Final Field Sampling Plan

Upper Hudson River Floodplain Deposition Sampling Program

Contract No. W912DQ-06-D-0008

May 2010

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Edison, New Jersey 08837

Prepared by:

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Under Contract to:

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KANSAS CITY DISTRICT
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Table of Contents

Table of Contents (cont.)

List of Tables

List of Figures

List of Abbreviations and Acronyms

DESA	Division of Environmental Science and Assessment
EPA	(United States) Environmental Protection Agency
FDSP	Floodplain Deposition Sampling Program
FSP	Field Sampling Plan
FTL	field team leader
GE	General Electric Company
GPS	global positioning system
IRM	Interim Remedial Measure
MS/MSD	matrix spike/matrix spike duplicate
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	polychlorinated biphenyl
QAPP	Quality Assurance Project Plan
RM	river mile
SOP	standard operating procedure
TCL	Target Compound List
UHR	Upper Hudson River
USACE	United States Army Corps of Engineers

1 Introduction

Ecology and Environment, Inc., under contract to the U.S. Army Corps of Engineers (USACE) Kansas City District, Contract No. W912DQ-06-D-0008, will perform the Floodplain Deposition Sampling Program (FDSP) in the Upper Hudson River (UHR) floodplains as described in this Field Sampling Plan (FSP).

1.1 Purpose of the Field Sampling Plan

The FDSP is designed to sample sediments deposited in the UHR floodplain during seasonal high-flow events and analyze it for the presence of polychlorinated biphenyls (PCBs). During high-flow events, sediment from the river bottom, potentially contaminated with PCBs, becomes suspended in the flow and redeposited elsewhere in the river system, including the floodplains.

Previous sampling was conducted by the National Oceanic and Atmospheric Administration (NOAA), U.S. Environmental Protection Agency (EPA), and General Electric Company (GE) to gain a better understanding of soil contamination within the floodplains. The New York State Department of Environmental Conservation (NYSDEC) also conducted limited sampling of floodplain sediment. The FDSP will continue the effort to gain a better understanding of sediments deposited by high-flow events.

This FSP includes procedures used to select sampling locations, install sampling devices, collect samples, handle and manage sample analysis, and report results for each sampling event. The Quality Assurance Project Plan (QAPP) is provided as Appendix A, and the Health and Safety Plan is provided as Appendix B.

1.2 Field Sampling Plan Organization

This Field Sampling Plan is organized as follows:

- **Section 1** introduces the FSP, identifies the extent of the study area, summarizes prior UHR floodplain soil investigations, and identifies the objectives of FDSP activities.
- **Section 2** presents the methods used to select the proposed sampling locations.
- **Section 3** describes the tasks required to install the sampling devices.

- **Section 4** describes the sampling and analysis activities. These include sample collection, record keeping, and laboratory procedures.

- **Section 5** references the literature used to develop this FSP.

1.3 Background and Setting

This section briefly describes the extent of the study area and prior investigations in the UHR floodplains to provide background for the sampling design.

1.3.1 Upper Hudson River Floodplains Study Area

The Hudson River in eastern New York State flows approximately 300 miles in a generally southern direction from its source, Lake Tear-of-the-Clouds in the Adirondack Mountains, to the Battery in New York City at the tip of Manhattan Island. For the purposes of this FSP, the study area is defined as the UHR floodplains that extend from the former location of the Fort Edward Dam to the confluence with the Mohawk River (approximate river mile [RM] 194.8 to approximate RM 156.3), including islands within the river.

The EPA divided the UHR between Fort Edward and Troy into three river sections for the sediment remediation activities outlined in the *Hudson River PCBs Site, New York, Record of Decision* (EPA 2002). The floodplain program further subdivided the river sections into eight reaches defined by dams or locks (see Figure 1-1). The FSP refers to these reaches as reference points.

1.3.2 Summary of Previous Investigations

The following information was used to select proposed sampling locations.

- **Aerial Photography, Spring 2007.** An aerial photographic survey was conducted for GE on April 22, 2007, from Fort Edward to Troy. This survey was performed by Axis GeoSpatial and was provided to the EPA for use in evaluating the UHR floodplains. This imagery was used to evaluate the spatial distribution of target locations and accessibility to these locations.

- **NYSDEC Flood Mud Collection Results, Pre-2009.** Over the past several years, NYSDEC has collected flood deposit samples at several locations along the UHR floodplains following extended high-flow events. The locations of these samples and their results were evaluated as part of the FDSP target location selection process.

L:\Buffalo\Hudson_River\Maps\Mxd2009\Annual_Sampling\River_Overview.mxd

WARREN COUNTY

Dewatering Facility

Former Fort Edward Dam

Lock 7

REACH 8

SECTION 1

Moreau

Fort Edward

Thompson Island Dam

REACH 7

Fort Miller Dam

Lock 6

SECTION 2

Northumberland

Greenwich

REACH 6

SARATOGA COUNTY

Northumberland Dam

Lock 5

87

Saratoga

REACH 5

Easton

WASHINGTON COUNTY

SECTION 3

Stillwater

Lock 4 Stillwater Dam

REACH 4

Lock 3

Hoosic River

Mechanicville

REACH 3

Lock 2

Schaghticoke

Halfmoon

REACH 2

RENSSELAER COUNTY

Lock 1

Waterford

REACH 1

Mohawk River

Brunswick

Cohoes

Federal Dam and Troy Lock

Green Island

LEGEND

- Reach
- Upper Hudson River Sections
- Dredge Areas Phase 1
- Dredge Areas Phase 2
- Hudson River
- Municipality Boundary

Hudson River PCBs SUPERFUND SITE

Figure 1-1
Upper Hudson River Study Area

0 2.5 5 Miles

- **Hydrodynamic Model, Spring 2008.** A hydrodynamic model of the UHR (ARCADIS 2008) was developed for GE during the UHR PCBs Cleanup Remedial Design. The model estimates the elevation of the river in each reach based on river flow at the Fort Edward gauging station. The estimated river elevations were used to help determine appropriate elevations at which to install the sampling devices for the FDSP.

- **Topographic Mapping, 2005-2006.** In 2005 and 2006, Chas. H. Sells, Inc., on behalf of GE, developed topographic mapping (1-foot intervals, 1 inch = 30 feet) of the UHR floodplains project area. These contour maps were used to help select potential FDSP target locations.

- **GE Sampling Event, 2008.** In 2008 GE conducted sampling (ARCADIS 2009) along the UHR floodplains as part of a Remedial Investigation/ Feasibility Study. The sampling locations, property access, and the results from this sampling event were evaluated when selecting the target sampling locations for the FDSP.

1.4 FSP Data Objectives

- Identify sediment deposition areas within the UHR floodplains study area.

- Determine the PCB concentrations in sediment deposits within depositional areas.

2 Selection of Sampling Locations

2.1 Sampling Location Selection Rationale

This section describes the rationale for selecting the proposed target sampling locations. Sampling locations were selected primarily based on site information provided through consultations with the EPA, NYSDEC, and the New York State Department of Health (NYSDOH). Additional site selection criteria included the distribution of sampling locations within the study area, consideration of areas previously sampled by NYSDEC, the ability to access the property and sampling locations, and the probability of inundation from periodic flooding and sediment being deposited.

2.1.1 Spatial Distribution of Sampling Locations

Sampling locations along the UHR were chosen to achieve representative coverage of the study area. Attempts were made to select sampling locations in each river reach and on both sides of the channel.

2.1.2 Flood Mud Locations

The NYSDEC flood mud locations were considered because these are areas where sediment is known to have been deposited by the river in previous years. The NYSDEC results are included in Appendix C and will supplement the findings of the FDSP.

2.1.3 Property Access

The FDSP will require personnel to install sampling devices on selected properties and to make multiple site visits to collect samples and maintain the devices. Initially, publicly owned lands were preferentially targeted as sampling locations. If publicly owned lands did not provide sufficient spatial distribution, then privately owned lands were considered. In addition, each property considered was evaluated for ease of access to the sampling location.

2.1.4 Probability of Deposition

Properties were evaluated to determine the probability of sediment deposits accumulating on the property. This evaluation was performed using a combination of prior knowledge of the properties, existing physical features, and site reconnaissance.

2.2 Sampling Locations

Table 2-1 presents the distribution of the proposed sampling locations within each river reach, and Figures 2-1 through 2-8 identify the locations. Table 2-2 profiles each sampling location.

Table 2-1 Distribution of Samples per Reach

Reach	Number of Samples
8	4
7	2
6	1
5	6
4	0
3	3
2	3
1	0

Table 2-2 Proposed Sampling Locations

Location ID[1]	Approx. River Mile	Location Description
EPA-R8-E-9495-01	194	NYSDEC flood mud location, at the northern end of project area; scrape sample.
EPA-R8-W-9394-01	193	NYSDEC flood mud location; scrape sample.
EPA-R8-E-9293-01	192	Low-lying area located near 2007 IRM.
EPA-R8-W-8889-01	189	Low-lying area located near 2007 IRM.
EPA-R7-E-8788-01	187	Low-lying area sampled in 2008; sediment deposition observed.
EPA-R7-W-8687-01	187	Sample distribution in Reach 7, property sampled in 2008 and 2009.
EPA-R6-E-8586-01	185	Low-lying area located near 2007 IRM.
EPA-R5-W-8182-01	182	NYSDEC flood mud location sampled in 2008 and 2009.
EPA-R5-E-7879-01	178	Low-lying area sampled in 2008.
EPA-R5-W-7677-01	177	Low-lying area located near 2009 IRM; sediment deposition observed.
EPA-R5-E-7576-01	175	Frequently flooded property located near 2009 IRM.
EPA-R5-W-7273-01	173	Sample distribution in Reach 5; sampled in 2008 and 2009.
EPA-R5-E-7071-01	171	Low-lying area sampled in 2008.
EPA-R3-E-6566-01	166	Low-lying area sampled in 2008.
EPA-R3-W-6566-01	165	NYSDEC flood mud location; scrape sample.
EPA-R3-W-6465-01	164	Low-lying area sampled in 2008
EPA-R2-E-6162-01	162	Sample distribution in Reach 2; sampled in 2008.
EPA-R2-W-6162-01	161	Low-lying area sampled in 2008 and 2009.
EPA-R2-W-5960-01	160	Sample distribution in Reach 2; sampled in 2008; scrape sample.

Notes:

[1] IRM = Interim Remedial Measure; sampling has been conducted on these properties

[2] Sample Location ID *EPA10-R8-E-9495-01* is interpreted as follows:

EPA indicates sampling location selected by EPA;
R8 indicates Reach 8;
E indicates east side of the river;
9495 indicates sampling location is between RM 194 and 195;
01 indicates that this is an initial sampling location.

The initial selection process did not identify suitable sampling locations in Reaches 1 and 4. Sample locations were not readily identified for various reasons, mainly, the lack of low-lying areas that are likely to flood during high-flow events and the lack of public or private lands that are accessible for sampling

Potential locations in these reaches will continue to be evaluated during the course of the FDSP and other floodplains-related work.

2.3 Adjustments and Changes to Selected Sampling Locations

This FSP has been developed to be flexible so that sampling locations can be adjusted as needed to collect representative samples. Sampling devices can be moved in the field if they have not yielded sediment or if they present access issues. Sampling devices can also be added to collect samples in new areas (e.g., in Reaches 1 and 4). During floodplain activities, members of the parties involved will consider other areas for potential sampling locations based on the established criteria as well as evidence of recent floodplain deposition. Frequent meetings with the parties involved will be held to discuss both current and new potential sampling locations to be added to the program. All proposed changes to the sampling locations will be discussed with the EPA and/or USACE Project Managers prior to being made. It is expected that changes to the sampling locations will generally be minor (e.g., relocating the sampling device within the current parcel of land to an area where more deposition is observed after high-flow events). New sampling locations will be documented with the established procedures for initial sample device installation (i.e., area will be photographed and documented within the field logbook, the Sampling Location Log Sheet, and the Daily Summary Report). Copies of the Daily Summary Report will be included with the Trip Report and the Data Report that are to be submitted, respectively, 7 and 90 days after a sampling event is completed.

All changes to this FSP will be documented in the Annual Report.

3 Installation of Sampling Devices

This section describes the method for installing the sampling devices. In several areas, no sampling device is necessary because flood deposition can be collected from existing man-made surfaces (e.g., boat ramps).

3.1 Property Access

The EPA will attempt to obtain permission from the owners of all property parcels containing proposed sampling locations for access to install the sampling devices and periodically recover samples from the devices. Property owners will first be contacted by phone. If an owner verbally expresses interest, the EPA will send them a permission letter to be signed and returned. If a property owner refuses to provide access or is nonresponsive to the EPA's attempts to obtain access, the EPA will consider sampling on an alternative property.

As part of obtaining access to each property, the EPA will consider input from the property owner about the location of the device.

Copies of all signed access agreements will be maintained in the Hudson River Field Office at 421 Lower Main Street., Suite 100, in Hudson Falls, New York.

3.2 Installation Method

Once permission has been received from the property owner, sampling devices will be installed on the property in areas subject to annual flooding. These areas will also be free of obstructions, have desirable topography and evidence of past sediment deposition, and will have minimal impact on the use of the property. The devices will be installed in areas that are not frequented by the public to reduce the potential for tampering.

Each sampling device will be placed on the ground in the selected location, leveled with the ground surface, and the top secured with bolts. Locations will be marked using survey lathe and flagging.

The devices will be marked as "Property of the United States Environmental Protection Agency" and the phone number for the Hudson River Field Office will be included.

Final sampling device locations will be documented using a global positioning system (GPS) unit. Field notes and pictures will also be used to further document each location. The installation information will be recorded on the Sampling Location Log Sheet (see Appendix D). Any changes to the original installation location in subsequent years will also be documented with the original coordinates, new coordinates, tax parcel change (if any), and reason(s) for the relocation. A new Sampling Location Log Sheet will be created for each relocation.

4 Sampling Activities

This section identifies the fieldwork methods to be used for the investigations described in Section 2. The fieldwork will include collection, handling, and analysis of the sediment deposit samples. Figures 2-1 though 2-8 show the proposed sampling locations for these activities.

4.1 Sample Collection

To increase the likelihood that the sampling devices collect flood-related sediment rather than soil/mud runoff from rain events, a sampling device was specifically designed and fabricated for this project (see Appendix E for diagrams). The design is based on information obtained during discussions with NYSDEC and the NYSDOH.

The field team leader (FTL) will monitor the river and the United States Geological Survey hydrological station at Fort Edward (Station 01327750) on a regular basis, along with river flow predictions provided by NOAA's National Weather Service Advanced Hydrologic Prediction Service.

A river flow rate of 12,000 cubic feet per second, corresponding to a stream gauge height of 23.50 feet as measured at the Fort Edward gauging station, is considered to be a flow condition capable of causing inundation of the floodplain areas in the downstream reaches of the river. However, factors such as time of year, weather conditions, attenuation of flow downriver, etc., also need to be considered before a sampling event is initiated. Therefore, the flow rate of the river at the Fort Edward gauging station is only one trigger that will be used to initiate a sampling event. A sampling event will be initiated only after discussion with the EPA and consideration of all relevant factors.

Potential scenarios of how the sampling program will be conducted are presented below:

1. In a wet year, flows in the river may remain high for weeks at a time, fluctuating up and down depending on groundwater levels, precipitation, snow melt, soil saturation conditions, etc. When it appears that the peak flow has been achieved and river flows are receding, scrape samples will be collected as soon as it is safe to do so, and the samples will be shipped to the lab for analysis. Due to fluctuating flow conditions, it may be several weeks before sam-

pling devices are accessible for sampling. Once the device samples have been collected, they will be shipped to the lab and analyzed. The sampling devices will then be cleaned and decontaminated for the next sampling event. Generally, although there may be other smaller flooding events on the river in a wet year that would normally trigger a sampling event in a dry year, sampling another event in a wet year may not be conducted unless it is a result of a significant flooding event separated by a reasonable amount of time between the two events.

2. In a dry year, flooding events are anticipated to have lower peak flow rates than in a wet year. As a result, samples may be collected at lower than desired flow rates. Due to the lower flow rates, it is likely that not all devices will have collected sediment. Nevertheless, the samples that are collected will be shipped to the lab and analyzed as one sampling event. If a larger flooding event occurs later in the season, then that event will be sampled as well.

3. During a wet season, when river levels do not recede very quickly, there is a good chance that when sample collection begins, many of the devices will still be underwater. When this occurs, samples will be collected from the devices that are accessible and sent to the lab for analysis. The devices will then be cleaned and decontaminated. As river levels continue to fluctuate, the previously sampled devices may end up underwater again. However, samples will be collected only from previously unsampled devices and sent to the lab for analysis. Any device that has been underwater will be cleaned and decontaminated. Although there may be several weeks separating the collection of samples from the sampling devices, this will be considered one sampling event and reported as such.

Previous experience has shown that floodplain deposits at the scrape sample locations wash away within a few days of the floodwaters receding. Once notice has been received to initiate a sampling event, scrape sample locations will be given priority and, to the extent practicable, samples from those locations will be collected as soon as floodwaters recede. Sampling of the devices will typically be conducted once the water levels stabilize at seasonally normal levels.

Once it is determined that the sampling devices should be sampled, a representative number of devices will be checked for deposition. If any of the devices has enough sediment to be sampled, all devices will be checked and any locations with sufficient sediment will be collected and analyzed. A sampling event does not need to include sample collection at every location. If sufficient deposition has not occurred to collect samples, the sediment will be left in place and the devices will be checked again after the next high-flow event. If significant deposition within the sampling devices occurs more than once per year, the potential for additional sampling events will be discussed with the EPA.

In addition to the locations identified in this FSP, additional sampling locations may be identified in the field during sampling based on field observations of sediment deposits. If a sampling device fails to collect sediment after an entire year of river flows, the location of the sampling device will be re-evaluated and the location may be modified.

It is expected that sampling will be conducted once in the spring and once in the fall. However, sampling could be conducted more or less frequently, depending on the flooding events that occur in a given year. The exact duration of the sampling program has not been determined, but it is expected to last multiple years.

Field inspections and field audits for the sampling activities will be conducted and prepared in accordance with Worksheet 32 of the QAPP (see Appendix A).

4.1.1 Sampling Device Monitoring

The sampling devices will be opened and checked for sediment deposition after high-flow events. Sampling devices will be checked a minimum of once every three months and more frequently during the flooding seasons. During each visit to the sampling locations, photos will be taken of the inside and outside of the sampling device and surrounding area, details of the site visit will be recorded in the Field Log Book, and the visit will be documented on the Sampling Location Log Sheet. Regular discussions will be held with the EPA and/or USACE Project Managers to discuss the field observations.

4.1.2 Methods of Sample Collection

4.1.2.1 Sampling at Device Locations

When a sampling device has collected sufficient sediment to be sampled, the water will be decanted to the surrounding ground and a representative amount of sediment will be removed and placed in an aluminum pan, where it will be homogenized using a stainless steel spoon. Once a sample has been collected, the sampling device will be decontaminated on-site in accordance with Section 4.4 below.

4.1.2.2 Sampling at Non-Sampling-Device Locations

At pre-determined scrape sampling locations, as well as in locations where sediment deposition is observed and collection of additional scrape samples is warranted, sediment deposits will be scraped from these surfaces into a disposable aluminum pan and homogenized using a stainless steel spoon. Caution will be used when scraping samples from the ground to prevent contaminating the samples with native material.

In addition to the documentation included per Section 4.1.3 below, the location of scrape samples will be documented using GPS.

4.1.3 Sample Collection, Labeling, and Shipping

Once sediment samples are homogenized, the sediment will be spooned into glass sample jars that meet EPA Division of Environmental Science and Assessment (DESA) laboratory criteria, and the jars will be properly labeled. Sediment samples will be logged by field personnel and described according to the Unified Soil Classification System for grain size distribution (i.e., gravel/coarse sand/fine sand/clay). Water will be decanted from a jar if sample settling produces 0.5 inch or more of water on top of the sediment. For each sample collected, photos will be taken of the inside and outside of the sampling device and the surrounding area, and details of the site visit will be recorded in the field log book and documented on the Sampling Location Log Sheet. The samples will be shipped to the designated laboratory in accordance with all applicable U.S. Department of Transportation regulations.

The FTL will use FORMS II Lite to generate the chain-of-custody forms for the samples submitted for analysis, as well as to provide an electronic database of all sampling activities (e.g., number of samples collected per location, any quality assurance/quality control samples collected, basic description of sediment collected, etc.). Copies of the chain-of-custody generated by FORMS II Lite will be submitted with the Trip Report following each sampling event, and the information will be incorporated into the Data Report.

4.1.4 Field Quality Control Samples

Quality control samples, including rinsate blank, duplicate samples, and matrix spike/matrix spike duplicates (MS/MSDs), will be collected as described in the QAPP (see Worksheets 20 and 28 in Appendix A).

Field duplicate samples will be collected at a frequency of 1 per 10 field samples, and MS/MSDs will be collected at a frequency of 1 per 20 field samples. One rinsate blank using deionized water will be collected during each sampling event to verify the sampling devices are clean prior to redeployment.

4.2 Sample Nomenclature, Labeling, Packaging, Shipping, and Custody

4.2.1 Sample Nomenclature and Labeling

All samples will be assigned a unique sample identifier (see Table 4-1). The identifier will contain the river reach, east or west bank location, river mile range, location ID, year of sample, and month of sample. This nomenclature convention is consistent with the UHR floodplains project. As an example, the first sample taken in Reach 8 along the east bank between RM 94 and 95 in April 2010 would read as follows: R8-E-9495-01-2010-04.

Table 4-1 Sample Nomenclature

River Reach	East/West Bank	River Mile Range	Location ID	Year	Month
R8	E	9495	01	2010	04

Field duplicates will be submitted blind to the analytical laboratory. As such, the sample nomenclature will be modified, and for duplicate samples the sample date and time will be omitted from the chain-of-custody. The nomenclature for duplicate samples will consist of replacing the river mile range with "FD" and the location ID with a counter. For example, a duplicate made from the parent sample R8-E-9495-01-2010-04 would be R8-E-FD-01. A second duplicate made from a sample in the same reach would be R8-E-FD-02.

Sample labels will be prepared using FORMS II Lite as described above in Section 4.1.3. Sample labels will include the nomenclature as well as other information, such as the type of analysis to be performed, the time and date the sample was collected, etc.

4.2.2 Sample Packaging and Shipping

The samples will be placed on ice (contained in double zip-locked bags) immediately following collection and then maintained at 4°C, including during transport to the laboratory.

