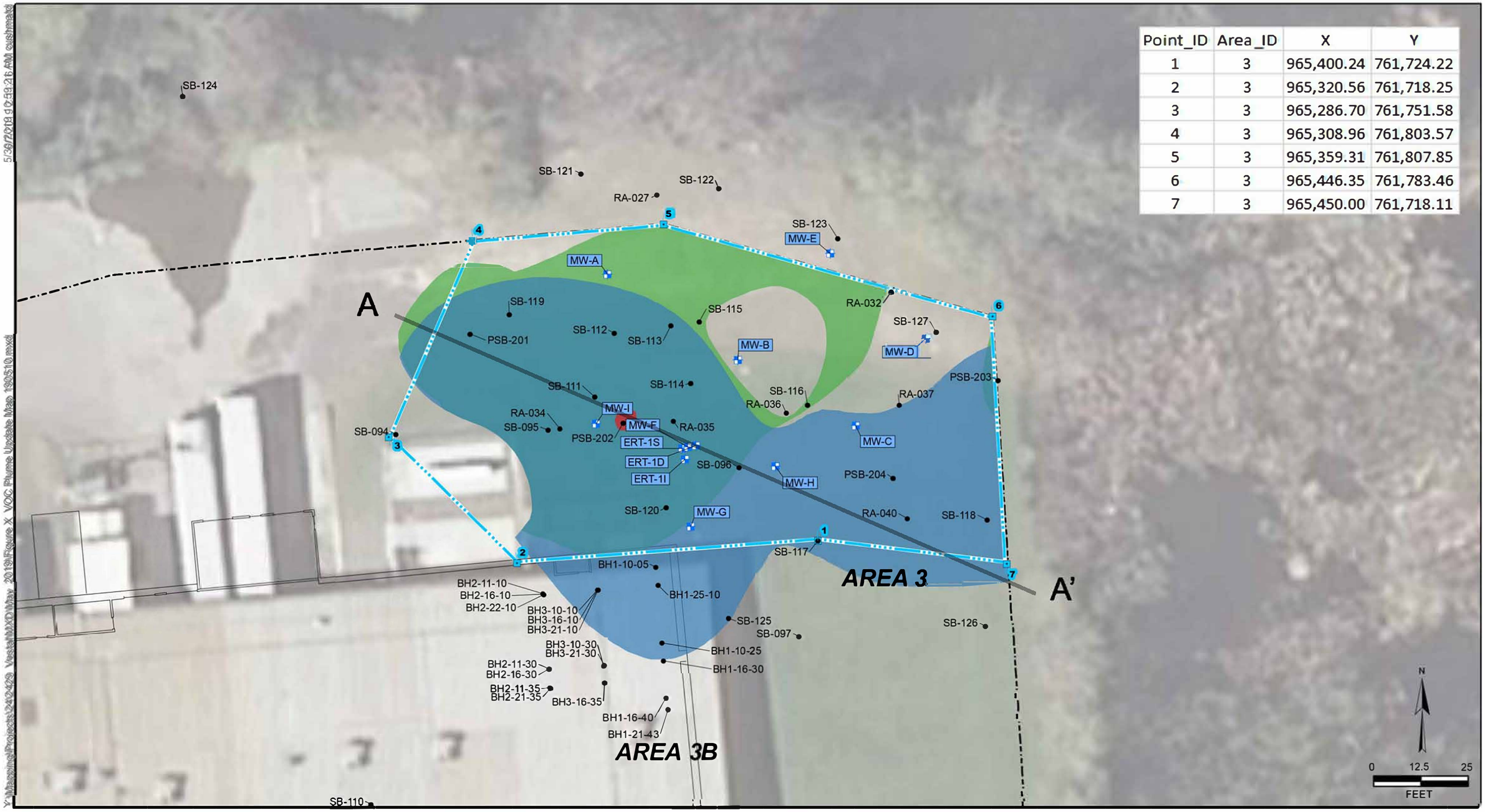
VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 3: VOC COC AREAL EXTENT

FILL / FINE SAND AND SILT ALLUVIUM

FIGURE 7-1

Point_ID	Area_ID	X	Y
1	3	965,400.24	761,724.22
2	3	965,320.56	761,718.25
3	3	965,286.70	761,751.58
4	3	965,308.96	761,803.57
5	3	965,359.31	761,807.85
6	3	965,446.35	761,783.46
7	3	965,450.00	761,718.11



MONITORING WELL LOCATION
VOC SOIL SAMPLE LOCATION
THERMAL TREATMENT ZONE
APPROXIMATE PROPERTY BOUNDARY
ISTT AREA BOUNDARIES

LATERAL EXTENT OF 1,1,1-TCA AT 0.68 MG/KG
LATERAL EXTENT OF TCE AT 0.47 MG/KG
LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG

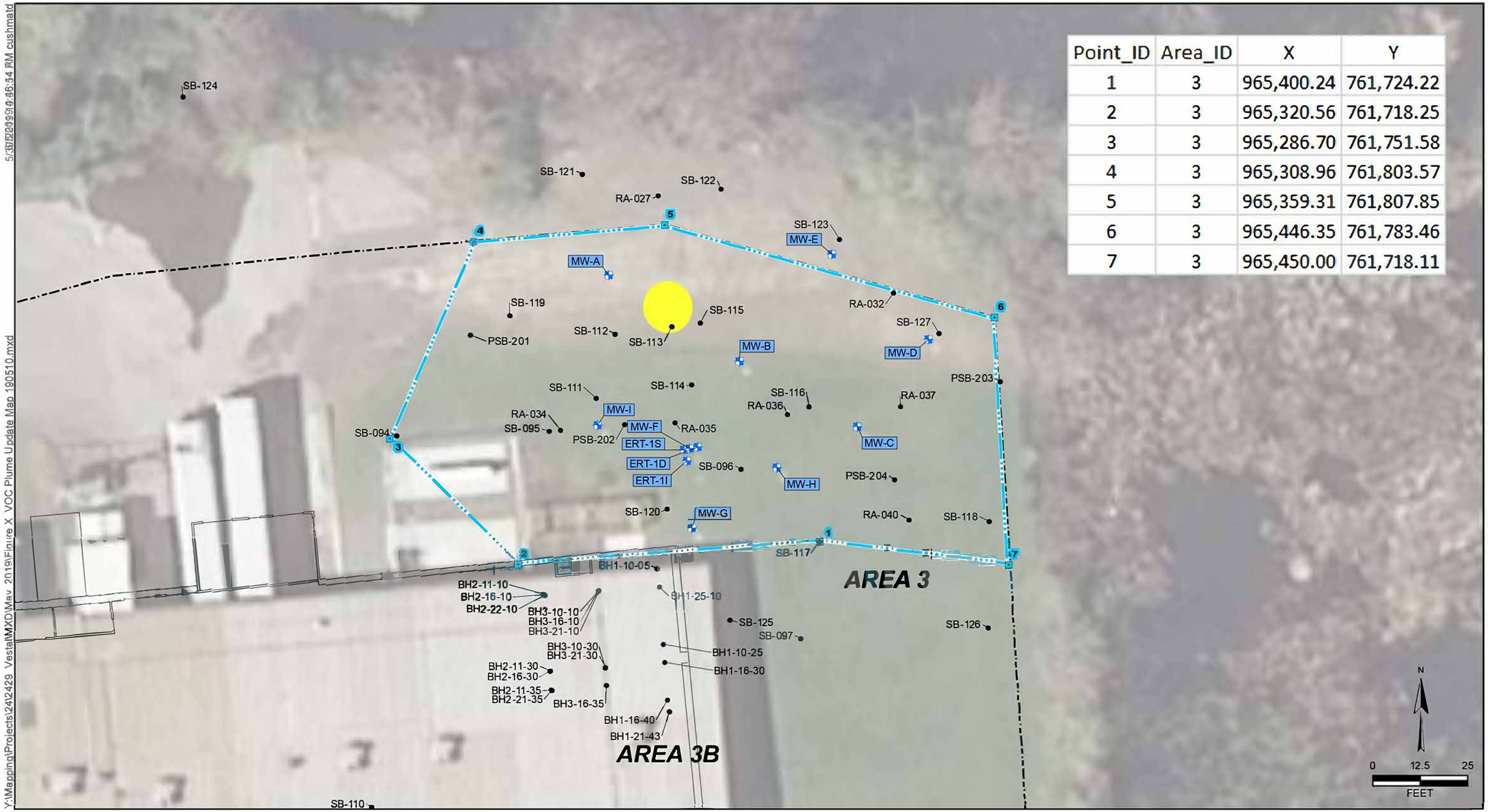
VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 3: VOC COC AREAL EXTENT
GLACIOFLUVIAL SAND AND GRAVEL

