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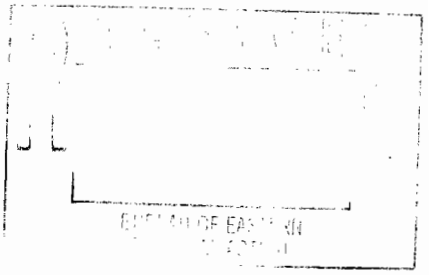
BROOKHAVEN
NATIONAL LABORATORY

managed by Brookhaven Science Associates
for the U.S. Department of Energy

MAR 15 2010

Mr. Douglas Pocze
Federal Facilities Section
U.S. EPA - Region II
290 Broadway - 18th Floor
New York, New York 10007-1866



Mr. Chek Beng Ng
Remedial Bureau A
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany New York, 12233-7015

Dear Mr. Pocze and Mr. Ng:

SUBJECT: PECONIC RIVER SEDIMENT TRAP REMOVAL WORK/SAMPLING AND ANALYSIS PLAN

The attached Peconic River Sediment Trap Work/Sampling and Analysis Plan and the Final Responses to November 20, 2009 NYS DEC and DOH Comments addresses all comments received.

All sample points not located beneath the sediment trap stone were sampled on March 10, 2010. Sample points located beneath the sediment trap stone will be sampled immediately after the trap is removed. The current plan is to remove the sediment trap in the late summer or fall of 2010.

Results for the March 10, 2010 sediment trap area samples will be available in mid-April and will be forwarded to EPA, NYSDEC, NYSDOH and SCDHS for discussion and evaluation.

NSF
Registered to ISO 14001

If you have any questions, feel free to contact me at (631) 344-5186.

Sincerely,

William Dorsch
Manager, Groundwater Protection Group
Environmental Protection Division

Enclosure: As stated

cc: C.B. Ng, (NYSDEC) w/encl
R. Quail, (NYSDEC) w/encl
A. Rapiejko, (SCDHS) w/encl
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BNL Groundwater Protection Group

FinalResponses to November 20, 2009 NYS DEC and DOH Comments on Peconic River Sediment Trap Removal Work/Sampling and Analysis Plan, dated October 8, 2009

Comment Number	Section/ Page	Comment	Response
1	General	The work plan does not address what follow-up action will be taken if contaminants in previously un-remediated sediment beneath and in close proximity to the sediment trap are found to not meet the cleanup goals specified in the Record of Decision (ROD). The State suggests that the work plan outline how the exceedances in the contamination, if found, will be addressed.	The purpose of the Work Plan is to describe the planned removal of the sediment trap, and to present the proposed sampling activities. Once the data is received and summarized, DOE will solicit regulator input on any potential future cleanup decisions. The data will be presented in the Completion Report. Section 1.0 will be revised to further clarify.
2	Page 5, Section 4.0	It is mentioned that care will be taken not to damage the geo-membrane beneath the sand. Does the work plan make any provisions to patch up any geo-membrane that has been found to be defective once the stones have been removed?	Text will be added to Section 4.0 to include provisions for patching the geomembrane, as needed.
3	Page 5, Section 4.0	It is stated that the sediment trap removal operation will occur "during a period of no flow to low flow". The Department would also recommend that the removal work be done during a time frame when there are no forecasted major rain events. Erosion control should be maintained on-site in case an unforeseen rain even occurs and there are non-stabilized sediments.	Agreed. To help minimize potential runoff, the removal will be performed when no significant rains are expected. Runoff/erosion control such as hay bales or silt fence will be used as necessary. The text in Section 3.0 and 4.0 will be revised to include this language.
4	Page 6, Section 4.0	What is the height of the clean rip-rap used to stabilize the geo-membrane after the sediment trap was removed?	The clean rip rap will be approximately four to eight inches in height. The text will be

Comment Number	Section/ Page	Comment	Response
			modified.
5	Page 8, Section 8.0	What is the time frame for the potential remediation of the section of the Peconic River that is within the vicinity of the sediment trap should high levels of contaminants be found in this investigation?	Potential future cleanup decisions in this area will be discussed with the regulators once the analytical data is received and summarized. Cleanup would be coordinated with other hot spot remediation work in the river as we have previously discussed.
6	Page 10, Section 9.2	Please justify analyzing only the top six inches of the sediment for most samples. Has any calculation been done to make sure that a deeper sediment depth analysis is not warranted? This is particularly important since more sedimentation would occur near the sediment trap, hence making the area around the trap more susceptible to deeper deposition of possible contaminants that was carried from the upstream.	As noted in Section 9.3, extensive sampling prior to, during and following the sediment cleanup have demonstrated that elevated mercury in un-remediated sediment is most likely to be found in the top six inches of sediment. If cleanup is required, post-cleanup rapid analysis turnaround (24-48 hours) confirmation samples would be used to determine whether additional sediment removal is necessary.
7	Page 10, Section 9.2	Does the collection of the two core samples within the removed sediment trap (STI-25 and STI-40) necessitate the puncturing of the geo-membrane? If so, are there any plans to patch up the geo-membrane?	If the geomembrane can not be peeled/rolled-back to expose a sample location without compromising the integrity of the geomembrane, it will be necessary to penetrate the geomembrane to collect the sample. In that case the geomembrane will be repaired.

Comment Number	Section/ Page	Comment	Response
8	Page 10, Section 9.2	The Department proposed that another sediment sample be collected at the other opening of the 30" drain culvert (adjacent to Station HQ) to test the effectiveness of the sediment trap.	An additional six inch sediment core sample will be included immediately downgradient of the location where the culvert effluent enters the river.

PECONIC RIVER SEDIMENT TRAP REMOVAL

WORK/SAMPLING AND ANALYSIS PLAN

Prepared for:

Brookhaven Site Office

Building 464, 53 Bell Avenue

Upton, New York 11973

March 10, 2010

Prepared by:

Brookhaven Science Associates, LLC

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Upton, New York 11973

Under Contract with the United States Department of Energy

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1.0 PECONIC RIVER SEDIMENT TRAP REMOVAL WORK/SAMPLING AND ANALYSIS PLAN

This work/sampling and analysis plan was prepared to direct the removal and disposal of the sediment trap from upstream of stream gauging station HQ in the Peconic River (Figures 1 and 2) and to minimize the potential for downstream transport of contaminants during the removal operation.