Sample containers will be placed inside sealed plastic bags as a precaution against cross-contamination caused by leakage or breakage. They will be placed in coolers in such a manner as to eliminate the chance of breakage during shipment. Ice (in double zip-locked plastic bags) will be placed in the coolers to keep the samples at 4°C throughout shipment. Each cooler will be designated in the "number of total number" format (e.g., 1 of 2, 2 of 2). The cooler designation will be placed on the chain-of-custody form.

Sample shipment will be performed in accordance with all applicable U.S. Department of Transportation regulations. The samples will be shipped to the EPA Region 2 DESA laboratory in Edison, New Jersey, by an overnight service. Arrangements will be made with the laboratory point of contact for samples that are to be delivered so that holding times are not compromised.

- EPA Region 2 DESA Laboratory
  2890 Woodbridge Avenue
  Building 209, MS-230
  Edison, NJ 08837
  Attn.: John Birri
  Tel.: (732) 906-6886

4.2.3 Sample Custody

A sample is considered to be in custody under the following situations:

- The sample is directly in your possession, or
- The sample is clearly in your view, or
- The sample is placed in a locked location, or

- The sample is in a designated secure area.

In order to demonstrate that the samples and coolers have not been tampered with during shipment, adhesive custody seals will be used. The custody seals will be placed around the cap of each sample container and across the cooler lids in such a manner that they will be visibly disturbed upon opening of the sample container or cooler. The seals will be initialed and dated by field personnel when affixed to the container and cooler.

Documentation of the chain-of-custody of the samples is necessary to demonstrate that the integrity of the samples has not been compromised between collection and delivery to the laboratory. Each sample cooler will be accompanied by a chain-of-custody record to document the transfer of custody from the field to the laboratory. All information requested in the chain-of-custody record will be completed. In addition, the number assigned by the overnight courier will be listed on the chain-of-custody record. One copy of the chain-of-custody form will be retained by the sampler and will be placed in the project records file. The remaining pages will be sealed in a plastic bag and placed inside of the cooler. Upon receipt at the laboratory, the chain-of-custody forms will be completed. It is the responsibility of the laboratory to document the condition of custody seals and sample integrity upon receipt.

4.2.4 Laboratory Analyses

The samples will be analyzed for PCBs and total organic carbon as described in the QAPP (Appendix A). Samples will be analyzed within the holding time specified by the analytical method summarized in Table 4-2. The laboratory will report data electronically in accordance with Worksheet 29 of the QAPP.

Table 4-2 Sample Container, Preservation, and Holding Time by Analytical Method

Method	Parameter	Matrix	Sample Container[a,b]	Preservation	Holding Time	
					Extraction	Analysis[c]
SOP C-91	TCL Aroclors	Sediment	Two 4-oz short glass jars with teflon-lined caps	Cool to 4°C	14 days	40 days
SOP C-88	Total organic carbon	Sediment	One 4-oz short glass jar with teflon-lined cap	Cool to 4°C	NA	28 days
SOP C-91	TCL Aroclors	Aqueous[d]	Two 1-L amber glass jars with teflon-lined caps.	Cool to 4°C	7 days	40 days

Notes:
[a] All containers to have teflon-lined lids.
[b] Samples chosen for quality assurance analysis require double the number of containers indicated.
[c] Holding times are based on verified time of sample receipt and should be less than the two days allotted for shipping.
[d] Water for the rinsate samples will be Environmental Sampling Supply Ultrapure water.

Key:
NA = Not applicable.
TCL = Target Compound List from the most current version of EPA DESA Lab SOP C-91.

4.3 Investigation-Derived Waste

Investigation-derived waste, including gloves, paper towels, spoons, etc., will be double-bagged and disposed of properly.

4.4 Equipment Decontamination

Sampling devices will be decontaminated on-site by removing visible sediment (scraping and/or brushing it off) and triple rinsing with potable water using a pressurized sprayer.

4.5 Documentation

Subsequent to any sampling, a Trip Report will be generated and submitted to USACE and EPA. This report will document the field activates associated with the sampling that was conducted. In addition, after each sampling event, which may include several sampling trips, a Data Report will be generated. The Data Report will include a summary of the sampling event, including analytical results and information from a Data Usability Summary, and a Document Peer Review will be performed in accordance with Worksheet 32 of the QAPP (see Appendix A).

A Progress Report and an updated schedule will be prepared and submitted to the EPA and USACE Project Managers on or about the 15th of each month.

An annual report will be generated to evaluate the results of the sampling program. The annual report will include an evaluation of the sampling locations, including an assessment of the need to add, remove, or relocate sampling locations. Any changes to the sampling locations, including the addition of new locations, the deletion of locations, or the moving of locations, will be documented in this report. The report will also include a summary of the other areas in the UHR floodplains where flood deposits are occurring and document them for future consideration. Finally, the annual report will include copies of each data report.

The results of the sample collection and analysis for each sampling location will be distributed to the respective property owner.

5 References

ARCADIS. 2008. *Phase 2 Intermediate Design Report, Attachment D - Hudson River Hydrodynamic Model Summary*. Prepared for General Electric Company, Albany, NY. May 2008.

ARCADIS. 2009. *Final Data Summary Report, 2008 Floodplain Sampling Activities, Upper Hudson River Floodplain*. Prepared for General Electric Company, Albany, NY. June 2009.

United States Environmental Protection Agency (EPA). 2002. *Hudson River PCBs Site, New York, Record of Decision*, New York, NY.

A Quality Assurance Project Plan

Project-Specific Quality Assurance Project Plan for Upper Hudson River Floodplain Deposition Sampling Program

Contract No. W912DQ-06-D-0008

May 2010

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Table of Contents

Section **Page**

List of Tables

List of Abbreviations and Acronyms

ANSETS	Analytical Services Tracking System
CA	Corrective Action
CAL	Corrective Action Log
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	contaminant of concern
CoC	chain-of-custody
CPR	cardiopulmonary resuscitation
DESA	Division of Environmental Science (Edison, NJ)
DoD	Department of Defense
DQIs	Data Quality Indicators
DSR	Data Summary Review
E & E	Ecology and Environment, Inc.
FORMS II Lite	Field Operations and Records Management System II Lite Software
FSP	Floodplain Sampling Plan
GC	gas chromatography
GC/ECD	gas chromatography/electron capture detector
GC-PCB	gas chromatography – polychlorinated biphenyls
GE	General Electric
HASP	Health and Safety Plan
HTRW	hazardous, toxic and radioactive waste
LCS	laboratory control sample
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
NA	not applicable
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSC	On-Site Coordinator
PCBs	Polychlorinated Biphenyls
PQOs	Project Quality Objective
PT	Proficiency Testing
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QLs	Quantitation Limits
QSM	Quality System Manual
ROD	Record of Decision
RPD	relative percent difference
RSCC	Regional Sample Control Coordinators
RSD	relative standard deviation
SEDD	Staged Electronic Data Deliverable
SMO	Sample Management Officer
SOM	Statement of Method
SOP	Standard Operating Procedure
SOW	Statement of Work
TAT	turnaround time
TCL	Target Compound List

TOC	total organic carbon
UHR	Upper Hudson River
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VOCs	volatile organic compounds

INTRODUCTION

Site Overview

The Hudson River, located in New York State, floods approximately once per year into the floodplains located along its banks. The flooding causes mud and sediment to be washed ashore and potentially contaminate the surrounding areas with polychlorinated biphenyls (PCBs). Sediment will be collected from both sampling devices and scrap samples in select locations where flooding is most likely to occur and deposit sediment during high flow events.

Site Description, History & Background

See the Record of Decision (ROD) for the Hudson River PCBs Site New York for a site description and background. An overview the site is also presented in Section 1 of the Field Sampling Plan (FSP) for the Upper Hudson River (UHR) Floodplain Deposition Sampling Program.

QAPP Worksheet #1 – Title and Approval Page

Quality Assurance Project Plan (QAPP) for Upper Hudson River Floodplain Deposition Sampling Program

Document Title

United States Army Corps of Engineers (USACE), Kansas City District

Lead Organization

Bryan Kroon, Robert Meyers, and Michael Cheplowitz, Ecology and Environment, Inc. (E & E)

Preparer's Name and Organizational Affiliation

368 Pleasant View Drive, Lancaster, NY 14086, 716-684-8060
bkroon@ene.com, rmeyers@ene.com, mcheplowitz@ene.com

Preparer's Address, Telephone Number, and E-mail Address

March 2010

Preparation Date (Month/Year)

Investigative Organization's Project Manager: Robert A Meyers 5/12/10

Signature/Date

Robert Meyers/ E & E

Printed Name/Organization

Investigative Organization's Project QA Officer: Marcia M. Galloway 5/12/10

Signature/Date

Marcia Galloway/ E & E

Printed Name/Organization

Lead Organization's Project Manager: Kathy Baker 5/19/10

Signature/Date

Kathy Baker/ USACE Kansas City District

Printed Name/Organization

Approval Signatures: for David Rosoff 5/25/10

Signature/Date

David Rosoff/ United States Environmental Protection Agency (USEPA or EPA) Region II Project Manager

Printed Name/Title
Approval Authority

Amelia Jackson 5/20/10

Signature/Date

Amelia Jackson/ EPA Region II Quality Assurance Officer

Printed Name/Title
Approval Authority

QAPP Worksheet #2 – QAPP Identifying Information

Site Number/Code: EPA Superfund Site No. *NJD980529408*
Operable Unit: NA
Contractor Name: Ecology and Environment, Inc.
Contractor Number: W912DQ-06-D-0008
Contract Title: USACE Kansas City District, Hazardous, Toxic and Radioactive Waste (HTRW) Division
Work Assignment Number: Task Order 0011

1. Identify guidance used to prepare QAPP:
   Uniform Federal Policy for Quality Assurance Project Plans (EPA-505-B-04-900B); USACE 200-1-3; Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 3 Final

2. Identify regulatory program: EPA Superfund

3. Identify approval entity: EPA Region II, USACE Kansas City District

4. Indicate whether the QAPP is a generic or a project-specific QAPP. (circle one)

5. List dates of scoping sessions that were held: 10-07-09, 11-12-09, 11-19-09, 07-09-09
   General scoping sessions: General scoping sessions discussed design and installation of the sampling device, property access issues, the sampling schedule, and the completion of the FSP and its related documents.

6. List dates and titles of QAPP documents written for previous site work, if applicable:

Title	Received Date

7. List organizational partners (stakeholders) and connection with lead organization:

   - EPA Region II – Client;
   - USACE Kansas City District – Lead Organization

8. List data users:
   EPA, USACE, Ecology and Environment, Inc., Louis Berger Group, Inc.

9. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion below:

   None

Circle QAPP elements and required information that are not applicable to the project. Provide an explanation in the QAPP.

2 QAPP Cross Reference Table

Required QAPP Element(s) and Corresponding QAPP Section(s)	Crosswalk to Required Documents	Optional QAPP Worksheet # in QAPP Workbook	Required Information
Project Management and Objectives			
2.1 Title and Approval Page		1	- Title and Approval Page
2.2 Document Format and of Contents 2.2.1 Document Control Format 2.2.2 Document Control Numbering System 2.2.3 of Contents 2.2.4 QAPP Identifying Information		2	- Table of Contents - QAPP Identifying Information
2.3 Distribution List and Project Personnel Sign-Off Sheet 2.3.1 Distribution List 2.3.2 Project Personnel Sign-Off Sheet		3 4	- Distribution List - Project Personnel Sign-Off Sheet
2.4 Project Organization 2.4.1 Project Organizational Chart 2.4.2 Communication Pathways 2.4.3 Personnel Responsibilities and Qualifications 2.4.4 Special Training Requirements and Certification		5 6 7 8	- Project Organizational Chart - Communication Pathways - Personnel Responsibilities and Qualifications Table - Special Personnel Training Requirements Table
2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background		9 10	- Project Planning Session Documentation (including Data Needs tables) - Project Scoping Session Participants Sheet - Problem Definition, Site History, and Background - Site Maps (historical and present)
2.6 Project Quality Objectives (PQOs) and Measurement Performance Criteria 2.6.1 Development of Project Quality Objectives Using the Systematic Planning Process 2.6.2 Measurement Performance Criteria		11 12	- Site-Specific PQOs - Measurement Performance Criteria Table
2.7 Secondary Data Evaluation		13	- Sources of Secondary Data and Information - Secondary Data Criteria and Limitations
2.8 Project Overview and Schedule 2.8.1 Project Overview 2.8.2 Project Schedule		14 15 16	- Summary of Project Tasks - Reference Limits and Evaluation Table - Project Schedule/Timeline Table

2 QAPP Cross Reference Table

Required QAPP Element(s) and Corresponding QAPP Section(s)	Crosswalk to Required Documents	Optional QAPP Worksheet # in QAPP Workbook	Required Information
Measurement/Data Acquisition			
3.1 Sampling Tasks 3.1.1 Sampling Process Design and Rationale 3.1.2 Sampling Procedures and Requirements 3.1.2.1 Sampling Collection Procedures 3.1.2.2 Sample Containers, Volume, and Preservation 3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures 3.1.2.4 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures 3.1.2.5 Supply Inspection and Acceptance Procedures 3.1.2.6 Field Documentation Procedures		17 18 19 20 21 22	- Sampling Design and Rationale - Sample Location Map - Sampling Locations and Methods/ Standard Operating Procedure (SOP) Requirements Table - Analytical Methods/SOP Requirements Table - Field Quality Control Sample Summary Table - Sampling SOPs - Project Sampling SOP References Table - Field Equipment Calibration, Maintenance, Testing, and Inspection Table
3.2 Analytical Tasks 3.2.1 Analytical SOPs 3.2.2 Analytical Instrument Calibration Procedures 3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures 3.2.4 Analytical Supply Inspection and Acceptance Procedures		23 24 25	- Analytical SOPs - Analytical SOP References Table - Analytical Instrument Calibration Table - Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody		26	- Sample Collection Documentation Handling, Tracking, and Custody SOPs - Sample Container Identification - Sample Handling Flow Diagram - Example Chain-of-Custody Form and Seal
3.4 Quality Control Samples 3.4.1 Sampling Quality Control Samples 3.4.2 Analytical Quality Control Samples		27	- Quality Control (QC) Samples Table - Screening/Confirmatory Analysis Decision Tree
3.5 Data Management Tasks 3.5.1 Project Documentation and Records 3.5.2 Data Package Deliverables 3.5.3 Data Reporting Formats 3.5.4 Data Handling and Management 3.5.5 Data Tracking and Control		28 29	- Project Documents and Records Table - Analytical Services Table - Data Management SOPs

2 QAPP Cross Reference Table

Required QAPP Element(s) and Corresponding QAPP Section(s)	Crosswalk to Required Documents	Optional QAPP Worksheet # in QAPP Workbook	Required Information
Assessment/Oversight			
4.1 Assessments and Response Actions 4.1.1 Planned Assessments 4.1.2 Assessment Findings and Corrective Action Responses		30 31	- Assessments and Response Actions - Planned Project Assessments Table - Audit Checklists - Assessment Findings and Corrective Action Responses Table
4.2 Quality Assurance (QA) Management Reports		32	- QA Management Reports Table
4.3 Final Project Report			
Data Review			
5.1 Overview			
5.2 Data Review Steps 5.2.1 Step I: Verification 5.2.2 Step II: Validation 5.2.2.1 Step IIa Validation Activities 5.2.2.2 Step IIb Validation Activities 5.2.3 Step III: Usability Assessment 5.2.3.1 Data Limitations and Actions from Usability Assessment 5.2.3.2 Activities		33 34 35 36	- Verification (Step I) Process Table - Validation (Steps IIa and IIb) Process Table - Validation (Steps IIa and IIb) Summary Table - Usability Assessment
5.3 Streamlining Data Review 5.3.1 Data Review Steps To Be Streamlined 5.3.2 Criteria for Streamlining Data Review 5.3.3 Amounts and Types of Data Appropriate for Streamlining			

QAPP Worksheet #3 – Distribution List

List of those entities to whom copies of the approved QAPP, subsequent QAPP revisions, addenda, and amendments will be submitted.

3 Distribution List

QAPP Recipients	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
Kathy Baker	Project Manager (PM)	USACE Kansas City District	816-389-3906	816-389-2023	kathy.t.baker@usace.army.mil	NA
David Rosoff	PM	EPA Region II	908-420-4465	732-906-6182	rosoff.david@epa.gov	NA
Amelia Jackson	Region II Quality Assurance Officer	EPA Region II	732-906-6164	732-906-6824	jackson.amelia@epa.gov	NA
Justin Deming	Public Health Specialist	New York State Department of Health (NYSDOH)	518-402-7896	518-402-7859	jhd01@health.state.ny.us	NA
William Shaw	State Representative	New York State Department of Environmental Conservation (NYSDEC)	518-402-9554	518-402-9773	wxshaw@gw.dec.state.ny.us	NA
Robert Meyers	Project Manager	E & E	716-684-8060	716-684-0844	rmeyers@ene.com	NA
Marcia Galloway	QA Officer	E & E	716-684-8060	716-684-0844	mgalloway@ene.com	NA
Adly Michael	EPA Regional Sample Control Coordinator (RSCC)	USEPA Region II	732-906-6161	732-321-6622		
John Birri	Special Projects Coordinator	USEPA Region II Division of Environmental Science and Assessment (DESA) Laboratory Branch	732-906-6886	732- 906-6165	birri.john@epamail.epa.gov	
						NA

QAPP Worksheet #4 – Project Personnel Sign-Off Sheet

Have copies of this form signed by key project personnel from each organization list to indicate that they have read the applicable QAPP sections and will perform the tasks as described. Each organization should forward the signed sheets to the central project file maintained by E & E's QA Officer. Any new personnel to the project should review and sign the sheet.

Organization: EPA Region II

4A Project Personnel Sign-Off EPA Region II

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
David Rosoff	PM, EPA Region II Hazardous Waste Support Section	908-420-4465	for David Rosoff	5/25/10
Amelia Jackson	EPA Region II Quality Assurance Officer	732-906-6164		5/7/10

QAPP Worksheet #4 – Project Personnel Sign-Off Sheet

Have copies of this form signed by key project personnel from each organization list to indicate that they have read the applicable QAPP sections and will perform the tasks as described. Each organization should forward the signed sheets to the central project file maintained by E & E's QA Officer. Any new personnel to the project should review and sign the sheet.

Organization: USACE Kansas City District

4B Project Personnel Sign-Off USACE Kansas City District

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
Kathy Baker	Project Manager	816-389-3906	Kathy Baker	5/19/10

QAPP Worksheet #4 – Project Personnel Sign-Off Sheet

Have copies of this form signed by key project personnel from each organization list to indicate that they have read the applicable QAPP sections and will perform the tasks as described. Each organization should forward the signed sheets to the central project file maintained by E & E's QA Officer. Any new personnel to the project should review and sign the sheet.

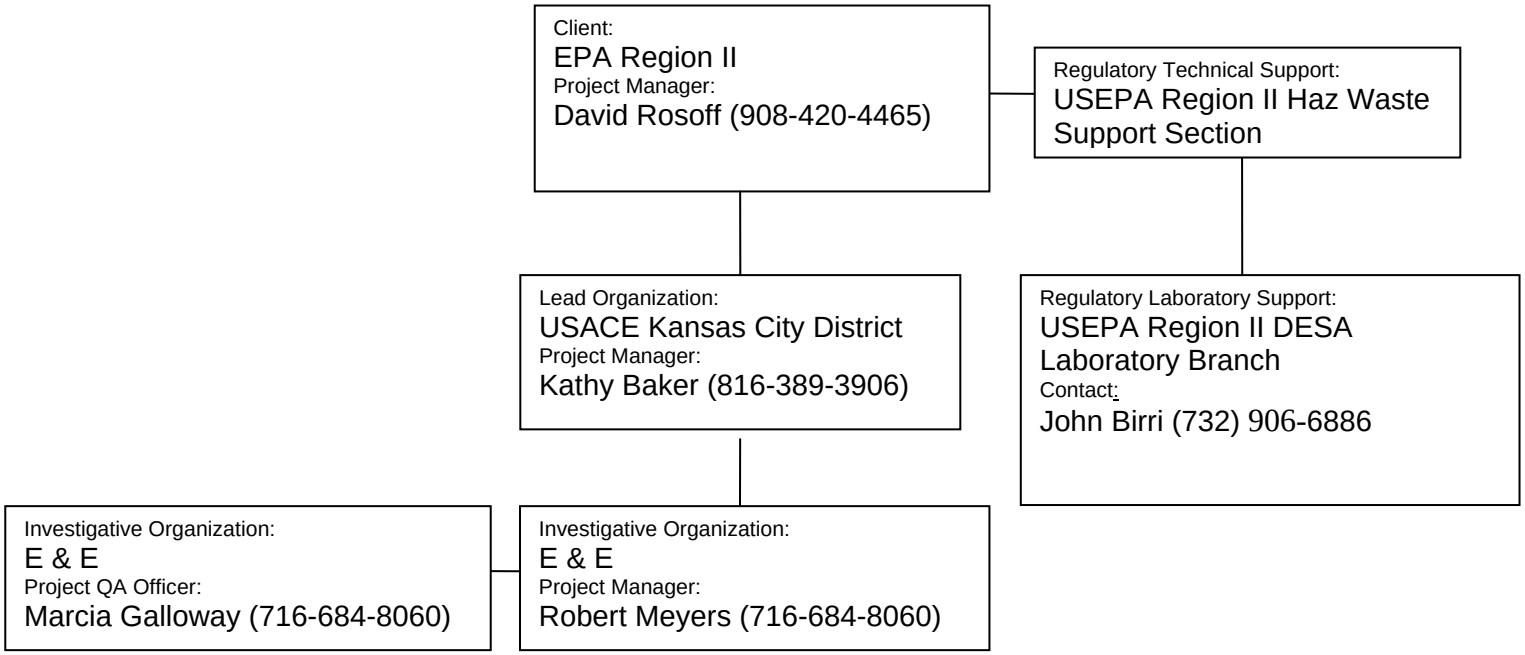
Organization: E & E

4C Project Personnel Sign-Off E & E

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
Marcia Galloway	QA Officer	716-684-8060	Marcia Galloway	5/12/10
Robert Meyers	Project Manager	716-684-8060	Robert A Meyers	5/12/10

QAPP Worksheet #5 – Project Organizational Chart

The following organization chart Identifies reporting relationships between all organizations involved in the project, including the lead organization and all contractors and subcontractor organizations.



QAPP Worksheet #6 – Communication Pathways

The communication pathways and modes of communication that will be used during the project, after the QAPP has been approved, are listed below.