FIGURE 7-2

DRAFT

Point_ID	Area_ID	X	Y
1	3	965,400.24	761,724.22
2	3	965,320.56	761,718.25
3	3	965,286.70	761,751.58
4	3	965,308.96	761,803.57
5	3	965,359.31	761,807.85
6	3	965,446.35	761,783.46
7	3	965,450.00	761,718.11



MONITORING WELL LOCATION
VOC SOIL SAMPLE LOCATION (1)
PREVIOUS PCB SOIL SAMPLE LOCATION
THERMAL TREATMENT ZONE
APPROXIMATE PROPERTY BOUNDARY (3)
ISTT AREA BOUNDARIES
LATERAL EXTENT OF TOTAL PCBS AT 10 MG/KG

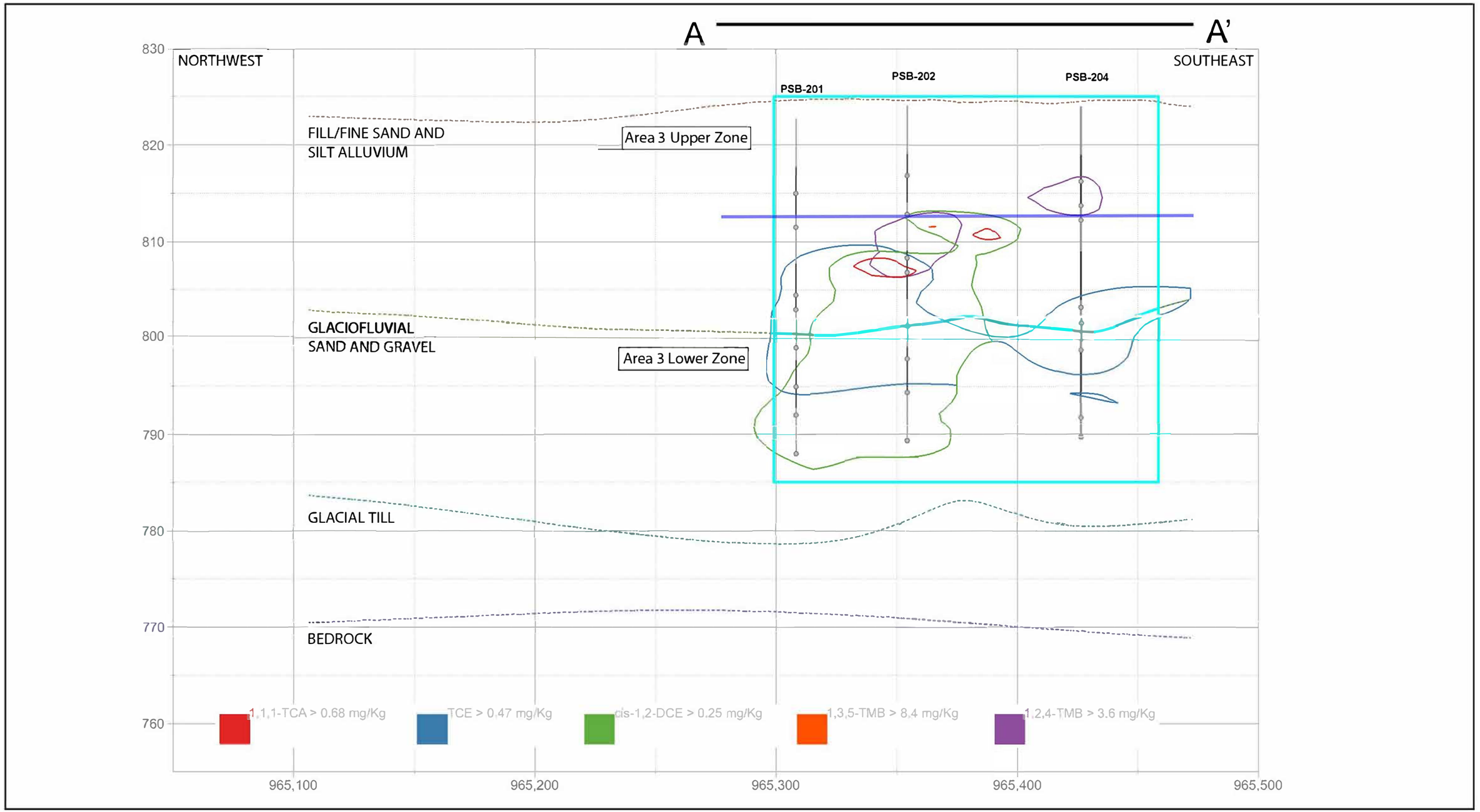
VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

Note: PCBS were not detected above the ROD treatment goals in the sand and gravel.

