6. RECOMMENDED ALTERNATIVE

EPA has reviewed the information contained in Sections 1 through 5 of this report and the results of supplemental sampling of riverbank soils presented in Subsection 6.1 of this report. EPA, with input from the public and applicable stakeholders, has recommended a removal alternative to be implemented in the EE/CA Reach. This recommendation is presented in Subsection 6.3 of this report. EPA presented this report to the Citizen's Coordinating Council on March 1, 2000, and held meetings with owners of properties abutting the EE/CA Reach on May 23 and June 7 and 8, 2000. On May 17, 2000, EPA Region I presented this report to EPA's National Remedy Review Board. The Board's comments on the EE/CA with EPA Region I's responses are provided in Appendix R.

The selected removal alternative will be available for public comment from July 17, 2000, to August 16, 2000. Comments received will be reviewed and considered, and responses will be provided. Following the public comment period, EPA will select a removal alternative in a document called an Action Memorandum.

Additional investigations are currently underway to fill data gaps identified in the draft EE/CA. The results from these additional investigations will not affect the recommended alternative, but rather help to better quantify the volumes of material to be excavated or to better characterize potential NAPL sources. These additional investigations are currently underway and are further discussed below.

6.1 SUPPLEMENTAL SAMPLING OF RIVERBANK SOILS

6.1.1 Introduction

WESTON conducted supplemental sampling of riverbank soils on residential properties abutting the EE/CA Reach of the Housatonic River. The objective of this supplemental sampling effort was to evaluate PCB contamination on the riverbanks of residential properties at depths greater than 3 ft.

To meet the above objective, one soil boring was advanced on the riverbank of each residential property abutting the river, and soil samples were collected from three depth intervals. The borings were advanced at the midpoint of the riverbank to a depth of 6 ft below grade (perpendicular to the slope of the bank) using a hand auger. This method allows the sample collected at the 5- to 6-ft interval perpendicular to the bank to be considered representative of a sample collected at the 15-ft depth from the top of riverbank or to the groundwater table, whichever is at the higher elevation (see Figure 6.1-1).

The borings were located within each residential property based on data from previous sampling events, and were hand augered at the location of the highest PCB result from the 2- to 2.5-ft-depth interval on that property. Soil samples were not collected from the upper 3 ft because this interval had been previously characterized during earlier investigations. Soil samples were collected from 3 to 3.5 ft, 4 to 4.5 ft, and 5 to 5.5 ft in each boring.

The samples were submitted to the on-site laboratory for PCB analysis. In addition, seven duplicate samples (representing approximately 10% of the total number of samples collected) were collected for QA/QC purposes. Approximately 10% of the samples were also submitted for TOC and grain size distribution analyses and for off-site confirmation analysis.

6.1.2 Results

Sampling was conducted between 13 December and 21 December 1999. A total of 98 samples were collected from 36 locations. The sampling program included only one sample location per property, limiting the amount of data collected to represent these residential properties. The sample locations and total PCB results are presented in Figure 6.1-2. The results of the PCB analysis are presented in Table 6.1-1.

Table 6.1-2 summarizes the PCB data by depth interval (and includes the corresponding shallower historical results for comparative purposes). Total PCBs were detected at concentrations up to 383 ppm. The average concentration for all depth intervals is 61.7 ppm. Higher PCB concentrations appear to be concentrated in specific areas including the east bank of Subreach 3-10, Subreaches 4-4A and 4-4B, and the east bank of Subreach 4-6.

6.1.3 Residential River Bank Cleanup Criteria Below Three Feet

USACE and EPA, in consultation with MADEP, have reviewed the cleanup criteria presented in Subsection 3.4 of this report for residential riverbank soils. Because existing laws and regulations restrict excavation of riverbanks, EPA and MADEP agree that applying the residential cleanup goal of 2 ppm below 3 ft in the riverbanks is overly conservative, due to the reduced potential for human exposure. Rather, applying a recreational type exposure scenario to residential bank soils below 3 ft is more indicative of the exposures that could be expected. Therefore, residential bank soils below 3 ft will be cleaned up to meet an average PCB concentration of 10 ppm. This will result in an increase to the total volume of bank soil proposed for excavation (See Subsection 6.1.4). This change also reflects the recommendation made by the National Remedy Review Board (NRRB) during their review of this project. The NRRB recommendation states:

> *The information presented to the board states that the contaminated river banks in residential areas could be excavated to a depth of up to 15 feet. The board believes the proposed excavation depth of 15 feet may be overly protective for river bank soils and may add significantly to the cost of soil or sediment removal. The board recommends that the Region reconsider the 15 foot excavation criterion for river bank soils.*

Specifically, the cleanup criteria for riverbank soil on residential properties are as follows:

- Maximum 2 ppm, based on a 95% UCL, in the 0- to 3-ft-depth interval. (No change.)
- Average PCB concentration within the 3- to 6-ft-depth interval is not to exceed 10 ppm.
- The maximum PCB concentration at any sample location below 3 ft cannot exceed 50 ppm.
- If the average PCB concentration below 3 ft exceeds 10 ppm, remove bank soils at 1-ft intervals and replace with soils with "non-detect" PCBs (0.6 ppm) and recalculate the average PCB concentration from the 3-ft depth down to the groundwater table.