A second purpose of the work/sampling and analysis plan is to propose sediment sampling protocols for evaluating whether the mercury concentration in previously un-remediated sediment beneath, and in close proximity to the sediment trap, meets the cleanup goals. Potential sediment mercury concentrations greater than or equal to 2.0 mg/kg will be submitted to and evaluated with the Environmental Protection Agency (EPA), New York Department of Environmental Conservation (DEC), New York Department of Health (DOH) and Suffolk County Department of Health Services (SCDHS).

2.0 INTRODUCTION, HISTORICAL BACKGROUND AND SITE DESCRIPTION

Past operations and practices at Brookhaven National Laboratory (BNL) have led to wastewater containing chemical and radiological contaminants being transported to the Sewage Treatment Plant (STP). The discharge of the STP to the Peconic River has led to deposition of heavy metals, radionuclides and PCBs in sections of the river both on BNL/U.S. Department of Energy (DOE) property and outside BNL/DOE property. Peconic River remediation of the onsite sediment was completed in 2004 and offsite cleanup was completed in 2005.

In 2002 a temporary sediment trap was installed on Laboratory property immediately upstream of stream gauging station HQ to minimize any migration of contaminants off Laboratory property until completion of the Peconic River remedy. The sediment trap was placed in the river at a location where the flow decreased due to an increase in river width and passage through a culvert (Figure 2) beneath a dirt road (Z-Path) to stream-gauging station HQ. This created a ponded area with a depositional environment in the section of the river upstream of Z-Path. Because this section of the Peconic River frequently dries up in late summer,

contaminants released into the river from the BNL STP have accumulated in this ponded area (Area D) upstream of Z-Path.

The sediment trap was constructed under the terms of a NYSDEC Equivalency Permit[1]. The sediment trap was installed prior to construction of a 2002 pilot study evaluating wetland recovery following sediment remediation, and also prior to the 2004 remediation of the onsite sections of the river upstream of the sediment trap. The location of the pilot study was immediately downstream of the sediment trap and between stream gauging station HQ and the site boundary. The purpose of the sediment trap was to prevent or minimize the potential for contaminants to migrate beyond the sediment trap and into the pilot study area or the offsite sections of the river.

As discussed in the Record of Decision[2] for the Peconic River, BNL/DOE is required to remove the sediment trap when remediation is complete and re-vegetation has been completed. The following states the Record of Decision (ROD) requirements for the sediment trap:

> "This sediment trap will remain in place until the work on Laboratory property is completed and the remediated areas are fully vegetated. At that time, DOE will submit a notification for approval of the removal of the sediment trap to EPA and New York State Department of Environmental Conservation (NYSDEC). The goal is to remove this sediment trap to re-open the areas to fish migration no later than one year after the remedy is implemented. Growth of vegetation and total suspended solids in surface water will be monitored on a routine basis and the data evaluated prior to removal of the sediment trap.[3]"

The cleanup of the off-site sections of the Peconic River was completed in 2005. On August 13, 2007 the NYSDEC confirmed that the Equivalency Permit criteria had been met. In the March 20, 2009 Draft 2008 Peconic River Monitoring Report, and in the transmittal letter for

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[1] DOE, 2002. Peconic River Pilot Studies Permit Equivalency Application, Brookhaven Area Site Office, February 2, 2002, Brookhaven National Laboratory, Upton, NY

[2] DOE, 2004. Final Operable Unit V Record of Decision for Area of Concern 30 (Peconic River), Brookhaven National Laboratory, Upton, NY, November 3, 2004.

[3] Final Operable Unit V Record of Decision For Area of Concern 30 (Peconic River), November 3, 2004, Brookhaven Science Associates for U.S. Department of Energy.

the report from DOE to NYSDEC and EPA[4], DOE requested permission to remove the sediment trap as required by the ROD. NYSDEC granted permission to remove the sediment trap on May 12, 2009[5]. Having evaluated both TSS measurements for the 2003 – 2008 period from stations directly upstream and downstream of the sediment trap and having also summarized and evaluated wetland plant re-vegetation in the remediated sections of the river per the ROD in the Final 2008 Peconic River Monitoring Report, BNL/DOE finalized their recommendation to remove the sediment trap. BNL/DOE assumes that the removal of the stone from the onsite section of the river can be performed without a local, state or federal permit.

The location of the sediment trap relative to the BNL STP and the BNL site boundary is shown in Figure 1. Figure 2 shows the position of the sediment trap relative to stream-gauging station HQ, Z-Path and post-cleanup confirmation samples that were collected in 2004. Figure 3 shows the locations of the proposed sampling stations and Figure 4 shows a cross section of the sediment trap.

Sections 1 -7 of this work/sampling plan describe the removal of the sediment trap. Sections 8 – 11 describe the plan for sampling and analysis.

2.1 Project Overview

The sediment trap is constructed of sized stone. Figure 4 shows a cross section of the sediment trap construction materials. The upstream surface of the trap is composed of 1 ½ inch stone. The function of the 1 ½ inch stone is to slow the flow and cause deposition of suspended material upstream of the sediment trap. The primary function of the six inch stone (i.e., rip rap) is to support the 1 ½ inch stone, yet allow downstream passage of water through the sediment trap to the culvert that conducts water to the stream gauging station HQ. A total of approximately 40 cubic yards of stone is estimated in the structure. The function of the sand

[4]Thomas J. Vero (DOE) to Mr. Chek Beng Ng (NYSDEC) and Mr. Doug Pocze (USEPA) concerning Brookhaven National Laboratory (BNL) Interagency Agreement: (IAG) Operable Unit March 27, 2009.
[5]Chek Ng (DEC)) to Thomas J. Vero (DOE), May 12, 2009 concerning DEC Comments on the *Draft 2008 Peconic River Monitoring Report*, March 20, 2009

layer between the stone and geo-membrane is to minimize the potential for the stone to puncture the geo-membrane. The combined function of the sand and geo-membrane is to minimize the potential for un-remediated sediment, potentially containing contaminants, from becoming suspended and transported downstream. This work plan describes the excavation of the sediment trap stone and the loading of the stone for transportation and disposal. Major work activities are delineated below.