Projected Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet

TREATMENT AREA 3: PCB AREAL EXTENT
FILL / FINE SAND AND SILT ALLUVIUM

FIGURE 7-3



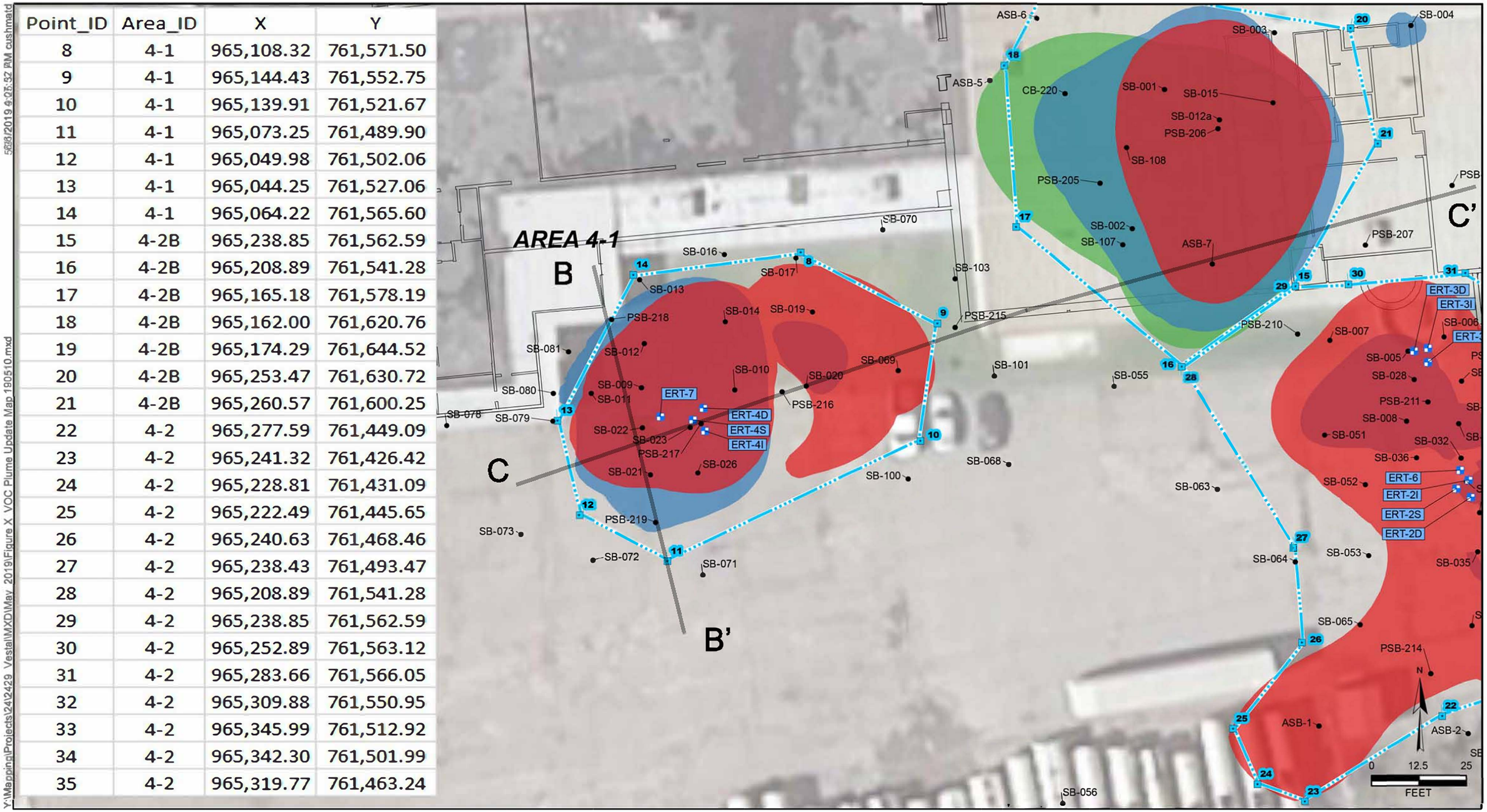
Generalized Elevation of the Potentiometric Surface of the Sand and Gravel Aquifer (March 18, 2018)

VESTAL CHLORINATED SOLVENT SITE
VESTAL, NEW YORK

TREATMENT AREA 3: CROSS SECTION A-A'

FIGURE 7-4

Point_ID	Area_ID	X	Y
8	4-1	965,108.32	761,571.50
9	4-1	965,144.43	761,552.75
10	4-1	965,139.91	761,521.67
11	4-1	965,073.25	761,489.90
12	4-1	965,049.98	761,502.06
13	4-1	965,044.25	761,527.06
14	4-1	965,064.22	761,565.60
15	4-2B	965,238.85	761,562.59
16	4-2B	965,208.89	761,541.28
17	4-2B	965,165.18	761,578.19
18	4-2B	965,162.00	761,620.76
19	4-2B	965,174.29	761,644.52
20	4-2B	965,253.47	761,630.72
21	4-2B	965,260.57	761,600.25
22	4-2	965,277.59	761,449.09
23	4-2	965,241.32	761,426.42
24	4-2	965,228.81	761,431.09
25	4-2	965,222.49	761,445.65
26	4-2	965,240.63	761,468.46
27	4-2	965,238.43	761,493.47
28	4-2	965,208.89	761,541.28
29	4-2	965,238.85	761,562.59
30	4-2	965,252.89	761,563.12
31	4-2	965,283.66	761,566.05
32	4-2	965,309.88	761,550.95
33	4-2	965,345.99	761,512.92
34	4-2	965,342.30	761,501.99
35	4-2	965,319.77	761,463.24



- MONITORING WELL LOCATION
- VOC SOIL SAMPLE LOCATION [1]
- THERMAL TREATMENT ZONE
- APPROXIMATE PROPERTY BOUNDARY [3]
- ISTT AREA BOUNDARIES
- LATERAL EXTENT OF 1,1,1-TCAAT 0.68 MG/KG [2]
- LATERAL EXTENT OF TCE AT 0.47 MG/KG
- LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG

Note: 1,2,4 TMB and 1,3,5 TMB were not detected above ROD treatment goals in the sand and gravel.

Projected Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet

VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 4-1: COC AREAL EXTENT
FILL / FINE SAND AND SILT ALLUVIUM

FIGURE 8-1

5/23/2019 9:25:32 PM cushmatd
Y:\Mapping\Projects\241429 Vestal\MXD\May 2019\Figure X VOC Plume Update Map 190510.mxd

Point_ID	Area_ID	X	Y
8	4-1	965,108.32	761,571.50
9	4-1	965,144.43	761,552.75
10	4-1	965,139.91	761,521.67
11	4-1	965,073.25	761,489.90
12	4-1	965,049.98	761,502.06
13	4-1	965,044.25	761,527.06
14	4-1	965,064.22	761,565.60
15	4-2B	965,238.85	761,562.59
16	4-2B	965,208.89	761,541.28
17	4-2B	965,165.18	761,578.19
18	4-2B	965,162.00	761,620.76
19	4-2B	965,174.29	761,644.52
20	4-2B	965,253.47	761,630.72
21	4-2B	965,260.57	761,600.25
22	4-2	965,277.59	761,449.09
23	4-2	965,241.32	761,426.42
24	4-2	965,228.81	761,431.09
25	4-2	965,222.49	761,445.65
26	4-2	965,240.63	761,468.46
27	4-2	965,238.43	761,493.47
28	4-2	965,208.89	761,541.28
29	4-2	965,238.85	761,562.59
30	4-2	965,252.89	761,563.12
31	4-2	965,283.66	761,566.05
32	4-2	965,309.88	761,550.95
33	4-2	965,345.99	761,512.92
34	4-2	965,342.30	761,501.99
35	4-2	965,319.77	761,463.24

- MONITORING WELL LOCATION
- VOC SOIL SAMPLE LOCATION [1]
- THERMAL TREATMENT ZONE
- APPROXIMATE PROPERTY BOUNDARY [3]
- ISTT AREA BOUNDARIES

- LATERAL EXTENT OF 1,1,1-TCA AT 0.68 MG/KG [2]
- LATERAL EXTENT OF TCE AT 0.47 MG/KG
- LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG

Note: 1,2,4 TMB and 1,3,5 TMB were not detected above ROD treatment goals in the sand and gravel.