6 Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (timing, pathways, etc.)
Point of Contact with EPA PM	USACE PM	Kathy Baker	816-389-3906	Kathy Baker will keep David Rosoff apprised of the project status.
Manage All Project Phases	E & E PM	Robert Meyers	716-684-8060	Robert Meyers will coordinate with Kathy Baker and the E & E project team on the planning, execution and delivery of all components of the Floodplains Sampling
Daily Summary Reports	Field Team Leader (FTL)	Michael Cheplowitz	518-747-4389	FTL will email formal daily reports to Robert Meyers and Kathy Baker. These reports will include the Field Adjustment information in lieu of a Field Adjustment Form.
Field Quality/Operational Issues	FTL	Michael Cheplowitz	518-747-4389	FTL will call Robert Meyers and E & E's QA Officer (Marcia Galloway) to discuss issues.
Lab Issues – EPA DESA Laboratory	Laboratory QA Officer –	Sumy Cherukara	(732) 906-6805 x6165	QA/QC issues will be reported by the Laboratory QA Officer t o US EPA RSCC. EPA RSCC will report issue to E & E. E & E will attempt to resolve issues with RSCC.
Release of Analytical Data from EPA DESA laboratory	EPA Branch Chief	John Bourbon	732-321-4469	Preliminary data will be released to Kathy Baker and David Rosoff for distribution and final data will be released after the appropriate validation has been successfully completed.
QAPP Amendments	USACE PM	Kathy Baker	816-389-3906	Major changes (e.g., changes in SOPs included in this document) require approval by Kathy Baker before they can be implemented

QAPP Worksheet #7 – Personnel Responsibilities and Qualifications Table

Project personnel associated with each organization, contractor, and subcontractor and their responsible roles are listed below.

7 Personnel Responsibilities and Qualifications

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
Kathy Baker	Project Manager	USACE Kansas City District	Manages Project for USACE	MS Hydrogeology, BS Chemistry and Geology, 10 years experience
David Rosoff	Project Manager	EPA Region II	Manages Project for EPA	MS Geology 20 yrs experience
Timothy Grady, PE	Contract Manager	E & E	Oversees project and program requirements	BS Civil Engineering, 27 yrs experience
Robert Meyers, P.G.	Project Manager	E & E	Manages project and field work and coordinates with USACE	BS Geology, 22 yrs experience
Marcia Galloway	Corporate QA Officer	E & E	QA oversight – sampling and analytical data, general project deliverables	MS Analytical Chemistry, BS Chemistry, 20 yrs experience
Thomas Siener, CIH	Corporate Heath and Safety Officer	E & E	Prepares/Reviews Health and Safety Plan (HASP)	BS Biology, 33 years experience

QAPP Worksheet #8 – Special Personnel Training Requirements Table

The following information is a list of specialized training requirements for the project for personnel implementing the work performed by E & E as documented in the work plan. Training requirements for subcontractors are listed below in general terms. Specific personnel training records for subcontract personnel will be reviewed during the bid review process.

8 Special Personnel Training Requirements

Project Function	Specialized Training By Title or Description of Course	Training Provider	Training Date	Personnel / Groups Receiving Training	Personnel Titles / Organizational Affiliation	Location of Training Records / Certificates[1]
Sample Shipment	United States Department of Transportation (USDOT) hazardous materials transportation	E & E	Annual Refresher	E & E Field Samplers		E & E Certified USDOT Lead Regional Hazmat Transportation Coordinator at E & E Headquarters (368 Pleasant View Dr, Lancaster, NY 14086)
Sample Collection	40-hour health and safety training program and the cardiopulmonary resuscitation (CPR)/ first aid certification	E & E	Annual Refresher	E & E Field Samplers		American Red Cross for CPR and First Aide/ E & E Regional Safety Coordinator for 8-hour refresher training
Laboratory Analysis	The DESA Laboratory maintains current NELAP accreditation.	Per the DESA Lab QMP and Region 2 requirements.	Per the DESA Lab QMP and Region 2 requirements.	EPA Region 2 DESA Lab personnel.		Original with EPA.

[1] If training records and/or certificates are on file elsewhere, document their location in this column. If training records and/or certificates do not exist or are not available, then this should be noted.

QAPP Worksheet #9 – Project Scoping Session Participants Sheet

Monthly conference calls have been implemented to discuss all aspects of project scope and progress. A copy of the minutes for each meeting and/or conference call is included in Attachment 1. A list of the meetings and scoping sessions completed to date is provided below:

9 Project Scoping Session Summary

Date of Session	Scoping Session Purpose	Key Decisions	Minute Locations
Scoping/Kick-off meeting 10-07-2009	Discuss scope (proposed sample locations), property access process and sample collection method with EPA and GE.	Agreed upon list of potential properties to be sampled, approach to obtaining property access, and sampling device to be used.	Located at the EPA's Hudson River Field Office (421 Lower Main St, Hudson Falls, NY 12205)
Monthly Conference calls with EPA, USACE, and Ecology and Environment, Inc.	Discussed project progress, issues, and schedule.	Varies by month.	Located at the EPA's Hudson River Field Office (421 Lower Main St, Hudson Falls, NY 12205)

QAPP Worksheet #10 – Problem Definition

The problem to be addressed by the project:
The Hudson River is located in eastern New York and flows approximately 300 miles in a generally southerly direction from its source, Lake Tear-of-the-Clouds in the Adirondack Mountains, to the Battery, located in New York City at the tip of Manhattan Island. For the purposes of the FSP, the study area is defined as the UHR floodplains, extending from the former location of the Fort Edward Dam to the Mohawk River confluence (approximate river mile [RM] 194.8 to approximate RM 156.3), including islands within the river.

The United States Environmental Protection Agency (EPA) divided the UHR between Fort Edward and Troy into three river sections for the sediment remediation activities outlined in the Hudson River PCBs Site New York Record of Decision (ROD; EPA 2002). The floodplain program further subdivided the river sections into 8 reaches defined by dams or locks (See Figure 1-1 in the FSP).

The goal of the FSP is to evaluate the effects of sediment deposits on the UHR floodplain as well as where these sediment deposits occur. The FSP includes the details for the evaluation of the location and installation of the floodplain sampling devices, and, presents the procedures for sample collection, analysis, and reporting for each sampling event.

An overview and description of the site is presented in Section 1 of the FSP.

The environmental questions being asked:

- What areas within the UHR floodplain study area receive sediment deposits following annual flooding events?

- What PCB concentrations are in the sediment deposits?

Observations from any site reconnaissance reports:
The study area is defined as the UHR floodplains, extending from the former location of the Fort Edward Dam to the Mohawk River confluence (approximate river mile [RM] 194.8 to approximate RM 156.3), including islands within the river. The floodplains consist of residential, commercial, and agricultural lands along both sides of the Hudson River. Throughout floodplain activities and during the development of this FDSP areas which sediment deposition was observed and areas that appear to be good sampling locations for this program were documented in field notes.

A synopsis of secondary data or information from site reports:
Previous Investigations contain data on:

- Previous samples collected during flood events by NYSDEC.
- Hydrodynamic modeling allowed for development of sampling locations.
- Positioning of target locations based on topographic mapping of area.
- Previous samples collected along UHR floodplains by General Electric (GE) and EPA.

These investigations are summarized in Section 1.3.2 of the FSP.

The possible classes of contaminants and the affected matrices:
Previous investigations and studies have limited the known contaminants to PCBs, contained in the sediments that were deposited in the river above the former Fort Edward Dam.

Project decision conditions:
Sampling of the sediment deposits along the UHR floodplain performed to define the concentrations of PCB's in the sediment deposits. Data collected form the target locations will be evaluated for PCB concentrations. The samples will be collected after high water events and sent to a laboratory for analysis.

- If there is a high water event, then sampling devices will be checked for sediment.
- If sample device locations have sufficient sediment for sampling, then samples will be collected.
- If sampling devices fail to collect sediment, then re-location will be considered.

QAPP Worksheet #11 – Project Quality Objectives/Systematic Planning Process Statements

Who will use the data?

- The data will be used by the USACE and the EPA.

What will the data be used for?

- Define areas within the UHR floodplain subject to sediment deposition.
- Characterize the PCB concentrations that exist in the sediment deposits.

What type of data are needed (matrix, target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)?

- Off-site laboratory techniques to be utilized for PCB Aroclor and total organic carbon (TOC) analysis of sediment deposits.

- Sediment samples will be collected as described in Section 4 of the FSP.

- TOC data are needed to evaluate the organic carbon content of sediments and potentially calculate the concentration of PCBs based on organic carbon.

How "good" does the data need to be in order to support the environmental decision?

- Analytical data needs to be approved through EPA data validation process and E & E internal data usability review process.

How much data is needed (number of samples for each analytical group, matrix, and concentration)?

- Several years of data is preferred to evaluate sediment deposits along the UHR floodplain.

- There are no specific screening criteria determined for these samples. The data are for evaluation purposes only. PCB reporting limits should be below 0.1 parts per million (ppm) which is the lowest New York State soil clean-up objective for PCBs.

Where, when, and how should the data be collected/generated?
Sediment samples will be collected following high flow events. The samples will be collected as described in Section 4 of the FSP.

The objectives of the sampling are:

- Verify that the sampling target locations receive sediment deposits.
- Establish the concentration of PCB's in the samples collected.

Who will collect and generate the data?

- Sediment analytical data will be generated by an EPA laboratory.
- Samples of sediment deposits will be collected by an E & E field team.

How will the data be reported?

- Analytical data will be reported via electronic data deliverables.
- Field data will be recorded in field logs.
- All data will be presented in annual reports and post-sampling data reports.

How will the data be archived?
Hard copies will be stored at EPA SMO office or EPA laboratory per their data retention procedures. E & E's headquarters building in Lancaster, NY for 5 years will store processed data.

Electronic copies of all reports and appendices will be submitted to USACE Kansas City District and USEPA Region II.

QAPP Worksheet #12 – Measurement Performance Criteria Table

The following worksheet identifies the data quality indicators (DQIs) for contaminants of concern that were identified as contaminants of concern in the ROD. Specific measurement and performance criteria for chemical analysis completed by the EPA DESA laboratory can be found in the DESA Lab SOP C-91.

12 Measurement Performance Criteria for PCBs

Matrix	Aqueous/Soil
Analytical Group	Pesticides/PCBs
Concentration Level	

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and / or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
NA	See Worksheets #28 and #23	Precision Accuracy	%RPD<30 Average Recovery 50-150%	LCS Duplicate	A
		Accuracy	Compound Specific (full range: 30-150%)	Matrix Spike	A
		Accuracy	Limits 30%-150%	Surrogate Compounds	A
		Accuracy	<RL	Method Blank	A

QAPP Worksheet #13 – Secondary Data Criteria and Limitations Table

The following table identifies all secondary data and information that will be used for the project and their originating sources.

13 Secondary Data Criteria and Limitations

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation / collection dates)	How Data Will Be Used	Limitations on Data Use
Aerial Photography	Axis GeoSpatial Aerial Photography, 2007	An aerial photo survey was conducted for General Electric Company (GE) on April 22, 2007 from Fort Edward to Troy.	This imagery was used in the evaluation of the spatial distribution of target locations and accessibility to these locations.	No limit on data use.
Flood Mud Sampling	New York State Department Environmental Conservation (NYSDEC) Flood Mud Collection Results, 2008	The NYSDEC collected samples of flood deposits from several locations along the UHR floodplain after an extended duration of high flow during the spring of 2008.	The locations of these samples and their results were evaluated as part of the selection of the FDSP target locations.	No limit on data use.
Hydrodynamic Model of UHR	ARCADIS Hydrodynamic Model, May 2008	A hydrodynamic model of the UHR was developed for GE during the UHR PCBs Cleanup Remedial Design.	The estimated river elevations were used to help determine appropriate elevations at which to install the sampling devices for the FDSP.	No limit on data use.
Topographic Mapping	Chas. H. Sells, Inc Topographic Survey, 2005 and 2006	In 2005 and 2006, Chas. H. Sells, Inc on behalf of GE developed topographic mapping, 1-ft. (1 in. = 30 ft. scale) contour intervals of the UHR floodplain project area.	The contour maps were used to help select potential FDSP target locations.	No limit on data use.
Floodplain Sampling	ARCADIS, June 2009. Final Data Summary Report, 2008 Floodplain Sampling Activities, Upper Hudson River Floodplain. Prepared for General Electric Company. Albany, NY	In 2008 GE conducted sampling along the UHR floodplains as part of a Remedial Investigation/Feasibility Study (RI/FS).	The sampling locations, including property access, and the results from this sampling event were evaluated in the determination of the target locations for this FSP.	No limit on data use.

QAPP Worksheet #14 – Summary of Project Tasks

The FSP provides a complete overview of the project activities. The specific project tasks addressed in this FSP include:

- Planning Tasks
  - Prepare Field Sampling Plan
  - Prepare Health and Safety Plan
  - Prepare project specific Quality Assurance Project Plan

- Sampling and Analysis
  - Manufacture sampling devices
  - Install sampling devices
  - Monitor river flows
  - Collect flood deposit samples
  - Documentation and sample handling
  - Collect field QC samples
  - Investigation-Derived Waste Management
  - Decontamination

- Laboratory Analysis
  - Data Validation
  - Electronic submittal of data

- Sampling event reports to USACE and EPA

QAPP Worksheet #15 – Reference Limits and Evaluation Table

The following worksheet identifies the target analytes/contaminants of concern and project-required action limits for each matrix and analytical group that were identified as contaminants of concern in the ROD. The quantitation limits (QLs) that must be met to achieve the project quality objectives and quantitation limits from reference methods also are listed. For completeness all Target Compound List (TCL) Aroclors are listed. The information related to analysis completed by the EPA DESA laboratory can be found in the EPA DESA SOP's for the contract.

15 EPA DESA Lab in Edison, NJ

CLP No.	Contaminant of Concern (COC)	Analyte	Chemical Abstracts Service (CAS) Number	Project Action Limit	Project QL Goal	Analytical Method QLs[1]	Achievable Laboratory Limits[2]		New York State Sediment Guidance Criteria[3]
				µg/kg	µg/kg	µg/kg	MDLs	QLs	
1	Y	Aroclor-1016	12674-11-2	100	33	31.25	[4]	31.25	100
2	Y	Aroclor-1221	11104-28-2	100	33	62.5	[4]	62.5	100
3	Y	Aroclor-1232	11141-16-5	100	33	31.25	[4]	31.25	100
4	Y	Aroclor-1242	53469-21-9	100	33	31.25	[4]	31.25	100
5	Y	Aroclor-1248	12672-29-6	100	33	31.25	[4]	31.25	100
6	Y	Aroclor-1254	11097-69-1	100	33	31.25	[4]	31.25	100
7	Y	Aroclor-1260	11096-82-5	100	33	31.25	[4]	31.25	100
8	Y	Aroclor-1262	37324-23-5	100	33	31.25	[4]	31.25	100
9	Y	Aroclor-1268	11100-14-4	100	33	31.25	[4]	31.25	100
10	N	TOC	TOC		1%	1%	1%	1%	

Notes:

[1] Analytical Method Detection Limits (MDLs) and QLs are those documented in validated methods.

[2] Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

[3] The last column represents New York State Department of Environmental Conservation, Soil Clean-up Objectives for Unrestricted use (Division of Environmental Remediation. 6 NYCRR PART 375. Environmental Remediation Programs. Subparts 375-1 to 375- 4 & 375-6. Effective December 14, 2006).

[4] Per DESA Lab records

QAPP Worksheet #16 – Project Schedule / Timeline Table

The project activities that will be performed during the course of the project are listed below. A schedule will be maintained by E & E and updated in monthly progress reports. The major tasks related to the QAPP are summarized below.

16 Project Schedule / Timeline

Activities	Organization	Anticipated Date(s) of Initiation	Anticipated Date of Completion	Deliverable	Deliverable Due Date
Develop QAPP	E & E	February 2010	March 2010	Draft QAPP	March 12, 2010
QAPP Approval	USACE	March 2010	March 2010	Comments On Draft	March 26, 2010
Revised QAPP	E & E	March 2010	April 2010	Final QAPP	April 2, 2010
QAPP (update after Lab chosen)	E & E	March 2010	April 2010	QAPP Update I	Within 15 days after selection of lab.
Field Investigation and Sampling	E & E	As flooding occurs, beginning Spring 2010	As flooding occurs, beginning Spring 2010	Field Logbooks and Daily Reports as attachments to the Data Summary Report (DSR)	Within 15 days of flooding event.
Sampling Report Preparation	E & E	30 days after completion of sampling event, beginning Spring 2010.	90 days after completion of sampling event, beginning Spring 2010.	DSR	90 days after field investigation events.
Annual Report Preparation	E & E	November Annually	February Annually	Annual Report	Mid-February Annually
QAPP Annual Review	E & E	November Annually	December Annually	Review of QAPP Letter and Any Updates	Annual Basis

QAPP Worksheet #17 – Sampling Design and Rationale

Section 2 of FSP provides a complete discussion of sampling design and rationale. A summary of the sample locations is included in Table 2-2 of the FSP.

QAPP Worksheet #18 – Sampling Locations and Methods/SOP Requirements Table

FSP Table 2-2 lists the proposed sample locations. Specific sample locations are confidential due to placement on private properties. The rationale for the selection of the sampling locations is described in Section 2 of the FSP. Sample collection methods are provided in Section 4 of the FSP.

QAPP Worksheet #19 – Analytical SOP Requirements Table

19 Summary of Sample Containers, Amounts, Preservation, and Holding Times for Sediment Samples, UHR Floodplain Deposition Sampling Program

Method	Parameter	Sample Container[a, b]	Preservation	Holding Time	
				Extraction	Analysis[c]
Sediment Samples					
DESA Lab SOP C-91, 3/2009	TCL Aroclors	Two 4-oz short glass jars with Teflon-lined caps	Cool to 4°C	14 days	40 days
DESA Lab SOP C-88	Total Organic Carbon	One 4-oz short glass jar with Teflon-lined cap	Cool to 4°C	NA	28 days
Rinsate Samples[d]					
DESA Lab SOP C-91, 3/2009	TCL Aroclors	Two 1-L amber glass jars with Teflon-lined caps.	Cool to 4°C	7 days	40 days

Notes:
Holding times are from time of sampling.
[a] All containers to have Teflon-lined lids.
[b] Samples chosen for quality assurance analysis require double the number of containers indicated.
[c] All number of days are from date of collection.
[d] Water for the rinsate samples will be Environmental Sampling Supply Ultrapure water.

Key:
NA = Not applicable.
TCL = Target Compound List from the most current version of EPA DESA Lab SOP C-91.

QAPP Worksheet #20 – Field Quality Control Sample Summary Table

Sampling and Chemical Analysis Detail Table, UHR Floodplain Deposition Sampling Program, summarizes by matrix and analytical group the number of field QC samples that will be collected and sent to the laboratory. The following table provides a summary of the totals for each type of sample collected.

20 Summary of Field Quality Control Requirements

Matrix	Analytical Group	Conc. Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of MS/ MSD	No. of Field Blanks (Trip)	No. of Equip. Blanks	No. of Proficiency Testing (PT) Samples	Total No. of Samples to Lab
Sediment	TCL Aroclors	Low	DESA Lab C-91, 3/2009	FSP	1 per 10	0	0	1 per Event	0	FSP
Sediment	TOC	NA	DESA Lab C-88	FSP	1 per 10	0	0	1 per 20	0	FSP

QAPP Worksheet #21 – Project Sampling SOP References Table

The SOPs associated with project sampling are listed below. Routine sampling SOPs for E & E field personnel are stored on E & E's intranet site.

21 Project Sampling SOP References

Reference Number	Title, Revision Date and / or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments

Note: Site specific sediment sampling methodology is described in Section 4.1 of the FSP and site specific equipment decontamination methodology is described in Section 4.4 of the FSP.

QAPP Worksheet #22 – Field Equipment Calibration, Maintenance, Testing, and Inspection Table

The field equipment and instruments (other than analytical instrumentation) that require calibration, maintenance, testing, or inspection are summarized below. The procedures for calibration of field analytical equipment are included in the SOPs provided in Attachment 2 (see Worksheet 21 for reference).

22 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description[a]	Field Calibration Procedure	Maintenance/Inspection Schedule	Responsible Personnel
Sediment Sampling Device	Custom built sediment trap	NA	Perform annual inspection and required maintenance	Michael Cheplowitz (FTL)

[a] Description is for typical equipment; equivalent units may be used.

See Appendix D of FSP for schematic of sampling device.

QAPP Worksheet #23 – Analytical SOP References Table

23 Analytical SOP Reference (EPA Region II DESA Laboratory)

Reference Number	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
DESA Lab SOP C-91	Analytical Method for the Analysis of Aroclors	Definitive	TCL Aroclors	Dual column wide-bore GC/ECD	EPA Region II DESA Laboratory	N
DESA Lab SOP C-88	Analytical Method for the Analysis of TOC	Definitive	TOC	Catalytic Combustion	EPA Region II Laboratory	N

QAPP Worksheet #24 – Analytical Instrument Calibration Table

The analytical instrumentation that will be used to perform off-site analysis is described briefly below. Additional details are provided in SOPs or in the EPA CLP SOW.

24 Analytical Instrument Calibration (EPA Region II DESA Laboratory)

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
GC/ECD (DESA Lab SOP C-91)	Initial Calibration	C-91 (Ref: EPA 608)	Relative Standard Deviation (RSD) ±25%, Not more than 10% of total analytes failure. RSD not more than 30%	1. Check instrument. 2. Reanalyze.	Lab personnel	DESA Lab C-91, 3/2009
GC /ECDPCBs (DESA Lab SOP C-91)	Continuing Calibration	Beginning and end of each analytical run	Max Percent Difference (%D) RRF ±25%	1. Reanalyze. 2. Qualify data.	Lab personnel	DESA Lab C-91, 3/2009

[1] Specify the appropriate reference letter or number from the Analytical SOP References (Worksheet #23).

QAPP Worksheet #25 – Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

The information regarding analytical is maintained by the EPA Region II DESA laboratory.

25 Analytical Instrument and Equipment Maintenance, Testing, and Inspection (EPA DESA Laboratories)

Instrument / Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
See laboratory files.								

[1] Specify the appropriate reference letter or number from the Analytical SOP References (Worksheet #23).

QAPP Worksheet #26 – Sample Handling System

This section identifies components of the project-specific sample handling system used by E & E and the subcontract laboratories. All field samples will be disposed by the subcontract laboratory according to their internal procedures. Samples must be stored at the laboratory for a minimum of 30 days after the final report is submitted.

Sample Collection

E & E will conduct nondestructive sampling on this project. E & E's sampling, as described in Section 4.1 of the FSP, will serve as the basis for sampling procedures for this investigation.

Site-specific investigation methodologies; sample types, numbers, and locations; and chemical constituents are identified in the FSP.

The order of sample collection at a specific location normally proceeds as follows:

1. TCL Aroclors
2. TOC

This sequence gives priority to PCB collection, the primary contaminant of concern.