- Mobilization
- Remove sediment trap materials
- Place materials in roll off containers for local transportation and short term storage of the stone at BNL prior to transport and disposal
- Decontaminate equipment
- Demobilize
- Evaluate mercury concentrations in the sediment beneath the sediment trap and upstream of the sediment trap
- Prepare and submit completion report

3.0 MOBILIZATION

Mobilization activities include completing those planning, administrative, training, equipment and materials receiving and inspecting activities necessary to begin the removal of the sediment trap. Erosion control will be provided as necessary. Sediment trap removal is scheduled to occur when seasonally varying river depths are at a minimum in order to minimize the potential for suspension and downstream transport of contaminants. If the water is not below the level of the Sediment trap geo-membrane, anti-erosion and dispersal steps described in Section 4.0 will be implemented.

3.1 Site Preparation

The work will take place along an unpaved road referred to as Z-Path. Excavation, transfer, and transport equipment will be staged on Z-Path. There is no additional site preparation required.

4.0 SEDIMENT TRAP REMOVAL OPERATIONS

Sediment trap removal activities are planned to occur during a period of no flow to low flow. These conditions typically occur in the late summer – fall seasons. If the water level is at or above the level of the geo-membrane, then the area of the sediment trap and adjacent sediment area that may require cleanup will be isolated with hydro-dams and river flow will be diverted around the area. A Cat 335 or equivalent excavator will be used to excavate the sediment trap. The excavator will be positioned on Z-Path to best access the trap. The excavator will reach and sequentially remove the sediment trap stone operating generally in a north to south direction. The excavator bucket will be brushed clean over each roll off container at the end of each work day prior to covering the roll-off container with a tarp and removing the roll off container from the sediment trap site.

Excavated materials will be placed in a roll-off container located immediately south of the excavator. The roll-off container will be provided by the transportation and disposal contractor. The empty roll-offs will be staged at BNL after passing through the radiation truck monitor. The loaded roll off will be covered with a tarp, and transported for weighing to the BNL waste management facility via the North Street southeast gate. An empty roll-off will then be transported and spotted at the excavation work area. This process will be repeated until all sediment trap materials have been removed. Throughout the stone removal operation care will be taken not to damage the geo-membrane beneath the sand. This may require manual removal of the stone layer directly above the sand and/or repair/patching of the geo-membrane if removal of the underlying potentially–contaminated sediment is delayed. Two 20 cubic yard roll off

containers are expected to be required to transport and store the estimated 40 cubic yards (54 tons of material). Two days are estimated to excavate and remove all trap materials from the excavation site.

A roll-off transport truck will be available throughout the excavation activity in order to clear Z-path in the event of an emergency.

Immediately after the sediment trap stone has been removed, the sediment beneath and in close proximity to the sediment trap will be sampled per the sampling and analysis plan contained in Sections 8 to 11 of this work/sampling plan.

Following the removal of the stone from the sediment trap and the subsequent sampling and analysis, four (4) to six (6) inches of clean rip-rap, will be placed on top of the sand to stabilize the geo-membrane, should it become exposed. The intent of stabilizing the geo-membrane is to prevent the potential contaminants in sediment beneath the trap from being eroded and transported downstream. Following the replacement of the stone there will be three layers, from bottom to top protecting the sediment from suspension: 1) the geo-membrane that was placed above the sediment; 2) the approximately six inches of clean sand that were placed above the geo-membrane; and, 3) the stone layer that stabilizes the geo-membrane. The compression of the sediment beneath the sediment trap that resulted from the overlying weight of the sediment trap (approximately 54 tons) is likely to be sufficient to prevent erosion of the sediment without any additional cover material. However, the additional stabilization provided by the geo-membrane, the sand layer, and the layer of geo-membrane stabilizing stone provides additional protection against potential sediment suspension and downstream transport.

4.1 Transport Sediment Trap Material to Appropriate Disposal Facility

Prior to transport and disposal, the roll off containers containing waste sediment trap material will be staged at BNL for weighing. The waste material will be characterized in accordance with a sampling and analysis plan (to be provided under separate cover) to determine the appropriate disposal destination.

5.0 DEMOBILIZATION

Demobilization will consist of the loading and transport of the equipment from the project site. Any excavation or other equipment used to remove or transport the sediment trap material will be routed from the work site to the BNL radiation truck monitor via the North Street gate.

6.0 PREPARE AND SUBMIT COMPLETION REPORT

A completion report will be prepared and submitted at the conclusion of the project. The report will have two principal subject areas: 1) sediment trap removal and disposal; 2) analytical results for sediment beneath and in close proximity to the sediment trap. The first section of the report will document the removal of the sediment trap, provide analytical characterization data for the sediment trap material, and discuss the waste transportation and disposal for the material. The second section of the report will discuss the sediment-sampling process and analytical tests.

7.0 PROJECT SCHEDULE

- Week 1 – Complete Project Planning and Administrative Requirements
- Week 2 – Mobilize Equipment and Materials.
- Week 3 – Complete Excavation, Remove Materials, Begin Demobilization. Collect/Analyze Sediment Samples from Beneath and Upstream of sediment trap.
- Week 4 – Complete Demobilization and Draft Completion Report

8.0 SAMPLING AND ANALYSIS PLAN

Potential remediation of the section of the Peconic River directly beneath, and in close proximity to, the sediment trap was deferred until the sediment trap could be removed and the underlying sediment could be sampled. The sediment will be sampled immediately following the removal of the overlying stone. Sampling results will provide data to evaluate the contaminant concentrations in sediment beneath and upstream of the sediment trap. Potential future cleanup decisions for this area will be discussed with the EPA, DEC, DOH and SCDHS once the analytical results are received and summarized. Potential cleanup would be coordinated with other previously discussed Peconic River remediation work.