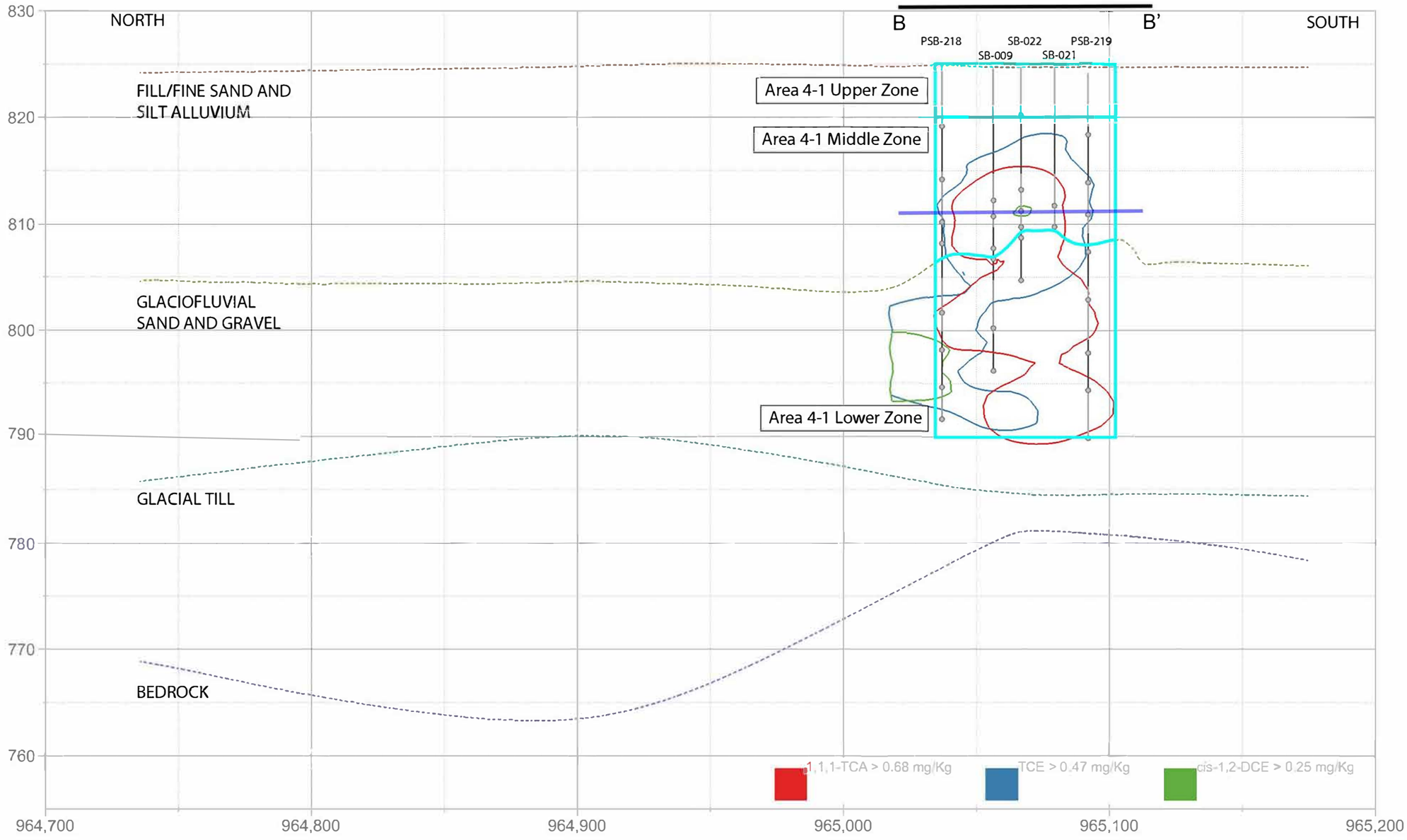
Projected Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet

VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 4-1: COC AREAL EXTENT
GLACIOFLUVIAL SAND AND GRAVEL

FIGURE 8-2

Y:\Mapping\Projects\2412429_Vestal\MXD\May_2019\Figure X VOC Plume Update Map 190510.mxd



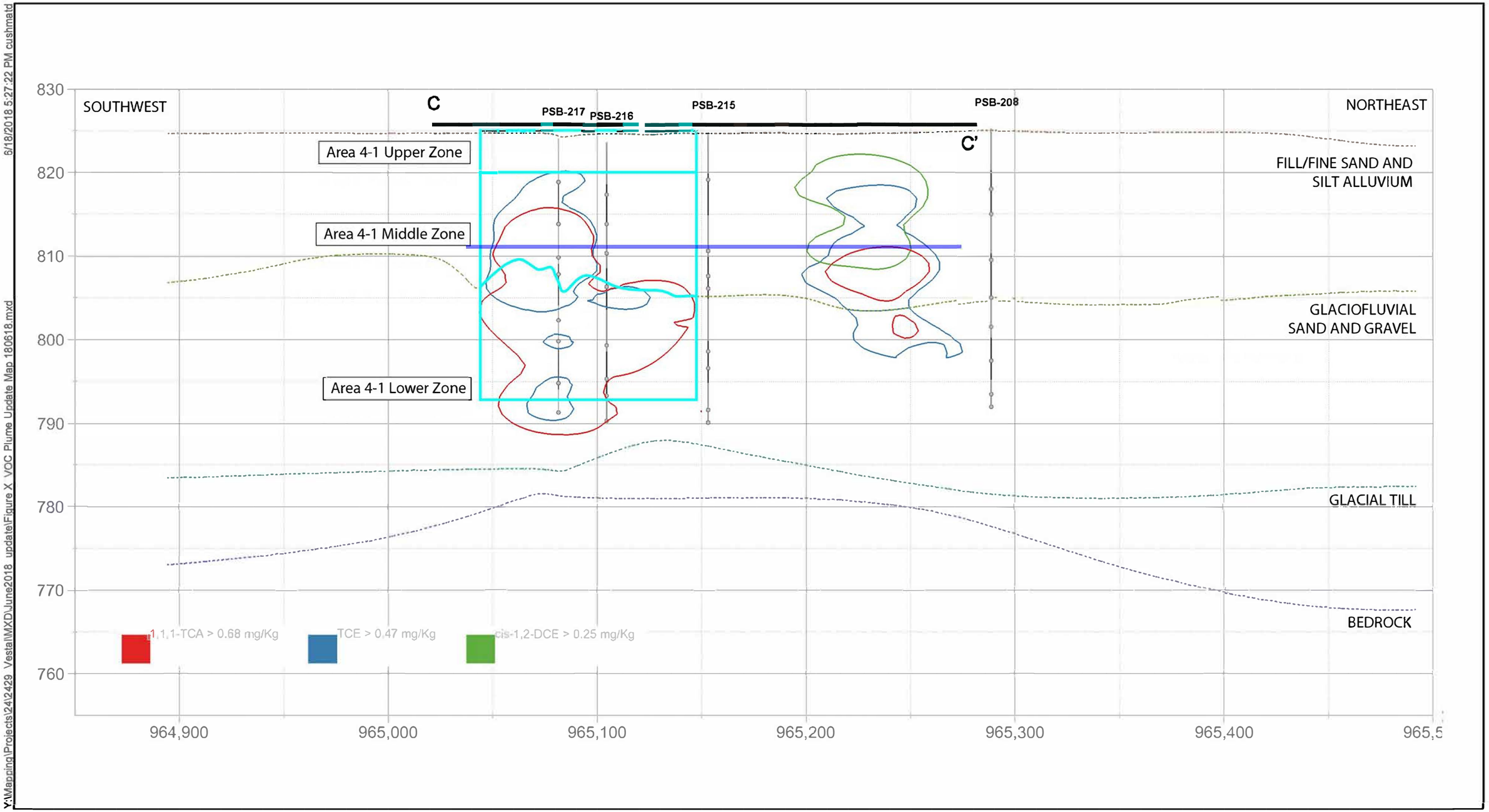
Y:\Mapping\Projects\242429 Vestal\MXD\June2018 update\Figure X VOC Plume Update Map 180618.mxd 6/19/2018 5:27:22 PM cushmaid