The remainder of this section describes typical procedures for the handling of investigation-derived waste, and sample containers, preservatives, holding times, packing, and shipping. Overall, the FTL will be responsible for ensuring correct methods are employed, documenting any problem and verifying required corrective actions. The PM will approve corrective actions, in consultation with client personnel, if appropriate. EPA and USACE must approve any changes to the sampling program including sample locations.

Sample Containers

The volumes and containers required for sampling activities are indicated in FSP Table 4-1 and 4-2. Prewashed sample containers will be purchased from an approved specialty container supplier, which prepares containers in accordance with EPA bottle-washing procedures. The sampling team must maintain a record of all sample bottle lot numbers shipped in the event of a contamination problem.

Samples Preservation and Holding Times

All samples requiring preservation will be preserved in the field immediately after collection and transportation to the site office. The only preservation required is cooling samples. No chemical preservation is required.

Sample preservation will be verified at the laboratory at receipt. If samples are improperly preserved, a corrective action form will be submitted to the laboratory project manager for follow-up action. The laboratory will notify the FTL or PM to implement corrective action in the field.

Sample Handling

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of samples but also prevents any detrimental effects due to the possible hazardous nature of the samples. Regulations for packaging, marking, labeling, and shipping of hazardous materials are promulgated by the USDOT in 49 CFR 171 through 177. E & E trains all staff responsible for the shipment of samples in these regulations. Procedures for sample packing and shipping are documented in the FSP, Section 4.2.2.

Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with their original containers;
- Shipping coolers must be partially filled with packing materials and ice (when required) to prevent bottles from moving and breaking during shipping;
- Environmental samples are to be cooled. Wet ice packaged in sealable, plastic bags will be used to cool samples during shipping. Ice is not to be used as a substitute for packing materials;
- Any remaining space in the cooler should be filled with inert packing material such as bubble wrap. Under no circumstances should material such as sawdust or sand be used;
- A duplicate custody record must be placed in a plastic bag and taped to the inside of the cooler lid. Custody seals are affixed to the sample cooler; and
- All containers for a given sample will be shipped in the same cooler when possible

Shipping Containers

Environmental samples will be properly packaged and labeled for transport and dispatched to the laboratory facility. The procedure in FSP Section 4.2.3 will be followed to mark and label sample shipments. A separate CoC record must be prepared for each shipping container. The following requirements for shipping containers will be followed:

Sample shipping containers will generally be commercially purchased coolers (e.g., Coleman coolers). Each container will be custody-sealed for shipment as appropriate. The container custody seal will consist of filament tape wrapped around the package at least twice and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the laboratory. In most cases, samples will be shipped using an overnight express carrier. Field personnel will provide the laboratory with a shipment schedule and notify them of deviations from planned activities. The field personnel will confirm with the laboratory if samples intended for Saturday delivery, no later than 3 p.m. (Eastern Standard Time) on Thursday.

QAPP Worksheet #27 – Sample Custody Requirements

The procedures that will be used to maintain sample custody and integrity are described below. Examples of CoC forms, traffic reports, sample identification, custody seals, laboratory sample receipt forms, and laboratory sample transfer forms will available be during on-site laboratory visits.

Sample Custody

Formal sample custody procedures begin when the precleaned sample containers are received from the container vendor. The field team and laboratory must follow written and approved methodologies and SOPs for shipping, receiving, logging, and internally transferring samples. Sample identification documents must be carefully prepared so that sample identification and CoC can be maintained and sample disposition controlled. Sample identification documents include field notebooks; sample labels; custody seals; and CoC records.

The primary objective of CoC procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from sampling through completion of all required analyses. A sample is in custody if it is:

- In a team member's physical possession;
- In a team member's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

Field Custody Procedures

Precleaned sample containers will be relinquished by the vendor to the FTL. The FTL will record receipt of the sample containers in the project logbook. The following field custody procedure will be used for collection of samples:

- As few persons as possible should handle samples;
- Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use;
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under CoC rules;
- The sample collector will record sample data in the field logbook; and
- The FTL will determine whether proper custody procedures were followed during the field work and decide if additional samples are required.

Sample Labels

Sample labels or tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. Sample labels or tags must be generated electronically by the EPA's Field Operations and Records Management System (FORMS) II Lite application. The sample labels are to be placed on bottles so as not to obscure any lot numbers, and sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-referencing with the logbook. For CoC

purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

Chain-of-Custody Record

The Region 2 DESA Lab CoC form must be fully completed by the field technician designated by the PM as responsible for shipping samples to the appropriate Region 2 DESA Lab. All information must be entered electronically using the FORMS II Lite program. Separate CoCs must be generated for organic and inorganic sample analyses. In the event of a system failure, appropriate back-up procedures must be followed, and Region 2 DESA Lab CoC forms must then be fully completed manually. The custody record also should indicate any special preservation techniques necessary or whether samples need to be filtered. Copies of CoC records are to be maintained with the project file.

The Analytical Services Tracking System (ANSETS) Form II Lite Submissions will be sent to Region II and a copy will be sent to the USACE.

Custody Seals

Custody seals are preprinted, adhesive-backed seals with security slots designed to break if the seals are disturbed. USDOT-approved sample shipping containers are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. Upon receipt at the laboratory, the custodian must check and document on a cooler receipt form that seals on shipping containers are intact.

Laboratory Custody Procedures

All laboratory custody procedures must maintain a system that provides for sample log-in, signing samples out to and back from individual analysts, data storage and reporting, and sample disposal. These procedures must ensure continuous documentation of sample custody from receipt to disposal. Procedures used by the laboratory must meet all EPA requirements. Laboratories must complete a cooler receipt form documenting the temperature and condition of samples on receipt. The form must be provided in the laboratory data package. The receipt information is verified prior to sample reporting.

QAPP Worksheet #28 – QC Samples Table

The QC sample criteria that will be used to perform analysis at the EPA DESA Laboratory are listed in SOPs referenced in Worksheet 23.

General project data quality indicators are highlighted below:

- Precision – Field duplicates will be collected to assess overall precision. Precision criteria is established and will be assessed by the Lab during internal data validation, prior to the release of their report. Data may be qualified as necessary if QC criteria are exceeded.

- Accuracy – Laboratory MS/MSDs will be used to assess accuracy. The primary data concern is to ensure analytical bias will not produced false negatives and that all potential contamination is accounted for in long term sampling. PCB Aroclors listed on Worksheet 15 of this QAPP need to be in the MS and should be within laboratory control limits.

- Representativeness – Data needs to be representative of the areas of potential sediment contamination at the site. The extent of contamination is critical for remedial design. Equipment and laboratory blanks will be used to assess field decontamination and laboratory background. No compounds from Worksheet 15 of this QAPP should be present. The criteria used to select the sampling locations are described in Section 2 of the FSP.

- Completeness – There are no critical samples or data points because of long term sampling aspects of the project and no specific completeness objective.

- Comparability – The ability to effectively compare data to historical results and screening criteria is important. Data needs to be generated from the same analytical methods and have the same reporting limits. The ability to compare data to specific guidance values is critical for evaluating long term sampling data.

28 QC Samples Table

Matrix	Aqueous/Soil
Analytical Group	Pesticides/PCBs
Concentration Level	
Sampling SOP	
Analytical Method/ SOP Reference	C-91 (Ref: EPA 608)
Sampler's Name	
Field Sampling Organization	
Analytical Organization	USEPA Region 2 Lab
No. of Sample Locations	

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Instrument Performance (PEM)	Beginning of each analytical run	Total breakdown <30%	Check Instrument	Lab personnel	Sensitivity Contamination	Total breakdown <30%
Initial Calibration	C-91 (Ref: EPA 608)	% RSD +/- 25% Not more than 10% of total analytes failure RSD not more than 30%	Check Instrument, Reanalyze	Lab personnel	Accuracy/ Precision	% RSD +/- 25% Not more than 10% of total analytes failure RSD not more than 30%
Continuing Calibration Check Standard (Alternate check standard)	Beginning and the end of each analytical run	Max %D RRF +/- 25%	Reanalyze, Qualify data	Lab personnel	Accuracy	Max %D RRF +/- 25%
Method Blank	1 per extraction batch	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
LCS/LFB	2 per extraction batch	Limits: Average Recovery 50-150% % RPD < 30	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy/ Precision	Limits: Average Recovery 50-150% % RPD < 30
Laboratory Matrix spikes	1 per extraction batch	Limits 30-150%	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy	Limits 30-150%
Surrogates	Each sample, standard, blank	Limits 30%-150%	Reinject, Qualify data	Lab personnel	Extraction efficiency, Accuracy	Limits 30%-150%

QAPP Worksheet #29 – Project Documents and Records Table

The documents and records that will be generated for all aspects of the project are listed below.

29 Project Documents and Records

Sample Collection Documents and Records	On-Site Analysis Documents and Records	Off-Site Analysis Documents and Records	Data Assessment Documents and Records	Other
Field Logbooks	NA	Laboratory Reports[1]	Data usability summary	Data Report
Daily Summary Reports		Sample Receipt Report		Annual Report
Sample Location Log Sheet		Completed CoC		
Photographs		Electronic data[2]		
FORMS II Lite Sample Summary Reports				
FORMS II Lite Sample ID Export				
CoC				
Airbill and Shipping Documents				

[1] Laboratory reports will be formatted consistent with the contract requirements.

[2] Laboratory electronic data reports will be formatted as comma delimited file.

QAPP Worksheet #30 – Analytical Services Table

The laboratories or organizations that will provide analytical services for the project are listed below.

30 Analytical Services Table

Matrix	Analytical Group	Method/ SOP	Sample Locations/ID Number	No. of Samples with MS/ MSD	Total Field Samples	Laboratory	Turn Around Time (TAT) in Days	Data Package/ Electronic Data Deliverable	Data Validator/ SOP	Tentative Field Schedule
Sediment	TCL Aroclors	DESA Lab SOP C-91	Sediment from collection apparatus	1 per 20	20+/- per sampling event	EPA DESA laboratory	21	Results Only Spreadsheet	EPA DESA Laboratory	Annually beginning Spring 2010
Sediment	TOC	DESA Lab C-88		1 per 20	20+/- per sampling event	EPA DESA laboratory	28	Results Only Spreadsheet	EPA DESA Laboratory	Annually beginning Spring 2010

QAPP Worksheet #31 – Planned Project Assessments Table

Type, frequency, and responsible parties of planned assessment activities that will be performed for the project are identified below.

31 Planned Project Assessments

Assessment Type	**Frequency**	**Internal or External**	**Organization Performing Assessment**	**Person(s) Responsible for Performing Assessment** (title and organizational affiliation)	**Person(s) Responsible for Responding to Assessment Findings** (title and organizational affiliation)	**Person(s) Responsible for Identifying and Implementing Corrective Actions (CA)** (title and organizational affiliation)	**Person(s) Responsible for Monitoring Effectiveness of CA** (title and organizational affiliation)
Field Inspections and Audits	TBD	External	USACE Kansas City District	USACE (TBD)	FTL	FTL and Robert Meyers, E & E PM	Marcia Galloway, E & E QA Officer
Field Inspections and Audits	At least once in the first year	Internal	E & E	Thomas Seiner, CIH Corporate Health & Safety Officer	Robert Meyers, E & E PM and Marcia Galloway, E & E QA Officer	Robert Meyers, E & E PM and Marcia Galloway, E & E QA Officer	Marcia Galloway, E & E QA Officer and USACE PM

QAPP Worksheet #32 – Assessment Findings and Corrective Action Responses

Procedures for handling QAPP and project deviations encountered during the planned project assessments are described below.

32 Assessment Findings and Corrective Action Responses

	Nature of Deficiencies Documentation	**Individual(s) Notified of Findings** (name, title, organization)	**Timeframe of Notification**	**Nature of Corrective Action Response Documentation**	**Individual(s) Receiving Corrective Action Response** (name, title, organization)	**Timeframe for Response**
Field Inspections	QC Inspection Checklist	E & E	Immediate or at close of inspection day	Change in sampling plan or letter of response	Marcia Galloway, E & E QA Officer ,Robert Meyers, E & E PM and Kathy Baker, USACE PM	Immediate or on approval of USACE and EPA
Field Audits	Audit Memo	FTL	Immediate or at close of audit day	Field logbooks or letter of response	Marcia Galloway, E & E QA Officer ,Robert Meyers, E & E PM and Kathy Baker, USACE PM	Immediate or on approval of USACE and EPA
Data Usability Summary	Memo	Laboratory PM	As needed	TBD	Bryan Kroon, E & E Data Validation Chemist	7 days for re-submittals and 48 for response
Document Peer Review	Hardcopy or electronic markup of deliverable	E & E Author(s) and PM	Prior to report submittal	Update report	Robert Meyers, E & E PM	48 hours for response

QAPP Worksheet #33 – QA Management Reports Table

The frequency and type of planned QA Management Reports is described below.

33 QA Management Reports

Type of Report	**Frequency** (daily, weekly monthly, quarterly, annually, etc.)	**Projected Delivery Date(s)**	**Person(s) Responsible for Report Preparation** (title and organizational affiliation)	**Report Recipient(s)** (title and organizational affiliation)
Daily Summary Report	Daily	Within seven days of completion of sampling event	FTL	Robert Meyers, E & E PM, Kathy Baker, USACE PM and David Rosoff, EPA PM
Progress Report	Monthly	15th day of the month	Robert Meyers, E & E PM	Kathy Baker, USACE PM
Updated Schedule	Monthly	15th day of the month	Robert Meyers, E & E PM	Kathy Baker, USACE PM
Data Report	One per sampling event	90 days after completion of sampling event	Robert Meyers, E & E PM and FTL	Marcia Galloway, E & E QA Officer, Kathy Baker, USACE PM, David Rosoff, EPA PM

QAPP Worksheet #34 – Verification (Step I) Process Table

For EPA DESA-generated data, the DESA laboratory will verify and validate the data according to internal procedures. The EPA DESA laboratory will provide a copy of the validation report and an electronic spreadsheet of the analytical results indicating the data qualified by the laboratory.

QAPP Worksheet #35 – Validation (Steps IIa and IIb) Process Table

The processes that will be followed to validated project data for EPA CLP laboratories are described as part of Worksheet 34. Validation process for E & E subcontract laboratory data are described below.

35 Validation (Steps IIa and IIb) Process

Data Source	Validation Input	Description	Responsible for Validation (name, organization)
Sediments	PCBs Results	Evaluate field QC sample results against QAPP criteria.	E & E Project Chemist
Sediments	All Data	Review using EPA SOPs	EPA Region II Chemist

QAPP Worksheet #36 – Validation (Steps IIa and IIb) Summary Table

The criteria used to validate the data are based on the laboratory QC limits and those specified by the analytical method.

36 Validation (Steps IIa and IIb) Summary Table

Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator
Sediment	TCL Aroclors	Low/Med	EPA Region II SOPs	EPA
Sediment	TOC	NA	EPA Region II SOPs	EPA

QAPP Worksheet #37 – Usability Assessment

The E & E Project Chemist will work with the final users of the data in performing data quality assessments. The data quality assessment may include some or all the following steps:

- Data that are determined to be incomplete or not usable for the project will be discussed with the project team. If critical data points are involved which impact the ability to complete the project objectives, the data users will report immediately to the PM. The PM will discuss the resolution of the issue with USACE technical staff and implement the necessary corrective actions (for example, re-sampling);

- Data that are non-detect but have reporting limits elevated due to blank contamination or matrix interference will be compared to screening values. If reporting limits exceed the screening values, then the results will be handled as incomplete data as described above;

- Data that are qualified as estimated will be used for all project decision making. If an estimated result is close to a screening value, then there is uncertainty in any conclusions as to whether the result exceeds the screening value. The data user must evaluate the potential uncertainty in developing recommendations for the site. If estimated results become critical data points in making final decisions on the site, the PM and USACE technical staff should evaluate the use of the results and may consider the data point incomplete.

The assessment process involves comparing analytical results to screening values and background concentrations to determine whether the contamination present is site related (i.e., above background levels) or significant (i.e., above screening values). Additional data assessment will be performed as part of the Sampling Evaluation Report.

Attachment 1 – Scoping Meeting and Planning Minutes

Monthly Call AGENDA
Hudson River Floodplains
January 21, 2009 3:00 EDT

Participants dial in number 888-804-4584 ID 96178

To initiate the call dial in using ID 961784221

Project Items

- 2010 Sampling Event and RAs
    - Selection of 2010 sample locations - Continuing effort planning on meeting with EPA to discuss week of the 25th.
    - Selection of 2010 RAs - Meeting held with GE on January 13th
- Long Term Floodplain Deposition Sampling Program (FDSP)
    - Work Plan progress - HASP approved by USACE, continuing work on UFP QAPP and work plan.
    - Property access completed - received access to all but two properties.
    - Schedule – Will begin installing samplers as weather permits.
- Review of Rogers Island Data
    - Continuing to review data provided by EPA,
    - Planning on trip to Edison EPA Offices to find additional documentation,
    - Will prepare summary for discussions with GE and Town of Fort Edward representatives.
- Data package sent to Canal Corps - Summarized sampling that has been conducted on Canal Corps property.
- Continuing to update database in an effort to prepare for future sampling events, and house all data and notes in one place.
- Updating Map books - Updating the overview and use area map books with the 2009 data, this will be distributed to the EPA, DEC, DOH and GE.
- Schedule next month's meeting.

Administrative

- No issues.

Monthly Call AGENDA
Hudson River Floodplains
February 25, 2010 3:00 EDT

Participants dial in number 888-804-4584 ID 96178

To initiate the call dial in using ID 961784221

Project Items

- 2010 Sampling Event and RAs
    - Selection of 2010 sample locations - Continuing meet with EPA on several occasions to discus potential locations, preparing list of potential properties to be submitted to GE.
    - Selection of 2010 RAs - Meeting held with GE on January 13th
- Long Term Floodplain Deposition Sampling Program (FDSP)
    - Work Plan progress - HASP approved by USACE, continuing work on UFP QAPP and work plan.
    - Property access completed - received access to all but two properties.
    - Schedule – Installed first devices on January 26th will continue to install weather permitting.
- Review of Rogers Island Data
    - Continuing to review data provided by EPA,
    - February 4th trip to Edison EPA Offices to find additional documentation,
    - Preparing summary for discussions with GE and Town of Fort Edward representatives. Anticipated to be finished this week.
- Prepared and sent letters to property owners sampled in 2009 by EPA.
- Submitted 2009 oversight daily field reports to EPA.
- Reviewed GE's 2009 Data Summary Report and Documentation Report, and will provide comments to EPA.
- Data package sent to Canal Corps on January 19, 2010- Summarized sampling that has been conducted on Canal Corps property.
- Continuing to update database in an effort to prepare for future sampling events, and house all data and notes in one place.
- Updating Map books - Updating the overview and use area map books with the 2009 data, this will be distributed to the EPA, DEC, DOH and GE.
- Schedule next month's meeting.
-

Administrative

- No issues.

Monthly Call AGENDA
Hudson River Floodplains
March 15, 2010 11:00 EDT

Participants dial in number 888-804-4584 ID 96178

To initiate the call dial in using ID 961784221

Project Items

- 2010 Sampling Event and RAs
    - Meeting set up with GE for April 15th to discuss potential sampling locations.
- Long Term Floodplain Deposition Sampling Program (FDSP).
    - Schedule – Completed installation of remaining devices on Thursday 3/11.
    - Work plan – Draft completed and in internal review process. Submitted request for lab on March 10, 2010.
- Review of Rogers Island Data
    - Distributed maps and data summary on March 5 & 9, 2010 to both GE and Town of Fort Edward representatives.
- Continuing to update database in an effort to prepare for future sampling events, and house all data and notes in one place.
- Updating map books - Updating the overview and use area map books with the 2009 data, this will be distributed to the EPA, DEC, DOH and GE. Anticipated completion end of March.
- RI Sampling Plan progress - update on John Kern status
- Schedule next month's meeting.

Administrative

- No issues.

Monthly Call AGENDA
Hudson River Floodplains
November 19, 2009 3:00 EDT

Participants dial in number 888-804-4584 ID 96178

To initiate the call dial in using ID 961784221

Project Items

- Schedule for Monthly Hudson Floodplains Conference Call.
- 2009 Short Term Response Actions (RAs)
    - Completion of 13 RAs
- 2010 Sampling Event and RAs
    - Review of 2009 data
    - Selection of 2010 sample locations
    - Selection of 2010 RAs
- Annual Sampling
    - Work Plan progress
        - General Scope
        - UFP QAPP
    - Schedule
- Review of Rogers Island Data
- Review of National Park Service Data
- Schedule December meeting

Administrative

- WVN for Archaeological Support of Short Term RAs - Pending

Monthly Call AGENDA
Hudson River Floodplains
December 17, 2009 3:00 EDT

Participants dial in number 888-804-4584 ID 96178

To initiate the call dial in using ID 961784221

Project Items

- 2010 Sampling Event and RAs (E & E assisting EPA)
  - Review of 2009 data (GE and Weston)
  - Review of GE letters (Includes 2009 data)
  - Selection of 2010 sample locations – January 13th meeting with GE
  - Selection of 2010 RAs
- Long Term Floodplain Deposition Sampling Program (FDSP) 5 to 10 yr duration.
  - Work Plan progress
  - Property access
  - HASP – USACE approved on 12/14/09
  - Schedule – Install sediment traps end December, early January.
- Review of Rogers Island Data – looking for data gaps
- Map book of National Park Service Data – completed and sent out on 12/4/09
- Schedule next month's meeting

Administrative

- No issues.

From: Chapman, Melanie S.
Sent: Wednesday, October 07, 2009 2:16 PM
To: Meyers, Bob; Gulczewski, Jill
Cc: Klawinski, Gary; Cheplowitz, Michael
Subject: Notes from today's floodplains/annual sampling meeting

Attachments: Annual Sampling_10-7-09.xls

Hello Bob and Jill,
Attached is the latest and greatest 2009 annual sampling table based from today's meeting with EPA, DEC, and DOH. This table is also located on the Hudson projects drive in the floodplains folder.
During the meeting we discussed the following:
1) Basic sequence of annual sampling events: site selection/access process, sediment trap type decision, QAPP development, field sample collection. Dave wants the traps in by the end of November 2009.
2) Discussed the sites listed on the attached table and reviewed each one via GIS and virtuals.
3) Sediment trap discussion: types, needs, locations on a site.
4) Quick updates on: DOH well study, clean up threshold numbers, waterline issues.

Please let me know if you have any questions.