9.0 Field Investigation

This section details the elements of the field investigation. The objective of the data to be collected per this plan is to evaluate the concentrations of mercury and other potential contaminants in the sediment that could be found beneath, and immediately upstream and downstream of the sediment trap. The procedures for obtaining samples, the sample locations, and the analyses to be conducted are included. A summary of the sampling program is presented in Table 1.

9.1 Conceptual Site Model

All wastewater discharged from the STP was passed through sand-filter beds to remove contaminants. Contaminants from inadvertent releases at concentrations greater than release limits have been transported to the Peconic River and have either remained in the surface water or been adsorbed to particles and deposited in low flow/energy sections of the river. Low density deposited material that has not become compacted and/or covered with vegetation has the potential to become re-suspended. A sediment trap was placed upstream of gauging station HQ to slow the river flow and deposit suspended matter and its adsorbed contaminants upstream of the sediment trap. The radius of the sediment trap is approximately 22 feet, and consequently the area covered by the sediment trap is approximately 760 square feet. This area beneath the sediment trap was not remediated in 2004 when the section of the river upstream of Z-Path was cleaned up. Therefore elevated concentrations of mercury, and potentially other contaminants, may be expected among the samples to be collected beneath the sediment trap after the trap is removed and in relatively close proximity to the trap. The locations to be sampled are discussed in the next section.

9.2 Sediment Collection

The location of each sample (except ST-SC1 and ST-SC2) will be measured from the left bank (facing upstream) toward the right bank (Figure 3). Samples will be collected at the location of the seasonal high water mark on the left shore of each transect and at 25 foot intervals between the left shore high-water mark and the right shore high-water mark of each transect. Transect ST1 will be located 5 feet upstream of and parallel to Z-Path and the wooden headwall. Transect ST2 will be located 35 feet upstream of and parallel to Z-Path and the wooden headwall.

Sub-surface sediment samples (cores) will be collected after the sediment trap has been removed. Because sediment trap removal is likely to disturb the small amount of sediment in the area of surface sample (0-2 inches) locations ST-SC1 and ST-SC2, these samples will be collected prior to removal of the sediment trap. Sediment trap removal is scheduled to occur when seasonally varying river depths are at a minimum in order to minimize the potential for suspension and downstream transport of contaminants. If the water is not sufficiently low, the sediment trap removal will be re-scheduled. The majority of the samples will be collected with a core or auger that samples the top six inches of the sediment. For samples which will be analyzed for several contaminants, it may be necessary to collect and composite multiple six-inch deep core samples[6] to provide sufficient sample mass to meet the laboratory sample mass requirements (Table 2).

In addition to the core samples, four additional surface samples will be collected with a trowel. Two of the four trowel samples will be collected between the sediment trap and the Z-Path headwall (ST-SC1 and ST-SC2). The other 2 surface samples (ST-SC3 and ST-SC4) will be collected upstream of the sediment trap at the deepest section of the river bed along transect ST2. Specifics about each of the core and trowel samples are discussed below.

Following removal of the sediment trap, two six inch core samples (Figure 3) will be collected from the un-remediated sediment beneath the geo-membrane and clean sand layer (see cross section of sediment trap in Figure 4). These two core samples to be collected within the footprint of the removed sediment trap are ST1-25 and ST1-40. If the geo-membrane can not be peeled/rolled back to expose a sample location without compromising the integrity of the geo-membrane, it will be necessary to penetrate the geo-membrane to collect the sample. In that case the geo-membrane will be repaired. Several inches of clean sand were placed on the geo-membrane after the geo-membrane was installed on the river bed. To minimize the dilution of potential contaminants in the sediment of the core sample, the sand layer must be removed from the top of the core sample before the six inch sediment sample is homogenized and placed in

[6] As noted in Section 9.3, extensive sampling prior to, during and following the sediment cleanup have demonstrated that elevated mercury in un-remediated sediment is most likely to be found in the top six inches of sediment. If

sample jars. An additional six-inch sediment core will be collected immediately downstream of the location where the culvert influent enters the river.

9.3 Sediment Sampling Procedures

Previous investigations have demonstrated that elevated mercury in un-remeditaed sediment is most likely to be found in the top six inches of the sediment. All core sediment samples will be collected from the top six inches or less if the sediment layer is not six inches deep. All top six inch sediment samples will be collected with a soil auger or a lined core. Detailed sediment sampling protocols, including precautions to minimize sediment disturbance, are defined in EM-SOP-600 (Sediment Sampling). The BNL Standards Based Management System will be used to address all safety concerns. Field-work will be conducted in accordance with an approved Work Permit. All samples will be logged and recorded per EM-SOP-202 (Sample Location Identification) and EM-SOP-600.

Large material (rocks, sticks, debris) will be removed from the sample prior to placing in sample bottles. Large material will be removed from the stainless steel bowl in which homogenization is performed. Samples will be thoroughly homogenized prior to placement in one or more sample bottles. Decontamination of equipment will be done between samples using site water.

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cleanup is required, post-cleanup rapid analysis turnaround (24-48 hours) confirmation samples would be used to determine whether additional sediment removal is necessary.

Table 1 Sampling Program Summary

Sample	Number of Transects Locations and Samples	Number of Samples	Analyses[7]
Transect ST1	1 transect with 5 core samples. This transect passes through the sediment trap area. Transect is approximately 5 feet upstream of the Z-Path headwall (Sample Area not previously cleaned up.)	5	Mercury, Silver, Copper, PCBs, Cesium-137
Additional Samples Within Boundary of Sediment Trap	2 composite samples of top 1-2 inches (ST-SC1 and ST-SC2) from area between sediment trap and headwall and above geo-membrane and sand. (Samples obtained prior to trap removal) (Sample Area not previously cleaned up.)	2	Mercury
Transect ST2	1 transect with 5 core samples. 2 composite samples of top 1 -2 inches from deepest section of transect (Transect area was cleaned up in 2004)	5 2	Mercury, (Silver, Copper, PCBs, Cesium-137 to be analyzed for in 10% of samples, =1) Mercury
SED	Single sample point downstream of Z-Path where culvert effluent enters river	1	Mercury
Total number of field samples		**15**	
QC Samples[8]			Mercury, Silver, Copper, PCBs, Cesium-137
	Field Blanks	1	
	Duplicates	1	
	Spikes	1	
Total Number of Field and QA/QC Samples		**18**	

[7] Samples from areas not previously remediated (Transect ST1, except 2 inch cores ST-SC1 and ST-SC2) will be analyzed for mercury, silver, copper, PCBs, and cesium-137. Samples from areas previously remediated will follow the Peconic River post-cleanup confirmatory sampling protocol and be analyzed for mercury, and 10 percent of the samples will also be analyzed for silver, copper, PCBs, and cesium-137. (Fractions will be rounded up to a whole number.