Generalized Elevation of the Potentiometric Surface of the Sand and Gravel Aquifer (March 18, 2018)

VESTAL CHLORINATED SOLVENT SITE
VESTAL, NEW YORK

TREATMENT AREA 4-1: CROSS SECTION B-B'

FIGURE 8-3

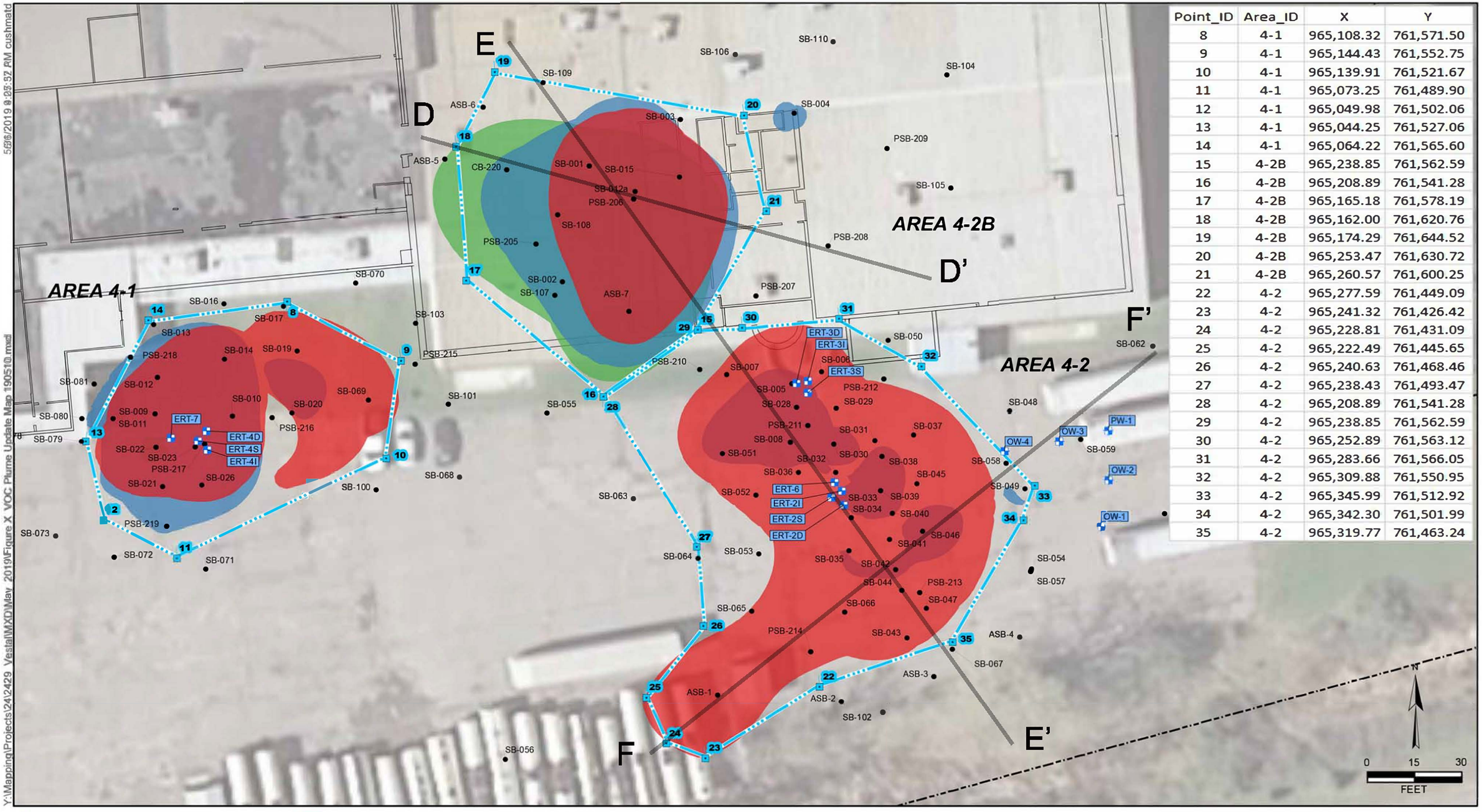


Generalized Elevation of the Potentiometric Surface of the Sand and Gravel Aquifer (March 18, 2018)

VESTAL CHLORINATED SOLVENT SITE
VESTAL, NEW YORK

TREATMENT AREA 4-1: CROSS SECTION C-C'

FIGURE 8-4



Point_ID	Area_ID	X	Y
8	4-1	965,108.32	761,571.50
9	4-1	965,144.43	761,552.75
10	4-1	965,139.91	761,521.67
11	4-1	965,073.25	761,489.90
12	4-1	965,049.98	761,502.06
13	4-1	965,044.25	761,527.06
14	4-1	965,064.22	761,565.60
15	4-2B	965,238.85	761,562.59
16	4-2B	965,208.89	761,541.28
17	4-2B	965,165.18	761,578.19
18	4-2B	965,162.00	761,620.76
19	4-2B	965,174.29	761,644.52
20	4-2B	965,253.47	761,630.72
21	4-2B	965,260.57	761,600.25
22	4-2	965,277.59	761,449.09
23	4-2	965,241.32	761,426.42
24	4-2	965,228.81	761,431.09
25	4-2	965,222.49	761,445.65
26	4-2	965,240.63	761,468.46
27	4-2	965,238.43	761,493.47
28	4-2	965,208.89	761,541.28
29	4-2	965,238.85	761,562.59
30	4-2	965,252.89	761,563.12
31	4-2	965,283.66	761,566.05
32	4-2	965,309.88	761,550.95
33	4-2	965,345.99	761,512.92
34	4-2	965,342.30	761,501.99
35	4-2	965,319.77	761,463.24

- MONITORING WELL LOCATION
- VOC SOIL SAMPLE LOCATION (1)
- THERMAL TREATMENT ZONE
- APPROXIMATE PROPERTY BOUNDARY (3)
- ISTT AREA BOUNDARIES

- LATERAL EXTENT OF 1,1,1-TCA AT 0.68 MG/KG (2)
- LATERAL EXTENT OF TCE AT 0.47 MG/KG
- LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG

Note: 1,2,4 TMB and 1,3,5 TMB were not detected above the ROD treatment goals in the sand and gravel.

