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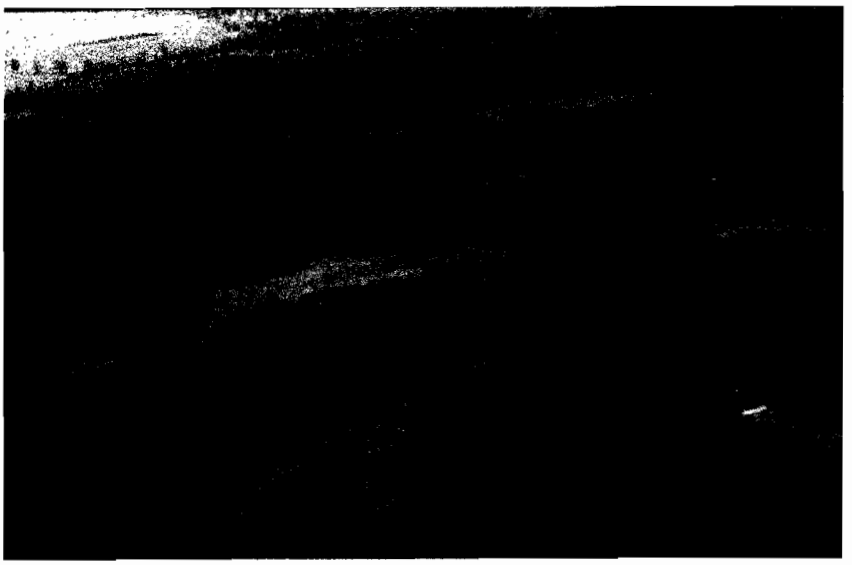

TOWN OF WILLSBORO
BLACK ASH POND
ENVIRONMENTAL RESTORATION PROJECT
WORK PLAN

JULY 2004

- Civil
- Geotechnical
- Environmental
- Zebra Mussel Controls

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TOWN OF WILLSBORO
BLACK ASH POND
ENVIRONMENTAL RESTORATION PROJECT
SI/RA WORK PLAN

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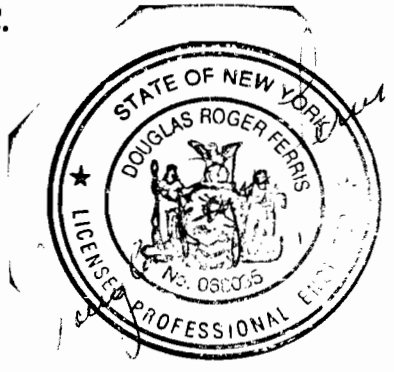
July 9, 2004



Douglas R. Ferris, P.E.

TOWN OF WILLSBORO – BLACK ASH POND ENVIRONMENTAL RESTORATION PROJECT A.SI/RA WORK PLAN

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SECTION 1: INTRODUCTION

1.0 General

This Work Plan identifies the Site Investigation/Remedial Alternative (SI/RA) development activities to be conducted at the Town of Willsboro – Black Ash Pond, located at the terminus of School Street in the Town of Willsboro, Essex County, New York. The following Work Plan addresses elements, of an SI/RA established pursuant to the NYSDEC Division of Environmental Remediation Program Policy DER-97-4058 and applicable guidance. Earth Science Engineering, P.C. (ESE) has developed this Work Plan based on a conceptual understanding of the site considering the sources of contamination, potential pathways of exposure, potential receptors and previous studies.

The scope and detail of the site characterization effort and remedial alternative development and analysis are based upon discussions with NYSDEC. This Work Plan includes various SI/RA details presented as subtasks to establish operating guidelines for the project.

1.1 SI/RA Work Plan

Section 2 of this Work Plan describes activities to be conducted during the SI/RA. The SI/RA Work Plan is consistent with, and addresses elements of, an SI/RA per NYSDEC Division of Environmental Remediation Program Policy DER-97-4058.

1.2 Sampling and Analysis Plan (SAP)

Section 3 presents the site specific SAP focusing on tasks, methodologies, and procedures necessary for the completion of media sampling and analysis as part of the SI. The SAP will identify media sample analysis in accordance with Contract Laboratory Protocol (CLP) methods and laboratory reporting in accordance with the 2000 NYSDEC Analytical Services Protocol (ASP) Category B deliverables. In general, the SAP will consist of two primary sections: 1) the Quality Assurance Project Plan (QAPP); and 2) the Field Sampling Plan (FSP).

1.2.1 Quality Assurance Project Plan (QAPP)

The QAPP describes the policies, organization, objectives, functional activities, and specific Quality Assurance (QA)/Quality Control (QC) activities designed to achieve the data quality goals or objectives of the specific project(s), data analyses, or continuing operations. For the data analysis portion of the QAPP, media sample analysis via Contract Laboratory Protocols (CLP) methods will be utilized to establish applicable analytical procedures and methodologies. In general the QAPP includes: 1) a project description; 2) a project organizational chart outlining project responsibilities; 3) QA objectives for data; 4) sample custody procedures during sample handling in the laboratory; 5) the types and frequency of calibration procedures for field/laboratory instruments, internal quality control checks, and quality assurance performance audits; 6) preventative maintenance procedures and schedule for corrective procedures for field and laboratory instruments; 7) specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness; and 8) data documentation and tracking procedures. Laboratory reporting will be completed in accordance with the 2000 NYSDEC Analytical Services Protocols (ASP) Category B deliverables.

1.2.2 Field Sampling Plan (FSP)

The SAP also includes an FSP consistent with "Field Methods Compendium" OSWER-Directive 9285.2-11 (Draft June 1993). The FSP is developed so that sample collection activities are

conducted in accordance with technically acceptable protocols and that data collected in the field meet the established data quality objectives. The FSP is developed prior to the initiation of field activities and will describe the methods and procedures for obtaining representative portions of the media being investigated and the data gathering methods. The FSP details the sampling objectives and protocol, including an anticipated schedule of sampling events, a description of the necessary equipment, sample types, locations, frequency, and analyses.

1.3 Citizens Participation Plan (CPP)

Section 4 includes the CPP designed to encourage communication between the Town of Willsboro, NYSDEC, and the public during the SI/RA and to provide interested and concerned citizens with accurate and timely information regarding site investigations and the alternatives for remediation. This plan will be a working document periodically reviewed and updated to reflect changes during the course of the SI/RA. A single public informational meeting will be held at the end of the project. The CPP will be consistent with applicable elements listed within the NYSDEC Division of Environmental Remediation Program Policy DER-97-4058.

1.4 Health and Safety Plan (HASP)

Section 5 describes the activities to be conducted to implement a HASP in accordance with 29 CFR Section 1910. This HASP will provide guidance on protecting personnel at, and in the vicinity of, the site during the SI. The HASP will be reviewed and updated whenever additional site data are received, on-site personnel change, the level of protection used on-site is upgraded or downgraded, or site operations differ from those covered by the existing plan.

1.5 Project Schedule

Section 6 includes a preliminary project schedule for the SI/RA. The project schedule includes a detailed list of project milestones estimated for the completion of the project.

SECTION 2: WORK PLAN

2.1 Introduction

2.1.1 Site Location and General History

The Town of Willsboro Black Ash Pond encompasses approximately 25 acres and is located at the terminus of School Street in the Town of Willsboro (hereinafter "Town"), Essex County, New York. The site is a former industrial property bounded to the north and west by the Bouquet River, to the east by lands owned by the Adirondack Nature Conservancy (ANC) and to the south by additional lands owned by the ANC and Town. The site was deeded to the Town in 1966 by Georgia-Pacific Corporation. There are no buildings or structures present on the site. The site was previously used for deposition and settling of combustion residue slurry (black ash). Phase I Environmental Site (ESA) Assessments for the parent parcel performed in 2001 and 2003, and a limited Phase II ESA conducted on the parent parcel in 2003, examined the black ash and discovered metals exceeding NYSDEC guidelines.

2.1.2 Physical Setting

The site location is shown in Figure 1. The site lies at an elevation of approximately 50 feet above mean sea level contiguous to the Bouquet River in the Town of Willsboro approximately two (2) miles west of Lake Champlain. Although a portion of the southern end of the parcel is fenced due to the adjacent Town of Willsboro Wastewater Treatment Plant, access can be obtained directly from a NYSDEC fishermen parking area. The surface of the site is flat, with the topography slightly climbing to the south. No permanent structures exist on the property, however a municipal wastewater treatment plant occupies a contiguous 2.7 acre parcel along the southern border. The majority of the parcel is covered by black ash and a thin layer of topsoil at some locations. Topographically, the site is located within the Bouquet River floodplain, with elevated uplands to the south and east of the site.

Consistent with the topography of the area, stormwater runoff percolates through the permeable black ash overburden and then seeps into the Bouquet River through the former dike/berm and eventually into Lake Champlain. According to US Department of Agriculture-Soil Conservation Service Soil Survey mapping for Essex County, the soils in the vicinity of the site are comprised primarily of mine spoil and urban land/fill. Review of surficial geologic mapping indicates that the unconsolidated soils in the vicinity of the site consist of a thin layer of lacustrine silt and clay, likely laminated and calcareous, overlain by riverine sandy loam, sands and gravels. The unconsolidated soils are probably underlain by glacial till.

The thickness of these types of unconsolidated deposits is typically variable in the immediate vicinity of the Bouquet River. Regional bedrock geologic mapping indicates that bedrock underlying the site consists of Potsdam sandstone from the Pre-Cambrian Era. Consistent with the topographic setting of the site and observation of seeps from the Black Ash Pond into the river, shallow groundwater flow in the area of the site would be perceived to flow across the site from south to north.

Groundwater within the deeper bedrock generally occurs within fractures, joint, and bedding planes commonly enlarged due to dissolution of carbonates and evaporates. There are reportedly no private or municipal groundwater wells used to supply potable water within a two (2) mile radius of the site. The residents within a ¼ mile radius of the site receive their domestic water from municipal service connections supplied by the Town. The Town receives raw water from Lake Champlain via an intake within Willsboro Bay approximately two (2) miles north of the project site.

2.1.3 SI/RA Approach

Site Investigations

Initial SI efforts include supplemental site reconnaissance to identify other potential areas of environmental concern at the site. Subsurface test trenches will be completed within the site and Black Ash Pond to provide preliminary identification of subsurface areas of environmental concern. A series of subsurface soil borings will then be focused upon areas of concern. Borings will be completed to refine the vertical limits of black ash and/or sludge deposition and corresponding potential environmental impacts, if any.

Groundwater monitoring wells will be installed within a limited number of the borings to assess potential impacts to the shallow groundwater table that may have occurred as a result of black ash deposition. As part of the SI, media samples will be collected from subsurface test trenches, soil borings, groundwater monitoring wells, Bouquet River sediments, waste leachate seeps along the bank of the river, and related offsite sediments and subsurface soils for laboratory analysis.

In the event that direct evidence of wastes or waste disposal (i.e., drums, chemicals, etc.) are encountered during the completion of the SI, it may be necessary to implement Interim Remedial Measures (IRMs) to quickly remediate potential point source hazards to human health and the environment. Although not expected or planned for purposes of this scope of work, ESE will be available to implement IRM specific efforts in the event IRM related efforts are deemed necessary.

After receipt of laboratory test reports, a data usability review shall be performed to confirm the validity of the data. The laboratory data will be utilized to prepare a site specific qualitative human health risk assessment. The results of site reconnaissance, field investigations, media sampling, laboratory analysis, data usability review, and qualitative human health risk assessment will be compiled and interpreted within a Site Investigation Report.

Development of Remedial Alternatives

As SI laboratory data reports are received, and areas of environmental concern identified, remedial alternative development efforts will initiate concurrently. The first effort for this task, remedial action objectives specifying remediation goals for contaminants identified, media of concern, and potential exposure pathways, will be identified. Thereafter, potential general remedial response actions, i.e., treatment, containment, excavation, extraction, disposal, and institutional actions), will be generated. After identifying applicable general response actions, suitable response action technologies for the remediation of contaminated media will be conceptualized.

The respective response action technologies will then be assembled into remedial alternatives for evaluation and screening based upon criteria including effectiveness (long-term and short-term), reliability, implementability, and cost. Upon completion of remedial alternative screening, a detailed remedial alternative evaluation will be conducted. In general, the alternatives will be evaluated in accordance with specific criteria to determine a cost-effective and efficacious remedy. NYSDEC will additionally evaluate the alternatives based on community acceptance. The results of the remedial alternative development and evaluation will be compiled within a Remedial Alternatives Report.

2.2 Site Investigations (Site Characterization)

The primary task of the SI involves Site Characterization to determine the nature and extent of contamination at the site. For this project, Site Characterization includes: 1) the collection and assessment of existing data; 2) subcontractor procurement; 3) the completion of field investigations; 4) the completion of a qualitative human health risk assessment; and 5) SI Report Preparation.

2.2.1 Collect and Analyze Existing Data

Prior to the initiation of active site investigation efforts, existing data will be assembled and evaluated, as appropriate, to complete a site history and site description. Additionally, existing site analytical data will be reviewed to determine its appropriateness for inclusion and reference in the SI/RA. During the evaluation of existing data, information on the local hydrogeology and hydrology will be reviewed. Commercial processes and waste handling and disposal practices will be reviewed to determine the types and quantities of wastes possibly deposited at the site and at related sites.

2.2.2 Subcontractor Procurement

ESE will prepare and administer contracts in preparation for fieldwork as part of the SI. Subcontractor procurement conducted in accordance with NYSDEC guidance include preparation of specifications, bid administration, contract negotiations, and preparation for subcontracted services, e.g., site survey and base mapping, test trenching, analytical laboratory services, subsurface borings and monitoring well installation.

2.2.3 Field Investigations

As an integral part of the SI, the following field investigations will be completed to determine the nature and extent of contamination at the site:

2.2.3.1 Site Reconnaissance and Records Search

A supplemental site reconnaissance effort (in addition to that previously completed as part of Phase I and Phase II ESA efforts) will be completed to identify the location of areas of environmental concern. ESE will perform a ground survey to establish scaled topographic site mapping to base future investigations and remedial actions.

2.2.3.2 Preliminary Subsurface Investigations

In order to verify the subsurface presence/absence of potential environmental impacts and/or general evidence of contaminant releases within the parcel, a series of test trenches will be completed utilizing a rubber tired backhoe or track excavator. Consistent with the area of the site (+/- 25 acres), it is estimated that twenty (20) subsurface test trenches be completed. During the completion of test trench excavations, soil and waste media samples will be routinely collected for total organic vapor screening via photo ionization detection.

In the event that obvious evidence of a previous contaminant release, soil staining, petroleum residue, or elevated volatile organic vapors are identified within the soil of a specific excavation, separate samples of the soil and/or waste media will be collected for laboratory analysis.

A total of fourteen (14) soil and/or waste media samples will be collected as part of the preliminary subsurface investigation effort for Target Compound List (TCL) analysis, consistent with applicable CLP Organic Laboratory Methods (OLM) and Inorganic Laboratory Methods (ILM). This includes five (5) samples to be utilized for related offsite/adjacent property locations.

2.2.3.3 Subsurface Borings and Groundwater Investigation

General Subsurface Soil and Hydrogeologic Investigation

To assess the existence of potential shallow soil and groundwater quality impacts within the property, it is proposed that twenty (20) shallow continuously sampled soil borings be completed at the site. Due to the possible significant thickness of waste material at the property and sensitive riverbank berm environment, it is proposed a series of continuously sampled subsurface borings (rather than test trenches) be completed along the river's edge and within the Black Ash Pond to confirm and/or assess the vertical presence of contaminant releases within the parcel. Five (5) of the soil borings shall be completed as shallow groundwater monitoring wells, constructed of PVC well screen and riser pipe, to assess the existence of potential shallow groundwater quality impacts in the area of the site

Subsurface Borings and Groundwater Monitoring Well Installations

The proposed locations of the twenty (20) soil borings and shallow groundwater monitoring wells are shown in Figure 2. The soil borings may be completed utilizing *Geoprobe*® (continuous) soil sampling or hollow stem auger techniques. Soil borings to be completed for monitoring well installation may utilize continuous split spoon sampling in accordance with ASTM D-1586-84 and be advanced using a 6-inch O.D. hollow stem auger without air or drilling fluids. Soil samples will be visually/manually classified in the field with the Burmeister Soil Classification System. Figure 3 includes a typical schematic of a shallow groundwater monitoring well. Split spoon samples and all boring

apparatus/tools shall be decontaminated (steam cleaned) between samples and receive a distilled water rinse. During continuous sampling, soil samples will be field screened for the presence of volatile organic compounds, using a photo ionization detector (PID) with a 6.2 eV lamp. In the event that evidence of a previous release, soil staining, petroleum residue, or elevated volatile organic vapors are identified within the soil of a specific boring, separate samples of the soil and/or waste media will be collected for laboratory analysis.

It is planned that a total of five (5) subsurface soil and/or waste media samples and five (5) groundwater samples be collected as part of the subsurface soil and groundwater investigation effort for Target Compound List (TCL) analysis, consistent with applicable CLP Organic Laboratory Methods (OLM) and Inorganic Laboratory Methods (ILM).

When it is determined that specific soil borings have attained an appropriate depth for well screening within the shallow aquifer, monitoring wells will be installed. During the completion of shallow borings and respective monitoring well installations, continuous sampling will define the unconsolidated geology prior to hollow stem auger or Geoprobe® advancement. All well installations will be constructed of two (2) inch diameter PVC tri-lock jointed screen and riser with locking caps. Since it appears that the local water table within the Black Ash Pond exists at approximately five (5) to thirteen (13)-feet below existing grade, the shallow groundwater monitoring wells will incorporate a 10-foot screen section to monitor the majority of the shallow groundwater-monitoring zone above the bedrock surface. All screens, risers and fittings will be factory sterilized and dedicated to a specific borehole. Screen slot size will be 0.01 or 0.006 inches (#10 or #6 slot). Sand incorporated within sand-pack shall consist of either "0" or "00" sizes dependent upon the gradation of material yielded from native soils surrounding the screened elevation. A bentonite seal, at least two (2) feet in thickness, will be placed following the installation of the sand pack. The bentonite seal will serve to minimize potential hydraulic communication (or short-circuiting) of infiltrating surface waters to the local shallow groundwater table. The balance of the borehole will be backfilled with a cement/bentonite grout. The placement of annular material will be coordinated with the withdrawal of augers or casing to minimize caving around the well screen and riser pipe. Annular material will be placed with a tremie to avoid bridging between riser and borehole.

As previously noted, the typical length of the screened interval will be ten (10) feet, with the sand pack extending a minimum of one (1) foot below and two (2) foot above the respective well screen. For each of the shallow wells, the screen will be installed so as to

"straddle" the apparent groundwater surface. A protective steel casing with a locking steel cap marked with the well identification number will be installed to maintain well integrity. The monitoring wells will be completed by placing a concrete cap sloped away from the respective well casing to prevent runoff infiltration. The void between each steel casing and PVC riser will be filled with heavy grade sand to prevent invasion by rodents and insects. A weep hole will be drilled into each steel casing, just above the concrete cap. All monitoring wells will be surveyed to establish horizontal and vertical control.

The elevations of each measuring point will be determined and water levels measured upon completion of well development to identify local groundwater contours and flow directions. During the completion of subsurface drilling tasks, spoil will be visually inspected, screened with a PID, placed in drums, and staged on-site, when warranted.

Well Development and Groundwater Sampling

Monitoring wells will be developed utilizing overpumping or a combination of surge block and overpumping depending on the well depth and rate of recovery. Where possible, development will continue until the water withdrawn from the well has a turbidity of 50 nephelometric turbidity units (NTUs) or less over three (3) successive measurements. Measurements will be made for each five (5) gallons of water removed from the well. During the development process, pH, conductivity and temperature will be measured and recorded. If the fifty (50) NTU development criterion cannot be met, the well will be deemed properly developed when the value of each of these parameters stabilizes to within ten (10) percent over three (3) successive measurements. In accordance with NYSDEC policy, the development waters generated from the monitoring wells will be discharged in the vicinity of the well.

As previously mentioned, groundwater sampling (for each of the five monitoring wells) will be conducted consistent with NYSDEC Quality Control approved methods, for Target Compound List (TCL) Parameters, consistent with applicable CLP Organic Laboratory Methods (OLM) and Inorganic Laboratory Methods (ILM) to determine the nature and extent of contamination.

2.2.3.4 Bouquet River Sediment and Seep Investigation

In an effort to identify and assess potential waste related environmental impacts on the adjacent Bouquet River, it is proposed that sediment samples be collected from two (2) depth intervals (12-inches and 24-inches) at one (1) upgradient and three (3) downgradient locations within the Bouquet River. As part of the preliminary reconnaissance effort, a search for known and potential waste-leachate seeps to the Bouquet River will be completed. Liquid seep or sediment from such locations will be sampled in order to determine the nature and extent of related contamination within the river sediments.

For purposes of this scope of work, it is planned that a minimum of one (1) waste media related seep sample will be collected for TCL parameter analysis, consistent with applicable CLP Organic Laboratory Methods (OLM) and Inorganic Laboratory Methods (ILM).