[8] QA/QC samples are collected at the frequency of 1 QA/QC sample per 20 field samples. EM-SOP-200 Collection and Frequency of Field Quality Control Samples

10.0 Analytical Methods

The analytes and methods, including detection limits and sample size pertinent to the methods, are presented in Table 2.

Table 2
Sediment Analytical Methods and Detection Limits

Parameter	Method	Minimum Sample Mass	Detection Limit
Mercury	7471a	5 g	0.1 mg/kg
PCBs	EPA 8082	120 g	20 ug/kg
Cesium-137	EPA 901.1	50 g	2.3 pCi/g

11.0 Sample and QA/QC Activities

This section discusses sample IDs, sample preparation, packaging documentation and QA/QC samples and activities. Samples will be identified and Chains of Custody will be completed per the BNL Specifications for Environmental Information Management System (EIMS) Analytical Data Format.

Location IDs will also be assigned to each sample location. The location ID will consist of the transect ID (e.g., ST1, ST2), followed by a hyphen and a one-digit, two-digit or three-digit number indicating the distance of that sample from the left bank transect post (when facing upstream). Samples collected at the left and right banks will have an "L" or an "R", respectively, appended at the end. For example, the sample collected at the stake on the left bank of transect ST1 will be named "ST1-0L", the sample collected 25 feet from the left stake in transect ST1 will be "ST1-25", and the sample collected on the right bank, assuming the river is 70 feet wide, would be "ST1-70R".

The four shallow composite samples (top 2 inches) will be named differently. The ST-SC1 and ST-SC2 will be collected prior to removal of the trap within the area between the headwall and the trap. ST-SC1 will be collected from surface material lying above the geo-membrane and sand on the

north side of the center of the culvert and ST-SC2 will be collected from the area of the trap from the center of the culvert. If there is insufficient sample mass it may be necessary to combine the samples.

The ST-SC3 and ST-SC4 samples will be collected from the deepest section of transect ST2 to evaluate potential contaminants that may have been transported downstream since the cleanup. Two samples will be collected from the top two inches of sediment. ST-SC 3 will be collected from the north section of the deepest area and ST-SC4 will be collected from the south part of the deepest section of the transect. The distance from the left end of the transect to the location of the collection area along the transect will be appended with a hyphen to the sample name. For example if the ST-SC3 sample was collected at an approximate distance of 47 feet from the ST2-0L, then the sample name would be ST2-SC3-47.

11.1 Sample Preparation

Sediment samples must be prepared prior to placing in sample jars and shipping to the analytical laboratories. The purpose of the preparation is to thoroughly homogenize the appropriate samples before packing the samples or dividing into aliquots for the analytical laboratory. Each sample will be homogenized in a stainless steel bowl with a stainless steel spoon and placed into sampling bottles. Prior to collecting a sample, the field team will review the sample container and preservation requirements. At the completion of sample collection activities at each location, the sampling team will ensure that the proper number and types of bottles were filled.

11.2 Sample Packaging and Shipping

Each individual sample bottle will be packaged within a plastic bag and then sealed. Glass bottles will be wrapped with protective packaging to ensure that sample bottles are not broken during shipment to the analytical laboratory. Temperature will be controlled with blue ice containers and/or plastic bags filled with ice and then sealed and placed inside each cooler with the samples to ensure that the samples arrive at the analytical laboratory at a temperature of four degrees Celsius (plus or

minus two degrees Celsius). A chain-of-custody will be completed by the sampling team and will accompany the samples to the laboratory. The chain-of-custody will be placed in a plastic bag, sealed, and placed inside the sample cooler with the samples. The samples will be shipped to the analytical laboratory via an overnight mail carrier.

11.3 Sample Documentation

The sample team will be required to keep a field notebook. The field notebook will be a bound weatherproof log book that will be filled out at the location of sample collection. It will contain sample designation, sample collection time, sample description, sample collection method, daily weather, field measurements, and other site-specific observations. The sample team will also complete a sample collection log for every sample that is collected. Completed sample collection logs will be provided to the BNL Groundwater Protection Group Project Manager.

11.4 Quality Assurance and Quality Control Samples

This section describes the QA/QC requirements for field activities that will be conducted as part of this sampling. Field instruments will not be used during the collection of samples under this sampling plan. General guidance on the collection of the QA/QC samples is presented in EM-SOP-200.

Field Blanks - Field blanks will be collected to evaluate potential cross-contamination of samples due to the sampling equipment. Field blank samples will be performed on pre-cleaned sample equipment. The frequency of field blanks to be collected is one field blank for every twenty samples shipped to the analytical laboratory. For projects with less than 20 samples of a collection type, a minimum of one field blank will be collected per sample type.

Field blanks will be obtained by pouring deionized water over the sampling equipment. The laboratory performing the sample analyses will supply deionized water for field blanks. The water will then be transferred into the appropriate sample bottles. The field blanks will be collected in the field

and will accompany field personnel to the sampling location. The field blanks will be collected and analyzed for the same parameters that the samples are being analyzed for that day.

Trip Blanks - Trip blanks are not required for sediment analyses or for analyses of mercury. Therefore, trip blanks are not part of this sampling plan.