Projected Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet

VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 4-2 AND 4-2B: COC AREAL EXTENT
FILL / FINE SAND AND SILT ALLUVIUM

FIGURE 9-1

Point_ID	Area_ID	X	Y
8	4-1	965,108.32	761,571.50
9	4-1	965,144.43	761,552.75
10	4-1	965,139.91	761,521.67
11	4-1	965,073.25	761,489.90
12	4-1	965,049.98	761,502.06
13	4-1	965,044.25	761,527.06
14	4-1	965,064.22	761,565.60
15	4-2B	965,238.85	761,562.59
16	4-2B	965,208.89	761,541.28
17	4-2B	965,165.18	761,578.19
18	4-2B	965,162.00	761,620.76
19	4-2B	965,174.29	761,644.52
20	4-2B	965,253.47	761,630.72
21	4-2B	965,260.57	761,600.25
22	4-2	965,277.59	761,449.09
23	4-2	965,241.32	761,426.42
24	4-2	965,228.81	761,431.09
25	4-2	965,222.49	761,445.65
26	4-2	965,240.63	761,468.46
27	4-2	965,238.43	761,493.47
28	4-2	965,208.89	761,541.28
29	4-2	965,238.85	761,562.59
30	4-2	965,252.89	761,563.12
31	4-2	965,283.66	761,566.05
32	4-2	965,309.88	761,550.95
33	4-2	965,345.99	761,512.92
34	4-2	965,342.30	761,501.99
35	4-2	965,319.77	761,463.24

MONITORING WELL LOCATION
VOC SOIL SAMPLE LOCATION [1]
THERMAL TREATMENT ZONE
APPROXIMATE PROPERTY BOUNDARY [3]
ISTT AREA BOUNDARIES

LATERAL EXTENT OF 1,1,1-TCA AT 0.68 MG/KG [2]
LATERAL EXTENT OF TCE AT 0.47 MG/KG
LATERAL EXTENT OF cis-1,2-DCE AT 0.25 MG/KG

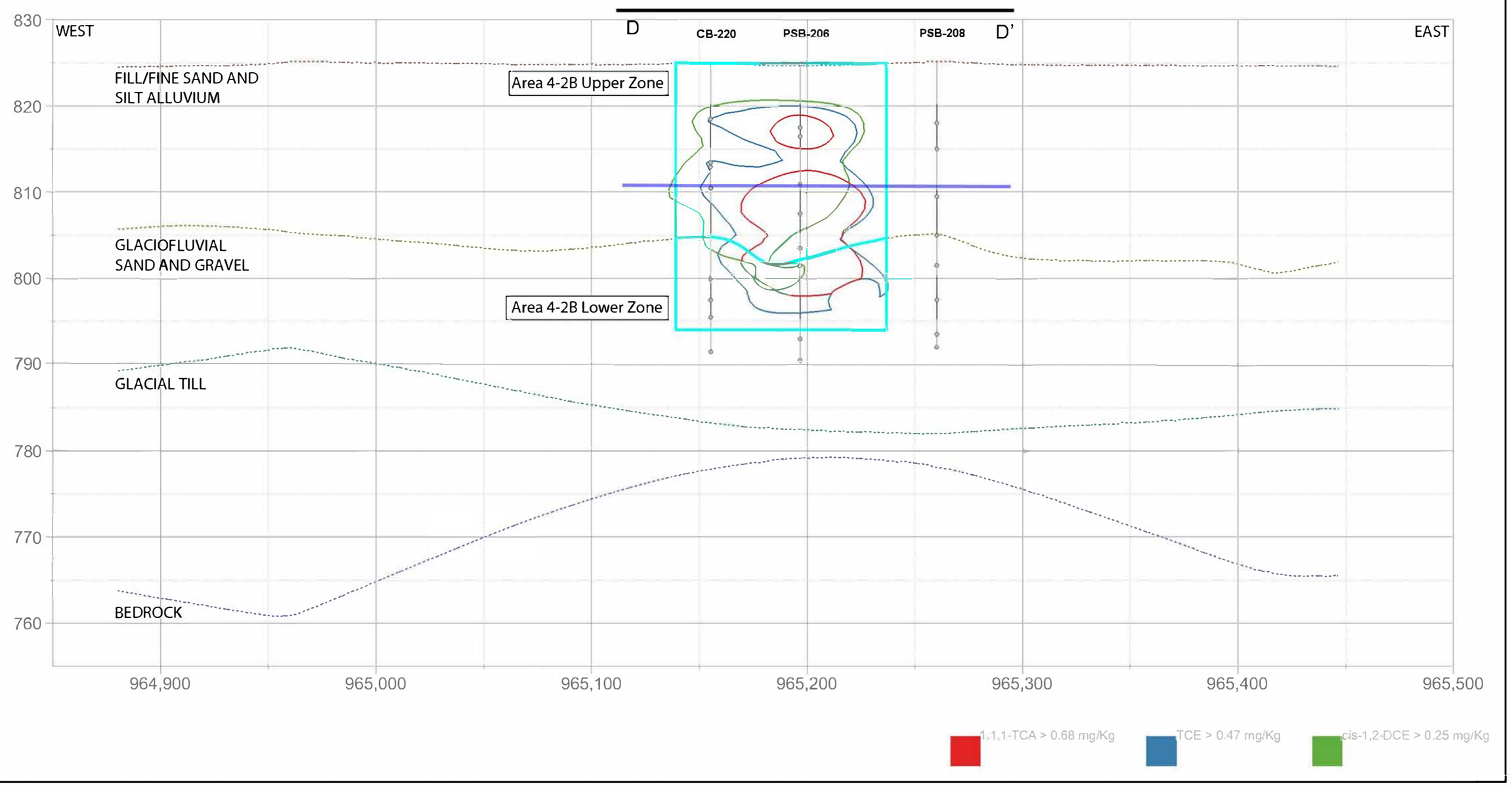
Note: 1,2,4 TMB and 1,3,5 TMB were not detected above the ROD treatment goals in the sand and gravel.