Thanks,
Melanie

Melanie Chapman, M.E.M.
Environmental Scientist
Ecology & Environment, Inc.
Albany, NY
518-459-1980 (5106)
mchapman@ene.com

Attachment 2 – Field Sample Collection Standard Operating Procedures

Title:	**SAMPLING EQUIPMENT DECONTAMINATION**
Category:	ENV 3.15
Revised:	March 1999

STANDARD OPERATING PROCEDURE

SAMPLING EQUIPMENT DECONTAMINATION

ecology and environment, inc.
368 Pleasant View Drive / Lancaster, New York 14086 / (716) 684-8060

TITLE:	**SAMPLING EQUIPMENT DECONTAMINATION**
CATEGORY:	ENV 3.15
REVISED:	March 1999

TABLE OF CONTENTS

LIST OF TABLES

TITLE:	SAMPLING EQUIPMENT DECONTAMINATION		
CATEGORY:	ENV 3.15	REVISED:	March 1999

1. Scope and Application

The purpose of this procedure is to provide a description of methods for preventing or reducing cross-contamination and general guidelines for designing and selecting decontamination procedures for use at potential hazardous waste sites. The decontamination procedures chosen will prevent introduction and cross-contamination of suspected contaminants in environmental samples, and will protect the health and safety of site personnel.

2. Method Summary

Removing or neutralizing contaminants that have accumulated on personnel and equipment ensures protection of personnel from permeating substances, reduces/eliminates transfer of contaminants to clean areas, prevents the mixing of incompatible substances, and minimizes the likelihood of sample contamination.

Cross-contamination can be removed by physical decontamination procedures. The abrasive and non-abrasive methods include the use of brushes, high pressure water, air and wet blasting, and high pressure Freon cleaning. These methods should be followed by a wash/rinse process using appropriate cleaning solutions. A general protocol for cleaning with solutions is as follows:

1. Physical removal.
2. Non-phosphate detergent plus tap water.
3. Tap water.
4. 10% nitric acid.
5. Distilled/deionized water rinse.
6. Solvent rinse.
7. Total air dry.
8. Triple rinse with distilled/deionized water.

This procedure can be expanded to include additional or alternate solvent rinses that will remove specified target compounds if required by site-specific work plans (WP) or as directed by a particular client.

3. Interferences

The use of distilled/deionized water commonly available from commercial vendors may be acceptable for decontamination of sampling equipment provided that it has been verified by laboratory analysis to be analyte-free distilled/deionized water. Distilled water available from local grocery stores and pharmacies is generally not acceptable for final decontamination rinses. Contaminant-free deionized water is available from commercial vendors and may be shipped directly to the site or your hotel.

The use of an untreated potable water supply is not an acceptable substitute for tap water. Tap water may be used from any municipal water treatment system.

4. Equipment/Apparatus

The following are standard materials and equipment used as a part of the decontamination process:

- Appropriate protective clothing;
- Air purifying respirator (APR);
- Field log book;
- Non-phosphate detergent;
- Selected high purity, contaminant-free solvents;
- Long-handled brushes;
- Drop cloths (plastic sheeting);
- Trash containers;
- Paper towels;
- Galvanized tubs or equivalent (e.g., baby pools);
- Tap water;
- Contaminant-free distilled/deionized water;
- Metal/plastic container for storage and disposal of contaminated wash solutions;
- Pressurized sprayers, H_2O;
- Pressurized sprayers, solvents;
- Trash bags;
- Aluminum foil;
- Sample containers;

- Safety glasses or splash shield; and
- Emergency eyewash bottle.

5. Reagents

There are no reagents used in this procedure aside from decontamination solutions used for the equipment. The type of decontamination solution to be used shall depend upon the type and degree of contamination present and as specified in the project/site-specific Quality Assurance Project Plan (QAPP).

In general, the following solvents are utilized for decontamination purposes:

- 10% nitric acid wash (reagent grade nitric acid diluted with deionized/distilled water – 1 part acid to 10 parts water)[a];
- Acetone (pesticide grade)[b] ;
- Hexane (pesticide grade)[b];
- Methanol; and
- Methylene chloride[b].

[a] Only if sample is to be analyzed for trace metals.
[b] Only if sample is to be analyzed for organics requiring specific or specialized decontamination procedures. These solvents must be kept away from samples in order to avoid contamination by decon solvents.

6. Procedures

Decontamination is the process of removing or neutralizing contaminants that have accumulated on both personnel and equipment. Specific procedures in each case are designed accordingly and may be identified in either the Health and Safety Plan (HSP), WP, QAPP, or all three.

As part of the HSP, a personnel decontamination plan should be developed and set up before any personnel or equipment enters the areas of potential contamination. Decontamination procedures for equipment will be specified in the WP and the associated QAPP. These plans should include:

- Number and layout of decontamination stations;
- Decontamination equipment needed (see Section 4);

- Appropriate decontamination methods;
- Procedures to prevent contamination of clean areas;
- Methods and procedures to minimize worker contact with contaminants during removal of protective clothing;
- Methods and procedures to prevent cross-contamination of samples and maintain sample integrity and sample custody; and
- Methods for disposal of contaminated clothing, equipment, and solutions.

Revisions to these plans may be necessary for health and safety when the types of protective clothing, site conditions, or on-site hazards are reassessed based on new information.

Prevention of Contamination

Several procedures can be established to minimize contact with waste and the potential for contamination. For example:

- Employing work practices that minimize contact with hazardous substances (e.g., avoid areas of obvious contamination, avoid touching potentially hazardous substances);
- Use of remote sampling, handling, and container-opening techniques;
- Covering monitoring and sampling equipment with plastic or other protective material;
- Use of disposable outer garments and disposable sampling equipment with proper containment of these disposable items;
- Use of disposable towels to clean the outer surfaces of sample bottles before and after sample collection; and
- Encasing the source of contaminants with plastic sheeting or overpacks.

Proper procedures for dressing prior to entrance into contaminated areas will minimize the potential for contaminants to bypass the protective clothing. Generally, all fasteners (zippers, buttons, snaps, etc.) should be used, gloves and boots tucked under or over sleeves and pant legs, and all junctures taped (see the Health and Safety Plan for these procedures).

Decontamination Methods

All personnel, samples, and equipment leaving the contaminated area of a site must be decontaminated to remove any chemicals or infectious organisms that may have adhered to them. Various decontamination methods will either physically remove, inactivate by chemical detoxification/disinfection/sterilization, or remove contaminants by both physical and chemical means.

In many cases, gross contamination can be removed by physical means. The physical decontamination techniques can be grouped into two categories: abrasive methods and non-abrasive methods.

6.1 Abrasive Cleaning Methods

Abrasive cleaning methods work by rubbing and wearing away the top layer of the surface containing the contaminant. The following reviews the available abrasive methods.

Mechanical

Mechanical methods include using brushes with metal, nylon, or natural bristles. The amount and type of contaminants removed will vary with the hardness of bristles, length of time brushing, and degree of brush contact. Material may also be removed by using appropriate tools to scrape, pry, or otherwise remove adhered materials.

Air Blasting

Air blasting equipment uses compressed air to force abrasive material through a nozzle at high velocities. The distance between nozzle and surface cleaned, air pressure, and time of air blasting dictate cleaning efficiency. The method's disadvantages are its inability to control the exact amount of material removed and its large amount of waste generated.

Wet Blasting

Wet blast cleaning involves the use of a suspended fine abrasive. The abrasive/water mixture is delivered by compressed air to the contaminated area. By using very fine abrasives, the amount of materials removed can be carefully controlled.

6.2 Non-abrasive Cleaning Methods

Non-abrasive cleaning methods work by either dissolution or by forcing the contaminant off a surface with pressure. In general, less of the equipment surface is removed using non-abrasive methods.

High-Pressure Water

This method consists of a high-pressure pump, an operator controlled directional nozzle, and high-pressure hose. Operating pressure usually ranges from 340 to 680 psi, which relates to flow rates of 20 to 140 lpm.

Steam Cleaning

This method uses water delivered at high pressure and high temperature in order to remove accumulated solids and/or oils.

Ultra-High-Pressure Water

This system produces a water jet from 1,000 to 4,000 atm. This ultra-high-pressure spray can remove tightly-adhered surface films. The water velocity ranges from 500 m/sec. (1,000 atm) to 900 m/sec. (4,000 atm). Additives can be used to enhance the cleaning action, if approved by the QAPP for the project.

High-Pressure Freon Cleaning

Freon cleaning is a very effective method for cleaning cloth, rubber, plastic, and external/internal metal surfaces. Freon 113 (trichlorotriflorethane) is dense, chemically stable, relatively non-toxic, and leaves no residue. The vapor is easily removed from the air by activated charcoal. A high pressure (1,000 atm) jet of liquid Freon 113 is directed onto the surface to be cleaned. The Freon can be collected in a sump, filtered, and reused.

Physical removal of gross contamination should be followed by a wash/rinse process using cleaning solutions. One or more of the following methods utilize cleaning solutions.

Dissolving

Removal of surface contaminants can be accomplished by chemically dissolving them, although the solvent must be compatible with the equipment and protective clothing. Organic solvents include alcohols, ethers, ketones, aromatics, straight-chain alkanes, and common petroleum products. Halogenated solvents are generally incompatible with protective clothing and are toxic. Table 1 provides a general guide to the solubility of contaminant categories in four types of solvents.

Surfactants

Surfactants reduce adhesion forces between contaminants and the surface being cleaned and prevents reposition of the contaminants. Non-phosphate detergents dissolved in tap water is an acceptable surfactant solution.

Rinsing

Contaminants are removed and rinsing through dilution, physical attraction, and solubilization.

Disinfection/Sterilization

Disinfectants are a practical means of inactivating infectious agents. Unfortunately, standard sterilization methods are impractical for large equipment and personal protective clothing.

6.3 Field Sampling Equipment Cleaning Procedures

The following steps for equipment cleaning should be followed for general field sampling activities.

1. Physical removal (abrasive or non-abrasive methods).
2. Scrub with non-phosphate detergent plus tap water.
3. Tap water rinse.
4. 10% nitric acid (required during sampling for inorganics only).
5. Distilled/deionized water rinse.
6. Solvent rinse (required during sampling for organics only).
7. Total air dry (required during sampling for organics only).
8. Triple rinse with distilled/deionized water.

Table 1 lists solvent rinses which may be required for elimination of particular chemicals. After each solvent rinse, the equipment should be air-dried and triple-rinsed with distilled/deionized water.

Solvent rinses are not necessarily required when organics are not a contaminant of concern. Similarly, an acid rinse is not necessarily required if analysis does not include inorganics.

NOTE: Reference the appropriate analytical procedure for specific decontamination solutions required for adequate removal of the contaminants of concern.

Sampling equipment that requires the use of plastic or teflon tubing should be disassembled, cleaned, and the tubing replaced with clean tubing, if necessary, before commencement of sampling or between sampling locations.

Table 1 Decontamination Solvents

Solvent	Soluble Contaminants
Water	Low-chain compounds Salts Some organic acids and other polar compounds
Dilute Bases For example: ■ detergent ■ soap	Acidic compounds Phenol Thiols Some nitro and sulfonic compounds
Organic Solvents: For example: ■ alcohols (methanol) ■ ethers ■ ketones ■ aromatics ■ straight-chain alkanes (e.g., hexane) ■ common petroleum products (e.g., fuel oil, kerosene)	Nonpolar compounds (e.g., some organic compounds)

WARNING: Some organic solvents can permeate and/or degrade the protective clothing.

7. Quality Assurance/Quality Control

QA/QC samples are intended to provide information concerning possible cross-contamination during collection, handling, preparation, and packing of samples from field locations for subsequent review and interpretation. A field blank (rinsate blank) provides an additional check on possible sources of contamination from ambient air and from sampling instruments used to collect and transfer samples into sample containers.

A field blank (rinsate blank) consists of a sample of analyte-free water passed through/over a precleaned/decontaminated sampling device and placed in a clean area to attempt to simulate a worst-case condition regarding ambient air contributions to sample contamination.

Field blanks should be collected at a rate of one per day per sample matrix even if samples are not shipped that day. The field blanks should return to the lab with the trip blanks originally sent to the field and be packed with their associated matrix.

The field blank places a mechanism of control on equipment decontamination, sample handling, storage, and shipment procedures. It is also indicative of ambient conditions and/or equipment conditions that may affect the quality of the samples.

Holding times for field blanks analyzed by CLP methods begin when the blank is received in the laboratory (as documented on the chain of parameters and associated analytical methods).

Holding times for samples and blanks analyzed by SW-846 or the 600 and 500 series begins at the time of sample collection.

8. Health and Safety

Decontamination can pose hazards under certain circumstances even though performed to protect health and safety. Hazardous substances may be incompatible with decontamination methods (i.e., the method may react with contaminants to produce heat, explosion, or toxic products). Decontamination methods may be incompatible with clothing or equipment (e.g., some solvents can permeate and/or degrade protective clothing). Also, a direct health hazard to workers can be posed from chemical decontamination solutions that may be hazardous if inhaled or may be flammable.

The decontamination solutions must be determined to be compatible before use. Any method that permeates, degrades, or damages personal protective equipment should not be used. If decontamination methods do pose a direct health hazard, measures should be taken to protect personnel or modified to eliminate the hazard.

All site-specific safety procedures should be followed for the cleaning operation. At a minimum, the following precautions should be taken:

1. Safety glasses with splash shields or goggles, neoprene gloves, and laboratory apron should be worn.

2. All solvent rinsing operations should be conducted under a fume hood or in open air.

3. No eating, smoking, drinking, chewing, or any hand-to-mouth contact is permitted.

9. References

Field Sampling Procedures Manual, New Jersey Department of Environmental Protection, 1988.

A Compendium of Superfund Field Operations Methods, EPA 540/p-87/001.

Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, USEPA Region IV, April 1, 1986.

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/USCG/EPA, October 1985.

B Health and Safety Plan

Revision 8
January 2008

ECOLOGY AND ENVIRONMENT, INC.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Project: Upper Hudson River Floodplain Deposition Sampling Program

Project No.: 002260.KZ11.02.01

TDD/PAN No.:

Project Location: Upper Hudson River

Proposed Date of Field Activities: December 2009 though June 2016 (Annually)

Project Director: Gary Klawinski

Project Manager: Bob Meyers

Prepared by: Michael Cheplowitz Date Prepared: 03/26/2010

Approved by: Tom Siener Date Approved: 03/26/2010

Table of Contents

List of Tables

1. INTRODUCTION

1.1 POLICY

It is E & E's policy to ensure the health and safety of its employees, the public, and the environment during the performance of work it conducts. This site-specific health and safety plan (SHASP) establishes the procedures and requirements to ensure the health and safety of E & E employees for the above-named project. E & E's overall safety and health program is described in *Corporate Health and Safety Program* (CHSP). After reading this plan, applicable E & E employees shall read and sign E & E's Site-Specific Health and Safety Plan Acceptance form.

This SHASP has been developed for the sole use of E & E employees and is not intended for use by firms not participating in E & E's training and health and safety programs. Subcontractors are responsible for developing and providing their own safety plans.

This SHASP has been prepared to meet the following applicable regulatory requirements and guidance:

Applicable Regulation/Guidance
29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER)
Other: U.S. Army Corps of Engineers Safety and Health Manual EM 385-1-1 and ER 385-1-92

1.2 SCOPE OF WORK

Description of Work: Sampling devices will be installed along the Upper Hudson River (UHR). Sampling of these devices for flood deposits will occur after flooding events. A flooding event is defined as flows exceeding 15,000 cubic feet per second (cfs). Sampling of these devices will include the sampling of flood deposits collected in these devices, the shipment of the samples to the lab and the disposal of any waste generated from the sampling.

Equipment/Supplies: Attachment 1 contains a checklist of equipment and supplies that will be needed for this work.

The following is a description of each numbered task:

Task Number	Task Description
01	Installation of sampling devices: this will include bring devices to site securing them at there location and documentation of the location.
02	Sampling of devices: sampling of the devices will occur when river flows exceed 15,000 cfs. Samples will be collected, jarred and sent to the laboratory.

1.3 SITE DESCRIPTION

Site Map: A site map or sketch is attached at the end of this plan.

Site History/Description (see project work plan for detailed description): The UHR project area is the section of the Hudson River from the Former Fort Edward Dam to the Federal Dam at Troy. The river and floodplains of the project area are contaminated with PCBs that were historically released into the river by General Electric Company.

Is the site currently in operation? ☒ Yes ☐ No

Locations of Contaminants/Wastes: The contaminants of this site are PCBs. The PCBs are located in the soil of the floodplains and the sediment of the river.

Types and Characteristics of Contaminants/Wastes:

☒ Liquid	☐ Solid	☒ Sludge	☐ Gas/Vapor
☐ Flammable/Ignitable	☐ Volatile	☐ Corrosive	☐ Acutely Toxic
☐ Explosive	☐ Reactive	☒ Carcinogenic	☐ Radioactive
☐ Medical/Pathogenic	Other:		

2. ORGANIZATION AND RESPONSIBILITIES

E & E team personnel shall have on-site responsibilities as described in E & E's standard operating procedure (SOP) for Site Entry Procedures (GENTECH 2.2). The project team, including qualified alternates, is identified below.

Name	Site Role/Responsibility
Bob Meyers	Project/Task Manager
Tom Siener	Site Safety Officer
Mike Cheplowitz	Field Team Leader/Safety Monitor
Mark Surette	Sampler
Bryan Kroon	Sample Manager

3. TRAINING

Prior to work, E & E team personnel shall have received training as indicated below. As applicable, personnel shall have read the project work plan, sampling and analysis plan, and/or quality assurance project plan prior to project work.

Training	Required
40-Hour OSHA HAZWOPER Initial Training and Annual Refresher (29 CFR 1910.120)	X
Annual First Aid/CPR	X
Hazard Communication (29 CFR 1910.1200)	X
40-Hour Radiation Protection Procedures and Investigative Methods	

Training	Required
8-Hour General Radiation Health and Safety	
Radiation Refresher	
DOT and Biannual Refresher	X
Other: _____	

4. MEDICAL SURVEILLANCE

4.1 MEDICAL SURVEILLANCE PROGRAM

E & E field personnel shall actively participate in E & E's medical surveillance program as described in the CHSP and shall have received, within the past year, an appropriate physical examination and health rating.

E & E's health and safety record (HSR) form will be maintained on site by each E & E employee for the duration of his or her work. E & E employees should inform the site safety officer (SSO) of any allergies, medical conditions, or similar situations that are relevant to the safe conduct of the work to which this SHASP applies.

Is there a concern for radiation at the site? ☐ Yes ☒ No

If no, go to 5.1.

4.2 RADIATION EXPOSURE

4.2.1 External Dosimetry

Thermoluminescent Dosimeter (TLD) Badges: TLD badges are to be worn by all E & E field personnel on certain required sites.

Pocket Dosimeters: N/A

Other:

4.2.2 Internal Dosimetry

☐ Whole body count ☐ Bioassay ☐ Other

Requirements: N/A

4.2.3 Radiation Dose

Dose Limits: E & E's radiation dose limits are stated in the CHSP. Implementation of these dose limits may be designated on a site specific basis.

Site-Specific Dose Limits: N/A

ALARA Policy: Radiation doses to E & E personnel shall be maintained as low as reasonably achievable (ALARA), taking into account the work objective, state of technology available, economics of improvements in dose reduction with respect to overall

health and safety, and other societal and socioeconomic considerations.

5. SITE CONTROL

5.1 SITE LAYOUT AND WORK ZONES

Site Work Zones: Refer to the map or site sketch, attached at the end of this plan, for designated work zones.

Site Access Requirements and Special Considerations: Permission of property owner must be obtained prior to accessing property

Illumination Requirements: Work Will be preformed during daylight hours.

Sanitary Facilities (e.g., toilet, shower, potable water): public facilities area available throughout the project area, and at the Hudson River Annex

On-Site Communications: N/A

Other Site-Control Requirements: N/A

5.2 SAFE WORK PRACTICES

Daily Safety Meeting: A daily safety meeting will be conducted for all E & E personnel and documented on the Daily Safety Meeting Record form or in the field logbook. The information and data obtained from applicable site characterization and analysis will be addressed in the safety meetings and also used to update this SHASP, as necessary.

Work Limitations: Work shall be limited to a maximum of 12 hours per day. If 12 consecutive days are worked, at least one day off shall be provided before work is resumed. Work will be conducted in daylight hours unless prior approval is obtained and the illumination requirements in 29 CFR 1910.120(m) are satisfied.

Weather Limitations: Work shall not be conducted during electrical storms. Work conducted in other inclement weather (e.g., rain, snow) will be approved by project management and the regional safety coordinator or designee.

Other Work Limitations:

Buddy System: Field work will be conducted in pairs of team members according to the buddy system.

Line of Sight: Each field team member shall remain in the line of sight and within verbal communication of at least one other team member.

Eating, Drinking, and Smoking: Eating, drinking, smoking, and the use of tobacco products shall be prohibited in the exclusion and contamination reduction areas, at a minimum, and shall only be permitted in designated areas.

Contamination Avoidance: Field personnel shall avoid unnecessary contamination of personnel, equipment, and materials to the extent practicable.

Sample Handling: Protective gloves of a type designated in Section 7 will be worn when containerized samples are handled for labeling, packaging, transportation, and other purposes.

Other Safe Work Practices:

6. HAZARD EVALUATION AND CONTROL

6.1 PHYSICAL HAZARD EVALUATION AND CONTROL

Potential physical hazards and their applicable control measures are described in the following table for each task.

Hazard	Task Number	Hazard Control Measures
Biological (flora, fauna, etc.)	1,2	■ Potential hazard: ■ Establish site-specific procedures for working around identified hazards. ■ Other:
Cold Stress	1,2	■ Provide warm break area and adequate breaks. ■ Provide warm noncaffeinated beverages. ■ Promote cold stress awareness. ■ See *Cold Stress Prevention and Treatment* (attached at the end of this plan if cold stress is a potential hazard).
Compressed Gas Cylinders		■ Use caution when moving or storing cylinders. ■ A cylinder is a projectile hazard if it is damaged or its neck is broken. ■ Store cylinders upright and secure them by chains or other means. ■ Other:
Confined Space		■ Ensure compliance with 29 CFR 1910.146. ■ See SOP for Confined Space Entry. Additional documentation is required. ■ Other:
Drilling		■ See SOP for Health and Safety on Drilling Rig Operations. Additional documentation may be required. ■ Landfill caps will not be penetrated without prior discussions with corporate health and safety staff. ■ Other:
Drums and Containers		■ Ensure compliance with 29 CFR 1910.120(j). ■ Consider unlabeled drums or containers to contain hazardous substances and handle accordingly until the contents are identified. ■ Inspect drums or containers and assure integrity prior to handling.