2.2.3.5. Offsite Investigation

Related properties from the parent parcel, most notably the ANC parcel to the east and the former pulp mill sludge lagoons located north of the subject property across the Bouquet River, shall be sampled via hand auger twelve (12) to twenty-four (24) inches below existing grade. It is anticipated that three (3) samples of residual sludge from the aforementioned sludge lagoons and a single (1) sample of the naturally encapsulated blask ash from the ANC's property shall be obtained for TCL parameter analysis, consistent with applicable CLP Organic Laboratory Methods (OLM) and Inorganic Laboratory Methods (ILM).

2.2.3.6. Phase 2 (Supplemental) Site Investigations

It is possible that one or more areas, contaminated media types, or chemical contaminants of concern will be identified. Accordingly, it is possible that additional Phase-2 (Supplemental) Site Investigations (including, but not limited to, river or seep sampling, subsurface soil sampling, soil borings and/or groundwater monitoring wells, and associated media sampling and analysis), may be necessary to accurately characterize primary areas of environmental concern at or adjacent to the site. As part of Phase 2 Site Investigations, analysis for a more focused/limited scope of parameters of concern may be appropriate. The scope of Phase-2 Site Investigations will be finalized after obtaining initial groundwater and subsurface soil sample analytical results.

2.2.4 Interim Remedial Measures (IRM)

Should direct evidence of wastes or waste disposal (i.e., drums, chemicals, etc.) be encountered during the SI, it may be necessary to implement IRM in order to quickly remediate potential point source hazards to human health and the environment. Although not expected or planned for purposes of this scope of work, ESE will be available to implement the following additional (IRM specific) scope of services in the event IRM are deemed necessary.

1. Provide an Engineer's Estimate of Project Cost for the IRM.
2. Prepare contract documents for the completion of the IRM.
3. Assist the Town in the preparation of standard non-technical Contract Document sections.
4. Conduct the Project Pre-Bid meeting.
5. Respond to Contractor questions and prepare Addenda as required.
6. Review Bids received by the Town and provide recommendation for Contract Award.
7. Provide on-site media sampling and documentation of IRM activities.
8. Provide an IRM close-out report following the completion of the IRM field remedial activities.

2.2.5 Qualitative Human Health Risk Assessment

To assess potential site hazards to human health and the environment, ESE will complete a qualitative human health risk assessment. This risk assessment includes a contaminant exposure and toxicity assessment. The results of this focused qualitative risk assessment will be used to develop an overall characterization of risk to humans and the environment. The focused risk assessment will assess the following aspects based on current and historic site specific analytical data: 1) contaminant identification and selection of indicator compounds and chemicals of concern; 2) exposure assessment to identify actual or potential exposure pathways and the extent or amount of exposure; 3) toxicity assessment and dose response information; and 4) risk characterization of the potential risks or adverse health/environment effects for each exposure scenario.

2.2.6 Data Usability Review and SI Reporting

In order to provide adequate, compliant, and defensible data consistent with NYSDEC Guidance, the analytical data generated as part of the SI shall be reviewed for data usability (excluding asbestos sample analyses). A general evaluation of field records and analytical data will be performed to assess whether the data are accurate and defensible.

Upon completion of the SI, ESE will prepare a Draft SI Report that will include, at a minimum, sections pertaining to the following: 1) site history; 2) summary of SI and IRM tasks; 3) physical and chemical characteristics of the environment (hydrogeology, soil characteristics); and 4) nature and extent of the identified contaminants of concern consistent with NYSDEC Guidance. A listing of applicable preliminary remedial alternatives will also be included within the final section of the SI Report. Upon completion of the Draft SI Report, a meeting with the Town and appropriate NYSDEC personnel will be held to discuss the cumulative results of the SI and identify preliminary remedial objectives and alternatives for the project. In an effort to maintain an expeditious project schedule, the development of Remedial Alternatives effort will be initiated during or immediately after the completion of preliminary site reconnaissance and site media sampling efforts. After SI analytical data are obtained, the identified remedial alternatives will be appropriately revised and a detailed analysis of alternatives completed.

2.3 Remedial Alternative Development (RAD)

2.3.1 Remedial Action Objectives and General Response Actions

Remedial action objectives describe what the remedial action intends to accomplish. Remedial action objectives are developed considering the existing data for the site, the NCP, and environmental standards, criteria, or guidelines (SCGs). As part of the initial stage of RAD, a listing of all relevant Federal and State SCGs will be listed to develop applicable and appropriate remedial action objectives. The identification and listing of project specific SCGs will be compiled using the *NYSDEC July 29, 1995 Memorandum titled, "Revised Index of New York State Standards, Criteria, and Guidelines (SCGs)*." These objectives specify remediation goals with respect to contaminants of concern, media of concern, and potential exposure pathways. The remediation goals are a subset of the remedial action objectives and consist of acceptable contaminant levels or a range of levels for each exposure route. After the remedial action objectives have been established, general response actions for each medium of interest will be developed. General response actions describe actions that may be utilized to attain the remedial action objectives for the site and, to the extent practicable,

describe areas of media to which the general response actions might be applied. These areas are identified considering acceptable exposure levels, potential exposure routes, the nature and extent of contamination, and other site conditions.

2.3.2 Remedial Alternative Development (RAD)

The following RAD specific tasks will be completed to identify project specific remedial action alternatives:

Identify Remedial Technologies

Potentially applicable remedial technology types and process options will be identified. The term "technology type" refers to general categories of technologies, i.e., chemical treatment, capping, etc. The term "technology process option" refers to specific processes within each technology type.

Evaluate Remedial Technologies

After identifying potential remedial technology types, each type will be evaluated and screened for suitability. The list of types and process options will be evaluated and screened based on their effectiveness and feasibility. Existing information and other available data will be used in the screening process. The effectiveness evaluation will focus on the potential effectiveness of the technology in handling the estimated volumes or areas of contamination and meeting the remediation goals, the potential impact on human health and the environment during the construction and implementation phase, and the reliability of the particular technology. The feasibility evaluation will consider both the technical and administrative feasibility of implementing the technology. After appropriate types and process options are selected, the technologies will be assembled into remedial alternatives.

Assemble Suitable Technologies Into Alternative Remedial Actions

To assemble alternatives, general response actions and process options chosen for each technology type for each medium are combined to form alternatives to meet all the remedial response objectives for the site as a whole. The alternative development process will focus only on the most viable options for site remediation. A description of each alternative will be given along with the rationale behind the assembly of the specific remedial action alternative.

2.3.3 ARAR Identification

Upon final assessment of the SI results, Federal and State standards, criteria, advisories, and guidance applicable to the hazardous substances at the site will be identified, including those ARARs (Applicable, or Relevant and Appropriate Requirements). Identification of these requirements early in the SI/RA process will assist in identifying remedial goals and remedial alternatives and allow for better planning of subsequent activities. ARAR identification will be based upon three (3) categories: chemical specific, location specific, and action specific. As previously mentioned, ARAR identification will be initiated as soon as SI data become available, with subsequent requirement identifications and revisions completed throughout the final portions of the SI and initial stages of RA development. Chemical specific ARARs are typically health or risk based numerical values or methodologies used to determine acceptable levels of contaminants, such as a Maximum Contaminant Level (MCL) for acceptable levels in drinking water. Location specific requirements typically restrict the concentration of contaminants or the conduct of the actions based on the location of the site with respect to environmentally sensitive areas, e.g., wetland or river floodplain. Action specific requirements are typically activity or technology based requirements that control hazardous waste activities, with the requirements typically triggered by the particular remedial activity selected under the remedial actions.

2.3.4 Initial Screening of Alternatives

Should a large number of viable remedial alternatives be developed, they will be screened to limit the number of alternatives undergoing detailed analysis. During the screening process, each alternative will be evaluated against its effectiveness (both long-term and short-term) and feasibility.

Effectiveness

The effectiveness evaluation considers both short-term and long-term effectiveness and the ability of the alternative to reduce the mobility, toxicity, or volume of contaminants. The short-term evaluation considers the remedial construction and implementation period. The long-term evaluation considers the period after the remedial action is completed, and whether the remedial objectives have been met. Alternatives providing significantly less effectiveness than other more may be eliminated, as well as those that do not provide adequate protection of human health and the environment.

Feasibility

The feasibility evaluation considers the technical and administrative feasibility of implementing the alternative. The implementation considerations of technical feasibility include the ability to construct, operate, and meet remedial regulations. Additionally, it considers operations and maintenance, and replacement and monitoring requirements after the remedial action is complete. Considerations of administrative feasibility include the ability to obtain approvals from federal and state regulatory agencies, the availability of treatment, storage and disposal services, and the availability of equipment and technical expertise. Alternatives that are technically or administratively not feasible or that would require equipment, specialists, or facilities unavailable within a reasonable time period will be eliminated.

2.3.5 Post Screening - Phase 2 Site Investigations and Evaluations

Alternatives that pass initial screening will undergo detailed analysis. This analysis may necessitate the collection of additional data to be used to further evaluate site characteristics or the collection of information to adequately evaluate the remedial alternatives. If necessary, supplemental SI will be proposed to further characterize site contaminants of concern. It is anticipated that supplemental sampling and analysis will be limited to only those contaminants of concern identified in the risk assessment and other parameters needed to assess treatment technologies, if required. If necessary, a Phase 2 SI Workplan will be developed to address post-screening data collection requirements. The post-screening phase may, as appropriate, include subtasks such as Supplemental SI, Literature Surveys, and/or Treatability Studies

2.3.6 Detailed Analysis of Alternatives

After a limited number of viable alternatives have been produced, a detailed analysis of alternatives will be conducted. This will include a narrative description of each alternative, e.g., the technology components and process options; an estimation of the quantity of materials to be handled; implementation requirements including schedule; major ARARs; and assumptions, uncertainties, and limitations. The detailed analysis of alternatives involves assessing each individual alternative against nine (9) evaluation criteria and conducting a comparative analysis focused on the relative performance of each alternative against those criteria.

Detailed Evaluation of Alternatives

The detailed analysis of alternatives will be consistent with NYSDEC Division of Environmental Remediation Program Policy DER-97-4058. A detailed analysis in the format proposed below allows for a comprehensive analysis of each alternative and efficient remedy selection as these criteria are organized based on the function of the criteria in the remedy selection process. In general, the nine (9) evaluation criteria are divided into three (3) groups. The groups are threshold criteria, primary balancing criteria, and modifying criteria.

Threshold Criteria: Threshold criteria relate to specific statutory requirements that each alternative must satisfy in order to be eligible for selection as the remedy. The threshold criteria are:

- *Overall Protection of Human Health and the Environment* - This criterion addresse the protection the alternative provides and draws on the assessment conducted under the other evaluation criteria, especially attainment of ARARs, long-term effectiveness and permanence, and short-term effectiveness.
- *Compliance with SCGs/ARARs: Compliance with SCGs* - This criterion evaluates whether each alternative attains the Standards, Criteria, and Guidance initially established for the site as part of the Remedial Alternative development procedure.
- *Compliance with ARARs (unless a specific ARAR is waived)* - This criterion evaluates whether each alternative attains federal and state ARARs or provides grounds for invoking a waiver.

Primary Balancing Criteria: Primary balancing criteria are used to identify major trade-offs between remedial alternatives. The five balancing criteria are:

- *Long-Term Effectiveness and Permanence* - This criterion evaluates the ability of the alternative to provide reliable protection at the conclusion of the remedial action. It focuses on the magnitude of residual risk remaining at the site, and the adequacy and reliability of engineering or institutional controls necessary to manage treatment residuals or untreated waste.
- *Reduction of Mobility Toxicity, or Volume Through Treatment* - This criterion assesses the degree the alternative meets the statutory preference to use recycling or treatment to reduce the mobility, toxicity, or volume of wastes posing a principal threat. This criterion considers the amount of waste destroyed, treated,

or recycled and the degree of expected reduction in toxicity, mobility, or volume using such actions. It also considers the type and quantity of residuals remaining following treatment.

- *Short-Term Effectiveness* - This criterion assesses the short term impacts of the alternative considering potential impacts on the community, on-site works, or the environment during construction and implementation of the alternative. Additionally, it considers the time until protection is achieved.
- *Feasibility* - This criterion evaluates the ease or difficulty of implementing the alternative by considering the technical and administrative feasibility of implementation, and the availability of various services such as TSD facilities and materials.
- *Cost* - This criterion considers the capital cost, including both direct and indirect costs, annual operating and maintenance (O&M) costs, and net present value of both capital and O&M costs.

Modifying Criteria: Modifying criteria are generally not considered until after the public comment period and consist of the following:

- *State Acceptance* - This criterion assesses the State's position on the alternative and use of State ARARs.
- *Community Acceptance* - This criterion assesses which component of the alternatives the community supports, has reservations toward or opposes.

Comparative Analysis of Alternatives

Once the alternatives have been evaluated with respect to the nine (9) evaluation criteria, a comparative analysis will be conducted to assess the relative performance of each alternative with respect each other. The purpose is to identify advantages and disadvantages, or strength and weaknesses, of each alternative so that trade-offs may be considered. Particular attention will be given to a comparative analysis with respect to the relationship between protectiveness and costs of remedial alternatives that provide similar levels of protection.

2.3.7 Selection of Remedy

A preferred alternative will be summarized at the completion of the detailed analysis. The preference will be based on the statutory cleanup requirements and the goals and expectations of the remedy selection process. A remedy will be proposed that reflects the scope and purpose of the

actions being undertaken and how that action relates to the long-term comprehensive response at the site. The nine (9) point remedy selection criteria previously discussed will be used to propose a remedy that:

- Protects human health and the environment;
- To the maximum extent practicable attains Federal and State public health and environmental standards (attains ARARs);
- Is cost-effective providing that it first satisfies the above two threshold criteria; satisfies the preference for selecting a remedy that involves as a principal element treatment that significantly and permanently reduces the mobility, toxicity, or volume of the hazardous wastes at the site.

The remedy proposed will ultimately attain the threshold criteria of protection of human health and the environment (attaining ARARs). A determination will be made to identify the cost-effectiveness of the remedy, provided that the remedy is protective and attains ARARs. Overall effectiveness will be determined by evaluating the three primary balancing criteria: long-term effectiveness and permanence; reduction of mobility, toxicity or volume through treatment; and short-term effectiveness. The overall effectiveness is then compared with cost to determine if the remedy is cost-effective. A remedy is cost-effective if costs are proportionate to overall effectiveness. The preference for utilizing treatment as a principal element when proposing a remedy will also be considered, along with State and public.

2.3.8 Remedial Alternative Report (RAR) and Public Meeting

Upon completion of the above, a Remedial Alternative Report (RAR) detailing the results of the technology and alternative screening and development process will be prepared. The report will consist of an Executive Summary describing the preferred alternative, followed by an Introduction describing the purpose and organization of the report including background information from the SI. The report will include identification and screening of technologies describing the remedial action objectives and general response actions followed by development and screening of alternatives. The report will conclude with a detailed analysis of alternatives including a narrative description of each alternative with comparative analyses.

Presentation material will be prepared for a public meeting to discuss the final results and evaluations of the SI/RAR as well as the NYSDEC Preliminary Remedial Action Plan (PRAP). In general, the public meeting will be held to discuss the technical aspects and results of the SI/RAR.

In accordance with the Citizen Participation Plan, at least fifteen (15) days prior to the public meeting, a synopsis of applicable information will be made available to the public for review.

After completion of the public meeting, a representative summary report, documenting the topics and concerns discussed during the public meeting, will be prepared and distributed, where practicable, to the NYSDEC, representatives of the Town and concerned citizens.

Section 3: Sampling and Analysis Plan

3.1 Introduction

This site specific Sampling and Analysis Plan (SAP) focuses on the tasks, methodologies, and procedures necessary for the completion of media sampling and analysis as part of the proposed SI. The SAP will identify media sample analysis in accordance with Contract Laboratory Protocols (CLP) methods and laboratory reporting in accordance with 2000 NYSDEC Analytical Services Protocols (ASP) Category B deliverables. The SAP includes two primary sections: 1) the Quality Assurance Project Plan (QAPP) and 2) the Field Sampling Plan (FSP).

The QAPP describes the policies, organization, objectives, functional activities, and specific Quality Assurance (QA)/Quality Control (QC) activities designed to achieve the data quality goals or objectives of the specific project(s), data analyses, or continuing operations. For the data analysis

portion of the QAPP, media sample analysis via Contract Laboratory Protocols (CLP) methods will be utilized to establish applicable analytical procedures and methodologies. In general the QAPP includes: 1) a project description; 2) a project organizational chart outlining project responsibilities; 3) quality assurance objectives for data; 4) sample custody procedures during sample collection in the laboratory; 5) the types and frequency of calibration procedures for field/laboratory instruments, internal quality control checks, and quality assurance performance audits; 6) preventative maintenance procedures and schedule for corrective procedures for field and laboratory instruments; 7) specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness; 8) data documentation and tracking procedures. Laboratory reporting will be completed in accordance with 2000 NYSDEC Analytical Services Protocols (ASP) Category B deliverables.

The SAP also includes a Field Sampling Plan (FSP) consistent with "Field Methods Compendium" OSWER-Directive 9285.2-11 (Draft June 1993). The FSP is developed so that sample collection activities are conducted in accordance with technically acceptable protocols and so that data collected in the field meets the established data quality objectives. The FSP is developed prior to the initiation of field activities and will describe the methods and procedures for obtaining representative portions of the media being investigated and data gathering methods. The FSP details the sampling objectives and sampling protocols, including an anticipated schedule of sampling events, a description of the necessary equipment, sample types, locations, frequency, and analyses.

3.2 Quality Assurance Project Plan (QAPP)

3.2.1 Project Description

The SAP includes identification of sampling locations and media, method of collection, handling, and preservation, and the protocol used for sample analysis. Environmental media to be sampled include soils, groundwater, river sediment, waste media, and leachate/seeps related to the waste media. The data will be utilized to form conclusions as to the presence, transport, and fate of site specific contaminants.

3.2.2 Project Organization and Responsibilities

The SAP will utilize the following project organization and associated responsibilities:

Project Manager	Douglas R. Ferris, P.E.
Quality Assurance/Quality Control	John M. Kanoza, P.E., C.P.G.
Laboratory Coordinator	John M. Kanoza, P.E., C.P.G.
Field Investigations	Eric J. Schwencke
Field Investigation Assistant	Dale E. Ferris

3.2.3 Data Quality Objectives

Data Quality Objectives (DQOs) are statements which describe the desired quality of data necessary to meet the objectives of the sampling program. The DQOs for the Black Ash Pond sampling program were formulated during the initial scoping effort and developed as part of this SAP. Data Quality Objectives Forms have been completed for each type of sampling media and are located in Appendix A. The general steps followed in preparation of the DQOs were as follows:

- Identification of the media to be sampled;
- Identification of the data uses;
- Identification of the data types;
- Identification of the data quality needs;
- Identification of the data quantity needs;
- Identification of the sampling and analysis procedure; and
- Review of data for completeness.

3.2.3.1 Sampled Media

This section identifies the media being investigated with one form completed for each media sampled.

3.2.3.2 Data Use

This section identifies the intended use(s) of the data according to the following:

- *Site Characterization* - Data are used to determine the composition, nature, and extent of contamination.
- *Risk Assessment* - Data are used to evaluate the actual or potential risks posed by contaminants present. Particular attention to sampling where human exposure is possible.

- *Health and Safety Plan (HASP)* - Data are used to establish level of protection needed for workers during site characterization.
- *Monitoring* - Data are used during the monitoring of the remedial action to assess the effectiveness of that action.
- *PRP Enforcement* - Data are used to help establish potentially responsible parties (PRP's).
- *Evaluation of Alternatives* - Data are used to evaluate various proposed remedial technologies and assist with design of alternatives.

3.2.3.3 Data Types

This section identifies the type of analyses to be performed.

3.2.3.4 Sample Collected

This section describes the sample collected:

- *Environmental* - Refers to a specific media sampled such as air, groundwater, soil, waste, river sediment, or leachate/seeps.
- *Source* - Refers to sampling an actual contamination source.
- *Grab* - Refers to a discrete sample representing a specific location.
- *Composite* - Refers to a sample that reflects a mixture of multiple grab samples representing the average properties for the area sampled.
- *Biased* - Refers to sampling focusing on a specific area of expected contamination or an uncontaminated area (background).

3.2.3.5 Analytical Support Levels

This section identifies the analytical options available to support data collection activities, including:

Level I: *Field Screening* - This level is characterized by the use of portable type instruments that provide real-time data. This section identifies the field monitoring equipment to be used and the manufacturer's specified detection limits, when available.

Level II: *Field Analysis* - This level is characterized by the use of portable analytical instruments in an on-site lab or transported to the site. This section identifies the field analysis to be used.

Level III: *Standard Analytical Protocols* - This method may use standard analytical

protocols or without the NYSDEC ASP deliverables/reportables documentation. This level is often used to support remediation requirements.

Level IV: *NYSDEC ASP Reportables/Deliverables* - This level is characterized by rigorous QA/QC protocols and reportables/deliverables documentation. This section will identify the CLP methods to be used.

Level V: *Non-Standard* - This level is characterized by methods that have been modified to meet specific site study or remediation needs or other specialized analytical methods that cannot be obtained through standard or typical avenues of analytical support. The section will identify the special method use and reference specific method procedures.