Projected Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet

VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 4-2 AND 4-2B: COC AREAL EXTENT
GLACIOFLUVIAL SAND AND GRAVEL

FIGURE 9-2

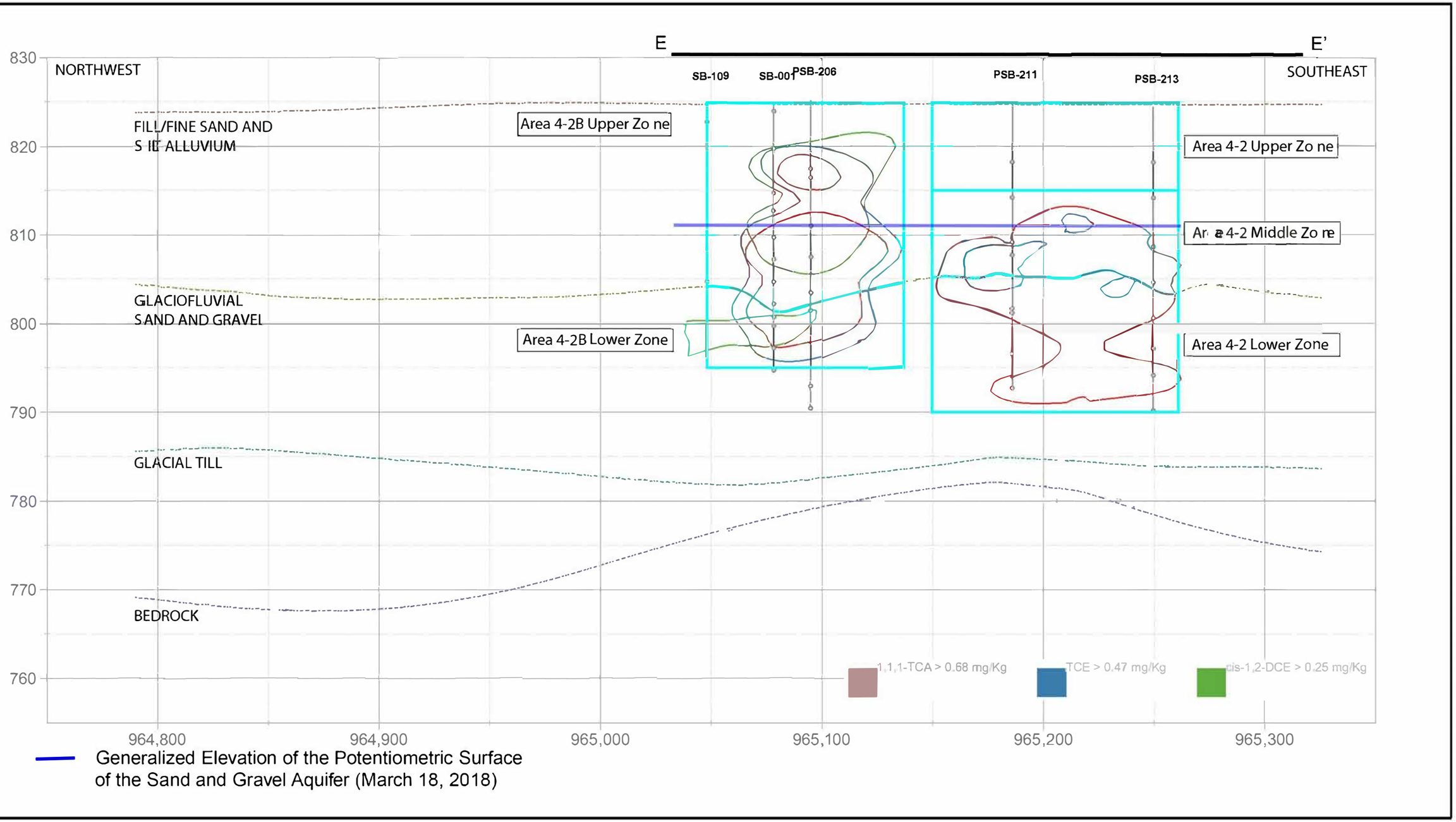


Generalized Elevation of the Potentiometric Surface of the Sand and Gravel Aquifer (March 18, 2018)

VESTAL CHLORINATED SOLVENT SITE
VESTAL, NEW YORK

TREATMENT AREA 4-2B: CROSS-SECTION D-D'

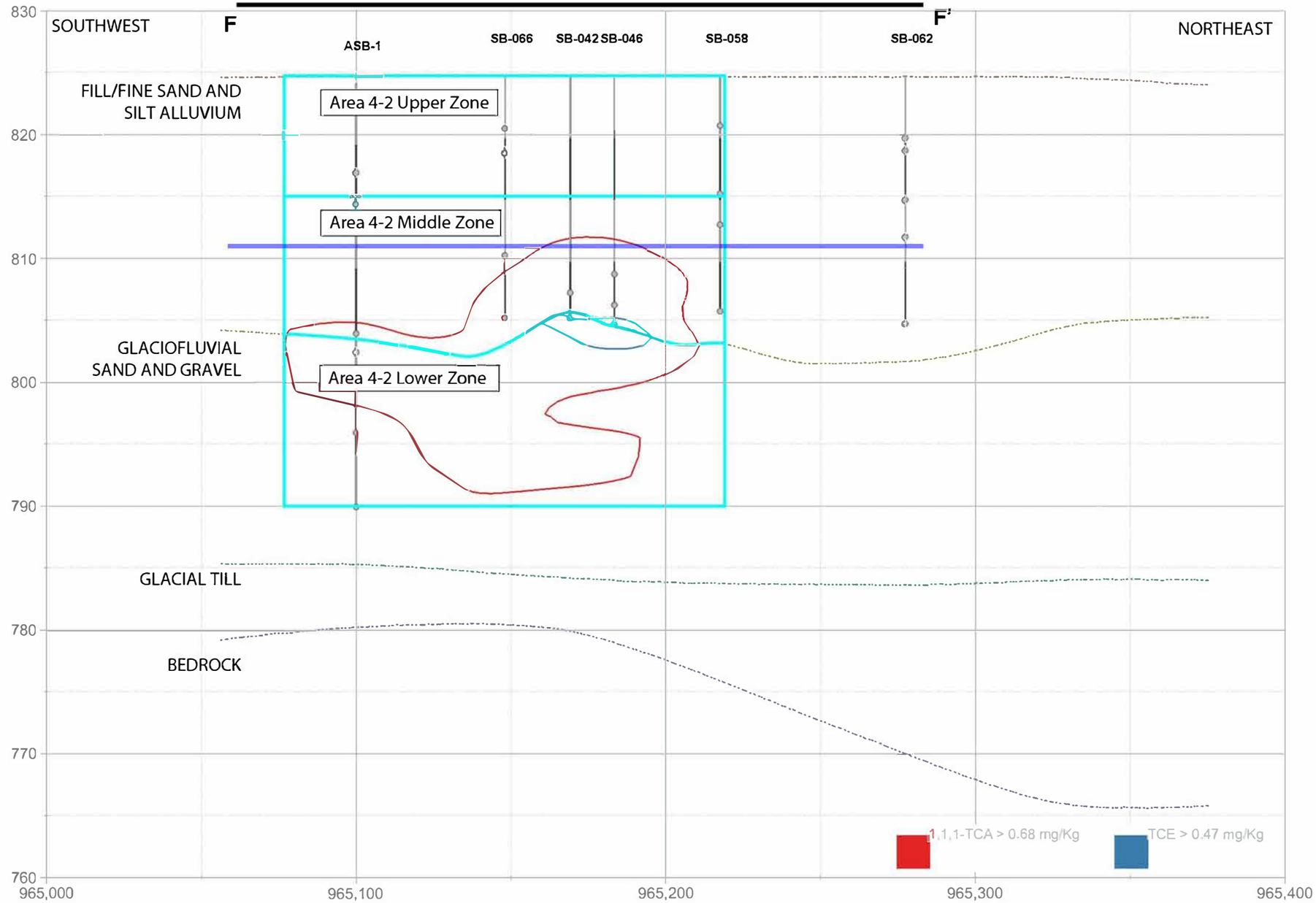
FIGURE 9-3



VESTAL CHLORINATED SOLVENT SITE
VESTAL, NEW YORK

TREATMENT AREAS 4-2 AND 4-2B: CROSS SECTION E-E'