Hazard	Task Number	Hazard Control Measures
		■ Move drums or containers only as necessary; use caution and warn nearby personnel of potential hazards.
		■ Open, sample, and/or move drums or containers in accordance with established procedures; use approved drum/container-handling equipment. ■ Other:
Electrical	1	■ Ensure compliance with 29 CFR 1910 Subparts J and S. ■ Locate and mark energized lines. ■ De-energize lines as necessary. ■ Ground all electrical circuits. ■ Guard or isolate temporary wiring to prevent accidental contact. ■ Evaluate potential areas of high moisture or standing water and define special electrical needs. ■ Other:
Excavation and Trenching		■ Ensure that excavations comply with and personnel are informed of the requirements of 29 CFR 1926 Subpart P. ■ Ensure that any required sloping or shoring systems are approved as per 29 CFR 1926 Subpart P. ■ Identify special personal protective equipment (PPE) (see Section 7) and monitoring (see Section 8) needs if personnel are required to enter approved excavated areas or trenches. ■ Maintain line of sight between equipment operators and personnel in excavations/trenches. Such personnel are prohibited from working in close proximity to operating machinery. ■ Suspend or shut down operations at signs of cave in, excessive water, defective shoring, changing weather, or unacceptable monitoring results. ■ Other:
Fire and Explosion		■ Inform personnel of the location(s) of potential fire/explosion hazards. ■ Establish site-specific procedures for working around flammables. ■ Ensure that appropriate fire suppression equipment and systems are available and in good working order. ■ Define requirements for intrinsically safe equipment. ■ Identify special monitoring needs (see Section 8). ■ Remove ignition sources from flammable atmospheres. ■ Coordinate with local fire-fighting groups regarding potential fire/explosion situations. ■ Establish contingency plans and review daily with team members. ■ Other:
Heat Stress	1,2	■ Provide cool break area and adequate breaks. ■ Provide cool noncaffeinated beverages. ■ Promote heat stress awareness. ■ Use active cooling devices (e.g., cooling vests) where specified. ■ See *Heat Stress Prevention and Treatment* (attached at the end of

Hazard	Task Number	Hazard Control Measures
		this plan if heat stress is a potential hazard).
Heavy Equipment Operation		■ Define equipment routes, traffic patterns, and site-specific safety measures. ■ Ensure that operators are properly trained and equipment has been properly inspected and maintained. Verify back-up alarms. ■ Ensure that ground spotters are assigned and informed of proper hand signals and communication protocols. ■ Identify special PPE (Section 7) and monitoring (Section 8) needs. ■ Ensure that field personnel do not work in close proximity to operating equipment. ■ Ensure that lifting capacities, load limits, etc., are not exceeded. ■ Other:
Heights (Scaffolding, Ladders, etc.)		■ Ensure compliance with applicable subparts of 29 CFR 1910. ■ Identify special PPE needs (e.g., lanyards, safety nets, etc.) ■ Other:
Noise		■ Establish noise level standards for on-site equipment/operations. ■ Inform personnel of hearing protection requirements (Section 7). ■ Define site-specific requirements for noise monitoring (Section 8). ■ Other:
Overhead Obstructions		■ Wear hard hat. ■ Other:
Power Tools		■ Ensure compliance with 29 CFR 1910 Subpart P. ■ Other:
Sunburn	1,2	■ Apply sunscreen. ■ Wear hats/caps and long sleeves. ■ Other:
Utility Lines	1,2	■ Identify/locate existing utilities prior to work. ■ Ensure that overhead utility lines are at least 25 feet away from project activities. ■ Contact utilities to confirm locations, as necessary. ■ Other:
Weather Extremes	1,2	■ Potential hazards: ■ Establish site-specific contingencies for severe weather situations. ■ Provide for frequent weather broadcasts. ■ Weatherize safety gear, as necessary (e.g., ensure eye wash units cannot freeze, etc.). ■ Identify special PPE (Section 7) needs. ■ Discontinue work during severe weather. ■ Other:
Other: In-river or near river work within 6 feet of water's edge.	1,2	■ During all in-river work or work near the river where immersion is possible, employee shall wear a United States Coast Guard (USCG)-approved commercial Type III PFD. All personnel conducting on-water oversight shall wear a USCG-approved Type V survival suit (Mustang type) when the sum of the air temperature and water

Hazard	Task Number	Hazard Control Measures
		temperature is less than 90 F. ■
Other:		■ ■

6.2 CHEMICAL HAZARD EVALUATION AND CONTROL

6.2.1 Chemical Hazard Evaluation

Potential chemical hazards are described by task number in Table 6-1. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

6.2.2 Chemical Hazard Control

An appropriate combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below published exposure levels (see Section 6.2.1).

Applicable Engineering/Administrative Control Measures: Samplers must wear PPE as described in section 7.2

PPE: See Section 7.

6.3 RADIOLOGICAL HAZARD EVALUATION AND CONTROL

6.3.1 Radiological Hazard Evaluation

Potential radiological hazards are described below by task number. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Task Number	Radionuclide	DAC (μCi/ml)	Route(s) of Exposure	Major Radiation(s)	Energy(s) (MeV)	Half-Life

6.3.2 Radiological Hazard Control

Engineering/administrative controls and work practices shall be instituted to reduce and maintain employee exposures to a level at or below the permissible exposure/dose limits (see sections 4.2.3 and 6.3.1). Whenever engineering/administrative controls and work practices are not feasible or effective, any reasonable combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below permissible exposure/dose limits.

Applicable Engineering/Administrative Control Measures: N/A

PPE: See Section 7.

TABLE 6-1

CHEMICAL HAZARD EVALUATION

Task Number	Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/ Description	FID/PID	
		PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
01/02	PCB* ***54%***	0.5 ***mg/m^3***	0.001 ***mg/m^3***	0.5 ***mg/m^3***	***Y***	***inhalation, skin absorption, ingestion, skin and/or eye contact***	***Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]***	-----	-----	-----
01/02	PCB* ***42%***	1 ***mg/m^3***	0.001 ***mg/m^3***	1 ***mg/m^3***	***Y***	***inhalation, skin absorption, ingestion, skin and/or eye contact***	***Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]***	-----	-----	-----
01/02	***Hexane***	50 ***ppm***	50 ***ppm***	50 ***ppm***	***N***	***inhalation, ingestion, skin and/or eye contact***	***Headache, nausea, giddiness***	***Gasoline***	***75 %***	***10.18***
01/02	***Alconox***	----	----	----	***Y***	***inhalation, ingestion, skin and/or eye contact***	***Irritation to skin, eye, lung***	----	----	----
01/02	***Acetone***	750 ***ppm***	250 ***ppm***	1000 ***ppm***	***Y***	***inhalation, ingestion, skin and/or eye contact***	***Irritation of eyes, dry mouth, throat, nausea, dizziness***	***Sweet Mint***	***60 %***	***9.69***

Note: Use an asterisk (*) to indicate known or suspected carcinogens.

7. LEVEL OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

The following levels of protection (LOPs) have been selected for each work task based on an evaluation of the potential or known hazards, the routes of potential hazard, and the performance specifications of the PPE. On-site monitoring results and other information obtained from on-site activities will be used to modify these LOPs and the PPE, as necessary, to ensure sufficient personnel protection. The authorized LOP and PPE shall only be changed with the approval of the regional safety coordinator or designee. Level A is not included below because Level A activities, which are performed infrequently, will require special planning and addenda to this SHASP.

Task Number	B	C	D	Modifications Allowed
01			X	
02			X	

Note: Use "X" for initial levels of protection. Use "(X)" to indicate levels of protection that may be used as site conditions warrant.

7.2 PERSONAL PROTECTIVE EQUIPMENT

The PPE selected for each task is indicated below. E & E's PPE program complies with 29 CFR 1910.120 and 29 CFR 1910 Subpart I and is described in detail in the CHSP. Refer to 29 CFR 1910 for the minimum PPE required for each LOP.

PPE	Task Number/LOP					
	01	02				
Full-face APR						
PAPR						
Cartridges:						
P100						
GMC-P100						
GME-P100						
Other:						
Positive-pressure, full-face SCBA						
Spare air tanks (Grade D air)						
Positive-pressure, full-face, supplied-air system						
Cascade system (Grade D air)						

PPE	Task Number/LOP					
	01	**02**				
Manifold system						
5-Minute escape mask						
Safety glasses	X	X				
Monogoggles						
Coveralls/clothing						
Protective clothing:						
Tyvek						
Saranex						
Other:						
Splash apron						
Inner gloves:						
Cotton						
Nitrile						
Latex						
Other:						
Outer gloves:						
Viton						
Rubber						
Neoprene						
Nitrile	X	X				
Other:						
Work gloves	X	X				
Safety boots (as per ANSI Z41)	X	X				
Neoprene safety boots (as per ANSI Z41)						
Boot covers (type: _____)						
Hearing protection (type: _____)						
Hard hat						
Face shield						
Other: Reflective safety vest	X	X				
Other: PFD on river or within 6 feet of river	X	X				

8. HEALTH AND SAFETY MONITORING

Health and safety monitoring will be conducted to ensure proper selection of engineering/administrative controls, work practices, and/or PPE so that employees are not exposed to hazardous substances at levels that exceed permissible exposure/dose limits or published exposure levels. Health and safety monitoring will be conducted using the instruments, frequency, and action levels described in Table 8-1. Health and safety monitoring instruments shall have been appropriately calibrated and/or performance-checked prior to use.

9. DECONTAMINATION PROCEDURES

All equipment, materials, and personnel will be evaluated for contamination upon leaving the exclusion area. Equipment and materials will be decontaminated and/or disposed and personnel will be decontaminated, as necessary. Decontamination will be performed in the contamination reduction area or any designated area such that the exposure of uncontaminated employees, equipment, and materials will be minimized. Specific procedures are described below.

Equipment/Material Decontamination Procedures (specified by work plan): Sampling devices will be decontaminated as specified in the Field Sampling plan. Decontamination procedures include the use of, wash tubs, brushes, spray bottles, Alconox, acetone, and hexane.

Ventilation: All decontamination procedures will be conducted in a well-ventilated area.

Personnel Decontamination Procedures: Use dry decontamination procedures all PPE(gloves) will be placed in plastic bags for disposal.

PPE Requirements for Personnel Performing Decontamination: Same as personnel working on site

Personnel Decontamination in General: Following appropriate decontamination procedures, all field personnel will wash their hands and face with soap and potable water. Personnel should shower at the end of each work shift.

Disposition of Disposable PPE: Disposable PPE must be rendered unusable and disposed as indicated in the work plan.

Disposition of Decontamination Wastes (e.g., dry wastes, decontamination fluids, etc.): All disposable equipment will be placed in a plastic bag for disposal, liquid decontamination wastes will be placed in buckets for disposal.

TABLE 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels[a]	
☐ PID (e.g., RAE mini RAE) ☐ FID (e.g., OVA 128-) ☐ TVA 1000					**Unknown Vapors** Background to 1 ppm above background: Level D 1 to 5 ppm above background: Level C 5 to 500 ppm above background: Level B >500 ppm above background: Level A	**Contaminant-Specific**
Oxygen Meter/Explosimeter					**Oxygen** <19.5% or >22.0%: Evacuate area; eliminate ignition sources; reassess conditions. 19.5 to 22.0%: Continue work in accordance with action levels for other instruments.	**Explosivity** ≤10% LEL: Continue work in accordance with action levels for other instruments; monitor continuously for combustible atmospheres. >10% LEL: Evacuate area; eliminate ignition sources; reassess conditions.
Radiation Alert Monitor (Rad-mini or RAM-4)					<0.1 mR/hr: Continue work in accordance with action levels for other instruments. ≥0.1 mR/hr: Evacuate area; reassess work plan and contact radiation safety specialist.	
Mini-Ram Particulate Monitor					**General/Unknown** Evaluate health and safety measures when dust levels exceed 2.5 milligrams per cubic meter.	**Contaminant-Specific**
HCN/H_2S (Monitox)					≥4 ppm: Leave area and consult with SSO.	
Draeger Colorimetric Tubes					**Tube** **Action Level** **Action**	
Air Monitor/Sampler Type: _____ Sampling medium: _____					**Action Level** **Action**	

TABLE 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels[a]
Personal Sampling Pump Type: _____ Sampling medium: _____					**Action Level** **Action**
Micro R Meter					<2 mR/hr: Continue work in accordance with action levels for other instruments. 2 to 5 mR/hr: In conjunction with a radiation safety specialist, continue work and perform stay-time calculations to ensure compliance with dose limits and ALARA policy. >5 mR/hr: Evacuate area to reassess work plan and evaluate options to maintain personnel exposures ALARA and within dose limits.
Ion Chamber					See micro R meter action levels above.
Radiation Survey Ratemeter/Scaler with External Detector(s)					**Detector** **Action Level** **Action**
Noise Dosimeter (Sound Level Meter)					≤85 decibels as measured using the A-weighed network (dBa): Use hearing protection if exposure will be sustained throughout work shift. >85 dBA: Use hearing protection. >120 dBA: Leave area and consult with safety personnel.
Other:					
Other:					

a Unless stated otherwise, airborne contaminant concentrations are measured as a time-weighted average in the worker's breathing zone. Acceptable concentrations for known airborne contaminants will be determined based on OSHA/NIOSH/ACGIH and/or NRC exposure limits. As a guideline, 1/2 the PEL/REL/TLV, whichever is lower should be used.

10. EMERGENCY RESPONSE

This section contains additional information pertaining to on-site emergency response and does not duplicate pertinent emergency response information contained in earlier sections of this plan (e.g., site layout, monitoring equipment, etc.). Emergency response procedures will be rehearsed regularly, as applicable, during project activities.

10.1 EMERGENCY RESPONSIBILITIES

All Personnel: All personnel shall be alert to the possibility of an on-site emergency; report potential or actual emergency situation to the team leader and SSO; and notify appropriate emergency resources, as necessary.

Team Leader: The team leader will determine the emergency actions to be performed by E & E personnel and will direct these actions. The team leader also will ensure that applicable incidents are reported to appropriate E & E and client project personnel and government agencies.

SSO: The SSO will recommend health/safety and protective measures appropriate to the emergency.

Other: _____

10.2 LOCAL AND SITE RESOURCES (including phone numbers)

Ambulance: 911

Hospital: Saratoga Hospital (518) 580-2450

Directions to Hospital (map attached at the end of this plan): From Route 4 take Route 29 East to Saratoga, Route 29 turns into Church Street. Hospital will be on the right.

Poison Control: (800) 336-6997

Police Department: Fort Edward (518) 747-6365 Mechanicville (518) 664-7383

Fire Department: Fort Edward (518) 747-8309 Mechanicville (518) 664-6121

Client Contact: Kathy Baker- USACE (816) 389-3906

Site Contact: Dave Rosoff

On-Site Telephone Number: Hudson River Field Office (518) 747-4389

Cellular Telephone Number: TBD

Radios Available: _____

Other: _____

10.3 E & E EMERGENCY CONTACTS

E & E Emergency Operations Center (24 Hours):	716/684-8060
Corporate Health and Safety Director, Dr. Paul Jonmaire:	716/684-8060 (office) 716/655-1260 (home)
Regional Office Contact:	518/459-1980(office) _____ (home)

Other:	_____ (office)
a. E & E Emergency Response Center:	716/684-8060
b. Corporate Health and Safety Director, Dr. Paul Jonmaire:	716/684-8060 (office) 716/655-1260 (home)
c. Assistant Corporate Safety Director, Tom Siener, CIH:	716/684-8060 (office) 716/662-4740 (home) 716/597-5868 (Cell)

10.4 OTHER EMERGENCY RESPONSE PROCEDURES

On-Site Evacuation Signal/Alarm (must be audible and perceptible above ambient noise and light levels): Three blasts of vehicle horn.

On-Site Assembly Area: Parking area used for specific property

Emergency Egress Route to Get Off Site: Take side roads to Route 4

Off-Site Assembly Area: Hudson River Field Office

Preferred Means of Reporting Emergencies: Cell phone

Site Security and Control: In an emergency situation, personnel will attempt to secure the affected area and control site access.

Spill Control Procedures: N/A

Emergency Decontamination Procedures: Wash hands and remove potentially contaminated PPE

PPE: Personnel will don appropriate PPE when responding to an emergency situation. The SSO and Section 7 of this plan will provide guidance regarding appropriate PPE.

Emergency Equipment: Appropriate emergency equipment is listed in Attachment 1. Adequate supplies of this equipment shall be maintained in the support area or other approved work location.

Incident Reporting Procedures: Contact E&E Inc. emergency contact with cellular phone.

ecology and environment, inc.

SITE-SPECIFIC HEALTH AND SAFETY PLAN ACCEPTANCE

Project:	
Project No.:	TDD/PAN No.:
Project Location:	
Project Manager:	Project Director:

The undersigned acknowledge that they have read and understood and agree to abide by the health and safety plan.

Name (Printed)	Name (Signature)	Date

ATTACHMENT 1

EQUIPMENT/SUPPLIES CHECKLIST

	No.
INSTRUMENTATION	
FID	
Thermal desorber	
O_2/explosimeter w/cal. Kit	
Photovac tip	
PID (probe: _____eV)	
Magnetometer	
Pipe locator	
Weather station	
Draeger tube kit (tubes: _____)	
Brunton compass	
Real-time cyanide monitor	
Real-time H_2S monitor	
Heat stress monitor	
Noise equipment	
Personal sampling pumps and supplies	
MiniRam dust monitor	
Mercury monitor	
Spare batteries (type: _____)	
RADIATION EQUIPMENT/SUPPLIES	
Documentation forms	
Portable ratemeter	
Scaler/ratemeter	
1" NaI gamma probe	
2" NaI gamma probe	
ZnS alpha probe	
GM pancake probe	
Tungsten-shielded GM probe	
Micro R meter	
Ion chamber	
Alert monitor	
Pocket dosimeter	

	No.
Dosimeter charger	
Radiation warning tape	
Radiation decon supplies	
Spare batteries (type: _____)	
SAMPLING EQUIPMENT	
4-oz. bottles	X
Half-gallon bottles	
VOA bottles	
String	
Hand bailers	
Thieving rods with bulbs	
Spoons	X
Knives	
Filter paper	
Bottle labels	X
MISCELLANEOUS	
Pump	
Surveyor's tape	
100' Fiberglass tape	
300' Nylon rope	
Nylon string	
Surveying flags	
Camera	X
Film	
Bung wrench	
Soil auger	
Pick	
Shovel	
Catalytic heater	
Propane gas	

	No.
Banner tape	
Surveying meter stick	
Chaining pins and ring	
Logbooks (___X__ large, _____ small)	1
Required MSDSs	1 set
Intrinsically safe flashlight	
Potable water	X
Gatorade or equivalent	X
Tables	
Chairs	
Weather radio	
Two-way radios	
Binoculars	
Megaphone	
Cooling vest	
EMERGENCY EQUIPMENT	
First aid kit	X
Stretcher	
Portable eye wash	X
Blood pressure monitor	
Fire blanket	
Fire extinguisher	X
Thermometer (medical)	
Spill kit	
DECONTAMINATION EQUIPMENT	
Wash tubs	
Buckets	
Scrub brushes	
Pressurized sprayer	
Spray bottle	
Detergent (type: _____)	
Solvent (type: _____)	
Plastic sheeting	
Tarps and poles	

	No.
Trash bags	X
Trash cans	
Masking tape	
Duct tape	X
Paper towels	X
Face mask	
Face mask sanitizer	
Step ladders	
Distilled water	X
Deionized water	
***SHIPPING EQUIPMENT**	
Coolers	X
Paint cans with lids, 7 clips each	
Vermiculite	
Shipping labels	X
DOT labels:	X
"Up"	X
"Danger"	
"Inside Container Complies ..."	X
Hazard Group	X
Strapping tape	X
Baggies	X
Custody seals	X
Chain-of-custody forms	X
Express shipment forms	X
Clear packing tape	X
Permanent markers	X
*A courier will be used for sample devilry if possible, which would reduce shipping requirements.	

COLD STRESS PREVENTION AND TREATMENT

Cold temperatures are potentially hazardous, especially when work is conducted without appropriate precautions. The following sections describe cold stress prevention and the recognition and treatment of cold stress emergencies.

Preventing Emergencies Due to Cold Stress

When working in situations where the ambient temperature is low, especially if low temperatures are accompanied by windy conditions, personnel should use the following cold-stress prevention measures:

- Wear warm, dry, loose-fitting clothing that is preferably worn in layers. Outer clothing should be waterproof and windproof. Inner clothing should be capable of retaining warmth even when it is wet (e.g., wool or polypropylene) or have wicking capabilities (to draw moisture and perspiration away from the skin).
- Wear lined and insulated footwear and warm gloves or mittens.
- Alternately remove and don clothing layers as necessary to regulate body temperature and reduce excess perspiration.
- Drink warm fluids as often as desired.
- Take frequent breaks to provide for cold stress monitoring.

Cold Stress Emergencies

Hypothermia. Exposure to cold can cause the body's internal temperature to drop to a dangerously low level. Hypothermia occurs when a person's body loses heat faster than it can be produced. The body's normal deep-body temperature is approximately 98.6 degrees Fahrenheit. If body temperature drops to 95 degrees Fahrenheit, uncontrollable shivering may occur. If cooling continues, these other symptoms may occur:

- Vague, slow, slurred speech;
- Forgetfulness, memory lapses;
- Inability to use hands;
- Frequent stumbling;
- Drowsiness;
- Exhaustion, collapse;
- Unconsciousness; and
- Death.

Hypothermia impairs the judgment of the victim. Hypothermia is possible even in temperatures above freezing and can be prevented by remaining warm and dry and avoiding overexposure to the cold.

If a person shows symptoms of hypothermia, perform the following:

- Remove the victim from exposure to wet and cold weather.
- Remove wet clothing.
- If the victim is only mildly affected, provide warm drinks and dry clothing.
- If the victim is more seriously affected (clumsy, confused, unable to shiver), begin safe-warming procedures such as hugging, wrapping in dry blankets, and the use of warm objects such as hot water bottles or heat packs, and arrange for evacuation. Do not give the victim warm drinks until he or she exhibits a clear level of consciousness and appears to be warming up.

Frostbite. Frostbite occurs when body tissue freezes. Severe frostbite can lead to reduced circulation and the possible need for amputation. To prevent frostbite, maintain good circulation and keep extremities warm and dry. In extreme cold, it is important to prevent heat loss from as many areas of the body as possible. Exposed limbs and the head are major areas of heat loss.

Tall, thin people; those in poor physical condition; people with chronic diseases; heavy smokers; children; the elderly; and those who have been drinking alcohol are more susceptible to frostbite than other people due to poor circulation, poor production of body heat, or both.

There may be no pain or numbness experienced with gradual freezing of body tissues. While in the cold, it is important to test extremities for sensation and ensure that clothing is loose-fitting and warm. Exposed parts of the body should be inspected routinely. Just before freezing, skin becomes bright red. As freezing continues, small white patches will appear and the skin will become less elastic, often remaining pitted after it is touched or squeezed.