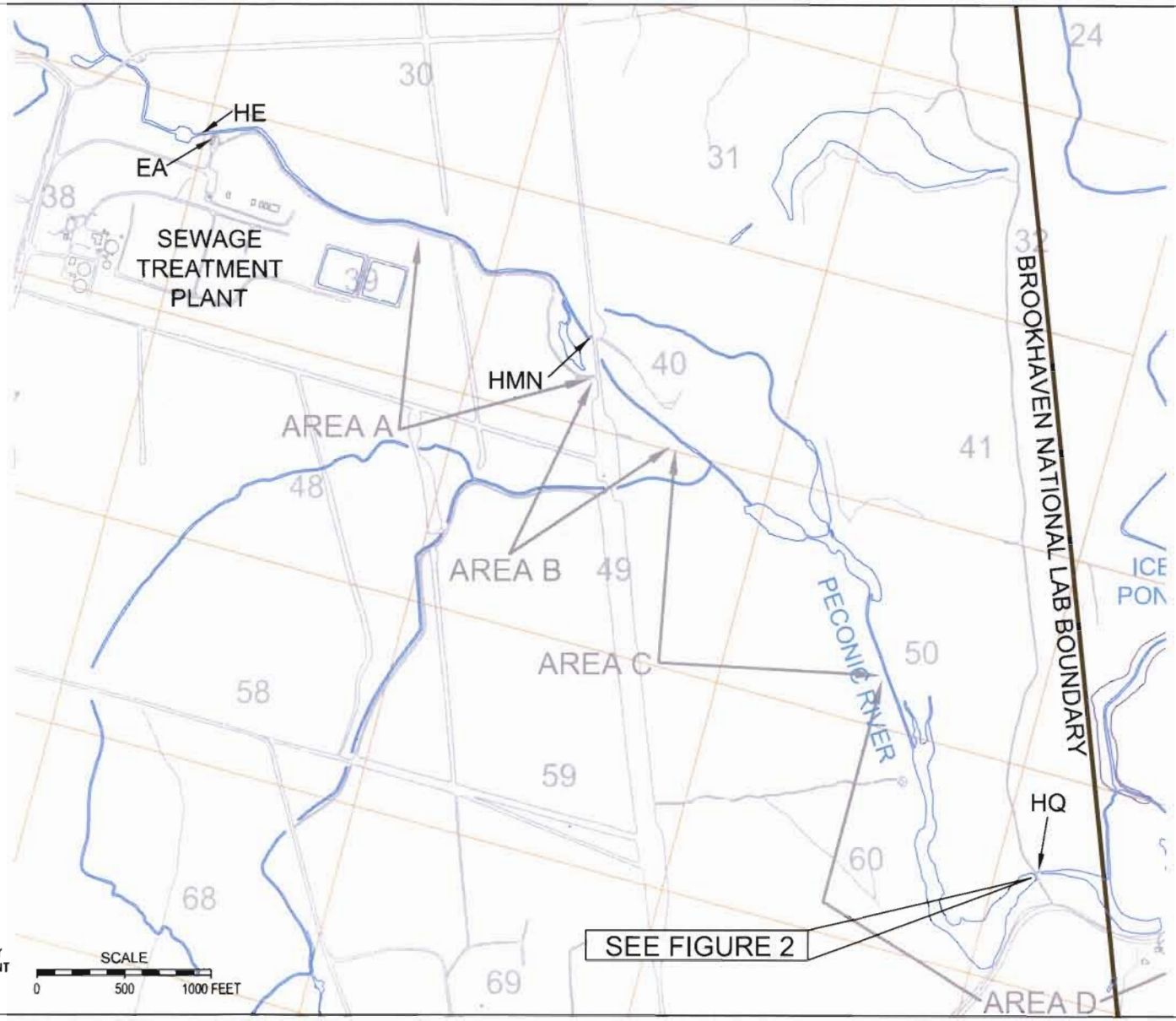
Duplicate Samples - Duplicate samples will be analyzed to check laboratory reproducibility of analytical data. At least five percent (one out of every 20 samples) of the total number of collected samples will be duplicated to evaluate the precision of the methods used.

Matrix Spike/Matrix Spike Duplicate Volume Requirements - Matrix spike/matrix spike duplicates (MS/MSD) are performed at a frequency of one MS/MSD for every twenty samples in a sample delivery group (SDG). Sample reanalysis may be necessary in certain situations. To ensure the laboratory has sufficient volume for MS/MSD analysis, triple sample volume must be collected and submitted to the analytical laboratory.

Split Samples - Split samples will be provided to the United States Environmental Protection Agency, the New York State Department of Environmental Conservation, or the Suffolk County Department of Health Services, at their discretion, provided these are requested in sufficient advance of the sampling event. Split sample data provide additional information to qualify project data. It can reveal data problems even when QC data are in control. Alternatively, split data can provide support to the laboratory data that may be questioned due to insufficient QC data.

When data are in disagreement, the disagreement should be explained or reconciled if possible. It should be verified that the data all originate from splits of the same sample, and both laboratories should be asked to check their results. Both data sets should be reviewed for supporting QC data, and any weaknesses should be identified.

Figures



NOTES:
THE CLEANUP AREAS MAY NOT PRECISELY REPRESENT THE ACTUAL SURVEYED CLEANUP AREAS.