3.2.3.6 Sampling Procedures

This section references the section of the FSP that describes the sampling procedures. If appropriate, this section also describes critical samples to be collected for this sampling event to be successful.

3.2.3.7 Data Quality Factors

This section describes factors which influence the quality or quantity of data to be collected. Primary contaminants and associated levels of concern are identified concerning ARARs or potential risks. The required detection limits are also provided or referenced.

3.2.3.8 QA/QC Samples

This section indicates additional samples to be collected to support QA/QC procedures, including:

- *Matrix Spike/Matrix Spike Duplicates* - Matrix spike duplicate samples are collected as a duplicate sample that the analytical laboratory does with known amounts of analyte. These QA/QC samples are intended to assess the extraction procedure used by the laboratory.
- Field Blanks_- Field (equipment) blanks are samples that are obtained by processing analyte-free water through the sample collection equipment in a manner identical to the sample collection procedures. Field blanks may be used during QA/QC procedures to evaluate if sampling equipment has contributed contaminants to the samples.
- *Trip Blanks* - Trip blanks are samples prepared prior to the sampling event in identical

field sampling containers and are kept with the collected samples throughout the sampling and analysis. Trip blank vials are not opened in the field and are analyzed for volatile organics only.

3.2.4 Sampling Procedures

All sampling objectives, locations, and procedures have been included within the FSP of this SAP. Items including Field Measurement Techniques, General Field Decontamination, and Sample Management have also been included within the FSP.

3.2.5 Laboratory Coordination

All chemical analyses for soils, water, river sediment, and waste media samples will be completed by a laboratory capable of performing project specific analyses as indicated in this QA/QC plan and approved by the NYSDOH/NYSDEC as having the appropriate standard operating procedures, QA/QC programs, current resumes, and organizational structure to complete analytical work as specified in this workplan. Where applicable for CLP quality data, the laboratory will be NYSDOH certified for CLP and will be required to remain certified throughout the project. The project specific QA/QC Officer will also be responsible for all project related laboratory coordination with the designated laboratory coordinator.

3.2.6 Analytical Methodologies

Sampling to characterize site contamination includes collection of samples from test trenches, borings, monitoring well groundwater samples, Bouquet River sediments, waste media and waste seep/leachate media collected within and/or adjacent to the site. The samples will be analyzed for Target Compound List (TCL) parameters in accordance with NYSDEC 2000 Analytical Services Protocol (ASP) 2000, Category B. The specific methods for sampling and analysis are listed in Table 1 for all matrices. Table 2 lists the TCL parameters.

Analysis of groundwater, soil, river sediment, waste media, and seeps/leachate will be performed according to NYSDEC ASP (2000) Category B Reportables/Deliverables protocols. Additional parameters appearing on the TCL not included under ASP protocol will be reported as results only and will not be subject to data usability review. The specific analyses for metals, volatile organic compounds (VOCs), Semi-VOCs, polychlorinated biphenyls (PCBs)/pesticides will be conducted according to the following NYSDEC ASP 2000 methodologies:

Parameter Group	Analysis Method
Organic Compounds (including VOCs, Semi-VOCs, PCBs/pesticides)	CLP - OLM 4.2
Metals	CLP – ILM 4.0
Mercury	CLP – ILM 4.0
Cyanide	CLP – ILM 4.0

3.2.6.1 Subsurface Soil Samples

During subsurface test trench and soil boring investigations, soil samples exhibiting evidence of previous chemical/contaminant release, soil staining, petroleum or chemical residue, and/or elevated field PID headspace volatile organic vapors, will be collected for separate TCL parameter analysis. Select on-site and off-site background soil samples collected as part of the SI will also be analyzed for TCL parameters. TCL analysis will be performed according to NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format.

3.2.6.2 Groundwater Samples

Groundwater samples will be analyzed for TCL parameters and, if necessary, a select list of geochemical parameters (i.e., pH, turbidity). All analyses will be performed according to NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format. Those parameters appearing on the TCL, but not subject to NYSDEC ASP 2000 Category B protocols, will be reported as results only and will not be subjected to data usability review.

3.2.6.3 River Sediments

In an effort to identify and assess potential waste related environmental impacts on the Bouquet River, river sediment samples will be collected from two depth intervals at one (1) upstream and four (4) downstream locations within the Bouquet River. The sediment samples will be analyzed for TCL parameters in accordance with NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format.

3.2.6.4 Waste Media Related Samples

As part of the SI, waste media (black ash and adjacent site sludge) that exhibits evidence of previous chemical/contaminant release, unusual soil staining, petroleum or chemical residue, and/or elevated field PID headspace volatile organic vapors, will be collected for separate TCL parameter analysis. As part of the preliminary reconnaissance effort, a search for potential waste-leachate seeps to the Bouquet River will be completed. In the event active seeps, dormant seeps, or evidence of direct drainage pathways to the river are identified, liquid seep or leachate from such locations will be sampled for TCL parameter analysis. It is planned that at least four (4) waste/waste related media samples (black ash and sludge) will be collected as part of the SI for TCL parameter analysis in accordance with NYSDEC ASP 2000 Category B protocols and the data presented in reportables/ deliverables format.

3.2.6.5 Trip Blanks

Trip blanks will accompany each shipment of aqueous and solid samples for VOC analysis. If several samples are collected for VOC analysis on any single day, all VOC samples will be packed in the same cooler as the trip blank. All trip blanks will be analyzed according to NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format.

3.2.6.6 Matrix Spike/Matrix Spike Duplicates

Duplicate samples will be obtained from groundwater (aqueous) and soil samples (solids). A general guideline of one (1) matrix spike/matrix spike duplicate (MS/MSD) sample in twenty (20) for each matrix will receive a duplicate sample. Consistent with the media sampling schedule and anticipated sample quantities, it is planned that one (1) MS/MSD sample will be collected from a groundwater water sampling location, while two (2) MS/MSD samples will be collected as part of soil investigations (one MS/MSD trench sampling location and one MS/MSD boring location). Due to the likely heterogeneity of the waste media related samples and expected low volume/number of such samples, it is unlikely that an MS/MSD sample will be collected for these media types. MS/MSD samples will be analyzed according to NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format.

3.2.7 Analytical Quality Control

The majority of analytical quality control for this project shall be in accordance with the methodology and QA/QC requirements as listed in NYSDEC ASP 2000 Category B. The following holding times calculated from the validated time of sample receipt (VTSR) will be required from the contracted analytical laboratory, regardless of sample matrix:

Parameter	Task	Holding Time
VOCs	Analysis	7 days from VTSR
Semi-VOCs	Extraction	5 days from VTSR
	Sample Clean-Up(s)*	5 days from VTSR
	Analysis	40 days from VTSR
PCBs/pesticides	Extraction	5 days from VTSR
	Sample Clean-Up(s)*	5 days from VTSR
	Analysis	40 days from VTSR
Mercury	Analysis	26 days from VTSR
Cyanide	Analysis	12 days from VTSR
Metals	Analysis	180 days from VTSR

* If sample cleanup performed during the 5-day period does not provide acceptable samples, these holding times may be extended to accomplish additional clean-up(s). If sample clean-up is required because of sample matrix interferences, samples may be diluted by no more than a 1:5 dilution to bring the analyte(s) on scale.

3.2.8 Reportables and Deliverables Documentation

The majority of analytical data generated as part of the SI will be presented in NYSDEC ASP 2000 Category B reportables/deliverables format and will be subjected to data usability review.

3.2.9 Data Validation, Usability, and Acceptability

Because the SI will produce data to be utilized to determine site specific Remedial Alternatives, it is important that an evaluation of the validity of the data generated be completed. It will be the responsibility of the project QA/QC officer to determine the usability, and acceptability of the data. In an effort to provide adequate, compliant, and defensible data consistent with NYSDEC Guidance, the analytical data generated as part of the SI shall be reviewed for data usability. A general evaluation of field records and analytical data will be performed to assess whether the data are accurate and defensible. The data usability review effort shall be completed for analytical data generated as part of the SI, consistent with NYSDEC-DUSR Guidance for this type of project.

A Data Usability report will be signed by the QA/QC officer and a signature page included with the data reporting. It should be noted that the Project Administrator will notify the NYSDEC QA officer prior to deviation from the agreed workplan analytical protocols.

3.3 Field Sampling Plan (FSP)

3.3.1 Sampling Objectives

Field sampling at the Black Ash Pond will be designed to obtain representative samples of environmental media in an effort to assess the impact the site may have upon human health and the environment. The FSP will include sampling for groundwater, subsurface soils in areas of potential environmental concern, Bouquet River sediments, leachate/seeps and waste media (black ash and sludge). The media samples collected as part of the SI will be analyzed for TCL parameters and analyzed according to NYSDEC ASP 2000 Category B protocols and the data presented in reportables/deliverables format.

3.3.2 Sampling Locations

3.3.2.1 Subsurface Soil Samples

In order to identify the location of potential environmental impacts originating from the waste material present at the site, a series of test trenches will first be completed within the site area, utilizing a rubber wheeled backhoe or track excavator. It is planned that approximately twenty (20) subsurface test trenches be completed within and around the area of known waste deposition. This effort will be completed to verify the approximate horizontal and vertical extent of waste at the site and subsurface presence/absence of environmental impacts and/or contaminant releases. During the completion of test trench excavations, soil samples will be routinely collected for total organic vapor screening, utilizing a photoionization detector. In the event that evidence of a previous chemical release, soil staining, petroleum residue, or elevated volatile organic vapors are identified within the soil of a specific excavation, separate samples of the soil will be collected for TCL analyses.

To assess the existence of potential intermediate depth soil contamination and impacts, a number of shallow continuously sampled *Geoprobe*® borings shall be completed at the site. During continuous soil sampling, samples will be field screened for the presence of total organic vapors utilizing a PID.

In the event evidence of a previous release, soil staining, petroleum residue, or elevated volatile organic vapors is identified within the soil of a specific boring, separate samples of the soil will be collected for TCL Analyses. Consistent with the dimensions and history of the site, it is planned that twenty (20) continuously sampled borings be completed at the site. As part of the subsurface soil investigation task, a number of remote off-site and industrial off-site background soil samples will be collected to assess the characteristics of native regional background and local industrial background soil/fill, respectively. It is estimated that fifteen (15) soil samples will be collected as part of the subsurface soil investigation task for TCL analysis, in accordance with NYSDEC-ASP. The final locations of planned subsurface test trench and soil boring investigations will be determined as part of site reconnaissance efforts.

3.3.2.2 Groundwater Monitoring Well Locations

As part of the SI, it is planned that at least five (5) of the subsurface soil borings will be completed as shallow groundwater monitoring wells. Monitoring wells will be constructed of 2-inch diameter PVC well screen and riser pipe, and include a sandpack along the well screen. Groundwater sampling will be completed at each monitoring well using a dedicated disposable polyethylene bailer. Shallow groundwater samples will be collected from each of the five (5) monitoring well locations for TCL parameter analysis, in accordance with NYSDEC-ASP. The final groundwater monitoring well locations will be determined during the completion of initial site reconnaissance efforts and subsurface soil investigations.

3.3.2.3 River Sediment Samples

To identify and assess potential waste related environmental impacts on the adjacent Bouquet River, sediment samples will be collected from two (2) depth intervals (12-inches and 24-inches) at one (1) upstream and three (3) downstream locations within the Bouquet River. It is planned that approximately five (5) river sediment samples will be collected for TCL parameter analysis, in accordance with NYSDEC-ASP. The final river sediment sampling locations will be determined during the completion of initial site reconnaissance efforts.

3.3.2.4 Waste Media Related Samples

As part of the SI, waste media (black ash and sludge) exhibiting evidence of previous chemical/contaminant release, unusual soil staining, petroleum or chemical residue, and/or

elevated field PID headspace volatile organic vapors, will be collected for separate TCL analysis. It is anticipated that sampling of these media will occur via test trenches, soil borings and/or excavation/auger methods.

In addition, a search for reported waste-leachate seeps to the Bouquet River will be completed. In the event active seeps, dormant seeps, or evidence of direct drainage pathways to the river are identified, liquid seep or leachate from such locations will be sampled for TCL parameter analysis. It is planned that at least four (4) waste/waste related media samples (ash, sludge) will be collected as part of the SI for TCL parameter analysis in accordance with NYSDEC ASP.

3.3.3 Sampling Procedures

3.3.3.1 Preparation for Sampling

The sample collection technique is of prime importance to assure the integrity of the collected sample. The following techniques include provisions so that:

- A representative sample is obtained;
- Contamination of the sample is minimized;
- The sample is properly preserved; and
- An acceptable Chain-of-Custody is maintained.

The QA/QC Sampling Component of the Plan includes:

- Incorporation of accepted sampling techniques referenced in the sampling plan;
- Procedures for documenting field actions contrary to the QA/QC Plan;
- Documentation of all preliminary activities, i.e., equipment check-out, calibrations, and container storage and preparation;
- Documentation of field measurement QC data (QC procedures for such measurements shall be equivalent to corresponding QC procedures);
- Documentation of field activities;
- Documentation of post-field activities including sample shipment and receipt, field team debriefing, and equipment check-in;
- Generation of QC samples including duplicate samples, field blanks, equipment blanks, and trip blanks; and
- The use of these samples in the context of data evaluation with details of the methods employed (including statistical methods) and of the criteria upon which

the information generated will be judged.

The personnel responsible for collection of soil, groundwater, sediment, and waste related media will be familiar with standard sampling procedures and follow appropriate protocol. Field records will be maintained in bound notebooks with numbered pages to document daily instrument calibration, locations sampled, field observations, and weather conditions. Each page will be dated and signed by the sampler. Each notebook will be numbered and a log of notebooks will be maintained by the Project Manager. Prior to sampling, all equipment must be procured and accommodations for sample container delivery and sample shipment made. The following is a list of general equipment to be available for sampling events. Special equipment for each sampling event is presented in the section describing that specific sampling event.

General Field Sampling Equipment

- Field Data Sheets
- Chain-of-Custody forms
- Engineer's tape and folding ruler with 0.01 foot intervals
- Field Record Sheets
- Latex gloves
- Face-safety shield
- Tyvek coveralls
- Respirators
- Photoionization detector
- Bio-degradable phosphate free detergent
- Coolers (with ice)
- 55 gallon drums
- Sample bottles
- Aluminum foil
- Duct and filament tape
- Tap water
- Distilled water
- Laboratory grade methanol and hexane
- 5-gallon wash buckets
- Decontamination cloths
- Large disposal containers

- Large plastic sheets

3.3.3.2 Soil Sampling

Soil samples will be collected using disposable or dedicated stainless steel spoons or hand trowels from the area(s) of test trenches, borings, and hand augers where evidence of potential contaminants or residues are encountered. The use of disposable or dedicated sampling equipment will eliminate the need for collection of field (equipment) blanks. The retrieved soil sample will be placed directly into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in coolers. The following equipment will be required for the sampling of soil, in addition to the general sampling equipment list:

- dedicated or disposable stainless steel spoons or hand trowels; and
- photoionization detector (PID).

The following activities will be completed prior to field sampling daily:

- Complete Soil Sample Sheet for trenches/borings to be sampled;
- Determine amount of sampling needed for the day and prepare necessary amount of coolers;
- Select appropriate sample bottles for the day's sampling. Soil samples will be collected within unpreserved glass, parameter specific, containers.

Sampling for matrix spike/matrix spike duplicates shall be performed at least once with each field batch at a minimum of one (1) for each twenty (20) samples.

3.3.3.3 Groundwater Sample Collection

Groundwater samples will be collected using dedicated, disposable HDPE bailers following evacuation of three bore-hole volumes or complete purging of the well. All other related sampling equipment will be properly decontaminated in the field. The following equipment will be required for sampling of monitoring wells in addition to the general sampling equipment list:

- Well Data Sheets
- Dedicated, disposable HDPE bailers (new wells)
- Electronic water level indicator
- Conductivity meter with calibration standards

- pH meter (portable)
- Thermometer
- Sample preservatives
- Acid resistant gloves
- pH paper
- Redox meter
- Dissolved oxygen meter

The following activities will be completed prior to sampling:

1. Complete Well Data Sheet for wells to be sampled;
2. Obtain sampling schedule for each well to be sampled;
3. Calibrate Photoionization Detector (PID) with the calibration gas;
4. Calibrate conductivity meter;
5. Calibrate pH meter with standard buffer solutions of pH 4, 7, and 10. The meter is calibrated again at each well site using only the buffer solution of pH 7;
6. Determine amount of sampling needed for the day, and prepare the necessary amount of cooler(s);
7. Each well to be sampled will have designated cooler(s) containing the pre-labeled, certified-clean, sample bottles. The groundwater samples will be placed in the cooler labeled for the well of their origin. The bottle shall be labeled with large distinguishable letters, so that groundwater samples will be placed in the proper cooler; and
8. Select the appropriate quantity of sample bottles for the day's sampling. Bottles shall be labeled with sample parameter and preservatives. Reusable glass bottles will have been sterilized and prepared at the laboratory. The bottles for the various parameters to be analyzed from each well location will be transported in a cooler.

The following steps describe the sample collection procedure for groundwater:

1. Unlock and remove well cap;
2. Test the air at the wellhead with the calibrated PID. If gases from the well caused ambient air to show greater than 5 ppm, stop work and refer to the HASP. Record the measurement on the Well Data Sheet;
3. Calibrate pH meter with standard buffer solution of pH 7. Rinse probes and sample cups carefully with distilled water before and after use;
4. Record the standard solutions used to calibrate, the date, and time on Well Data Sheets;
5. Purge the static water within the well to determine amount of water for purging, calibrate

interfere with analytical results should also be recorded.

15. Lock well, inspect well site, and note any maintenance required.
16. Dispose of potentially contaminated materials in designated container for contaminated solids.

3.3.3.4 River Sediment Samples

River sediment samples will be collected using intermediate, disposable glass containers. The use of disposable or dedicated sampling equipment eliminates the need for collection of field (equipment) blanks. The retrieved sediment sample will be placed into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in appropriate coolers. Upon filling parameter specific containers, each container will be capped, with a minimum amount of headspace, and placed within specific sample coolers for delivery to the laboratory. Upon completing river sediment sampling, each parameter and location specific sample will be logged within the appropriate sampling field book and Chain-of-Custody form. Prior to field sampling of miscellaneous media samples, the following activities will be completed:

- Locate each sediment sampling location within the field using a facility site map and site markers;
- Flag and/or mark, with identification, each sampling location at the river bank;
- Locate, identify and photograph each sampling location and record such information on field data sheets and field map;
- Plan sampling schedule;
- Calibrate Photoionization Detector (if used);
- Collect, label, and organize appropriate disposable trowels, spoons, intermediate sample containers, and final laboratory containers;
- Complete section on River Sediment Sample Sheet for site area/location to be sampled;
- Determine amount of sampling needed for the day and prepare necessary number of coolers;
- Select appropriate sample bottles for the day's sampling.

The following activities will be completed during the River Sediment sampling process:

- Collect sediment samples from pre-designated locations at each sampling location (working from the most downstream location upriver to the most upstream location) using disposable, certified-clean, intermediate glass sampling containers;

- Cap container and complete proper Chain-of-Custody form and field data sheet; and
- Transport containers and Chain-of-Custody form to laboratory.

3.3.3.5 Waste Media Related Samples

Waste media related samples will be collected using disposable or dedicated stainless steel spoons, hand trowels, or intermediate disposable (glass) containers (for semi-aqueous media). The use of disposable or dedicated sampling equipment will eliminate the need for collection of field (equipment) blanks. The retrieved sample will be placed directly into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in appropriate coolers. If applicable, aqueous samples will be sampled using an intermediate, disposable, certified clean, glass-pint sampling container. Parameter specific liquid media sample containers will then be filled. Upon filling parameter specific containers, each container will be capped, with a minimum headspace, and placed within specific sample coolers for delivery to the laboratory. Upon completing waste media sampling, each parameter and location specific sample will be logged within the appropriate sampling field book and Chain-of-Custody form. Prior to field sampling of miscellaneous media samples, the following activities will be completed:

- Locate each miscellaneous (black ash, sludge, leachate, or seep) sampling location within the field using a facility site map and site markers;
- Flag and/or mark, with identification, each sampling location;
- Locate, identify and photograph each sampling location and record such information on field data sheets and field map;
- Plan sampling schedule;
- Calibrate Photoionization Detector (if used for screening);
- Collect, label, and organize appropriate disposable trowels, spoons, intermediate sample containers, and final laboratory containers;
- Fill out appropriate section on Waste Media Sample Sheet for site area/location to be sampled;
- Determine amount of sampling needed for the day and prepare the necessary number of coolers;
- Select appropriate sample bottles for the day's sampling.

The following activities will be completed during the Waste Media sampling process:

- Collect appropriate media sample from pre-designated location at each sampling location using dedicated or disposable spoons/trowels (solids) or certified clean, intermediate, glass sampling containers (liquids);

- Measure water level to nearest 0.01 ft with an electronic water level indicator.
- Decontaminate water level indicator tape and cable with distilled water - biodegradable phosphate free-detergent solution and rinse with distilled water.

pH Measurement - pH will be determined using a portable pH meter, 100 ml disposable beakers, and pH calibration standards. The pH meter will be calibrated to within 0.05 pH units of the reference standard. Sample pH will be recorded to the nearest 0.05 pH units and readings repeated until measurements do not fluctuate greater than 0.03 pH units. Upon completion of pH measurements, probe will be washed, rinsed, and re-calibrated.