Serious freezing is most common in the feet because people are less aware of them, circulation and sensation are poorer, and warm footwear is difficult to obtain. Hands are usually the next to freeze. Exposed parts of the head will freeze less rapidly because they are conditioned to exposure and have a better blood supply.

In very cold weather, avoid touching cold metal with bare body parts. In the event that this happens, release the skin gently using heat, warm water, or urine. Avoid handling gasoline, kerosene, or similar liquids which, when handled in cold weather, can cause immediate frostbite.

If a person shows symptoms of frostbite, consult a medical professional, if possible, and perform the following:

- Initiate rewarming only if subsequent refreezing is not a possibility (thawing and refreezing should always be avoided because this is very injurious to tissue). Rewarm body parts in water that is approximately 100 to 105 degrees Fahrenheit. Do not try to thaw the body parts using cold water, snow, or intense heat from fires or stoves. The whole body may be immersed in warm water if necessary.

- If a large portion of an extremity is frozen when rewarming is initiated, the deep body temperature may drop as cooled blood begins to circulate throughout the body. Provide warm liquids to alleviate this situation.

- Move the afflicted part gently and voluntarily during rewarming.

- Use pain medication if it is available. Rewarming can be acutely painful. After thawing is completed, a deep pain may persist for several days, depending on the severity of the frostbite. Pain may be a good sign as it indicates that nerve function is present.

- A dull purple color, swelling, or blisters indicate serious injury and the need for medical attention. Consult a medical professional.

HEAT STRESS PREVENTION AND TREATMENT

During Hudson River Investigations

Elevated temperatures are potentially hazardous, especially when work is conducted without appropriate precautions. The following sections describe heat stress prevention and the recognition and treatment of heat emergencies.

Effects of Heat

The human body, being warm blooded, maintains a fairly constant internal temperature, even though it is being exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands.

Interference with the elimination of heat leads to its accumulation and to the elevation of body temperature. If heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to shed large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

When the temperature of the surrounding air becomes equal to or rises above the body temperature, heat must be lost solely by vaporization of the moisture or sweat from skin surfaces. As the air becomes more humid (contains more moisture), vaporization from the skin decreases. Weather conditions including high temperatures (90 to 100 degrees F), high humidity, and little or no breeze cause the retention of body heat. Such conditions or a succession of such days (a heat wave) increase the chances of a medical emergency due to heat.

Preventing Emergencies Due to Heat

When working in situations where the ambient temperatures and humidity are high, and especially in situations where protection levels A, B, or C are required, the site safety officer should:

- Ensure that all employees drink plenty of fluids (water or sports drinks - not caffeinated or carbonated drinks);
- Ensure that frequent breaks are scheduled so overheating does not occur;
- Revise work schedules, when necessary, to take advantage of the cooler parts of the day (i.e., 5:00 a.m. to 11:00 a.m. and 6:00 p.m. to nightfall);
- Provide shelter or shaded rest areas;
- Provide cooling devices (showers, cooling vests), and
- Train workers to recognize and treat heat stress.

Preventing Emergencies Due to Heat

While working in level D (normal work clothing), heat stress screening should be conducted based on the Wet Bulb, Globe Temperature (WBGT). The WBGT takes into account the effects of air temperature, radiant heat, and humidity. Appropriate work-rest regimens should be implemented based on the WBGT. Table 1 includes the WBGT criteria for three listed work-rest regimens. Acclimatization requires up to three weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work.

Table 1. Screening Criteria for Heat Stress Exposure

WBGT Values in Degrees Centigrade

	Acclimatized				Unacclimatized			
Work Demands	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
100% Work	29.5	27.5	26		27.5	25	22.5	
75% Work; 25% Rest	30.5	28.5	27.5		29	26.5	24.5	
50% Work; 50% Rest	31.5	29.5	28.5	27.5	30	28	26.5	25
25% Work 75% Rest	32.5	31	30	29.5	31	29	28	26.5

Source: ACGIH TLVs and BEIs

In the event it is deemed necessary to upgrade to impermeable protective clothing (Level C), Physiological monitoring should be conducted at the appropriate time interval based on the adjusted temperature as indicated in Table 2 below. Physiological monitoring includes a measurement of the heart rate and oral temperature. The heart rate is measured by counting the radial pulse for 30 seconds. If the individual's heart rate is in excess of 180 beats per minute minus his/her age, or the oral temperature exceeds 100.6 F, exposure to heat stress should be discontinued.

Table 2. Frequency of Physiological Monitoring for Fit and Acclimatized Workers

Adjusted Temperature[1]	Impermeable Clothing (Level C)
90 F or above	After each 15 minutes of work
87.5 – 90 F	After each 30 minutes of work
82.5 - 87.5 F	After each 60 minutes of work
77.5 - 82.5 F	After each 90 minutes of work
72.5 - 77.5 F	After each 120 minutes of work

Source: Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH/OSHA/USCG/EPA, 1985)

[1]Calculate the adjusted air temperature (ta adj) by using this equation: ta adj F = ta F + (13 x % sunshine). Measure air temperature with a standard thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

Heat Emergencies

Heat Cramps. Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. Loss of salt from the body causes very painful cramps in leg and abdominal muscles. Heat cramps may also result from drinking iced water or other drinks either too quickly or in too large a quantity. The symptoms of heat cramps are:

- Painful muscle cramps in legs and abdomen;
- Faintness; and
- Profuse perspiration.

To provide emergency care for heat cramps, move the patient to a cool place. Give him or her sips of liquids such as Gatorade or its equivalent. Apply manual pressure to the cramped muscle. Move the patient to a hospital if there is any indication of a more serious problem.

Heat Exhaustion. Heat exhaustion may also occur in individuals working in hot environments and may be associated with heat cramps. Heat exhaustion is caused by the loss of large amounts of fluid due to sweating, sometimes with excessive loss of salt. The blood vessels in the skin become dilated and a large amount of blood is pooled in the skin. There is a decrease in blood volume due to dehydration. This condition, plus the blood that is pooled in the lower extremities when in an upright position, may lead to an inadequate return of blood to the heart and eventual physical collapse. The symptoms of heat exhaustion are:

- Weak pulse;
- Rapid and usually shallow breathing;
- Generalized weakness;
- Pale, clammy skin;
- Profuse perspiration;
- Dizziness/faintness; and
- Unconsciousness.

To provide emergency care for heat exhaustion, move the patient to a cool place and remove as much clothing as possible. Have the patient drink cool water or sports drinks. If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling. Treat the patient for shock and move him or her to a medical facility if there is any indication of a more serious problem.

Heat Stroke. Heat stroke is a profound disturbance of the heat-regulating mechanism and is associated with high fever and collapse. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. It is a serious threat to life and carries a 20% mortality rate. Sometimes this condition results in convulsions,

unconsciousness, and even death. Direct exposure to sun, poor air circulation, poor physical condition, and advancing age (over 40) can increase the chance of heat stroke. Alcoholics are extremely susceptible. The symptoms of heat stroke are:

- Sudden onset;
- Dry, hot, and flushed skin;
- Dilated pupils;
- Early loss of consciousness;
- Full and fast pulse;
- Deep breathing at first, followed by shallow or faint breathing;
- Muscle twitching, growing into convulsions; and
- Body temperature reaching 105 to 106 degrees F or higher.

When providing emergency care for heat stroke, remember that it is a life-threatening emergency. Transportation to a medical facility should not be delayed. Move the patient to a cool environment, if possible, and remove as much clothing as possible. Ensure an open airway. Reduce body temperature promptly by dousing the body with water or, preferably, by wrapping the patient in a wet sheet. If cold packs are available, place them under the arms, around the neck, at the ankles, or any place where blood vessels that lie close to the skin can be cooled. Protect the patient from injury during convulsions.

NIOSH Publication 2005-149 September 2005

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Chlorodiphenyl (54% chlorine)

CAS 11097-69-1

$C_6H_3Cl_2C_6H_2Cl_3$ (approx)

RTECS TQ1360000

Synonyms & Trade Names
Aroclor® 1254, PCB, Polychlorinated biphenyl

DOT ID & Guide
2315 171

Exposure Limits	NIOSH REL*: Ca TWA 0.001 mg/m^3 See Appendix A [*Note: The REL also applies to other PCBs.]
	OSHA PEL: TWA 0.5 mg/m^3 [skin]

IDLH Ca [5 mg/m^3] See: IDLH INDEX

Conversion

Physical Description
Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.

MW: 326 (approx)	BP: 689-734°F	FRZ: 50°F	Sol: Insoluble
VP: 0.00006 mmHg	IP: ?		Sp.Gr(77°F): 1.38
Fl.P: NA	UEL: NA	LEL: NA	

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities
Strong oxidizers

Measurement Methods
NIOSH 5503; OSHA PV2088
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

See also: INTRODUCTION See ICSC CARD: 0939 See MEDICAL TESTS: 0176

NIOSH Publication 2005-149 September 2005

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Acetone

CAS 67-64-1

$(CH_3)_2CO$

RTECS AL3150000

Synonyms & Trade Names
Dimethyl ketone, Ketone propane, 2-Propanone

DOT ID & Guide
1090 127

Exposure Limits	
	NIOSH REL: TWA 250 ppm (590 mg/m^3)
	OSHA PEL†: TWA 1000 ppm (2400 mg/m^3)

IDLH 2500 ppm [10%LEL] See: 67641

Conversion 1 ppm = 2.38 mg/m^3

Physical Description
Colorless liquid with a fragrant, mint-like odor.

MW: 58.1	BP: 133°F	FRZ: -140°F	Sol: Miscible
VP: 180 mmHg	IP: 9.69 eV		Sp.Gr: 0.79
Fl.P: 0°F	UEL: 12.8%	LEL: 2.5%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Oxidizers, acids

Measurement Methods
NIOSH 1300, 2555, 3800; OSHA 69
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
Up to 2500 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system

See also: INTRODUCTION See ICSC CARD: 0087 See MEDICAL TESTS: 0002

ALCONOX MSDS

Section 1 : MANUFACTURER INFORMATION

Product name: Alconox

Supplier: Same as manufacturer.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Supplier MSDS date: 2009/04/20

D.O.T. Classification: Not regulated.

Section 2 : HAZARDOUS INGREDIENTS

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE
497-19-8	7-13	SODIUM CARBONATE	NOT AVAILABLE	4090 MG/KG RAT ORAL 6600 MG/KG MOUSE ORAL	2300 MG/M3/2H RAT INHALATION 1200 MG/M3/2H MOUSE INHALATION
7722-88-5	10-30	TETRASODIUM PYROPHOSPHATE	5 MG/M3	4000 MG/KG RAT ORAL 2980 MG/KG MOUSE ORAL	NOT AVAILABLE
7758-29-4	10-30	SODIUM PHOSPHATE	NOT AVAILABLE	3120 MG/KG RAT ORAL 3100 MG/KG MOUSE ORAL >4640 MG/KG RABBIT DERMAL	NOT AVAILABLE

Section 2A : ADDITIONAL INGREDIENT INFORMATION

Note: (supplier).
CAS# 497-19-8: LD50 4020 mg/kg - rat oral.
CAS# 7758-29-4: LD50 3100 mg/kg - rat oral.

Section 3 : PHYSICAL / CHEMICAL CHARACTERISTICS

Physical state: Solid

Appearance & odor: Almost odourless.
White granular powder.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): Not applicable.

Vapour density (air=1): Not applicable.

By weight: Not available.

Evaporation rate (butyl acetate = 1): Not applicable.

Boiling point (°C): Not applicable.

Freezing point (°C): Not applicable.

pH: (1% aqueous solution).
9.5

Specific gravity @ 20 °C: (water = 1).
0.85 - 1.10

Solubility in water (%): 100 - > 10% w/w

Coefficient of water\oil dist.: Not available.

VOC: None

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Not available.

Sensitivity to mechanical impact: Not applicable.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: None

Section 5 : REACTIVITY DATA

Chemical stability:	Stable under normal conditions.
Conditions of instability:	None known.
Hazardous polymerization:	Will not occur.
Incompatible substances:	Strong acids. Strong oxidizers.
Hazardous decomposition products:	See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry:	Skin contact, eye contact, inhalation and ingestion.
Effects of Acute Exposure	
Eye contact:	May cause irritation.
Skin contact:	Prolonged contact may cause irritation.
Inhalation:	Airborne particles may cause irritation.
Ingestion:	May cause vomiting and diarrhea. May cause abdominal pain. May cause gastric distress.
Effects of chronic exposure:	Contains an ingredient which may be corrosive.
LD50 of product, species & route:	> 5000 mg/kg rat oral.
LC50 of product, species & route:	Not available for mixture, see the ingredients section.
Exposure limit of material:	Not available for mixture, see the ingredients section.
Sensitization to product:	Not available.
Carcinogenic effects:	Not listed as a carcinogen.
Reproductive effects:	Not available.
Teratogenicity:	Not available.
Mutagenicity:	Not available.
Synergistic materials:	Not available.
Medical conditions aggravated by exposure:	Not available.
First Aid	
Skin contact:	Remove contaminated clothing. Wash thoroughly with soap and water. Seek medical attention if irritation persists.
Eye contact:	Check for and remove contact lenses. Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.
Inhalation:	Remove victim to fresh air. Seek medical attention if symptoms persist.
Ingestion:	Dilute with two glasses of water. Never give anything by mouth to an unconscious person. Do not induce vomiting, seek immediate medical attention.

Section 7 : PRECAUTIONS FOR SAFE HANDLING AND USE

Leak / Spill: Contain the spill.
Recover uncontaminated material for re-use.
Wear appropriate protective equipment.
Contaminated material should be swept or shoveled into appropriate waste container for disposal.

Waste disposal: In accordance with municipal, provincial and federal regulations.

Handling procedures and equipment: Protect against physical damage.
Avoid breathing dust.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Launder contaminated clothing prior to reuse.

Storage requirements: Keep containers closed when not in use.
Store away from strong acids or oxidizers.
Store in a cool, dry and well ventilated area.

Section 8 : CONTROL MEASURES

Precautionary Measures

Gloves / Type:

Neoprene or rubber gloves.

Respiratory / Type:

If exposure limit is exceeded, wear a NIOSH approved respirator.

Eye / Type:

Safety glasses with side-shields.

Footwear / Type: Safety shoes per local regulations.

Clothing / Type: As required to prevent skin contact.

Other / Type: Eye wash capability should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

NIOSH Publication 2005-149 September 2005

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

n-Hexane

CAS 110-54-3

RTECS MN9275000

$CH_3[CH_2]_4CH_3$

Synonyms & Trade Names
Hexane, Hexyl hydride, normal-Hexane

DOT ID & Guide
1208 128

Exposure Limits	
	NIOSH REL: TWA 50 ppm (180 mg/m^3)
	OSHA PEL†: TWA 500 ppm (1800 mg/m^3)

IDLH 1100 ppm [10%LEL] See: 110543

Conversion 1 ppm = 3.53 mg/m^3

Physical Description
Colorless liquid with a gasoline-like odor.

MW: 86.2	BP: 156°F	FRZ: -219°F	Sol: 0.002%
VP: 124 mmHg	IP: 10.18 eV		Sp.Gr: 0.66
Fl.P: -7°F	UEL: 7.5%	LEL: 1.1%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers

Measurement Methods
NIOSH 1500, 3800; OSHA 7
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
Up to 500 ppm:
(APF = 10) Any supplied-air respirator*
Up to 1100 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, nose; nausea, headache; peripheral neuropathy: numb extremities, muscle weakness; dermatitis; dizziness; chemical pneumonitis (aspiration liquid)

Target Organs Eyes, skin, respiratory system, central nervous system, peripheral nervous system

See also: INTRODUCTION See ICSC CARD: 0279 See MEDICAL TESTS: 0114

NIOSH Publication 2005-149 September 2005

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Chlorodiphenyl (42% chlorine)

CAS 53469-21-9

$C_6H_4ClC_6H_3Cl_2$ (approx)

RTECS TQ1356000

Synonyms & Trade Names
Aroclor® 1242, PCB, Polychlorinated biphenyl

DOT ID & Guide
2315 171

Exposure Limits	NIOSH REL*: Ca TWA 0.001 mg/m^3 See Appendix A [*Note: The REL also applies to other PCBs.]
	OSHA PEL: TWA 1 mg/m^3 [skin]

IDLH Ca [5 mg/m^3] See: 53469219 **Conversion**

Physical Description
Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor.

MW: 258 (approx)	BP: 617-691°F	FRZ: -2°F	Sol: Insoluble
VP: 0.001 mmHg	IP: ?		Sp.Gr(77°F): 1.39
Fl.P: NA	UEL: NA	LEL: NA	

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities
Strong oxidizers

Measurement Methods
NIOSH 5503; OSHA PV2089
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

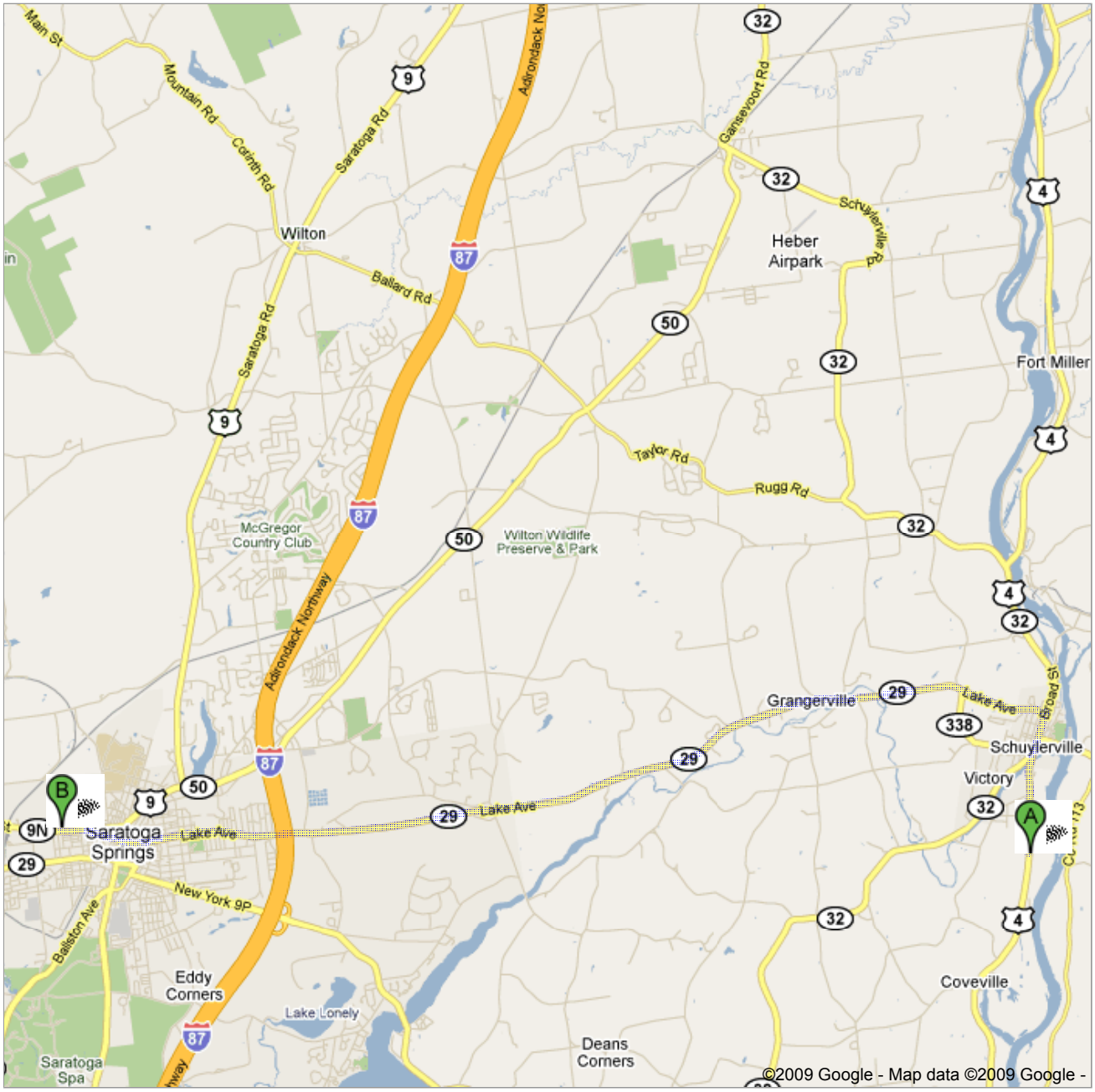
Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

See also: INTRODUCTION See MEDICAL TESTS: 0175

Google maps

Directions to Saratoga Hospital
211 Church St, Saratoga Springs, NY 12866-1090
- (518) 580-2450
13.1 mi – about **22 mins**



US-4 E

4	1. Head **north** on **US-4 E** toward **Schuyler St** About 3 mins	go 1.6 mi total 1.6 mi
29	2. Turn **left** at **NY-29 W/Spring St** Continue to follow NY-29 W About 17 mins	go 10.7 mi total 12.3 mi
	3. Continue onto **Church St** About 2 mins	go 0.7 mi total 13.0 mi
	4. Turn **right** at **Myrtle St** Destination will be on the right	go 299 ft total 13.1 mi

Saratoga Hospital
211 Church St, Saratoga Springs, NY 12866-1090 - (518) 580-2450

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

C

New York State Department of Environmental Conservation Sampling Results

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway, 11th Floor
Albany, New York 12233-7015
Phone: (518) 402-9625 • Fax: (518) 402-9020 / (518) 402-9627
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

Division of Environmental Remediation Laboratory Analytical Report

The case narrative and analytical reports for the Hudson River PCB site are attached.

Case Narrative

Site Name: Hudson River PCB Site

Date received: 05/08/08

For sample delivery group(s): 129-01

All QA/QC associated with this sample delivery group were within acceptable method criteria, except that the percent recovery for the decachlorobiphenyl surrogate for samples 508-129-006, ...-129-007, ...-129-008, and ...-129-010, exceeded the method criteria range of 50 - 150%. The results for these particular samples should be considered as estimates, since it is possible that the 1242 Aroclor hit could be lower than is reported.