FIGURE 9-4

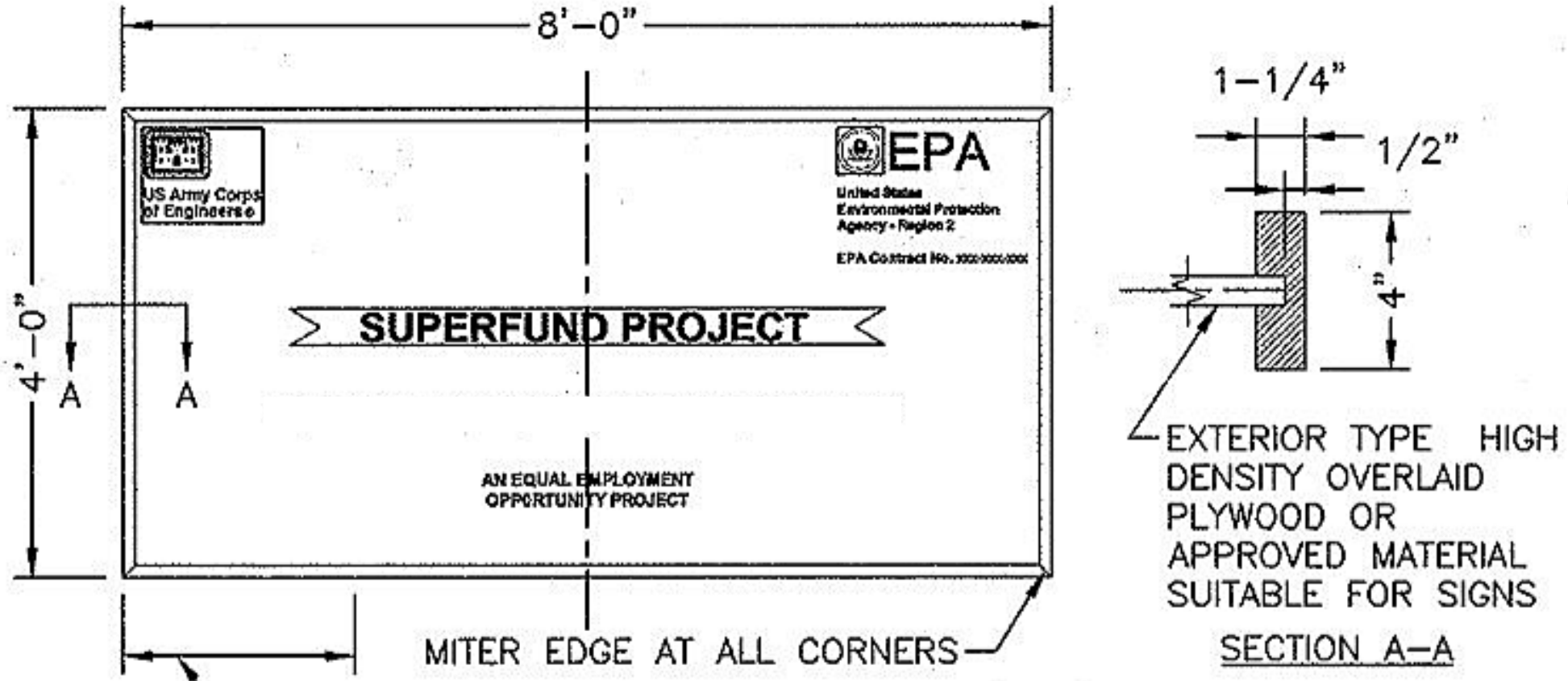


Generalized Elevation of the Potentiometric Surface of the Sand and Gravel Aquifer (March 18, 2018)

VESTAL WATER SUPPLY WELL 1-1
SUPERFUND SITE

TREATMENT AREA 4-2: CROSS SECTION F-F'

FIGURE 9-5



PROJECT SIGN

FIGURE 10

DATUM NAD 83 NAVD 88

Stage Road

Vestal Rail Trail

BLOCK 1
LOT 6
N/F 200 STAGE ROAD ASSOCIATES, LLC.
DB. 02371 PG. 0507

BLOCK 1
LOT 31
N/F 200 STAGE ROAD
ASSOCIATES, LLC.
DB. 02295 PG. 0153

MOBIL OIL CORPORATION
GAS LINE 40' EASEMENT

6" BURIED MOBIL OIL
CORPORATION GAS LINE
(MINIMUM DEPTH 80")

Notes:
Address of site is 200 & 201 Stage Road, Vestal N.Y., 13851

Datums are NAD 83 (Horizontal) NAVD 88 (Vertical).

LEGEND (ADDITIONAL UTILITIES):
- STORM DRAIN
- FLOOR DRAIN PIPING
- SVE SYSTEM SUBSURFACE PIPING
- SS SANITARY SEWER
- W WATER
- G GAS
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- POTENTIAL UNKNOWN UTILITY
- FLOOR DRAIN
- ASB-2 ADDITIONAL BORING
- 1 CONTROL POINT

NOTES:
1. WATER, SANITARY, AND HVAC RUN OVERHEAD INSIDE OF BUILDING.
2. UTILITY LOCATIONS WERE NOT SURVEYED BY A LICENSED SURVEYOR AND SHOULD BE CONSIDERED APPROXIMATE.
3. CONTROL POINTS PROVIDED BY GEOD AND POSTED BY HDR.

Survey Control Points

ID	Northing	Easting	Elevation
1	761694.8	964878.1	821.902
2	761811.3	965359.4	824.387
3	761520.3	965461.2	824.604
101	761470.3	965233	824.552
102	761627.9	965175.5	825.225
103	761635.1	965295.9	825.257
110	761453.5	965083	823.767
111	761430.3	964899.5	824.157
112	761686.5	964830.7	822.516
113	761804.1	965153.7	821.091
114	761699.6	964935.6	824.538
115	761629	965178.8	825.205

LEGEND
- Wood Utility Pole
- Wood Utility Pole With Street light
- Guy Wire
- Sign
- Protective Post
- G Gas Marker
- GM Gas Meter
- Stand Pipe
- Fire Hydrant
- W Water Valve
- E Electrical Box
- Soil Boring
- Monitor Well
- Unknown Type Manhole
- Unknown Type Valve or Cleanout
- BM Benchmark
- MON FOUND Existing Boundary Monument Found
- REBAR FND Existing Boundary Pin Found
- Deciduous Tree
- C.L.F. Chain Link Fence
- E.O.P. Edge Of Pavement
- (D) Deed
- (S) Survey
- 823.54 Spot Elevation
- Treeline
- 825 Major Contour Line
- Minor Contour Line

Graphic Scale
60 0 30 60 120
(In Feet)
1 inch = 60 ft.

Date:	By:	Description
00/00/00	---	------

Revisions

GEOD CORPORATION
PHOTOGRAMMETRIC SCIENCES - SURVEY TECHNOLOGIES
CORPORATE OFFICE:
24 Kanouse Rd., Newfoundland, N.J. 07435 - (973) 697-2122 FAX: (973) 838-6433

C-001 Existing Site Conditions Of Vestal Chlorinated Solvent Site

Prepared For: HDR Located In: Vestal N.Y.

Drawn By:A.J.H.
Checked: B.R.B.
Scale: 1" = 60'
Date: 4/25/2018
Drawing C-001
Page: 1 of 1

PAUL J. EMILIUS Jr.
N.Y. Professional Land Surveyor Lic. No 050203