//oernt/gis/gw_projects/paconic river/Fig 1 Sediment Trap Location 081109.dwg

BROOKHAVEN NATIONAL LABORATORY

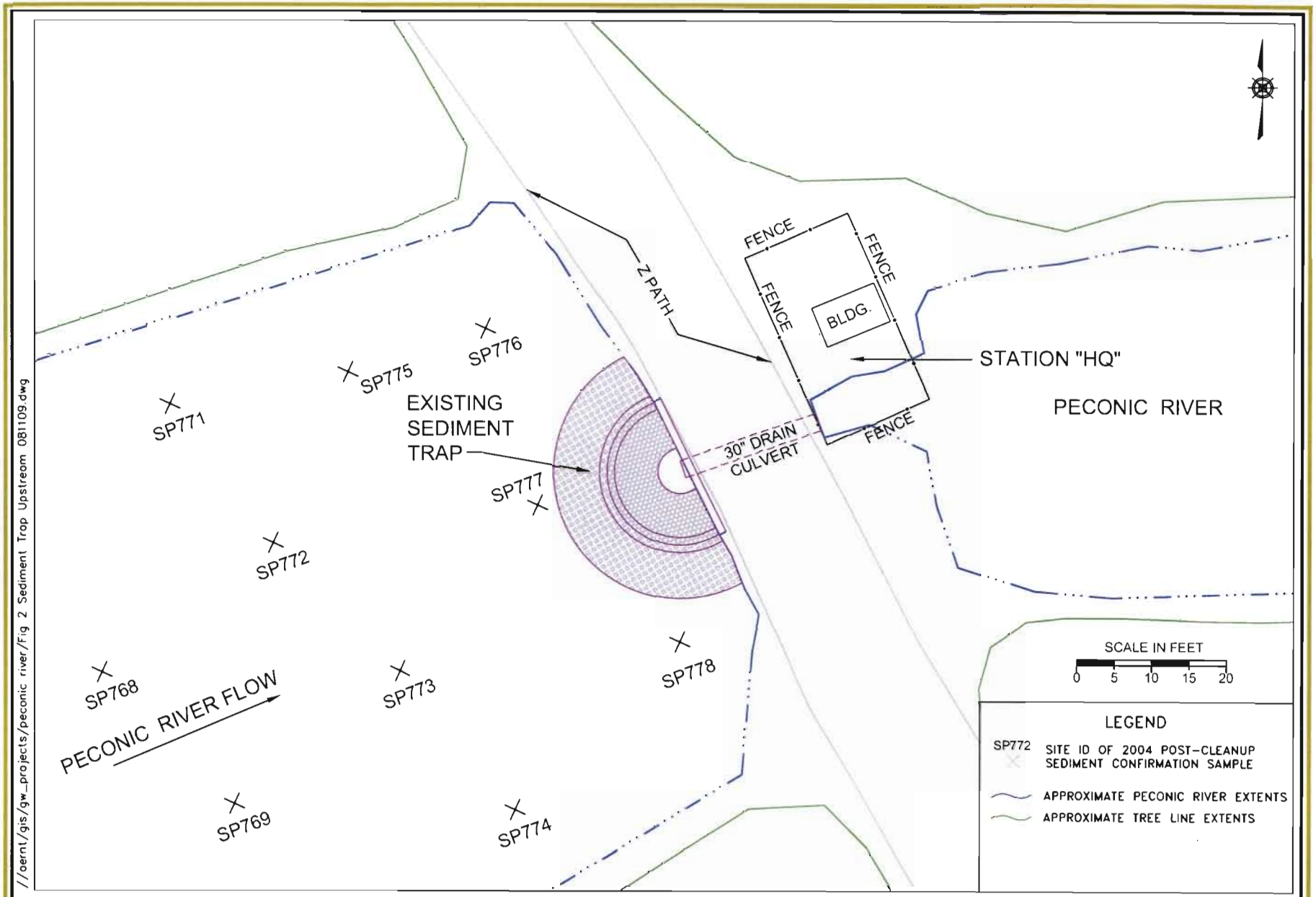
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

SEDIMENT TRAP LOCATION

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	08/11/09	–
CHKD:	APPD:	REV.:	NOTES:
WM	–	–	–

FIGURE NO.: 1



BROOKHAVEN NATIONAL LABORATORY

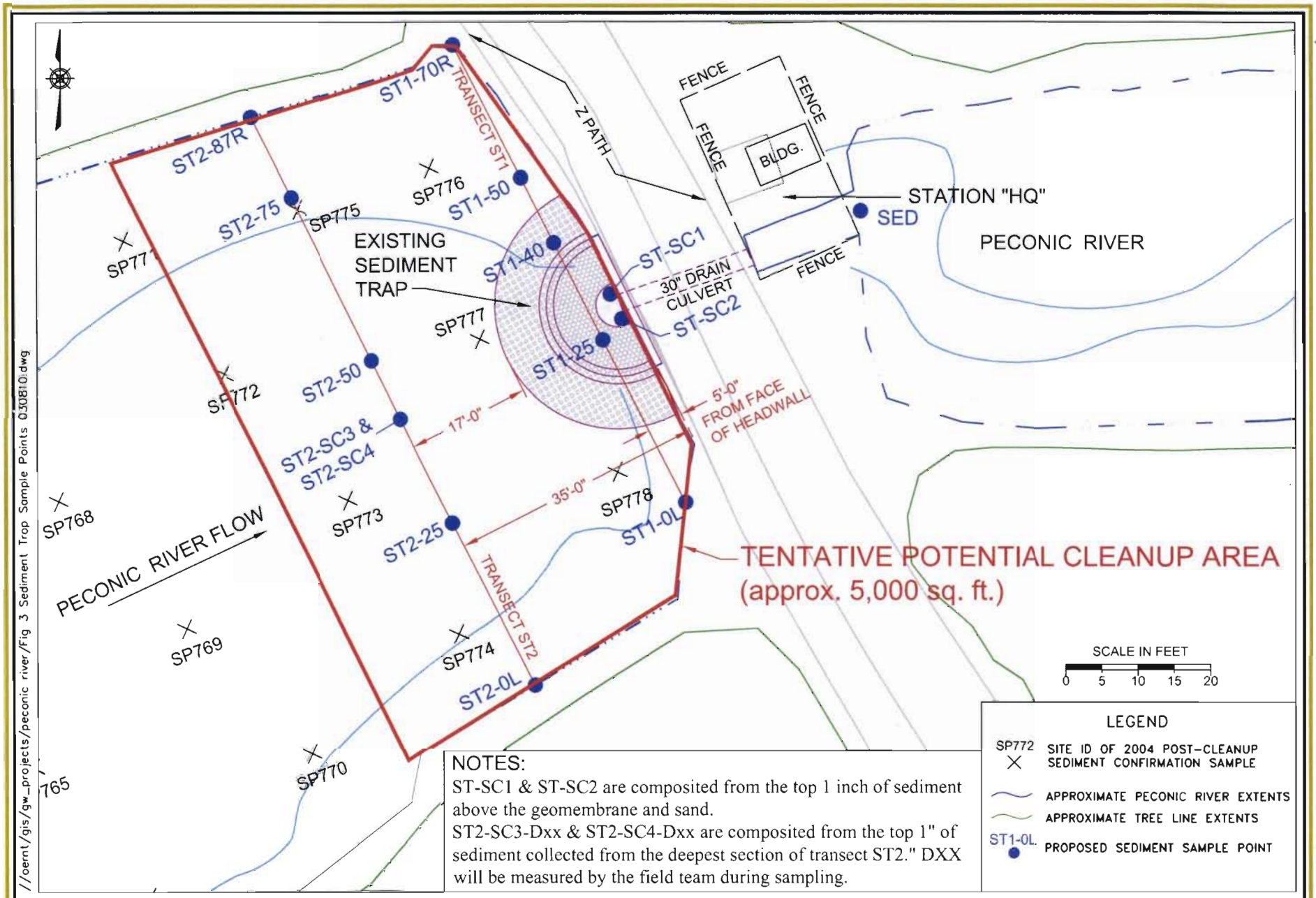
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