*Temperature Measurement*_- A field thermometer will be pre-calibrated in the laboratory to within one degree centigrade and re-calibrated weekly thereafter.

*Specific Conductance Measurement*_- A specific conductance meter will be field calibrated daily with a 1M KCl reference solution to 1413 ohms/cm at 25 ° C. Sample aliquots for specific conductance and temperature will be obtained directly from the sampling point in 100 ml disposable beakers.

Photoionization Detector (PID) - The PID will be calibrated daily (and more often as required by manufacturer's data) prior to use with calibration test gases.

3.3.5 General Decontamination

The following procedures will be performed for the decontamination of investigation equipment, sampling equipment, and personnel after each drilling/sampling event:

*Drill/Geoprobe® rig, backhoe, and excavator*_- The Drill/Geoprobe® rig, backhoe, and/or excavator will be steam cleaned prior to ingress and egress from the site. Greases and oils will not be used on any down-hole equipment during drilling or exploration activities.

Investigation equipment - To avoid cross contamination, use of a PID meter and cleaning between each sampling site will be employed on backhoe arms, buckets, hollow stem augers, casing, drill rods, and appurtenances.

Split spoon sampler - The split spoon sampler will be scrubbed, cleaned, and subjected to a series of rinses between each sampling event. Multiple split spoon samplers will be used in a rotation.

Reusable equipment - The following steps will be employed to decontaminate reusable equipment:

- Rinse equipment of soil or foreign material with potable water;
- Immerse and scrub equipment with bio-degradable phosphate-free detergent and potable water;
- Immerse and scrub in a potable water rinse without detergent;

- Immerse and scrub in distilled water;
- Saturate by spraying or immersing with laboratory-grade hexane;
- Air dry and wrap cleaned equipment in foil for transport to next monitoring site,
- Decontamination rinseate will not be considered hazardous unless visual inspection or monitoring by PID/other equipment indicate contaminants may be present. Uncontaminated rinseate waters can be discharged on-site. If contaminants are expected to be present, rinseate should be placed in 55 gallon drums and stored on-site for proper disposition.

Disposable equipment - The following steps will be employed to decontaminate disposable equipment:

- Rinse with potable water;
- Remove all standing liquid from equipment;
- Dispose of equipment in dedicated container for contaminated solids;
- Dispose of rinsate in 55 gallon drums if contaminants are expected to be present.

Sample containers - upon filling and capping sample bottles, the exterior of the bottle will be wiped clean with a paper towel. Towels will be deposited in a dedicated container for contaminated solids.

Personnel decontamination - The following procedures will be used to decontaminate sampling personnel:

- After each sampling event, plastic gloves will be deposited in a dedicated container for contaminated solids;
- At the end of each sampling day, Tyvek coveralls will be deposited of in a dedicated container for contaminated solids;
- Boots will be rinsed with potable water to remove mud, clay, or any other contaminants;
- Personnel will be required to follow procedures outlined in the HASP.

3.3.6 Sample Management Plan

3.3.6.1 Sample Management

The Sample Management Plan provides procedures to document and track samples and corresponding results. A series of pre-printed forms with appropriate information facilitates documentation and tracking. Documentation materials include sample labels, sample characterization and Chain-of-Custody forms, daily field reports, and sample logs.

Sample Label - A sample label will be completed for each sample obtained and be affixed to the sample container. The label is configured to address various types of media and

Waste Media	WM	Soil, ash, sludge or seep	WM 1
Background Samples	-	All	B1, B2, etc.
Matrix Spike Duplicate	-	All	MSD1, MSD2, etc.
Trip Blanks	TB	All	TB1, TB2, etc.

As an example of a sample designation, sample GW-MW3S-F-04 represents a groundwater sample obtained from monitoring well MW-3S during the Fall 2004 sampling event.

3.3.6.3 Sample Handling

Each sample will be dispensed into appropriate sample containers for the analysis to be performed. Appropriate sample preservatives will be added to sample containers by the analytical laboratory prior to delivery, except where the sample preservative must be added after sample collection. All samples requiring cold storage will be immediately placed in coolers with appropriate packaging materials to protect from breakage during shipment. Sample coolers will be filled with cubed ice (no "Blue Ice") prior to leaving the sample collection location. Should a local analytical laboratory be contracted (within 60 statute miles), samples will be hand delivered to the laboratory each day. The Chain-of-Custody forms will be signed by the laboratory personnel receiving the samples. Should an analytical laboratory be contracted that is not based locally, and a common carrier used for sample shipment, the Chain-of-Custody forms will be signed by the sampler and carrier personnel and placed inside the cooler(s). Careful packaging techniques will be used to prevent sample containers from breakage during handling, e.g., cardboard, foam wrap, or Styrofoam. All samples will be delivered to the analytical laboratory either on the day of collection or within 24 hours of sample collection. Samples will be collected with sufficient time allowed at the end of the work day for the analytical laboratory to properly receive/process Chain-of-Custody forms.

Section 4: Citizen Participation Plan

4.1 Introduction

4.1.1 Overview

This Citizen Participation Plan (CPP) describes the public participation program to be implemented by the Town and NYSDEC during the SI/RA development for the Black Ash Pond. The CPP is designed to encourage communication between the Town, NYSDEC, and the community during the SI/RA and to provide interested and concerned citizens with accurate and timely information about the alternatives for site cleanup. The Town and NYSDEC are committed to a CPP as part of their responsibilities for this Environmental Restoration Project. Citizen participation will promote public understanding of Town and NYSDEC responsibilities, planning activities, and remedial activities for the site. It will provide the opportunity for the Town and the NYSDEC to learn from the public information that will enable them to develop a comprehensive remedial program protective of both the public health and the environment.

This plan is intended to be a working document periodically reviewed and updated to reflect changes during site remediation. This CPP is divided into eight sections: 1) Introduction; 2) Basic Site Information; 3) Project Overview; 4) Interested/Affected Public; 5) Identification of State Regulatory Agency Contacts; 6) Document Repositories; 7) Citizen Participation Activities for Each Major Element of the Remedial Program; and 8) Glossary of Key Terms and Major Program Elements. The plan provides a public participation strategy in connection with the SI/RA.

4.1.2 Plan Objectives

The principal objectives of the CPP are:

- To provide area residents with a clear understanding of the Environmental Restoration Program as it applies to this site. This will provide area residents and other concerned members of the community with a realistic expectation of the activities, complexities, and time involved with the site investigation, evaluation, and remediation;

- To provide accurate, understandable information concerning the SI/RA program to all interested members of the public. The Town and NYSDEC will work closely with county, state, and other local officials and organizations to identify and fulfill the information needs of the community. Information will be distributed via several media sources including press releases, direct mailing

of newsletters or fact sheets, formal and informal public meetings, and through the project's document repositories.

- To maintain good relations with local media to ensure accurate reports of SI/RA activities. An important goal of the CPP will be to keep the media informed about the project and to obtain accurate newspaper, television, and radio coverage of the project.

4.2 General Site Information

4.2.1 Site Location and General History

Purpose and Scope

The proposed project includes the site investigation of a 25± acre parcel of land owned by the Town of Willsboro (hereinafter "Town") adjacent to the Boquet River, a designated Wild Scenic and Recreational River. The property was acquired by the Town on December 20, 1966, from Georgia-Pacific Corporation (GPC) at a time when GPC was liquidating real property assets in the community. The project area includes a pulp mill waste deposition lagoon constructed along the Boquet River, consisting of a large dike and decantation basin. Residual black ash was deposited to a depth of up to 15 ft in the basin over a large area of the property. A 2400 linear-ft containment dike constructed along the riverbank perimeter is extremely unstable, allowing black ash, sand and dike construction material to discharge into the river.

The scope of the project incorporates the full investigation of the Black Ash Pond and characterization of the waste onsite as well as the extent of related offsite environmental degradation present. Development of a Remedial Alternatives Report will be included. Site remediation is anticipated to include, as a minimum, the containment of the black ash material and stabilization of 2400± linear feet of the riverbank impacted by the Black Ash Pond dike.

Environmental History

The project site was used as a deposition area for spent black liquor used in the making of paper pulp. The Champlain Fibre Company later known as the Willsboro Pulp Mill and most recently owned by GPC operated a pulp mill on the opposite side of the Boquet River from the black ash location from 1884 to 1965. The black liquor was a combination of soda ash,

chemical lime, wood fiber and soft coal. The black ash is the residue of spent black liquor combustion dumped in a basin area approximately 900 ft long and 400 ft wide. Surface samples of the black ash earlier (c. 1988) analyzed by the New York State Department of Health characterized the black ash as 98 percent carbon and small quantities of lime. However, in 2003 additional scrutiny of the black ash revealed the ash may contain metals exceeding the New York State Department of Environmental Conservation (NYSDEC) TAGM 4046 guidelines.

The deposition lagoons were formed by constructing a crescent shaped, 12 to 15-ft-high dike along the course of the riverbank. Concrete pavement is still evident on portions of the dike that has not eroded into the Boquet River indicating the use of the berm as a wheeled vehicle access. A large pipe protrudes through the remainder of the structure and outfalls into the river. The pipe documents the extent of dike erosion that has occurred. Construction material for the dike appears to have been onsite material from the riverbank, black ash, logs, bricks and other available materials. Black ash layers can be seen along the face of the dike and a black cloudy discharge into the Boquet River is evidence of offsite migration.

The recent testing of black ash material on adjacent properties indicating heavy metal contamination, combined with the fact that NYSDEC permits the Town to dump black ash into the Boquet River to facilitate the reduction of ice jams, has caused NYSDEC to desire a more comprehensive evaluation of the Black Ash Pond and related pulp mill waste deposits.

4.2.2 Physical Setting

The Boquet River is a major component of a NYSDEC salmonid restoration program in Lake Champlain and contains a fish ladder immediately upstream of the project site. The Willsboro Black Ash Pond Property contains a public access site for fishermen that routinely traverse the black ash pond and riverbanks to access this extremely important recreational resource. The site includes access to a large crib structure and fishing platform adjacent to a large pool at the base of a large dam where migrating salmon congregate. In addition, the meandering bend of the river and islands provide excellent wading and shore fishing opportunities. Unfortunately, a large portion of the riverbank is inaccessible due to severe erosion with steep slopes and dike instability. The erosion has also contributed to sedimentation within the river to the mouth of the Boquet River, more than a mile downstream. A small boat launch is also located on the property near the downstream portion of the site. The property is situated adjacent to tax map lot number 45.001 which is occupied by the Town's secondary wastewater treatment plant. The treatment plant discharge pipe is located on tax map lot 20.1

following the route of the existing access road to a surface discharge site between the boat launch and the eastern limits of the black ash pond. The Town intends to improve this property for a tertiary-wastewater treatment system.

Moreover, the Town is committed to utilizing the property as a public recreational resource incorporating fishermen, boater access and ecological education. Wastewater treatment system expansion and storage of equipment and supplies relating to public utility functions are also contemplated.

4.3 Project Description

4.3.1 Overview

The remedial program will consist of four (4) to five (5) distinct phases:

a) Preliminary SI
b) Interim Remedial Measures (if required)
c) Final SI/RA Development
d) Remedial Design (if required)
e) Remedial Construction (if required)

4.3.2 Project Objective

The overall goal of the project is to investigate, develop, and implement a remedial program to abate possible threats to public health and the environment caused by contamination at the site. The main objective of the SI/RA is to acquire sufficient data to identify the need for, extent of, and approach to, remedial measures for the site. The SI will provide adequate information for the characterization of the physical, geological, hydrological, chemical, and environmental factors unique to the site and define the source, nature, and extent of contamination. Upon completion of preliminary site investigation tasks, including site reconnaissance and test trenches, subsurface soil borings will be completed to identify potential subsurface soil impacts. Groundwater monitoring wells will then be installed to identify potential impacts to local groundwater. Boquet River sediments and seeps along the river banks near the Black Ash Pond will also be sampled to identify previous and potential impacts to the Boquet River, as well as waste media (black ash, sludge).

Site characterization data gathered during this phase of the project will be utilized to evaluate the environmental health risks associated with the site and the development of possible remedial

4.	31.09-1-45.001	Town of Willsboro P.O. Box 370 Willsboro, NY 12996

4.5 Identification of State Department Contacts

NYSDEC Contacts

Daniel Eaton, (Project Manager)
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233-7020

Mr. Richard Wagner, P.E.
NYSDEC Region 5
Route 86
Ray Brook, NY 12977
(518) 897-1200

Mr. David Winchell, CP Specialist
NYSDEC Region 5
Route 86
Ray Brook, NY 12977
(518) 897-1200

NYSDOH Contact

Mr. Daniel Gevaghty; Regional Toxics Coordinator
New York State Department of Health/Central Office
Bureau of Toxic Substance Assessment
Frear Building
1 Fulton Street
Troy, NY 12180
(518) 408-5423

Mr. Rich Fedigan
New York State Department of Health
Bureau of Environmental Exposure Investigation
547 River Street, Room 300
Troy, NY 12180-2216

4.6 Document Repositories

Documents related to investigation and remedial activities will be available for public review at the following locations:

1. Willsboro Town Hall
   Farrel Road, P.O. Box 370
   Willsboro, NY 12996
   Hours: M-Fri.; 9 a.m. - 4 p.m.

2. NYSDEC Region 5 Ray Brook/Hazardous Waste Remediation
   Route 86
   Ray Brook, NY 12977

Documents placed in the document repositories when available include, but are not limited to:

- Background Information Reports
- Contract Documents for the SI/RA
- Work Plan for the SI/RA
- Interim Remedial Design and Construction Documents (if applicable)
- SI Report
- RA Report
- Preliminary Remedial Action Plan Record of Decision
- Remedial Design Document (if applicable)
- Plans and Specifications for Remedial Construction (if applicable)
- Testing--Sampling and Monitoring Data
- Meeting Transcripts and Responsiveness Summaries
- The Site Specific CPP
- Fact Sheets, Newsletters and Public Notes

4.7 Citizen Participation Activities for Each Major Element of the Remedial Program

This section describes the specific citizen participation activities to be conducted per the NYSDEC CPP and Order of Consent for the site. These activities represent the minimum citizen participation activities for the site. This site specific CPP will be reviewed on an ongoing basis as the remediation program proceeds. Additional citizen participation activities will be added, if deemed necessary by the NYSDEC or the Town, depending upon public interest. Major changes in the remediation program and/or unexpected findings at the site will necessitate additional citizen participation activities. Listed below are the major citizen participation activities to be performed relative to the progress of the remediation program.

4.7.1 Development of the Scope of Work for the SI/RA

- Establish local document repository with documents available to date;
- Prepare site specific mail list;
- Place a minimum of one copy of the Work Plan for the SI/RA in the document repositories; and
- Mail informational letter to contact list, including brief description of the site, objectives of the SI/RA, overview of the SI/RA, documents available at the repository, and request information and comments that may be useful in finalizing the Work Plan for the SI/RA, and listing contact people from the Town and NYSDEC.

4.7.2 SI/IRM Report Documents Publicly Available

- Place a minimum of one (1) copy of the report in all repositories;
- Use the mailing list to inform interested and affected parties of availability of the report. Notice will include, but not be limited to, summary of work completed as part of the SI and IRM; summary of findings; schedule of remainder of SI/RA; location of document repositories; listing of contact people from the Town and NYSDEC. NYSDEC or the Town may add additional citizen participation activities to this section that they believe would be beneficial and appropriate; and
- Use the mailing list and press releases to notify interested and affected parties that report is available for review, of upcoming informal public information meeting, and of public comment period.

4.7.3 Final Remedial Alternatives Report and Proposed Remedial Action Plan (PRAP)

- Update all repositories with copies of the final SI/RA Report and PRAP;
- Use the mailing list and press releases to notify interested and affected parties that report is available for review, of upcoming formal public meeting, and of public comment period;
- Publish legal notices required to inform public of 45-day comment period and formal public meeting date and location;
- Conduct formal public meeting, complete with transcript, informing public of all technical aspects of program, findings and results of the SI/RA and IRM, recommended remedial steps, projected impact on public and environment, and receive public comments; and
- Prepare and distribute a responsiveness summary after public meeting.

4.7.4 Remedial Design

- Place copy of the final Remedial Design documents in repositories;
- Use mailing list, press releases, and/or advertisements to notify public of availability of Remedial Design documents.

4.7.5 At Project Completion

- Use mailing list to explain accomplishments of remedial program at the site, provide a description of the long-term operational, monitoring and maintenance requirements at the site, identify who is responsible for ongoing operations, monitoring, and maintenance and identify contact people for the Town and NYSDEC.

4.8 Glossary of Key Terms and Major Program Elements

4.8.1 Definitions of Commonly Used CPP Terms

Availability Session - Schedule gathering of the project staff and public in a setting less formal than a public meeting. Encourages "one-to-one" discussions whereby the public meets project staff on an individual or small group basis to discuss particular questions or concerns.

Citizen Participation - A process to inform and involve the interested/affected public in the decision-making process during identification, assessment and remediation of inactive hazardous waste sites. This process helps to assure that the best decisions are made from environmental, human health, economic, social and political perspectives.

Citizen Participation Plan - A document that describes the site-specific citizen participation activities that will take place to complement the "technical" (remedial) activities. It also provides site background and rationale for the selected citizen participation program for the site. A plan may be updated or altered as public interest or the technical aspects of the program change.

Citizen Participation Specialist - A staff member within the Office of Public Affairs who provides guidance, evaluation and assistance to help the Project Administrator carry out his/her Site-Specific Citizen Participation program.

Contact List - Names, addresses, and/or telephone numbers of individuals, groups, organizations, and media interested and/or affected by a particular hazardous waste site. Compiled and updated by the NYSDEC. Site interest, stage of remediation, and other factors guide the comprehensiveness of the list. Used by the NYSDEC to inform and involve the interested/affected public.

Document Repository - Typically a regional NYSDEC office and/or public building, such as a library, near a particular site, whereby documents related to remedial and citizen participation activities at the site are available for public review. Provides access to documents at times and a location convenient to the public. Environmental Management Councils (EMCs), Conservation Advisory Committee (CACs), as well as active local groups, often serve as supplemental document repositories.

Information Sheet - A written discussion of a site's remedial process, or parts thereof, prepared by the NYSDEC for the public in layperson language. May be prepared for the "general" public or a particular segment. Uses may include discussion of an element of the remedial program, opportunities for public involvement, availability of a report or other information, or announcement of a public meeting. May be mailed to all or part of the interested public, distributed at meetings and availability sessions, or sent on an "as requested" basis.

Project Manager - A NYSDEC staff member within the Division of Hazardous Waste Remediation (usually an engineer, geologist or hydrogeologist) responsible for the day-to-day administration of activities, and ultimate disposition of, one or more hazardous waste sites. The Project Manager works with the Office of Public Affairs as well as fiscal and legal staff to accomplish site-related goals and objectives.

projects.

Section 5: Health and Safety Plan

APPENDICES

5.1 General Information

The HASP described in this document will address health and safety considerations for all those activities that personnel employed by Earth Science Engineering, P.C., (ESE), may be engaged in during the SI at the Black Ash Pond, located in Willsboro, New York and implemented by the Health and Safety Officer (HSO).

Compliance with this HASP is required of all ESE personnel who enter this site. The content of a HASP may change or undergo revision based upon additional information made available to health, safety, and training (H&S) committee, monitoring results or changes in the technical scope of work. Any changes proposed must be reviewed by the H&S committee. This HASP was written specifically for those employees of ESE and is not intended for use by others.

Responsibilities

Project Administrator: Work Phone: (518) 963-8133	Douglas R. Ferris, P.E.	(ESE)
Site Health and Safety Officer: Work Phone: (518) 963-8133	Eric J. Schwencke	(ESE)
Emergency Coordinator Work Phone: (518) 572-3036	Douglas R. Ferris, P.E.	(ESE)

Emergency Phone Numbers

Fire Department:	911	
Ambulance:	911	
Police:	911	
Hospital: Hospital Route Included as Figure 1	(518) 561-2000	CVPH Hospital
Poison Control Center:	1-800-252-5655	
Oil Spills and Hazardous Material Spills:	1-800-457-7362	

5.2 Health And Safety Personnel

5.2.1 Health and Safety Personnel Designations

The following information briefly describes the health and safety designations and general responsibilities which may be employed for the SI.

5.2.2 Project Manager (PM)

The following information briefly describes the health and safety designations and general responsibilities which may be employed for the SI.

5.2.2 Project Manager (PM)

The PM is responsible for the overall project including the implementation of the HASP. Specifically, this includes allocating adequate manpower, equipment, and time resources to conduct site activities safely.

5.2.3 Health and Safety Officer (HSO)

The HSO is the person on-site responsible for assuring that personnel under direction comply with the requirements of the HASP and that personnel protective equipment needed for site work is available.

5.2.4 Emergency Coordinator

The Emergency Coordinator is responsible for implementation of the Emergency Plan as presented in Section XIII of this HASP, establishment and supervision of the emergency response team, and conducting training programs for personnel assigned duties on the emergency response team.