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.00g

% Moisture: 51% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-01

SDG No.: 129-01

Lab Sample ID: 508-129-001

Lab File ID: 08F0449.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	795	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.00g

% Moisture: 0.4% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-02

SDG No.: 129-01

Lab Sample ID: 506-129-002

Lab File ID: 08F0437.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/14/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	460	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.00g

% Moisture: 66% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-03

SDG No.: 129-01

Lab Sample ID: 508-129-003

Lab File ID: 08F0452.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	1800	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.01g

% Moisture: 63% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-04

SDG No.: 129-01

Lab Sample ID: 508-129-004

Lab File ID: 08F0453.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	2640	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.02g

% Moisture: 57% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-05

SDG No.: 129-01

Lab Sample ID: 508-129-005

Lab File ID: 08F0454.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	3060	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.02g

% Moisture: 29% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-06

SDG No.: 129-01

Lab Sample ID: 508-129-006

Lab File ID: 08F0455.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	970	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.00g

% Moisture: 0.6% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-07

SDG No.: 129-01

Lab Sample ID: 508-129-007

Lab File ID: 08F0447.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	530	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Field Sample No.: WS8-08

Site Code: 546013

SDG No.: 129-01

Matrix: (soil/water) Soil

Lab Sample ID: 508-129-008

Sample wt/vol: 10.01g

Lab File ID: 08F0448.D

% Moisture: 39% decanted:(Y/N) N

Date Received: 5/08/08

Extraction: ASE

Date Extracted: 5/13/2008

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 5/15/2008

Injection Volume: 2.0(uL)

Dilution Factor: 2

GPC Cleanup: (Y/N) N

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	680	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Field Sample No.: WS8-09

Site Code: 546013

SDG No.: 129-01

Matrix: (soil/water) Soil

Lab Sample ID: 508-129-009

Sample wt/vol: 10.00g

Lab File ID: 08F0462.D

% Moisture: 40% decanted:(Y/N) N

Date Received: 5/08/08

Extraction: ASE

Date Extracted: 5/13/2008

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 5/15/2008

Injection Volume: 2.0(uL)

Dilution Factor: 2

GPC Cleanup: (Y/N) N

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	510	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

PCB ORGANICS ANALYSIS DATA SHEET

Site Name: Hudson River PCB Site

Site Code: 546013

Matrix: (soil/water) Soil

Sample wt/vol: 10.00g

% Moisture: 43% decanted:(Y/N) N

Extraction: ASE

Concentrated Extract Volume: 5000 (uL)

Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N

Field Sample No.: WS8-10

SDG No.: 129-01

Lab Sample ID: 508-129-010

Lab File ID: 08F0463.D

Date Received: 5/08/08

Date Extracted: 5/13/2008

Date Analyzed: 5/15/2008

Dilution Factor: 2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND (ug/L or ug/Kg)	ug/Kg	Q
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	630	D
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D, 12th Floor
625 Broadway Albany, New York 12233-7013
Phone: (518) 402-9676 • Fax: (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

July 23, 2008

Supervisor Mitchell Suprenaut
Town of Fort Edward
118 Broadway
Fort Edward, New York 12828

Re: Hudson River Flood Plain - 2008-05-08 Flood Mud Collection Results - Terminal Wall in Fort Edward

Dear Supervisor Suprenaut:

This letter serves to inform you that on May 8, 2008, the Department collected an environmental sample of the fresh "flood mud" laid down on part of the Terminal Wall in Fort Edward by the Hudson River during the recent high flow event that occurred between April 10 and May 4, 2008. The intent of this sampling event, and other similar sampling events in past years, was to monitor for polychlorinated biphenyls (PCBs) in the fresh "flood mud" deposits on the flood plain in a limited number of locations and to improve our knowledge about the dynamics of potential PCB distribution during periods of flooding on the upper Hudson River.

One sample was collected from a recently flooded area at the Terminal Wall. The sample (WS8-02) was collected of the accumulated sediment on the first tread down from the sidewalk level, at the southern end of the northern set of concrete steps that lead down to the water along the Terminal Wall. The analytical results for this sample confirm the presence of PCB Aroclor 1242 at a concentration of 0.46 parts per million (ppm). This concentration is below New York's residential soil cleanup objective of 1 ppm and there is no need to avoid this area because subsequent rain events or wind are likely to disperse the "flood mud" and frequent or prolonged exposure is unlikely given the recreational nature and use of the Terminal Wall and the adjacent park. People can further reduce their potential for exposure by taking simple precautions when working or playing in these areas or any areas routinely flooded by the river. These precautions include washing of one's hands, avoiding incidental ingestion of soil during play, cleaning any soil-covered toys or tools after use, and minimizing digging or moving of soil in areas where routine flooding occurs. A more detailed discussion is provided on the enclosed "PCBs and the Upper Hudson River Flood Plain" Information Sheet prepared by the Department, the New York State Department of Health, and the United States Environmental Protection Agency (USEPA).

The sample was analyzed for PCBs by our Division of Environmental Remediation Laboratory using USEPA Method 8082. The Laboratory Analytical Report for the given sample from the Terminal Wall in Fort Edward is attached for your information and use. The photograph taken during the sample collection event, is also attached for your information and use.

If you have any questions or if you would like to discuss these results or any other issues related to the upper Hudson River flood plains further, please contact me at (518) 402-9676.

Sincerely,

William J. Shaw
Hudson River Unit
Remedial Bureau D
Division of Environmental Remediation

cc: Mayor Matthew Traver - Village of Fort Edward
J. Deming - NYSDOH

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D, 12th Floor
625 Broadway Albany, New York 12233-7013
Phone: (518) 402-9676 • Fax: (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

July 23, 2008

Thomas Miller, Chief
New York State Department of Environmental Conservation
Division of Operations
Bureau of Design and Construction - 3rd Floor
625 Broadway
Albany, New York 12233-5252

Re: Hudson River Flood Plain - 2008-05-08 Flood Mud Collection Results - NYSDEC Boat Launch in Moreau

Dear Mr. Miller:

This letter serves to inform you that on May 8, 2008, the Department collected an environmental sample of the fresh "flood mud" laid down on the flood plain at the NYSDEC Boat Launch in Moreau by the Hudson River during the recent high flow event that occurred between April 10 and May 4, 2008. The intent of this sampling event, and other similar sampling events in past years, was to monitor for polychlorinated biphenyls (PCBs) in the fresh "flood mud" deposits on the flood plain in a limited number of locations and to improve our knowledge about the dynamics of potential PCB distribution during periods of flooding on the upper Hudson River.

One sample was collected from a recently flooded area at the Boat Launch in Moreau. The sample (WS8-01) was collected of the accumulated sediment on the northern edge of the concrete pad (just out of the water lap line) at the Boat Launch. The analytical results for this sample confirm the presence of PCB Aroclor 1242 at a concentration of 0.795 parts per million (ppm). This concentration is below New York's residential soil cleanup objective of 1 ppm and there is no need to avoid this area because subsequent rain events or wind are likely to disperse the "flood mud" and frequent or prolonged exposure is unlikely given the recreational nature and use of the Boat Launch. People can further reduce their potential for exposure by taking simple precautions when working or playing in this area or any areas routinely flooded by the river. These precautions include washing of one's hands, avoiding incidental ingestion of soil during play, cleaning any soil-covered toys or tools after use, and minimizing digging or moving of soil in areas where routine flooding occurs. A more detailed discussion is provided in the enclosed "PCBs and the Upper Hudson River Flood Plain" Information Sheet prepared by the Department, the New York State Department of Health, and the United States Environmental Protection Agency (USEPA).

The sample was analyzed for PCBs by our Division of Environmental Remediation Laboratory using USEPA Method 8082. The Laboratory Analytical Report for the given sample from the NYSDEC Boat Launch in Moreau is attached for your information and use. Photographs taken during the sample collection event, are also attached for your information and use.

If you have any questions or if you would like to discuss these results or any other issues related to the upper Hudson River flood plains further, please contact me at (518) 402-9676.

Sincerely,

William J. Shaw
Hudson River Unit
Remedial Bureau D
Division of Environmental Remediation

cc: J. Deming - NYSDOH

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D, 12th Floor
625 Broadway Albany, New York 12233-7013
Phone: (518) 402-9676 • Fax: (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

July 22, 2008

Mayor John Sherman
Village of Schuylerville
35 Spring Street
Post Office Box 56
Schuylerville, New York 12871

Re: Hudson River Flood Plain - 2008-05-08 Flood Mud Collection Results - Fort Hardy Park

Dear Mayor Sherman:

As you know, on May 8, 2008, the Department collected environmental samples of the fresh "flood mud" laid down on the flood plain at Fort Hardy Park in Schuylerville by the Hudson River during the recent high flow event that occurred between April 10 and May 4, 2008. The intent of this sampling event, and other similar sampling events in past years, was to monitor for polychlorinated biphenyls (PCBs) in the fresh "flood mud" deposits on the flood plain in a limited number of locations and to improve our knowledge about the dynamics of potential PCB distribution during periods of flooding on the upper Hudson River.

Two samples were collected from the recently flooded areas at Fort Hardy Park. The first sample (WS8-04) was collected of the accumulated sediment on the lawn area along the River side of the concrete and rock stairway at the northern end of the "Concert Bowl" and Band Stand. The analytical results for this sample confirm the presence of PCB Aroclor 1242 at a concentration of 2.64 parts per million (ppm). The second sample (WS8-05) was collected of the accumulated sediment on the lawn area along the southern end of the Band Stand in the "Concert Bowl" itself. The analytical results for this sample confirm the presence of PCB Aroclor 1242 at a concentration of 3.06 ppm. While these concentrations are slightly above New York's residential soil cleanup objective of 1 ppm, there is no need to avoid these areas because subsequent rain events or wind are likely to disperse the "flood mud" and frequent or prolonged exposure is unlikely given the recreational nature of the park. However, people can reduce their potential for exposure by taking simple precautions when working or playing in these areas or any areas routinely flooded by the river. These precautions include washing of one's hands, avoiding incidental ingestion of soil during play, cleaning any soil-covered toys or tools after use, and minimizing digging or moving of soil in areas where routine flooding occurs. A more detailed discussion is provided on the enclosed "PCBs and the Upper Hudson River Flood Plain" Information Sheet prepared by the Department, the New York State Department of Health, and the United States Environmental Protection Agency (USEPA).

Both samples were analyzed for PCBs by our Division of Environmental Remediation Laboratory using USEPA Method 8082. The Laboratory Analytical Report for the two samples from Fort Hardy Park are attached for your information and use.

If you have any questions or if you would like to discuss these results or any other issues related to the upper Hudson River flood plains further, please contact me at (518) 402-9676.

Sincerely,

William J. Shaw
Hudson River Unit
Remedial Bureau D
Division of Environmental Remediation

cc: J. Deming - NYSDOH

"William Shaw"
<wxshaw@gw.dec.state.ny.us>
07/22/2008 02:49 PM

To <office@villageofschuylerville.org>
cc <jhd01@health.state.ny.us>
bcc
Subject Hudson River Flood Plain - 2008-05-08 Flood Mud Collection Results - Fort Hardy Park

Mayor John Sherman
Village of Schuylerville

Mayor Sherman,

The attached electronic document entitled '2008-07-22 Letter to Schuylerville Mayor Sherman - 2008-05-08 Flood Mud Results' transmits the results of the "flood mud" samples that were collected by the NYS Department of Environmental Conservation on May 8, 2008 from two locations at Fort Hardy Park in Schuylerville. This electronic document was signed by William Shaw on July 22, 2008.

This email provides you with correspondence from the New York State Department of Environmental Conservation, Division of Environmental Remediation - Remedial Bureau D - Hudson River Remediation Unit.

A paper copy of this document will be mailed out to you shortly.

Please contact me at (518) 402-9676 if you experience problems with this transmission.

. . . Wm. Shaw - Hudson River Remediation Unit

ecc:
J. Deming - NYSDOH

ebcc:
W. Daigle - NYSDEC
K. Farrar - NYSDEC
D. Tromp - NYSDEC
R. Fedigan - NYSDOH
D. Ripstein - NYSDOH
J. Davis - NYSDOL
B. Conetta - USEPA
D. King - USEPA (Hudson River Field Office)
D. Rosoff - USEPA (Hudson River Field Office)

2008-07-22 Letter to Schuylerville Mayor Sherman - 2008-05-08 Flood Mud Results.pdf

Information Sheet Summer 2008

PCBs and the Upper Hudson River Floodplain

Introduction

Sediments within the Upper Hudson River are contaminated with polychlorinated biphenyls (PCBs) as a result of industrial discharges that occurred between the 1940s and 1970s. PCBs were discharged to the river from the General Electric plants in Hudson Falls and Fort Edward and were subsequently transported downstream. Once PCBs entered the river, they were deposited and mixed with the sediments at many locations on the river bottom and at some locations along the shoreline. In 2002, the U.S. Environmental Protection Agency (EPA) signed a Record of Decision (ROD) for the cleanup of the Hudson River PCBs Superfund Site. The PCB-contaminated sediments on the river bottom will be remediated as part of the upcoming Hudson River dredging project. The ROD also states that concerns related to possible exposure of residents and ecological receptors to PCBs in the floodplain must be evaluated. This information sheet is intended to provide you with information that will help you to minimize your potential exposure to PCB-contaminated soils in floodplain areas along the Hudson River between Fort Edward and the Troy Dam.

Deposition of PCBs in Floodplain Areas

The river is a dynamic system that has the ability to pick-up, carry, and move river bottom sediments, some of which may contain PCBs, further downstream. During periods of flooding, fine-grained sediments, and any PCBs that they contain, may be deposited above the riverbank upon the floodplain and become part of the soil. Certain areas of the floodplain are more likely to accumulate PCB-contaminated soil. These include low-lying areas right next to the river that are subject to frequent flooding, backwater areas, and areas on the inside of large bends in the river. In many instances soils within floodplain areas may appear wet and muddy throughout the year. It is these areas where flooding occurs and floodplain deposits accumulate that people may be exposed to soils contaminated with PCBs.

Minimizing Exposure to PCBs in Floodplain Soil

Potential health risks from exposure to the PCBs in floodplain soils depend on PCB concentrations and the extent to which people contact soil containing PCBs. The extent of contact depends on the types of activities that contribute to exposure and the duration and frequency of these activities. Considering that the presence and concentration of PCBs at any given location may not be known without collecting and analyzing soil samples, the following discussion should be considered when spending time in floodplain areas.

Children may come into direct contact with PCB-contaminated soil while playing or digging in the dirt. During these activities they may incidentally ingest soil through hand-to-mouth activity. For example, this exposure may occur when young children put toys or hands into their mouths or do not properly wash their hands before eating. Therefore, to reduce potential exposures it is important to assure that childrens' hands, feet and toys are washed after playing or digging in the dirt.

D Sampling Location Log Sheet

Sampling Location Log Sheet

Location Name:_____ Tax ID:_____ Owner:_____

Date/Time	Activity	Comments

HUDSON RIVER PCBs SUPERFUND SITE, NEW YORK
Long Term Floodplain Deposition Program

DAILY SUMMARY REPORT

Tax ID:	Sample ID:	Owner:

General Comments:_____
_____
_____
_____
_____

Picture ID	Direction	Caption

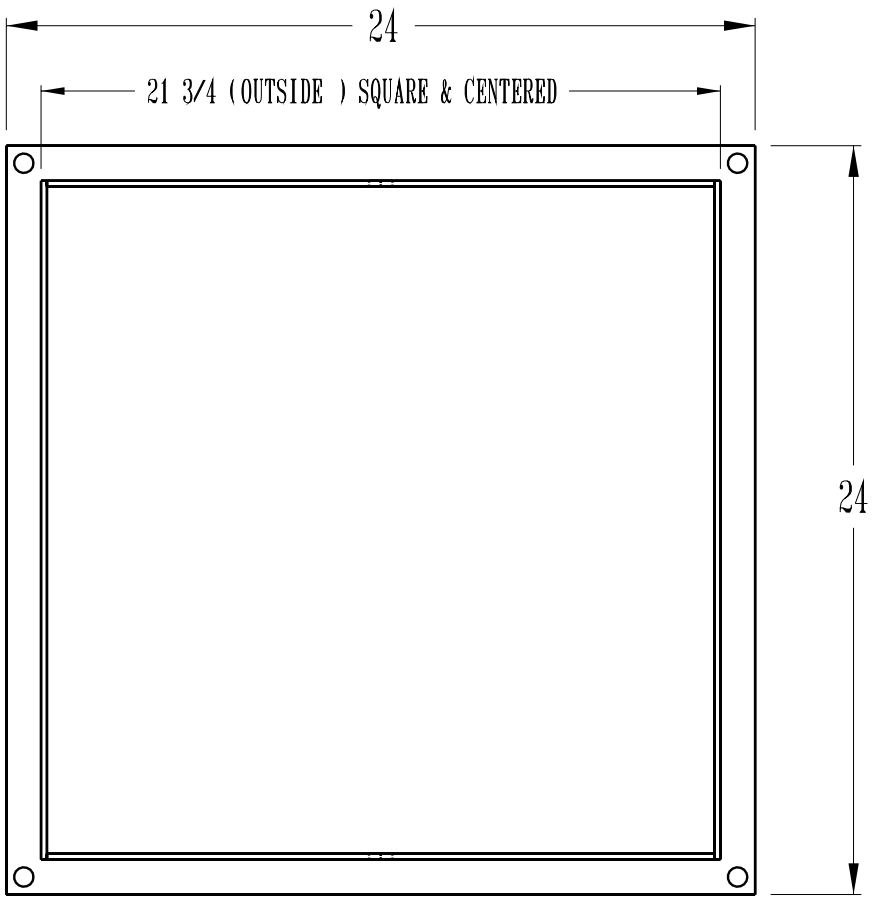
Tax ID:	Sample ID:	Owner:

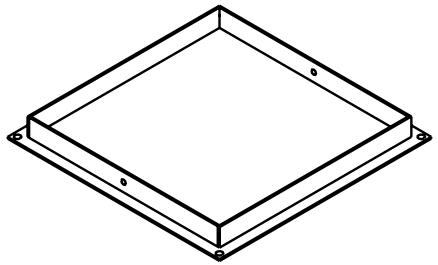
General Comments:_____
_____
_____
_____
_____

Picture ID	Direction	Caption

Staff Names:	Agency/Firm: Ecology and Environment, Inc.
Staff Signatures:	Date:

E Diagrams of Sampling Device





NOTE:
MATERIAL = 3/16" HOT ROLLED - CUT & DRILLED
WELD CORNERS AND STITCH WELD TO PLATE

REV	BY	DESCRIPTION	DATE

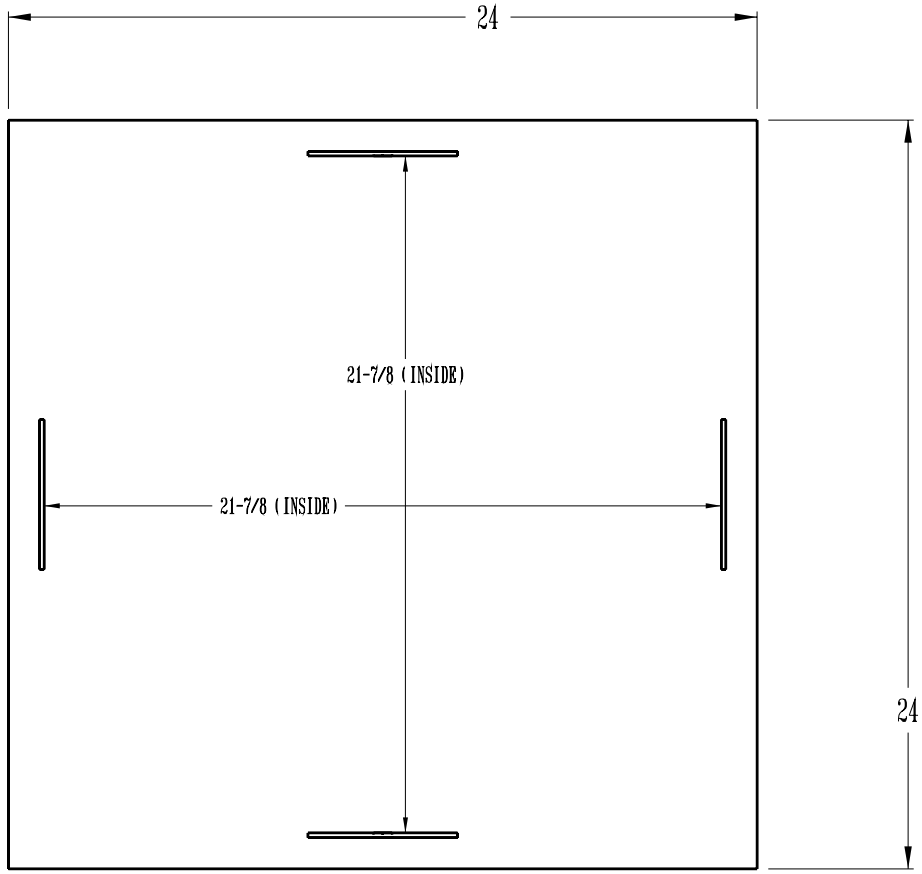
REVISIONS

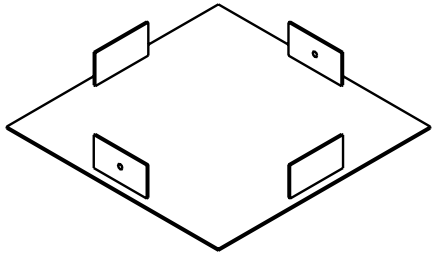
BREAK ALL SHARP EDGES
125 RMS FINISH UNLESS OTHERWISE SPECIFIED

The BROWNELL GROUP, L.P.
2357 STATE ROUTE 4
FORT EDWARD, NEW YORK 12828

TITLE: BOTTOM ASSEMBLY

MAT'L: 3/16" HOT ROLLED STEEL		TOLERANCES FRACT +/- 1/32" DEC +/- .003 ANG +/- 0.5°	
CHECKED	BY: BGB	SCALE: NONE	
APPROVED	DATE: 05 NOVEMBER 2009	DWG. NO: SK-110509-01-01	SHEET 1 OF 1 / REV # 1
ABCDEFG	ECOLOGY & ENVIRONMENT		





NOTE:
MATERIAL = 3/16" HOT ROLLED - CUT & DRILLED
STITCH WELD TO PLATE
MUST FIT INTO BOTTOM ASSEMBLY WITH HOLES ALIGNED

REV	BY	DESCRIPTION	DATE

REVISIONS

BREAK ALL SHARP EDGES
125 RMS FINISH UNLESS OTHERWISE SPECIFIED

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The BROWNELL GROUP, L.P.
2357 STATE ROUTE 4
FORT EDWARD, NEW YORK 12828

TITLE:
TOP PLATE ASSEMBLY

MAT'L: 3/16" HOT ROLLED STEEL			TOLERANCES FRACT +/- 1/32" DEC +/- .003 ANG +/- 0.5°
CHECKED	BY: BGB	SCALE: NONE	
APPROVED	DATE: 05 NOVEMBER 2009	DWG. NO: SK-110509-01-02	SHEET 1 OF 1
ABCDEFG	ECOLOGY & ENVIRONMENT		REV # 0