SEDIMENT TRAP UPSTREAM OF STREAM GAUGING STATION HQ

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
AJZ	–	08/11/09	–
CHKD:	APPD:	REV.:	NOTES:
WM	–	–	–

FIGURE NO.: 2



//oernt/gis/gw_projects/peconic river/Fig 3 Sediment Trap Sample Points 030810.dwg

NOTES:
ST-SC1 & ST-SC2 are composited from the top 1 inch of sediment above the geomembrane and sand.
ST2-SC3-Dxx & ST2-SC4-Dxx are composited from the top 1" of sediment collected from the deepest section of transect ST2." DXX will be measured by the field team during sampling.

BROOKHAVEN NATIONAL LABORATORY
ENVIRONMENTAL PROTECTION DIVISION

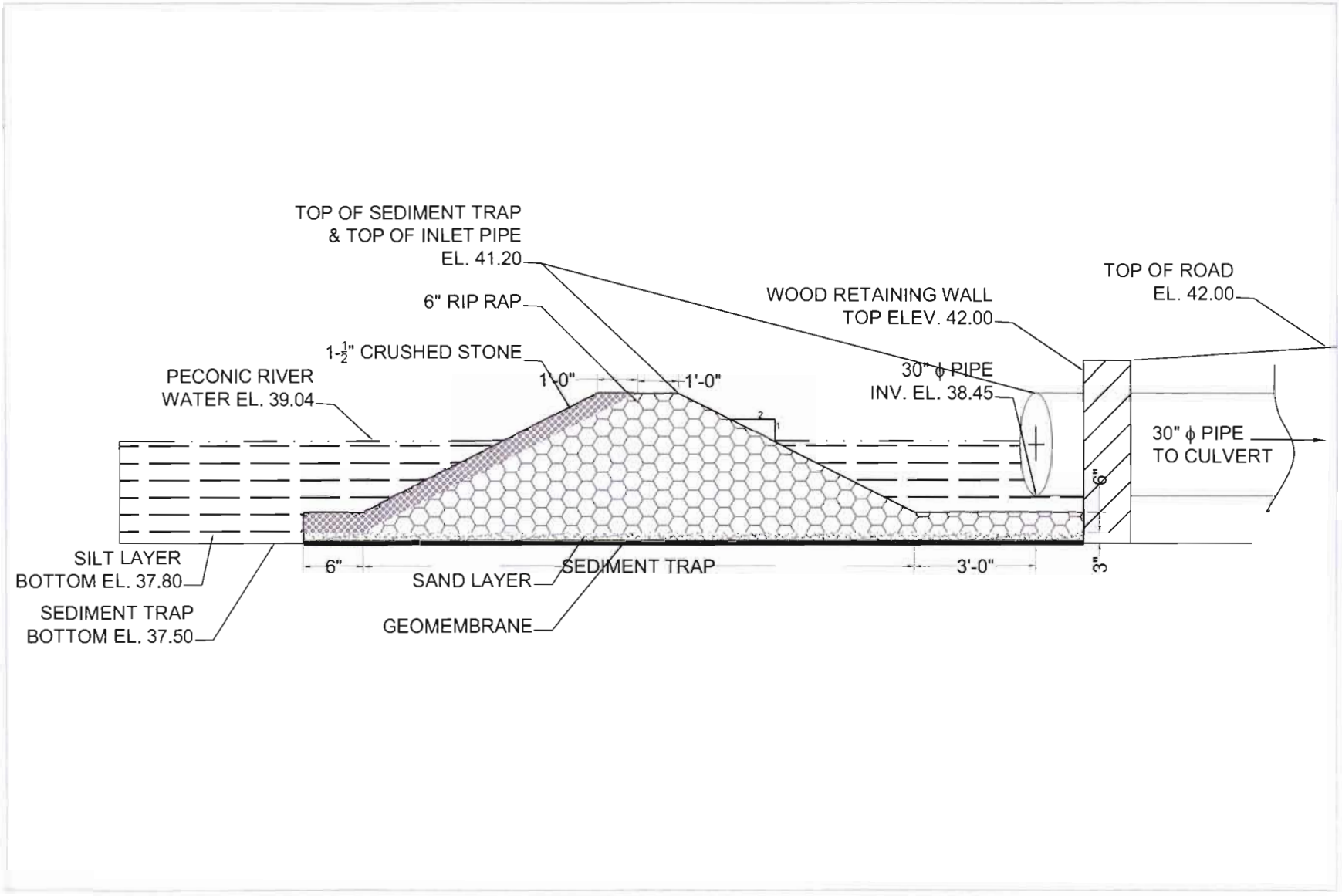
TITLE:

PROPOSED SEDIMENT TRAP SAMPLE POINTS

MERCURY SAMPLING PECONIC RIVER

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
AJZ	–	01/27/10	–
CHKD:	APPD:	REV.:	NOTES:
WM	–	–	–

FIGURE NO.: 3



//oernt/gis/gw_projects/peconic river/Fig 4 Sediment Trap Section 081109.dwg

BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

SEDIMENT TRAP SECTION

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
AJZ	–	08/11/09	–
CHKD:	APPD:	REV.:	NOTES:
WM	–	–	–

FIGURE NO.: 4