5.3 Pertinent Site Information

5.3.1 Site Location and General History

Purpose and Scope

The proposed project includes the site investigation of a 25± acre parcel of land owned by the Town of Willsboro (hereinafter "Town") adjacent to the Boquet River, a designated Wild Scenic and Recreational River. The property was acquired by the Town on December 20, 1966, from Georgia-Pacific Corporation (GPC) at a time when GPC was liquidating real property assets in the community. The project area includes a pulp mill waste deposition lagoon constructed along the Boquet River, consisting of a large dike and decantation basin. Residual black ash was deposited to a depth of up to 15 ft in the basin over a large area of the property. A 2400 linear-ft containment dike constructed along the riverbank perimeter is extremely unstable, allowing black ash, sand and dike construction material to discharge into the river.

The scope of the project incorporates the full investigation of the Black Ash Pond and characterization of the waste onsite as well as the extent of related offsite environmental

degradation present. Development of a Remedial Alternatives Report will be included. Site remediation is anticipated to include, as a minimum, the containment of the black ash material and stabilization of 2400± linear feet of the riverbank impacted by the Black Ash Pond dike.

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5.3.2 Physical Setting

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access to a large crib structure and fishing platform adjacent to a large pool at the base of a large dam where migrating salmon congregate. In addition, the meandering bend of the river and islands provide excellent wading and shore fishing opportunities. Unfortunately, a large portion of the riverbank is inaccessible due to severe erosion with steep slopes and dike instability. The erosion has also contributed to sedimentation within the river to the mouth of the Boquet River, more than a mile downstream. A small boat launch is also located on the property near the downstream portion of the site. The property is situated adjacent to tax map lot number 45.001 which is occupied by the Town's secondary wastewater treatment plant. The treatment plant discharge pipe is located on tax map lot 20.1 following the route of the existing access road to a surface discharge site between the boat launch and the eastern limits of the Black Ash Pond. The Town intends to improve this property for a tertiary-wastewater treatment system.

Moreover, the Town is committed to utilizing the property as a public recreational resource incorporating fishermen, boater access and ecological education. Wastewater treatment system expansion and storage of equipment and supplies relating to public utility functions are also contemplated.

5.4 Hazard Assessment And Hazard Communication

The most likely routes of exposure during SI tasks and (if necessary) Interim Remedial Measures (IRM) at the site include skin adsorption and inhalation due to exposure to wastes or waste-residues which may be present below grade, specifically during test pit or remedial excavations. Consistent with the history of the site, it is expected that the chemical hazards which may be associated with site activities include primarily heavy metals, e.g., selenium, arsenic, and zinc.

Mechanical hazards associated with the waste debris and site conditions (along the bank of the Bouquet River) must be recognized at the site. Additionally, physical hazards must be recognized. The ground surface is uneven in most areas of the site and the possibility of tripping or falling exists in most areas. During warm weather, contact with vectors such as bees,wasps or ticks is also a concern. It is assumed that site workers have the potential to be exposed to concentrations of hazardous petroleum substances.

It is difficult to draw a correlation between the concentrations of contaminants found in one media and the potential for exposure to these contaminants to site workers. However, their presence may indicate that some potential for exposure to these compounds exist, and the requirements for protective measures and monitoring of exposure is based on this potential. Pertinent information regarding typical compounds which may be constituents of products, wastes, or contamination at the site are discussed below:

Arsenic

CAS Registry ID: 7440-38-2
The element arsenic is a steel grey, very brittle, crystalline, semimetallic (metalloid) solid. It tarnishes in air, and when heated rapidly oxidizes to arsenous oxide which has a garlic odor. Upon heating arsenic and some minerals containing arsenic, it sublimes. Arsenic and its compounds are very poisonous.

Dioxins/Furans

Dioxins and furans are a family if chemicals comprising 75 different types of dioxin compounds and 135 related compounds known as furans.

Chemically, dioxins and furans are alike in that they are all formed when certain organic compounds and chlorine are heated to high temperatures. However, the degrees of toxicity of different dioxins and furans vary greatly. The most studies form of dioxin, 2, 3, 7, 8-TCDD, is also considered to be the most toxic.

PCB

PCB's are a class of chemicals known as polychlorinated biphenyls. They are entirely man-made and do not occur naturally. PCBs are mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. More than 1.5 billion pounds of PCBs were manufactured in the United States prior to cessation of production in 1977. PCBs have been linked to reproduction defects.

Selenium

CAS Registry ID: 7782-49-2
Selenium is a non metallic element that is gray in color with a metallic luster. Elemental selenium is relatively nontoxic and is considered to be an essential trace element. However, hydrogen selenide (H_2Se) and other selenium compounds are extremely toxic, and resemble arsenic in their physiological reactions. Hydrogen selenide in a concentration of 1.5 ppm is intolerable to man. Selenium occurs in some soils in amounts sufficient to produce serious effects on animals feeding on plants such as locoweed (an American plant) grown in such soils.

Zinc

CAS Registry ID: 7440-66-6
Zinc is a bluish-white, lustrous metal. It is brittle at ambient temperatures but is malleable at 100 to 150° C. It is a reasonable conductor of electricity, and burns in air at high red heat with evolution of white clouds of the oxide. Zinc is not particularly toxic and is an essential element in the growth of all animals and plants.

5.5 Training

5.5.1 Basic Training Required

Completion of the 40-hour Health and Safety Training for Hazardous Waste Operations and three days on the job training under the supervision of the HSO is required for all employees who will perform work in areas where the potential for a toxic exposure exists.

5.5.2 Advanced Training

Advanced training, as necessary, will be provided to any personnel who will be expected to perform site work utilizing Level A protection or other specialized operation to be undertaken at the site.

5.5.3 Site-Specific Training

Training will be provided that specifically addresses the activities, procedures, monitoring, and equipment for the site operations prior to going on site. Training will include familiarization with site and facility layout, known and potential hazards, and emergency services at the site, and details all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

5.5.4 Safety Briefings

ESE project personnel will be given briefings by the HSO on a daily or as needed basis to further assist site personnel in conducting their activities safely. Pertinent information will be provided when new operations are to be conducted. Changes in work practices must be implemented due to new information made available, or if site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safety practices. When conformance with these practices is not being followed, or if deficiencies are identified during safety audits the project manager will be notified.

5.5.5 First Aid and CPR

The HSO will identify those individuals requiring this training in order to oversee emergency treatment if so required during field activities. It is expected that a selected number of field workers will have First Aid training and some members of the field team will have CPR training. These courses will be consistent with the requirements of the American Red Cross Association.

5.6 Zones

5.6.1 Site Zones

Three types of site activity zones are identified for the SI activities, including the Work Zone, Contamination Reduction Zone, and the Support Zone.

5.6.1.1 Work Zone (Exclusion Zone)

The Work Zone is (are) the area(s) where contamination is known to be or likely to be present or area(s) where activity is being conducted which has the potential to cause harm. The Work Zone will be any area in the general vicinity of active site work or intrusive activities. It is anticipated that the location of the Work Zone will change as various investigating activities change. No one may enter the Work Zone without the necessary protective equipment and without permission from the HSO.

5.6.1.2 Contamination Reduction Zone

The Contamination Reduction Zone is defined as the area of the site where personal and equipment decontamination will be conducted. Considering the limited size of the site, it is planned that the contamination reduction zone be located at the NYSDEC Fishermen Access Parking Area

5.6.1.3 Support Zone

The support area is considered the uncontaminated area. This area may include the ESE trailer command post or pre-work area/personnel vehicles which will provide for communications and emergency response. Appropriate safety and support equipment also will be located in this zone.

5.7 Personal Protective Equipment

5.7.1 General

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Depending upon the type and levels of waste material present at the site, varying degrees of protective equipment will be needed. If the possible hazards are unknown, a reasonable level of protection will be taken until sampling and monitoring results can ascertain potential risks. The levels of protection listed below are based on Environmental Protection Agency Guidelines. A list of the appropriate clothing for each level is also provided.

Level A protection must be worn when a reasonable determination has been made that the highest available level of respiratory, skin, eye, and mucous membrane protection is needed. It should be noted that while Level A provides maximum available protection, it does not protect against all possible hazards. Consideration of the heat stress that can arise from wearing Level A protection should also enter into the decision making process.

Level A protection includes:

- Open Circuit, pressure-demand SCBA
- Totally encapsulated chemical resistant suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level B protection must be used when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body (i.e., the back of the neck) is unlikely.

Level B protection includes:

- Open circuit, pressure-demand SCBA or pressure airline with escape air bottle
- Chemical protective clothing:
- Overalls and long sleeved jacket; disposal chemical resistant coveralls; coveralls; one or two piece chemical splash suit with hood
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level C must be used when the required level of respiratory protection is known, or reasonably assumed to be, not greater than the level of protection afforded by air purifying respirators; and hazardous materials exposure to the few unprotected areas of the body (i.e., the back of the neck) is unlikely.

Level C protection includes:

- Full or half face air-purifying respirator
- Chemical protective clothing:
- Overalls and long-sleeve jacket; disposable chemical resistant coveralls; coveralls; one or two piece chemical splash suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective

- Boots, chemical protective

Level D is the basic work uniform. It cannot be worn on any site where respiratory or skin hazards exist.

Level D protection includes:

- Safety boots/shoes
- Safety glasses
- Hard Hat with optional face shield

Note that the use of SCBA is contingent upon the user receiving special training in the proper use and maintenance of such equipment.

5.7.2 Personal Protective Equipment - Specific

Level D with some modification will be required when working in the work zone on this site. In addition to the basic work uniform specified by Level D protection, chemical protective gloves with a surgical type inner liner will be required when contact with soil, leachate, sludge or black ash material is likely. An upgrade to a higher level (Level C) of protection may occur if determined necessary by the HSO.

5.8 Monitoring Procedures

5.8.1 Monitoring During Site Operations

All site environmental monitoring should be accompanied by meteorological monitoring of appropriate climatic conditions.

5.8.1.1 Drilling Operations (Monitoring Well Installation and Subsurface Borings)

Monitoring will be performed by the HSO or drilling observer during the conduct of work. A photoionization detector (PID) will be utilized to monitor the breathing zone, the borehole, and geological samples upon their retrieval. Drill cuttings will also be monitored. A combustible gas indicator (CGI) with oxygen alarm may also be used to monitor the borehole for the presence of

combustible gases. Similar monitoring of fluids produced during well development will also be conducted.

5.8.1.2 Test Trenches

Monitoring will be performed during excavation and sampling operations when ESE personnel are within the work zone. A PID will be utilized to monitor the breathing zone, the excavated area, and material taken from the excavation. Monitoring of the breathing zone with a CGI and oxygen meter will be conducted.

5.8.1.3 Other Media Sampling

Monitoring will be performed during sampling operations when ESE personnel are within the work zone. A PID will be utilized to monitor the breathing zone, the sampling area, and material taken from the sample location. Monitoring of the breathing zone with a CGI and oxygen meter will be conducted where applicable for confined space entry.

5.8.2 Action Levels

If readings on the PID exceed 10 ppm for more than fifteen minutes consecutively, then personal protective equipment should be upgraded to Level C. The air purifying respirator used with Level C protective equipment must be equipped with organic vapor cartridges. If readings on the explosive gas meter are within a range of 10%–25% of the LEL then continuous monitoring will be implemented. Readings above 25% of the LEL indicate the potential for an explosive condition. Sources of ignition should be removed and the site should be evacuated.

5.8.3 Personnel Monitoring Procedures

Personnel monitoring shall be performed as a contingency measure in the event that VOC concentrations are consistently above the 1.0 ppm action level as detected by the CGI and/or PID. If the concentration of VOCs is above this action level, then amendments to the HASP must be made before work can continue at the site.

5.8.4 Medical Surveillance Procedures for Evidence of Personal Exposure

All ESE personnel who will be performing field work at the Site must be medically qualified. Additional medical testing may be required by the HSO in consultation with the company physician if an overt exposure or accident occurs, or if other site conditions warrant further medical surveillance.

5.8.5 Heat Stress Monitoring

It is anticipated that heat stress may be a concern. Guidance relating to heat stress control is presented in Appendix A of this HASP.

5.9 Communications

Cellular phones will be assigned to each ESE employee conducting investigations at the site for communication with emergency support services/facilities. Guidance relating to site communications which may be implemented depending on conditions and circumstances is presented in Appendix B of this HASP.

5.10 Safety Considerations For Site Operations

5.10.1 General

Standard safe work practices that will be followed include:

- Do not climb over/under drums, or other obstacles.
- Do not enter the work zone alone.
- Practice contamination avoidance, on and off-site.
- Plan activities ahead of time, use caution when conducting concurrently running activities.
- No eating, drinking, chewing or smoking is permitted in work zones.
- Due to the unknown nature of waste placement at the site, extreme caution should be practiced during excavation activities.
- Apply immediate first aid to any and all cuts, scratches, abrasions, etc.
- Be alert to your own physical condition. Watch your buddy for signs of fatigue, exposure, etc.
- A work/rest regimen will be initiated when ambient temperatures and protective clothing create a potential heat stress situation.
- No work will be conducted without adequate natural light or without appropriate supervision.
- Task safety briefings will be held prior to onset of task work.
- Ignition of flammable liquids within or through improvised heating devices (barrels, etc.) or space heaters is forbidden.
- Entry into areas of spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment is prohibited.
- Any injury or unusual health effect must be reported to the site HSO.

- Prevent splashing or spilling of potentially contaminated materials.
- Use of contact lenses is prohibited while on site.
- Beards and other facial hair that would impair the effectiveness of respiratory protection are prohibited.
- Field crew members should be familiar with the physical characteristics of investigations, including:
  - Wind direction in relation to potential sources
  - Accessibility to co-workers, equipment, and vehicles
  - Communication
  - Hot Zones (areas of known or suspected contamination)
  - Site Access
  - Nearest water sources
- The number of personnel and equipment in potentially contaminated areas should be minimized consistent with site operations.

5.10.2 Field Operations

5.10.2.1 Intrusive Operations

The HSO or designee will be present on-site during all intrusive work, e.g., drilling operations, excavations, trenching, and will provide monitoring to oversee that appropriate levels of protection and safety procedures are utilized by ESE personnel. The use of salamanders or other equipment with an open flame is prohibited and the use of protective clothing especially hard hats and boots, will be required during drilling or other heavy equipment operations. All contaminated equipment, e.g., augers, split spoons, drill pipe, backhoe, bucket, etc., will be placed on liner material when not in use, or during steam cleaning. Communications will be maintained at all times.

5.10.2.2 Excavations and Excavation Trenching

Guidance relating to safe work practices for ESE employees regarding excavations and excavating/trenching operation is presented in Appendix C of this HASP.

5.11 Decontamination Procedures

Decontamination involves physically removing contaminants and/or converting them chemically into innocuous substances. Only general guidance can be given on methods and techniques for decontamination.

Decontamination procedures are designed to:

- Remove contaminant(s).
- Avoid spreading the contamination from the work zone.
- Avoid exposing unprotected personnel outside of the work zone to contaminants.

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Each person involved in site operations must practice the basic methods of contamination avoidance listed below. Additional precautions may be required in the HASP.

- Know the limitations of all protective equipment being used.
- Do not enter a contaminated area unless it is necessary to carry out a specific objective.
- When in a contaminated area, avoid touching anything unnecessarily.
- Walk around pools of liquids, discolored areas, or any area that shows evidence of possible contamination.
- Walk upwind of contamination, if possible.
- Do not sit or lean against anything in a contaminated area. If you must kneel (e.g., to take samples), use a plastic ground sheet.
- If at all possible, do not set sampling equipment directly on contaminated areas. Place equipment on a protective cover such as a ground cloth.
- Use the proper tools necessary to safely conduct the work.

Specific methods that may reduce the chance of contamination are:

- Use of remote sampling techniques.
- Opening containers by non-manual means.
- Bagging monitoring instruments.
- Use of drum grapplers.
- Watering down dusty areas.

Equipment which will need to be decontaminated includes tools, monitoring equipment, and personal protective equipment. Items to be decontaminated will be brushed off, rinsed, and dropped into a plastic container supplied for that purpose. They will then be washed with a detergent solution and rinsed with clean water.

Monitoring instruments will be wrapped in plastic bags prior to entering the field in order to reduce the potential for contamination. Instrumentation that is contaminated during field operations will be

carefully wiped down. Heavy equipment, if utilized for operations where it may be contaminated, will have prescribed decontamination procedures to prevent hazardous materials from potentially leaving the site. The on-site contractor will be responsible for decontaminating all construction equipment prior to demobilization.

5.12 Disposal Procedures

All discarded materials, waste materials, or other objects shall be handled in such a way as to reduce or eliminate the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for proper disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract and consistent with regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal.

5.13 Emergency Plan

As a result of the hazards at the site, and the conditions under which operations are conducted, there is the possibility of emergency situations. This section has established procedures for the implementation of an emergency plan.

5.13.1 Emergency Coordinator

The Site Emergency Coordinator, Douglas R. Ferris, P.E., (518) 572-3036
shall implement the emergency plan whenever conditions at the site warrant such action. The Site Emergency Coordinator will be responsible for assuring the evacuation, emergency treatment, emergency transport of site personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

5.13.2 Evacuation

In the event of an emergency situation, such as fire, explosion, significant release of toxic gases, etc., all personnel will evacuate and assemble in a designated assembly area (most likely the project trailer or personnel vehicles). The Emergency Coordinator will have authority to contact outside services as required.

Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The Emergency Coordinator must see that access for emergency equipment is provided and that all ignition sources have been shut down once the alarm

has been sounded. Once the safety of all personnel is established, the Fire Department and other emergency response groups will be notified by telephone of the emergency.

5.13.3 Potential or Actual Fire or Explosion

Immediately evacuate the site and notify local fire and police departments, and other appropriate emergency response groups, if LEL values are above 25% in the work zone or if an actual fire or explosion has taken place.

5.13.4 Environmental Incident (spread or release of contamination)

Control or stop the spread of contamination if possible. Notify the Emergency Coordinator and the Project Manager. Other appropriate response groups will be notified as appropriate.

5.13.5 Personnel Injury

Emergency first aid shall be applied on-site as necessary. Then, decontaminate (en route if necessary) and transport the individual to nearest medical facility if needed. The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. The directions to the hospital and a map are found in Figure 1.

5.13.6 Personnel Exposure

Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. Eyes should be thoroughly rinsed with water for at least 15 minutes.

Inhalation: Move to fresh air and/or, if necessary, decontaminate and transport to emergency medial facility.

Ingestion: Decontaminate and transport to emergency medical facility.

Puncture Wound/Laceration: Decontaminate, if possible, and transport to emergency medical facility. HSC will provide medical data sheets to medical personnel as requested.

5.13.7 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work can continue without sacrificing the health and safety of ESE field workers.

5.13.8 Incident Investigation and Reporting

In the event of an incident, procedures discussed in the ESE incident investigation and reporting policy, which is presented in Appendix D of this HASP, shall be followed.

5.14 Community Relations And Health & Safety Plan

5.14.1 Community Relations

Community relations may be a sensitive matter. All ESE employees should be aware of issues associated with this specific site. Conversations with community members not involved in activities at the site should be limited. Conversations between site workers off the site, in restaurants, etc., should not include discussions of the potential hazards on the site nor should negative statements be made regarding the site.

5.14.2 Community Health and Safety Plan

5.14.2.1 Site Access

In general, the majority of active and/or intrusive efforts to be completed as part of the SI will occur during the completion of test trench excavations and test borings. Community residences are located relatively remote from the site. During completion of the Site Investigation efforts, site access will be limited only to those personnel (field sampling technicians, geologists, engineers, and subcontractors) who are scheduled to be involved with site specific investigation. Site access restrictions will be primarily achieved by means of the driveway entrance proximate to the Town of Willsboro Wastewater Treatment Plant.

5.14.2.2 Community Health and Safety Monitoring

As part of the SI, three general types of efforts are scheduled, including, non-intrusive reconnaissance tasks, sampling or monitoring tasks (monitoring point sampling), and intrusive tasks (test trenching, subsurface borings, monitoring point/well installation). During completion of general reconnaissance and sampling or monitoring tasks, potential for health and safety risks to off-site landowners or the local community are not anticipated.

During completion of intrusive efforts at or adjacent to the site, health and safety monitoring efforts will be concentrated immediately adjacent to the area or areas in which intrusive efforts are being completed. Since the air pathway is the most available and likely avenue for the release of potential contaminants to the atmosphere at or near the site, in addition to limiting public or community access to the areas in which intrusive efforts are completed, health and safety measures will primarily consist of monitoring the air pathway for worker exposure.

5.14.2.3 Community Air Monitoring Plan

Since the field activities (test trenches, groundwater monitoring wells, and remedial excavations, if necessary) to be completed during the SI and IRM include a degree or area of intrusion, air monitoring for protection of the local community will be focused at the area of intrusion. During completion of intrusive investigation tasks, efforts will be initiated to complete field work at a pace which will minimize the creation of airborne dust or particulates. During periods of extreme wind or rain, intrusive field work will be halted until such time as the potential for creating airborne dust or particulate matter is limited.

5.15 Authorizations

ESE personnel authorized to enter the site while operations are being conducted must be approved by the HSO. Authorization will involve completion of appropriate training courses, medical examination requirements, and review and sign-off of this HASP. No ESE personnel should enter the work zone alone. Each ESE employee should check in with the HSO or Project Manager prior to entering the work zones.

HASP APPENDIX A

GUIDANCE ON HEAT STRESS CONTROL

EARTH SCIENCE ENGINEERING, P.C.
HEALTH & SAFETY GUIDELINE #15
HEAT STRESS CONTROL

1.0 Purpose

To establish procedures for the implementation and operation of a heat stress prevention, evaluation, and response program.

2.0 Scope

Applies to all activity where personnel may be exposed to environments exceeding 70 degrees Fahrenheit performing Levels C and B work, and environments exceeding 80 degrees Fahrenheit for Level D work.

3.0 Definitions

Acclimatization – Acclimatization is the process of the body becoming accustomed to extremes in temperature.

ACGIH TLV 1991/92 – Heat stress threshold limit values (TLVS) are intended to protect workers from the severest effects of heat stress and heat injury and to describe exposures to hot working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from exceeding 38°c (100.4°f).

Wet-Bulb Globe Temperature (WBGT) – this is the simplest and most suitable technique to measure the environmental factors associated with heat stress. The value is calculated by using equations show in appendix.

Work-Rest Regimen – This is a ratio of time spent working versus time spent resting. The ratio applies to one-hour periods. For example, a work-rest regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

4.0 Responsibilities

Employees – All employees must be alert to signs of development of symptoms of heat stress in themselves and in those working with them. Personnel must also be aware of emergency corrective action.

Health and Safety Coordinator (HSC) – The HSC is responsible for establishing and enforcing the work-rest regimen to control heat stress.

5.0 Guidelines

Acclimatization to heat involves a series of physiological and [psychological adjustments that occur in an individual during his first week of exposure to hot environmental conditions. The work-rest regimen in this procedure is valid for acclimated workers who are physically fit

5.1 Effects of Heat Stress

Hot weather can cause physical discomfort, loss of efficiency, and personal injury. Wearing personal protective equipment puts a worker at considerable risk of developing heat stress since protective clothing decreases natural body ventilation.

Heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites. Regular monitoring and preventive measures are essential to the health and safety of personnel conducting field work.

Early symptoms of heat stress may include fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement. If not recognized or treated, heat stress may be serious; even fatal.

Heat-related problems include:

1. Heat Rash caused by continuous exposure to hot and humid air and aggravation of the skin by chafing clothes. This decreases the ability to tolerate heat as well as being a nuisance.

2. Heat cramps caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

3. Heat exhaustion caused by increased stress on various organs to meet increased demands for body cooling. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; or fatigue.

4. Heat Stroke, the most severe form of heat stress. Heat stroke is considered an Immediately Dangerous to Life or Health (IDLH) condition and as such must be treated as an emergency. Any person suffering from heat stroke must be cooled down immediately and brought to a hospital. Decontamination procedures should not be implemented. Signs and symptoms are: red, hot dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; or coma.

   It is important to note that individuals vary in their susceptibility and their reactions to heat related conditions. Factors that may predispose someone to a heat condition include:

   - Lack of physical fitness
   - Lack of acclimatization
   - Age
   - Dehydration
   - Obesity
   - Alcohol and Drug Use
   - Infection

- Sunburn
- Diarrhea
- Chronic Disease

5.2 First Aid/Medical Treatment

The following first aid and medical treatments are recommended. First aid training is recommended.

1. Heat Rash - Apply mild drying lotions and utilize cool, dry sleeping quarters to allow skin to dry between heat exposures.

2. Heat Cramps – Administer commercially available electrolyte-balanced liquids. Seek medical attention if serious.

3. Heat Exhaustion – Remove to cooler environment, rest in reclining position. Drink plenty of fluids.

4. Heat Stroke – Immediate and rapid cooling by immersion in chilled water with massage, or wrapping in wet sheet and fanning. These steps are to be taken while waiting for emergency response to arrive, or while transporting the victim to an emergency medical facility. This is a life-threatening situation.

5.3 Heat Stress Prevention

One or more of the following will help prevent or reduce heat stress:

1. Drinking water shall be available to the workers to encourage frequent small drinks, i.e., one cup every 15-20 minutes (about 150 ml or ¼ pint). The water shall be kept reasonable cool (55-60°F) and shall be placed outside the contaminated areas.

   The workers shall be encouraged to salt their foods and maintain well balanced diets. If workers are unacclimatized, a commercially available product such as Gatorade or Exceed may be used for electrolyte replacement.

2. Cooling devices may be used to aid natural body ventilation. These devices, however, add weight, and their use should be balanced against worker efficiency.

3. Long cotton underwear should be worn. It acts as a wick to help absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.

4. Provide air-conditioned shelter or shaded areas to protect personnel during rest periods.

5. Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.

6. Conduct operations in the early morning or evening.

7. Rotate shift workers.

8. Add additional personnel to work teams.

9. Mandate work slowdowns.

10. Good hygienic standards must be maintained by frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods.

11. The workers shall be instructed in hot weather procedures. The training program shall include as a minimum, instruction in:

    a. Proper cooling procedures and appropriate first aid treatment.

    b. Proper clothing practices.

    c. Proper eating and drinking habits.

    d. Recognition of impending heat exhaustion.

    e. Recognition of signs and symptoms of impending heat stroke.

    f. Safe work practices.

5.4 Heat Stress Monitoring

Specific procedures will be established by the HSC and/or in the site specific Health and Safety Plan. Appendix A and B discuss the use of WBGT values.

5.5 Work-Rest Regimen

A work-rest regimen will be established for fieldwork where personnel may be exposed to environments exceeding 80 degrees Fahrenheit for Level D work and environments exceeding 70 degrees Fahrenheit performing Levels C and D work. The American Conference of Governmental Industrial Hygienists' TLV Heat Stress Threshold Limit Values will be used as a guideline.

If any heat stress symptoms are identified by the employee or buddy, the HSC should be notified immediately and all work activity should cease until the situation is corrected.

5.6 Biological Monitoring

One of the following procedures shall be followed in order to make sure a work-rest regimen is providing proper personal protection and to document exposure.

1. Hear rate (HR) should be measured by the pulse for 30 seconds at the beginning of the resting period. The HR should not exceed 110 beats/min. If the HR is higher, the next work period should be shortened by 33 percent, while the length of rest period stays the same. If the pulse rate is still greater than 110 beats/min. at the beginning of the next rest period, the following work cycle should again be shortened by 33 percent. The length of the initial work period will be determined by the HSC. If WBGT monitoring is conducted, Table 1 will identify the initial work period.

2. Body temperature shall be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperatures (OT) at the beginning of the rest period should not exceed 99.6°F. If it does, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the OT still exceeds 99.6°F at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. OT should be measured at the end of the rest period to make sure that it has dropped below 99°F. At no time shall work begin in impermeable or semi permeable garments when OT is above 100.6°F.

6.0 References

ACGIH TLV Booklet, 1991-1992

7.0 Attachments

Table 1 – Permissible Heat Exposure Threshold Limit Values

Appendix A - Wet-Bulb Globe Temperature Index

Appendix B – Manual Measurement of WBGT Factors

TABLE 1
Permissible Heat Exposure Threshold Limit Values
(values are given in °F WBGT)

Work-Rest Regime	Light	Moderate	Heavy
Continuous Work	86	80	77
75% Work - 24% Rest, Each Hour	87	82	78
50% Work - 50% Rest, Each Hour	89	85	82
25% Work - 75% Rest, Each Hour	90	88	86

APPENDIX A

Wet-Bulb Globe Temperature Index

A baseline work-rest regimen is selected using the WBGT procedure. The period of work will be adjusted based on the biological monitoring outlines in Subsection 5.7 of this procedure.

The WBGT in conjunction with the workload required to perform each task is used to determine work-rest regimen. **Light** work examples include such tasks as sitting or standing to control machines of performing light hand or arm work. **Moderate** work includes walking about in coated coveralls and respirators doing moderate lifting and pushing. **Heavy** work corresponds to pick and shovel-type work or the use of full body protective clothing. *It must be assumed that any activity involving this type of clothing will be considered heavy work.*

In order to determine the WBGT the following equations are used:

- Outdoors with solar load:
  WBGT = 0.7 WB + 0.2 GT + 0.1 DB

- Indoors or outdoors with no solar load:
  WBGT = 0.7 WB + 0.3 GT

  WB = Natural Wet-Bulb Temperature
  DB = Dry-Bulb Temperature
  GT = Globe Thermometer Temperature

The factors involved in the above equations can be measured using a direct reading instrument or manually measuring each factor.

- An example of a direct-reading heat stress monitor is the Reuter-Stokes Widget No. RSS-214 heat stress monitor.

- Requirement of the individual factors requires the following equipment:

  - Dry-bulb thermometer
  - Natural wet-bulb thermometer
  - Globe thermometer
  - Stand

APPENDIX B

Manual Measurement of WBGT Factors

The range of the dry and the natural wet-bulb thermometers shall be -5°C to 50°C with an accuracy of 0.5°C. The dry-bulb thermometer must be shielded from the sun and the other radiant surfaces of the environment without restricting the airflow around the bulb. The wick of the natural wet-bulb thermometer shall be kept wet with distilled water for at least ½ hour before the temperature reading is made. It is not enough to immerse the other end of the wick into a reservoir of distilled water and wait until the whole wick becomes wet by capillary action. The wick shall be wetted by direct application of water from a syringe ½ hour before each reading. The wick shall extend over the bulb of the thermometer, covering the stem about one additional bulb length. The wick should always be clean and new wicks shall be washed before using.

A globe thermometer, consisting of a 15 cm (6-inch) diameter hollow copper sphere painted on the outside with a matter black finish or equivalent, shall be used. The bulb or sensor of a thermometer (range -5°C to 100 C with an accuracy of 0.5°C) must be fixed in the center of the sphere. The globe thermometer shall be exposed at least 25 minutes before it is read.

A stand shall be used to suspend the three thermometers so that they do not restrict free airflow around the bulbs.

It is permissible to use any other type of temperature sensor that gives identical reading as that of a mercury thermometer under the same conditions.

The thermometers must be so placed that the readings are representative of the condition where the men work or rest, respectively. All readings shall be recorded on the site log.

In many cases WBGT is the simplest and most suitable technique to measure heat. However, this system is only valid for light summer clothing. When special personal protective clothing is required for performing a particular job the worker's heat tolerance is reduced and the permissible heat exposure limits are not applicable since this clothing is heavier, impedes sweat evaporation and/or has higher insulation value.

HASP APPENDIX B

GUIDANCE ON SITE COMMUNICATIONS

EARTH SCIENCE ENGINEERING, P.C.
HEALTH & SAFETY GUIDELINE #13
SITE COMMUNICATIONS

1.0 Purpose

This guideline contains information and requirements necessary to make sure field activities are conducted with adequate provision for communications among field personnel and to emergency agencies.

2.0 Scope

The guideline applies to all field activities conducted by Earth Science Engineering, P.C. Additional provisions for communications will be addressed in each Site-Specific Health and Safety Plan (HASP), as needed. Field communications must be provided not only to make sure field personnel can communicate with one another, but, also to contact off-site technical and emergency assistance.

3.0 Definitions

None.

4.0 Responsibilities

Employees – All employees are responsible for knowing and using the specified communications to make sure field work is safely completed and/or to respond to emergencies.

Health and Safety Coordinator (HSC) – the HSC is responsible for determining the proper methods of communication required at a particular site, for training site personnel in the use of these communications, and for providing and maintaining the communications as specified.

5.0 Guidelines

5.1 On-Site Communications

Each person shall be able to communicate with other personnel at all times. This communication may be via sound (air horn), electronic (two way radio, bullhorn, etc.), or visual means.

A set of hand signals shall be designated and agreed upon by all personnel at each site activity, for use if electronic communications fail. The site-specific training shall include explanation of the following standard hand signals:

Signal	Meaning
Hand gripping throat:	Out of air, can't breath
Grip partner's wrist Place both hands around waist:	Leave area immediately, now

Hands on top of head:	Need assistance
Thumbs up:	OK, I'm all right, I understand
Thumbs down:	No, negative

Whichever communication system is selected as a primary system, a backup system must be provided. For example, hand signals may be used as a backup if radio communications fail. All internal systems should be:

- Clearly understood by all personnel;
- Checked and practiced daily;
- Intrinsically safe (spark free).

A special set of emergency signals should be set up. These should be:

- Different from ordinary signals;
- Brief and exact;
- Limited in number so that they are easily remembered.

When designing and practicing communication systems, remember that:

- Background noise on-site will interfere with talking and listening;
- Wearing personal protective equipment will impede hearing and limit vision (e.g., the ability to recognize hand and body signals);
- Inexperienced radio users may need practice in speaking clearly.

5.2 Off-site Communications

Every field task shall provide for off-site communications to be able to contact local emergency agencies. Acceptable methods include mobile telephone, radio (CB, other) on a frequency monitored by emergency agencies, on-site telephone (portable or land-line), or a phone (booth or private home) within one-mile of the site. Where a private home phone is to be used, personnel shall make sure access to the home is guaranteed by the owner. Explicit directions and a map shall be prominently displayed. Adequate change shall be conveniently provided where a phone booth is specified for off-site communications.

6.0 References

None.

7.0 Attachments

None.

HASP APPENDIX C

GUIDANCE ON EXCAVATION/TRENCHING OPERATIONS

EARTH SCIENCE ENGINEERING, P.C.
HEALTH & SAFETY GUIDELINE #14
EXCAVATION/TRENCHING OPERATIONS

1.0 Purpose

To establish safe operating procedures for excavation/trenching operations at Earth Science Engineering, P.C. work sites.

2.0 Scope

Applies to all Earth Science Engineering, P.C. activity where excavation or trenching operations take place.

3.0 Definitions

Excavation – Any manmade cavity or depression in the earth's surface, including its sides, walls, or face, formed by earth removal and producing unsupported earth conditions by reasons of the excavation.

Trench – A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

4.0 Responsibilities

Employees – All employees must understand and follow the procedures outlined in this guideline during all excavation and trenching operations.

Health and Safety Coordinator (HSC) – The HSC is responsible for ensuring these procedures are implemented at each work site.

5.0 Guidelines

5.1.1 Hazards Associated With Excavation/Trenching

The principle hazards associated with excavation/trenching are;

- Suffocation, crushing or other injury from falling material;
- Damage/failure of installed underground services and consequent hazards;
- Tripping, slipping or falling;
- Possibility of explosive, flammable, toxic or oxygen-deficient atmosphere in excavation.

5.2 Procedures Prior to Excavation

1. Underground utilities –

   - Determine the presence and location of any underground chemical or utility pipes, electrical, telephone or instrument wire or cables.

   - Identify the location of underground services by stakes or markers.

   - De-energize or isolate underground services during excavation. If not possible, or location is not definite, method or excavation shall be established to minimize hazards by such means as:

     1) Use of hand tools in area of underground services;

     2) Insulating personnel and equipment from possible electrical contact.

     3) Use tools or equipment that will reduce possibility of damage to underground services and hazard to worker.

2. Identify Excavation Area

   - Areas to be excavated shall be identified and segregated by means of barricades, ropes and/or signs to prevent access of unauthorized personnel and equipment. Suitable means shall be provided to make barriers visible at all times.

3. Surface Water

   - Provide means of diverting surface water from excavation.

4. Shoring/Bracing

   - Shoring or bracing that may be required for installed equipment adjacent to the excavation shall be designed by a competent person.

5. Structural Ramps

   - Structural ramps that are used solely by employees as a means of access or egress from the excavation shall be designed by a competent person.

5.3 Procedures For Doing the Excavation

1. Determine the need for shoring/sloping – The type of soil will establish the need for shoring, slope of the excavation, support systems, and equipment to be used. The soil condition may change as the excavation proceeds. Appendices A, B, C, D, E, and F of the OSHA Excavation Regulation, 29 CFR 1926 Subpart P (Attachment 1) are to be used in defining shoring and sloping requirements.

2. Mobile equipment – For safe use of mobile industrial equipment in or near the excavation, the load carrying capacity of soil shall be established and suitable protection against collapse of soil provided by the use of mats, barricades, restricting the location of equipment, or shoring.

3. Excavated material (spoil) shall be stored at least 2 feet from the edge of the excavation.

4. All trench (vertical sides) excavations greater than 5 feet in depth shall be shored.

5. Ladders or other means of access/egress to excavations shall be provided at a

   1) Maximum spacing of 100 feet on the perimeter of open excavation and

   2) 25 feet for trench excavations greater than 4 feet in depth.

6. The excavation shall be inspected daily for changes in conditions. Look for the presence of ground water, change in soil condition, or effects of weather such as rain or freeze. A safe means of continuing the work shall be established based on changes in condition.

7. Appropriate monitoring for gas, toxic, or flammable materials will be conducted to establish the need for respiratory equipment, ventilation or other measures required to continue the excavation safely.

8. Adequate means of dewatering the excavation shall be provided as required.

9. A signal person shall be provided to direct powered equipment if working in the excavation with other personnel.

10. A signal person shall be provided when back filling excavations to direct powered equipment working in the excavation with other personnel.

11. Warning vests will be worn when employees are exposed to public vehicular traffic.

12. Employees shall stand away from vehicles being loaded or unloaded, and shall not be permitted underneath loads handled by lifting or dragging equipment.

13. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available if hazardous atmospheric conditions exist or may be expected to develop. The specifics will be determined by the HAC/HSM.

14. Walkways or bridges with standard guardrail shall be provided where employees or equipment are required or permitted to cross over excavations.

5.4 Entering the Excavation

No Earth Science Engineering, P.C. employee shall enter an excavation which fails to meet the requirements of Section 5.3 of this guideline.

6.0 References

OSHA Regulations 29 CFR 1926 Subpart P – Excavations
29 CFR 1926 Subpart P, Appendices A, B, C, D, E, and F

6.0 Attachments

None

HASP APPENDIX D

GUIDANCE ON INCIDENT INVESTIGATION AND REPORTING

EARTH SCIENCE ENGINEERING, P.C.
HEALTH & SAFETY GUIDELINE #2
INCIDENT INVESTIGATION AND REPORTING

1.0 Purpose

To prevent the occurrence or reoccurrence of accidents on Earth Science Engineering, P.C. work sites and to establish a procedure for investigation and reporting of incidents occurring in, or related to Earth Science Engineering, P.C.'s work activities.

2.0 Scope

Applies to all incidents related to Earth Science Engineering, P.C.'s work activities.

3.0 Definitions

Accident – An undesired event resulting in personal injury and/or property damage, and/or equipment failure.

Fatality – An injury resulting in death of the individual.

Incident – Any occurrence which results in, or could potentially result in, the need for medical care or property damage. Such incidents shall include lost time accidents or illness, medical treatment cases, unplanned exposure to toxic materials or any other significant occurrence resulting in property damage or in "near misses".

Incidence Rate – The number of injuries, illnesses, or lost workdays related to a common exposure base of 100 full-time workers. The rate is calculated as:

$$N/EH \times 200{,}000$$

N = number of injuries and illnesses or lost workday cases; EH = total hours worked by all associates during calendar year. 200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year).

Injury – An injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or from a single instantaneous event in the work environment.

Lost Workday Case – A lost workday case occurs when an injured or ill employee experiences days away from work beginning with the next scheduled workday. Lost workday cases do not occur unless the employee is affected beyond the day of injury or onset of illness.

Recordable Illness – An illness that results from the course of employment and must be entered on the OSHA 200 Log and Summary of Occupational Injuries and Illnesses. These illnesses require medical treatment and evaluation of work related injury. For example, dermatitis, bronchitis, irritation of eyes, nose, and throat can result from work and non-work related incidents.

Recordable Injury – An injury that results from the course of employment and must be entered on the OSHA 200 Log and Summary of Occupational Injuries and Illnesses. These injuries require medical treatment; may involve loss of consciousness; may result in restriction of work or motion or transfer to another job; or result in a fatality.

Near Miss – An incident which, if occurring at a different time or in a different personnel or equipment configuration, would have resulted in an incident.

4.0 Responsibilities

Employees – It shall be the responsibility of all Earth Science Engineering, P.C. employees to report all incidents as soon as possible to the HSC. Regardless of the severity.

Human Resources – has overall responsibility for maintaining accident/incident reporting and investigations according to current regulations and recording injuries/illness on the OSHA 200 Log and posting the OSHA 200 Log.

Health and Safety Coordinator (HSC) – It is the responsibility of the HSC to investigate and prepare an appropriate report of all accidents, illnesses, and incidents occurring on or related to Earth Science Engineering, P.C. work. The HSC shall complete Attachment A within 24 hours of the incident occurrence.

Health and Safety Manager (HSM) – It is the responsibility of the HSM to investigate and prepare an appropriate report of all lost time injuries and illnesses and significant incidents occurring on or related to Earth Science Engineering, P.C. The HSM shall maintain the OSHA 200 form.

Project Managers (PM) – It shall be the PM's responsibility to promptly correct any deficiencies in personnel, training, actions, or any site or equipment deficiencies that were determined to cause or contribute to the incident investigated.

5.0 Guidelines

5.1 Incident Investigation

The HSC will immediately investigate the circumstances surrounding the incident and will make recommendations to prevent recurrence. The HSM shall be immediately notified by telephone if a serious accident/incident occurs. The incident shall be evaluated to determine whether it is OSHA recordable. If the incident is determined to be OSHA 200 recordable, it shall be entered on the OSHA 200 form.

The following minimum information should be gathered in an accident investigation:

- Where and when the accident occurred;
- Who and what were involved, operating personnel and witnesses
- How the accident or illness exposure occurred;
- List of objects or substances involved;
- The nature of the injury or illness and the part(s) of the body affected;
- Discussion of the causes, and recommendations for prevention of recurrence.

5.2 Incident Report

The completed accident report must be completed by the HSC within 24 hours of the incident and distributed to the PM, HSM, and Human Resources. This form shall be maintained by Human Resources for at least five years for all OSHA recordable cases. This form serves as an equivalent to the OSHA 101 form.

5.3 Incident Follow-Up Report

The incident Follow-Up Report (Attachment B) shall be distributed with the Incident Report within one week of the incident. Delay in filing this report shall be explained in a brief memorandum.

5.4 Reporting of Fatalities or Multiple Hospitalization Accidents

Fatalities or accidents resulting in the hospitalization of five or more employees must be reported to OSHA verbally or in writing within 48 years. The report must contain 1) circumstances surrounding the accident(s), 2) the number of fatalities, and 3) the extent of any injuries.

5.5 OSHA 200 Summary Form

Recordable cases must be entered on the log within six workdays of receipt of the information that a recordable case has occurred. The OSHA log must be kept updated to within 45 calendar days.

OSHA 200 forms must be updated during the 5-year retention period, if there is a change in the extent or outcome of an injury or illness which affects an entry in a log. If a change is necessary, the original entry should be lined out and a corrected entry made on that log. New entries should be made for previously unrecorded cases that are discovered or for cases that initially weren't recorded but were found to be recordable after the end of the year Log totals should also be modified to reflect these changes.

5.5.1 Posting

The log must be summarized at the end of the calendar year and the summary must be posted from February through March 1.

5.6 OSHA 200S

Facilities selected by the Bureau of Labor Statistics (BLS) to participate in surveys of occupational injuries and illnesses will receive the OSHA 200S. The data from the annual summary on the OSHA 200 log should be transferred to the OSHA 200S, other requested information provided and the form returned as instructed by the BLS.

5.7 Access to OSHA Records

All OSHA records (accident reporting forms and OSHA 200 logs) should be available for inspection and copying by authorized Federal and State government officials.

Employees, former employees, and their representatives must be given access for inspection and copying to only the log, OSHA No. 200, for the establishment in which the employee currently works or formerly worked.

6.0 References

29 CFR Part 1904

7.0 Attachments

Attachment A – Incident Investigation Form

Attachment B – Incident Follow-Up Report

Attachment C – Establishing Recordability

ATTACHMENT A

Incident Investigation Form

Accident investigation should include:

Location
Time of Day
Accident Type
Victim
Nature of Injury
Released Injury
Hazardous Material
Unsafe Acts
Unsafe Conditions
Policies, Decisions
Personal Factors
Environmental Factors

ATTACHMENT B

Date_____

Incident Follow-Up Report

Date of Incident:

_____

Site: _____

Brief description of incident_____

_____

_____

Outcome of incident: _____

_____

_____

_____

_____

_____

Physician's recommendations: _____

_____

_____

_____

Date the injured returned to work: _____

ATTACH ANY ADDITIONAL INFORMATION TO THE FORM.

Associates who travel on company business are considered to be engaged in work related activities all the time they spend in the interest of the company. This includes travel to and from customer contacts, and entertaining or being entertained for purpose of promoting or discussing business. Incidents occurring during normal living activities (eating, sleeping, recreation) or if the associate deviates from a reasonably direct rout of travel are not considered OSHA recordable.

3. Distinction between Medical Treatment and First Aid

First aid is defined as any one-time treatment, and any follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care. Such one time treatment, and follow-up visit for the purpose of observation, is considered first aid even though provided by a physician or registered professional personnel.

Injuries are not minor if:

a) They must be treated only by a physician or licensed medical personnel;

b) They impair bodily function (i.e., normal use of senses, limbs, etc.);

c) They result in damage to physical structure of a non-superficial nature (fractures);

d) They involve complications requiring follow-up treatment.

ESTIMATED PRELIMINARY PROJECT SCHEDULE
TOWN OF WILLSBORO - BLACK ASH POND
BROWNFIELDS SITE INVESTIGATION/REMEDIAL ALTERNATIVE REPORT (SI/RAR)

Tasks SITE INVESTIGATIONS	Duration	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25
1. Project Scoping and Workplan Preparation	3-weeks																									
2. NYSDEC Workplan Review	3-weeks																									
3. Subcontract Procurement	2-weeks																									
4. Survey and Preliminary Site Recon/Research	2-weeks																									
5. Preliminary Subsurface Investigations	1-week																									
4. Test Borings and Groundwater Investigations	2-weeks																									
5. River Sediment and Waste Leachate Investigations	1-week																									
6. Qual. Human Health Risk Assessment	1-week																									
7. Data Usability Review and Site Investigation Report	4-weeks																									
8. Meeting w/ Town & DEC; NYSDEC SI Report Review	2-weeks																									
REMEDIAL ALTERNATIVE DEVELOPMENT/REPORT		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25
1. Identify Remedial Action Objectives and Alternatives; ARAR Identification	2-weeks																									
2. Initial Screening Alternatives; Determine Need for Additional Investigations	2-weeks																									
3. Detailed Analysis of Alternatives	3-weeks																									
4. Recommendation of Remedy and Remedial Alternatives Report	2-weeks																									
5. NYSDEC SI/RAR Report Review	4-weeks																									
6. Public Meeting	1-week																									

NOTE: Overall timeframe will be adjusted for NYSDEC review and comment for Project Deliverables; Schedule does not incorporate time for IRM(s) or Phase 2 Site Investigations that may be needed

TABLE 1: SAMPLING AND ANALYSIS MATRIX
TOWN OF WILLSBORO - BLACK ASH POND ENVIRONMENTAL RESTORATION PROJECT

MATRIX	SAMPLING EVENT	# OF SAMPLES	LOCATIONS	QA/QC SAMPLES	PARAMETERS AND ANALYTICAL METHODS
SOILS	1 (SDG #1)	10	Various Subsurface (Test Trench) Locations (TT-#) and Background Soil Samples	1 matrix spike (MS), 1 matrix spike duplicate (MSD), 1 trip blank	Organic Compounds (Including VOCs, Semi-VOCs, PCBs, and Tentatively Identifiable Compounds) via Method CLP-OLM 4.2 Metals, Mercury, Cyanide via Method CLP-ILM 4.0
	2 (SDG #2)	5	Various Subsurface (Boring) Locations (B-#)	1 matrix spike (MS), 1 matrix spike duplicate (MSD), 1 trip blank	Organic Compounds (Including VOCs, Semi-VOCs, PCBs, and Tentatively Identifiable Compounds) via Method CLP-OLM 4.2 Metals, Mercury, Cyanide via Method CLP-ILM 4.0
GROUNDWATER	3 (SDG #3)	5	Monitoring Wells MW-1, MW-2, MW-3, MW-4, and MW-5	1 matrix spike (MS), 1 matrix spike duplicate (MSD), 1 trip blank	Organic Compounds (Including VOCs, Semi-VOCs, PCBs, and Tentatively Identifiable Compounds) via Method CLP-OLM 4.2 Metals, Mercury, Cyanide via Method CLP-ILM 4.0
RIVER SEDIMENT AND SEEP	2 (SDG #4)	9	River Sediment Locations SD-1, SD-3, SD-4, and SD-5 and a single seep location (SD-2)	1 matrix spike (MS), 1 matrix spike duplicate (MSD), 1 trip blank	Organic Compounds (Including VOCs, Semi-VOCs, PCBs, and Tentatively Identifiable Compounds) via Method CLP-OLM 4.2 Metals, Mercury, Cyanide via Method CLP-ILM 4.0
WASTE MEDIA & WASTE RELATED RESIDUE	2 (SDG #5)	4	Various waste and waste residue media encountered during completion of SI	1 trip blank MS/MSD Not Applicable due to variable matrix and sample heterogeneity	Organic Compounds (Including VOCs, Semi-VOCs, PCBs, and Tentatively Identifiable Compounds) via Method CLP-OLM 4.2 Metals, Mercury, Cyanide via Method CLP-ILM 4.0

NOTES: SDG = sample delivery group; all media samples to be analyzed in accordance with NYSDEC 2000 Analytical Services Protocol, Category B protocols via listed CLP organic laboratory methods (OLM) and CLP inorganic laboratory methods

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

	Volatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
1.	Dichlorodifluoromethane	75-71-8	10	10	1200	(50)
2.	Chloromethane	74-87-3	10	10	1200	(50)
3.	Bromomethane	74-83-9	10	10	1200	(50)
4.	Vinyl chloride	75-01-4	10	10	1200	(50)
5.	Chloroethane	75-00-3	10	10	1200	(50)
6.	Trichlorofluoromethane	75-69-4	10	10	1200	(50)
7.	1,1-Dichloroethene	75-35-4	10	10	1200	(50)
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	10	10	1200	(50)
9.	Acetone	67-64-1	10	10	1200	(50)
10.	Carbon Disulfide	75-15-0	10	10	1200	(50)
11.	Methyl Acetate	79-20-9	10	10	1200	(50)
12.	Methylene chloride	75-09-2	10	10	1200	(50)
13.	trans-1,2-Dichloroethene	156-60-5	10	10	1200	(50)
14.	Methyl tert-Butyl Ether	1634-04-4	10	10	1200	(50)
15.	1,1-Dichloroethane	75-35-3	10	10	1200	(50)
16.	cis-1,2-Dichloroethene	156-59-2	10	10	1200	(50)
17.	2-Butanone	78-93-3	10	10	1200	(50)
18.	Chloroform	67-66-3	10	10	1200	(50)
19.	1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
20.	Cyclohexane	110-82-7	10	10	1200	(50)
21.	Carbon tetrachloride	56-23-5	10	10	1200	(50)
22.	Benzene	71-43-2	10	10	1200	(50)
23.	1,2-Dichloroethane	107-06-2	10	10	1200	(50)
24.	Trichloroethene	79-01-6	10	10	1200	(50)
25.	Methylcyclohexane	108-87-2	10	10	1200	(50)
26.	1,2-Dichloropropane	78-87-5	10	10	1200	(50)
27.	Bromodichloromethane	75-27-4	10	10	1200	(50)
28.	cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
29.	4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
30.	Toluene	108-88-3	10	10	1200	(50)
31.	trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
32.	1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
33.	Tetrachloroethene	127-18-4	10	10	1200	(50)
34.	2-Hexanone	591-78-6	10	10	1200	(50)
35.	Dibromochloromethane	124-48-1	10	10	1200	(50)

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)

	Volatiles (cont.)	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
36.	1,2-Dibromoethane	106-93-4	10	10	1200	(50)
37.	Chlorobenzene	108-90-7	10	10	1200	(50)
38.	Ethyl Benzene	100-41-4	10	10	1200	(50)
39.	Total Xylenes	1330-20-7	10	10	1200	(50)
40.	Styrene	100-42-5	10	10	1200	(50)
41.	Bromoform	75-25-2	10	10	1200	(50)
42.	Isopropylbenzene	98-82-8	10	10	1200	(50)
43.	1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
44.	1,3-Dichlorobenzene	541-73-1	10	10	1200	(50)
45.	1,4-Dichlorobenzene	106-46-7	10	10	1200	(50)
46.	1,2-Dichlorobenzene	95-50-1	10	10	1200	(50)
47.	1,2-Dibromo-3-chloropropane	96-12-8	10	10	1200	(50)
48.	1,2,4-Trichlorobenzene	120-82-1	10	10	1200	(50)

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
34.	Phenol	108-95-2	10	330	10,000	(20)
35.	bis(2-Chloroethyl) ether	111-44-4	10	330	10,000	(20)
36.	2-Chlorophenol	95-57-8	10	330	10,000	(20)
37.	1,3-Dichlorobenzene	541-73-1	10	330	10,000	(20)
38.	1,4-Dichlorobenzene	106-46-7	10	330	10,000	(20)
39.	1,2-Dichlorobenzene	95-50-1	10	330	10,000	(20)
40.	2-Methylphenol	95-48-7	10	330	10,000	(20)
41.	2,2'-oxybis(1-Chloro-propane) #	108-60-1	10	330	10,000	(20)
42.	4-Methylphenol	106-44-5	10	330	10,000	(20)
43.	N-Nitroso-di-n-propylamine	621-64-7	10	330	10,000	(20)
44.	Hexachloroethane	67-72-1	10	330	10,000	(20)
45.	Nitrobenzene	98-95-3	10	330	10,000	(20)
46.	Isophorone	78-59-1	10	330	10,000	(20)
47.	2-Nitrophenol	88-75-5	10	330	10,000	(20)
48.	2,4-Dimethylphenol	105-67-9	10	330	10,000	(20)
49.	bis(2-Chloroethoxy) methane	111-91-1	10	330	10,000	(20)
50.	2,4-Dichlorophenol	120-83-2	10	330	10,000	(20)
51.	1,2,4-Trichlorobenzene	120-82-1	10	330	10,000	(20)
52.	Naphthalene	91-20-3	10	330	10,000	(20)
53.	4-Chloroaniline	106-47-8	10	330	10,000	(20)
54.	Hexachlorobutadiene	87-68-3	10	330	10,000	(20)
55.	4-Chloro-3-methylphenol	59-50-7	10	330	10,000	(20)
56.	2-Methylnaphthalene	91-57-6	10	330	10,000	(20)
57.	Hexachlorocyclopentadiene	77-47-4	10	330	10,000	(20)
58.	2,4,6-Trichlorophenol	88-06-2	10	330	10,000	(20)
59.	2,4,5-Trichlorophenol	95-95-4	25	800	25,000	(50)
60.	2-Chloronaphthalene	91-58-7	10	330	10,000	(20)
61.	2-Nitroaniline	88-74-4	25	800	25,000	(50)
62.	Dimethyl phthalate	131-11-3	10	330	10,000	(20)
63.	Acenaphthylene	208-96-8	10	330	10,000	(20)
64.	2,6-Dinitrotoluene	606-20-2	10	330	10,000	(20)
65.	3-Nitroaniline	99-09-2	25	800	25,000	(50)
66.	Acenaphthene	83-32-9	10	330	10,000	(20)

Previously known by the name bis(2-Chloroisopropyl) ether

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
67.	2,4-Dinitrophenol	51-28-5	25	800	25,000	(50)
68.	4-Nitrophenol	100-02-7	25	800	25,000	(50)
69.	Dibenzofuran	132-64-9	10	330	10,000	(20)
70.	2,4-Dinitrotoluene	121-14-2	10	330	10,000	(20)
71.	Diethylphthalate	84-66-2	10	330	10,000	(20)
72.	4-Chlorophenyl phenyl ether	7005-72-3	10	330	10,000	(20)
73.	Fluorene	86-73-7	10	330	10,000	(20)
74.	4-Nitroaniline	100-01-6	25	800	25,000	(50)
75.	4,6-Dinitro-2-methylphenol	534-52-1	25	800	25,000	(50)
76.	N-nitrosodiphenylamine	86-30-6	10	330	10,000	(20)
77.	4-Bromophenyl phenyl ether	101-55-3	10	330	10,000	(20)
78.	Hexachlorobenzene	118-74-1	10	330	10,000	(20)
79.	Pentachlorophenol	87-86-5	25	800	25,000	(50)
80.	Phenanthrene	85-01-8	10	330	10,000	(20)
81.	Anthracene	120-12-7	10	330	10,000	(20)
82	Carbazole	86-74-8	10	330	10,000	(20)
83.	Di-n-butyl phthalate	84-74-2	10	330	10,000	(20)
84.	Fluoranthene	206-44-0	10	330	10,000	(20)
85.	Pyrene	129-00-0	10	330	10,000	(20)
86.	Butyl benzyl phthalate	85-68-7	10	330	10,000	(20)
87.	3,3'-Dichlorobenzidine	91-94-1	10	330	10,000	(20)
88.	Benz[a]anthracene	56-55-3	10	330	10,000	(20)
89.	Chrysene	218-01-9	10	330	10,000	(20)
90.	bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10,000	(20)
91.	Di-n-octyl phthalate	117-84-0	10	330	10,000	(20)
92.	Benzo[b]fluoranthene	205-99-2	10	330	10,000	(20)
93.	Benzo[k]fluoranthene	207-08-9	10	330	10,000	(20)
94.	Benzo[a]pyrene	50-32-8	10	330	10,000	(20)
95	Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10,000	(20)
96.	Dibenz[a,h]anthracene	53-70-3	10	330	10,000	(20)
97.	Benzo[g,h,i]perylene	191-24-2	10	330	10,000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculated on dry weight basis as required by the Protocol, will be higher.

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

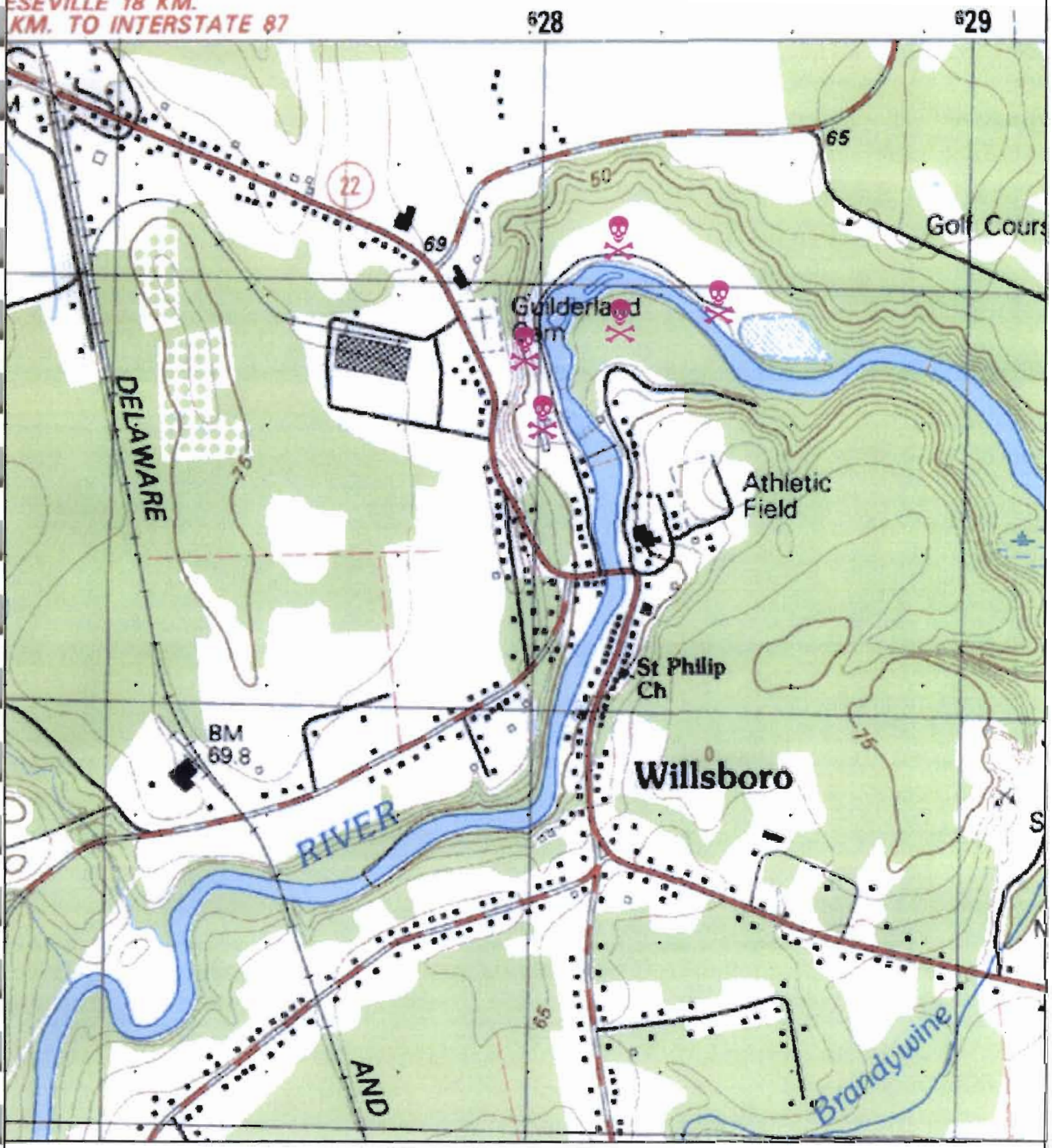
	Pesticides/Aroclors	CAS Number	Quantitation Limits* Water µg/L	Soil µg/Kg	On Column (pg)
98.	alpha-BHC	319-84-6	0.05	1.7	5
99.	beta-BHC	319-85-7	0.05	1.7	5
100.	delta-BHC	319-86-8	0.05	1.7	5
101.	gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102.	Heptachlor	76-44-8	0.05	1.7	5
103.	Aldrin	309-00-2	0.05	1.7	5
104.	Heptachlor epoxide	1024-57-3	0.05	1.7	5
105.	Endosulfan I	959-98-8	0.05	1.7	5
106.	Dieldrin	60-57-1	0.10	3.3	10
107.	4,4'-DDE	72-55-9	0.10	3.3	10
108.	Endrin	72-20-8	0.10	3.3	10
109.	Endosulfan II	33213-65-9	0.10	3.3	10
110.	4,4'-DDD	72-54-8	0.10	3.3	10
111.	Endosulfan sulfate	1031-07-8	0.10	3.3	10
112.	4,4'-DDT	50-29-3	0.10	3.3	10
113.	Methoxychlor	72-43-5	0.50	17.0	50
114.	Endrin ketone	53494-70-5	0.10	3.3	10
115.	Endrin aldehyde	7421-36-3	0.10	3.3	10
116.	alpha-Chlordane	5103-71-9	0.05	1.7	5
117.	gamma-Chlordane	5103-74-2	0.05	1.7	5
118.	Toxaphene	8001-35-2	5.0	170.0	500
119.	AROCLOR-1016	12674-11-2	1.0	33.0	100
120.	AROCLOR-1221	11104-28-2	2.0	67.0	200
121.	AROCLOR-1232	11141-16-5	1.0	33.0	100
122.	AROCLOR-1242	53469-21-9	1.0	33.0	100
123.	AROCLOR-1248	12672-29-6	1.0	33.0	100
124.	AROCLOR-1254	11097-69-1	1.0	33.0	100
125.	AROCLOR-1260	11096-82-5	1.0	33.0	100

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculate on dry weight basis, as required by the Protocol, will be higher.

Superfund Target Compound List (TCL) and Contract Required Quantitation Limit

Parameter		Contract Required Quantitation Level (µg/L)
1.	Aluminum	200
2.	Antimony	60
3.	Arsenic	10
4.	Barium	200
5.	Beryllium	5
6.	Cadmium	5
7.	Calcium	5000
8.	Chromium	10
9.	Cobalt	50
10.	Copper	25
11.	Iron	100
12.	Lead	3
13.	Magnesium	5000
14.	Manganese	15
15.	Mercury	0.2
16.	Nickel	40
17.	Potassium	5000
18.	Selenium	5
19.	Silver	10
20.	Sodium	5000
21.	Thallium	10
22.	Vanadium	50
23.	Zinc	20
24.	Cyanide	10

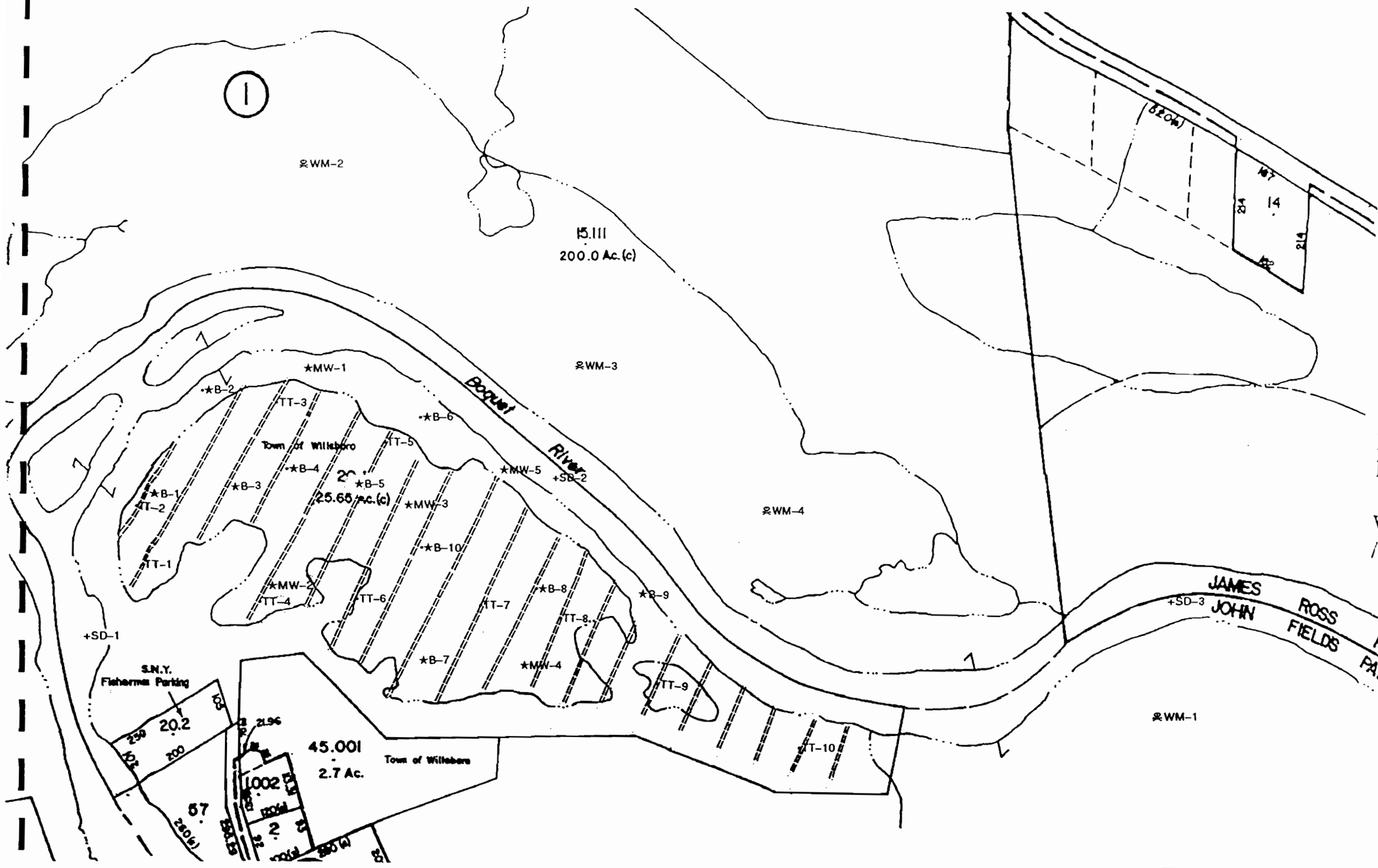
SITE LOCATION MAP



Name: WILLSBORO
Date: 6/4/103
Scale: 1 inch equals 1000 feet

Location: 044° 21' 52.9" N 073° 23' 38.3" W
Caption: Former Pulp Mill Property

SITE PLAN WITH SI SAMPLING LOCATIONS



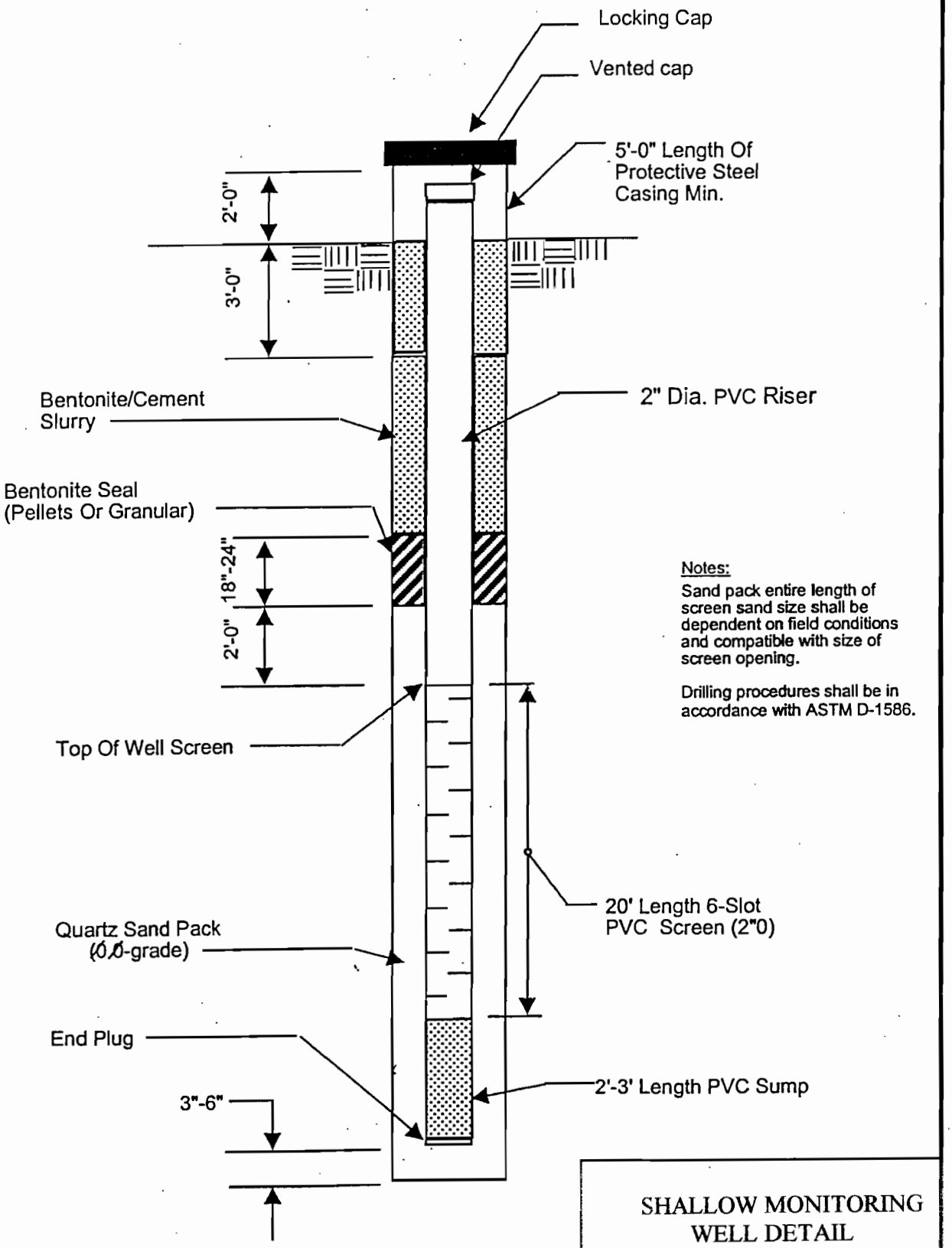
LEGEND

Proposed Test Trench Location	==
Soil Boring Location / Number	★B
Soil Boring Location Number / Sampling Location	•★B
Soil Boring/Monitoring Well Location / Number	★MW
Test Trench Sample Location / Number	•TT-
River Sediment Sample Location / Number	+SD-
Waste Sample Location / Number	☠WM-

EARTH SCIENCE ENGINEERING, P.C.

24 S. Main Street
Willsboro, New York 12996
Tel: (518) 963-8133 Fax: (518) 963-7490

Town of Willsboro-Black Ash Pond
Environmental Restoration Project



Notes:

Sand pack entire length of screen sand size shall be dependent on field conditions and compatible with size of screen opening.

Drilling procedures shall be in accordance with ASTM D-1586.

SHALLOW MONITORING WELL DETAIL

ESE

DATA QUALITY OBJECTIVES (DQOs) FORM

Site Name/Location

Town of Willsboro – Black Ash Pond
School Street
Willsboro, New York

Sampling Objectives

Characterize groundwater quality proximate to the site. Determine the presence and potential extent of groundwater contamination at or proximate to the site.

Sampled Media

✓ groundwater __ river sediment ___ soils
__ waste/waste related media

Date Use

✓ site characterization ✓ risk assessment ___ health and safety ✓ monitoring
✓ evaluate remediation alternatives

Data Types	Parameters
✓ TCL	✓ PCB ✓ VOCs ✓ Semi-VOCs ✓ Metals ✓ Mercury ✓ Cyanide
✓ Field Parameters	✓ pH ✓ Sp.Cond. ✓ Turb __ Temp. __ Eh
__ Geochemical Parameters	_ Alk _ Cl- __ DO _ NH4- _ NO3- _ TOC _ TDS _ Hardness _ SO4

Level of Analysis

Level I: Field Screening

Level II: Field Analysis

Level III: ASP Analytical Methods
Samples will be analyzed in accordance with NYSDEC-ASP 2000 Category B (including CLP-OLM 4.2 for organic compounds and CLP-OLM 4.0 for metals, mercury, and cyanide)

Level IV: ASP Reportables/Deliverables
NYSDEC-ASP 2000 Category B Reportables/Deliverables documentation to be provided.

Sampling Procedures

Sampling procedures detailed within Sampling and Analysis Plan (SAP).

Data Quality Factors

Analytical Detection Limits will be consistent with ASP-Contract required Quantitation Limits (CRQLs).

QA/QC Samples

_ Duplicate ✓ Matrix Spike ✓ Matrix Spike Duplicate
__ Field Blank ✓ Trip Blank

DATA QUALITY OBJECTIVES (DQOs) FORM

Site Name/Location:

Town of Willsboro – Black Ash Pond
School Street
Willsboro, New York

Sampling Objectives:

Characterize surficial and/or subsurface soils within and adjacent to the site (collected from test trenches/borings) to assess the presence and potential extent of soil contamination.

Sampled Media

__ groundwater __ river sediment ✓ soils
__ waste/waste related media

Date Use

✓ site characterization ✓ risk assessment __ health and safety __ monitoring
✓ evaluate remediation alternatives

Data Types	**Parameters**
✓ TCL	✓ PCB ✓ VOCs ✓ Semi-VOCs ✓ Metals ✓ Mercury ✓ Cyanide
__ Field Parameters	__ pH __ Sp.Cond. __ Turb __ Temp. __ Eh
__ Geochemical Parameters	__ Alk __ Cl- __ DO __ NH4- __ NO3- __ TOC __ TDS __ Hardness __ SO4

Level of Analysis

Level I: Field Screening

Level II: Field Analysis

Level III: ASP Analytical Methods
Samples will be analyzed in accordance with NYSDEC-ASP 2000 Category B (including CLP-OLM 4.2 for organic compounds and CLP-OLM 4.0 for metals, mercury, and cyanide)

Level IV: ASP Reportables/Deliverables
NYSDEC-ASP 2000 Category B Reportables/Deliverables documentation to be provided.

Sampling Procedures

Sampling procedures detailed within Sampling and Analysis Plan (SAP).

Data Quality Factors

Analytical Detection Limits will be consistent with ASP-Contract required Quantitation Limits (CRQLs).

QA/QC Samples (2 sets of MS/MSDs)

__ Duplicate ✓ Matrix Spike ✓ Matrix Spike Duplicate
__ Field Blank ✓ Trip Blank

DATA QUALITY OBJECTIVES (DQOs) FORM

Site Name/Location:

Town of Willsboro – Black Ash Pond
School Street
Willsboro, New York

Sampling Objectives:

Characterize sediments within the adjacent Bouquet River to assess the presence and potential extent of river sediment contamination.

Sampled Media

__ groundwater ✓ river sediment __ soils
__ waste/waste related media

Date Use

✓ site characterization ✓ risk assessment __ health and safety __ monitoring
✓ evaluate remediation alternatives

Data Types	**Parameters**
✓ TCL	✓ PCB ✓ VOCs ✓ Semi-VOCs ✓ Metals ✓ Mercury ✓ Cyanide
__ Field Parameters	__ pH __ Sp.Cond. __ Turb __ Temp. __ Eh
__ Geochemical Parameters	__ Alk __ Cl- __ DO __ NH4- __ NO3- __ TOC __ TDS __ Hardness __ SO4

Level of Analysis

Level I: Field Screening

Level II: Field Analysis

Level III: ASP Analytical Methods
Samples will be analyzed in accordance with NYSDEC-ASP 2000 Category B (including CLP-OLM 4.2 for organic compounds and CLP-OLM 4.0 for metals, mercury, and cyanide)

Level IV: ASP Reportables/Deliverables
NYSDEC-ASP 2000 Category B Reportables/Deliverables documentation to be provided.

Sampling Procedures

Sampling procedures detailed within Sampling and Analysis Plan (SAP).

Data Quality Factors

Analytical Detection Limits will be consistent with ASP-Contract required Quantitation Limits (CRQLs).

QA/QC Samples

__ Duplicate ✓ Matrix Spike ✓ Matrix Spike Duplicates
__ Field Blank ✓ Trip Blank

DATA QUALITY OBJECTIVES DQOs) FORM

Site Name/Location:

Town of Willsboro – Black Ash Pond
School Street
Willsboro, New York

Sampling Objectives:

Characterize waste and waste related media (seeps/leachate) to identify presence/absence of waste specific contaminants.

Sampled Media

__ groundwater __ river sediment __ soils
✓ waste/waste related media

Date Use

✓ site characterization ✓ risk assessment __ health and safety __ monitoring
✓ evaluate remediation alternatives

Data Types	Parameters
✓ TCL	✓ PCB ✓ VOCs ✓ Semi-VOCs ✓ Metals ✓ Mercury ✓ Cyanide
__ Field Parameters	__ pH __ Sp.Cond. __ Turb __ Temp. __ Eh
__ Geochemical Parameters	_ Alk _ Cl- _ DO _ NH4- _ NO3- _ TOC _ TDS _ Hardness _ SO4

Level of Analysis

Level I: Field Screening

Level II: Field Analysis

Level III: ASP Analytical Methods
Samples will be analyzed in accordance with NYSDEC-ASP 2000 Category B (including CLP-OLM 4.2 for organic compounds and CLP-OLM 4.0 for metals, mercury, and cyanide)

Level IV: ASP Reportables/Deliverables
NYSDEC-ASP 2000 Category B Reportables/Deliverables documentation to be provided.

Sampling Procedures

Sampling procedures detailed within Sampling and Analysis Plan (SAP).

Data Quality Factors

Analytical Detection Limits will be consistent with ASP-Contract required Quantitation Limits (CRQLs).

QA/QC Samples (MS/MSD not applicable due to variable matrix and sample heterogeneity)

_ Duplicate __ Matrix Spike __ Matrix Spike Duplicates
_ Field Blank ✓ Trip Blank

RPR DAILY REPORT – ESE, P.C. SITE INVESTIGATION

PROJECT: Town of Willsboro, Black Ash Pond Environmental Restoration **Project No.:** P-01-002J

Report No.:

Contractors: **Date:**

1. Any special incidents?
   ☐ Deliveries ☐ Blasting ☐ Strikes ☐ Accidents X None ☐ Other
2. Any special instructions given to the Contractor summarize Contractor's response below.
   ☐ Tests ☐ Defective Work ☐ Schedules ☐ Damages X None ☐ Other
3. Were there any damages to property? ☐ Yes X No
4. List any claims (verbal or written) made by the Contractor. If written, attach.
   ☐ Changes ☐ Relocations ☐ Delays ☐ Quantities X None
5. Weather and site conditions:

Time	Precipitation	Skies	Air Temperature	Ground/Pavement Moisture

6. List any visitors to the site:

7. Did observations reveal any work not in compliance with the Contract Document?
   ☐ Yes X No (If yes, explain and describe actions taken below.)

8. Were photographs taken by the project representative?
   ☐ Yes X No (If yes, indicate location, description and number.)

GENERAL PROGRESS OF WORK AND NOTES

Contractors On-site:

PROJECT: Town of Willsboro, Black Ash Pond Environmental Restoration	**Project No.:** P-01-002J
Report No.:	
Contractors:	**Date:**

SERVICES CONDUCTED			
LOCATION	TYPE	DESCRIPTION	COMMENTS

NON-COMPLIANCE ITEMS

MATERIALS RECEIVED OR USED		
FROM	DESCRIPTION	QUANTITY (APPROX.)

CONTRACTOR'S EQUIPMENT ON SITE					
No.	TYPE	HRS. USED			

LABOR ON SITE					
NO.	TRADE	HRS. WORKED	NO.	TRADE	HRS. WORKED

PROJECT: Town of Willsboro, Black Ash Pond Environmental Restoration	**Project No.:** P-01-002J
Report No.:	
Contractors:	**Date:**

DIFFICULTIES ENCOUNTERED AND DELAYS	
INSTRUCTIONS GIVEN TO CONTRACTOR	INFORMATION RECEIVED FROM CONTRACTOR

HSO ON SITE FROM _____ am _ TO _____ am __AND _____ pm _ TO _____ pm_

BY: _____, RPR

_____
(SIGN)

Distribution:
Enclosures:

DAILY SAFETY LOG

Project: _____ Project No.: _____

Project Team: _____ Date: _____

Others on Site: _____

Location: _____

Weather Conditions: _____

Summary of Site Conditions: _____

_____

_____

_____

_____

State Any First Aid Administered: _____

_____

_____

_____

_____

_____

_____

By: _____

To be included with all lab data and with each Work Plan.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements*					
		*VOA GC/MS	*BNA GC/MS	*VOA GC	*PEST PCB	*METALS	*OTHER

* Check Appropriate Boxes

* CLP, Non-CLP (Please indicate year of protocol)
* HSL, Priority Pollutant

PERSONAL SAFETY LOG

Employee Name:_____ Site Name:_____

Client Name:_____ Project Number:_____

Work Performed:_____

Date							
Work Area							
Hours on Site							
Coveralls							
Tyvek							
Gloves, Inner							
Gloves, Outer							
Boots							
Hard Hat							
Face Shield							
Resp., Dust							
Resp., Half							
Resp., Full							
SCBA							
Resp., ESC							
Dosimeter							
AirMonitor							
Others							
Decontamination							
Complete							
Incomplete							

Comments:_____