Table 6.1-3 summarizes the PCB data by depth interval for each sample location. Average PCB concentrations for the 3- to 6-ft-depth interval, replacement of the 3- to 4-ft-depth interval with non-detect PCB concentration (0.6 ppm), and replacement of the 3- to 5-ft-depth interval with non-detect PCB concentration are also presented. The table then presents the required excavation depth to reach the revised cleanup criteria. Figure 6.1-3 shows the sample locations and graphically depicts the required excavation depths to achieve the revised cleanup criteria.

6.1.4 Estimated Cleanup Volumes

The volume of riverbank material required to safely remove contaminated soil to the revised cleanup was estimated. The total riverbank cleanup volume estimated in Appendix O (using the previous cleanup criteria presented in Subsection 3.4) is 46,507 yd^3. With excavation on residential properties extended to the depths necessary to reach the revised cleanup criterion, the estimated riverbank soil excavation volume would increase by 3,740 yd^3 to a total of 50,247 yd^3. The estimated sediment excavation volume is 43,225 yd^3.

6.2 RECOMMENDED ALTERNATIVE EVALUATION PROCESS

The criteria for evaluation of the alternatives presented in Section 5 fall into three broad categories—Effectiveness, Implementability, and Cost. The criteria are described in detail in Subsections 5.1.1, 5.1.2, and 5.1.3 and are listed in Table 6.2-1. Each alternative is evaluated in detail in Section 5.

6.3 RECOMMENDED ALTERNATIVE

6.3.1 Overview

The recommended alternative consists of a modified Base Alternative 2, sheetpiling and pump bypass, along with Disposal Option A, consolidation of 50,000 yd^3 of contaminated soil and sediment at the GE On-Site Consolidation Areas with off-site disposal of material in excess of 50,000 yd^3. The recommended alternative was chosen based on what EPA believes to be the most effective and efficient approach to remediation in the EE/CA Reach based on existing data.

In addition to the recommended alternative, an alternate excavation alternative is also proposed. The alternate excavation alternative is to allow the removal contractor or EPA the flexibility to adjust field operations to take advantage of the Contractor's capabilities and experience as well as experience gained in observing the removal action in the Upper Reach 0.5-Mile Removal currently being performed by GE. The alternate excavation alternative would be implemented in instances where the contractor can show, after EPA approval, that the excavation alternative is a more effective and efficient approach to remediation.

6.3.2 Removal Recommendation: Transect 64 to Transect 96

As indicated, the recommended alternative is a modified version of Base Alternative 2. Beginning just downstream of the Lyman Street Bridge, sheetpiling would be installed from Transect 64 and continue downstream to Transect 96 (Figure 6.3-1). Since sheetpiling cannot be installed under the Lyman Street Bridge, wet excavation, with in-stream diversion, is proposed only for under the bridge.

Sheetpiling is proposed for this section primarily because the river abuts Oxbows A, B, and C. These oxbows were filled in with material from the GE plant site and are contaminated with PCBs. GE is required under the Consent Decree to further characterize the extent of contamination in these oxbows. Based on conditions encountered during the removal activities in the Upper Reach 0.5-Mile Removal, an unexpected source of NAPL could be encountered.

EPA believes that sheetpiling will provide better excavation control in the smaller cells if NAPL is found. If further bank sampling, currently in progress, determines that encountering NAPL is unlikely, then pump bypass will be an allowed alternative. However, if the additional sampling does indicate the possible presence of NAPL, then additional response actions may be necessary. Response actions to address NAPL from the oxbows or other NAPL encountered in the EE/CA Reach may include soil and sediment excavation, NAPL removal, and/or capping. The need for additional response actions and associated costs for known NAPL areas will be addressed in the final Action Memorandum.

Wet excavation for this portion of the river is not recommended due to greater water depth (2 to 3 ft), sediment thickness (2 to 4 ft), and higher % fines (21.5%). Because of the water depth and thickness of sediment, setting up in-stream diversions for wet excavation will be difficult. Control of depth of excavation and containment of bank slopes will also be difficult due to water depth.

6.3.3 Removal Recommendation: Transect 96 to Transect 168

Pump bypass is recommended from Transect 96 to Transect 168, because it is the alternative that best accommodates the difficult conditions of this portion of the EE/CA Reach. From Transect 96 down to the Elm Street Bridge, the eastern banks are very high and steep (20 ft high at slopes as steep as 1H:1V). Access along the east bank is also limited due to homes and businesses, making it virtually impossible to install sheetpiling or excavate from the top of bank on this side. Although the bank on the west side is lower with a more moderate slope, installation of sheetpiling on this side will greatly impact an existing business (supermarket). Sheetpiling is also not recommended due to shallow bedrock in this area making the driving of the sheetpiling impossible. Wet excavation is also not recommended for Transects 96 to 106 (Elm St. Bridge) because of the 2- to 3-ft water depth, 28.5% fines, and 2- to 4-ft sediment thickness.

The section of river below the Elm Street Bridge to about Transect 154 is characterized by the abundant cobbles that cover the streambed (cobble reach). Flow in this section of the river is swift. The streambed elevation drops about 8 ft in this section compared to only 10 ft over the entire EE/CA Reach. Except for some isolated deeper pockets, bedrock in this section is about 2 ft below the streambed. Because of the shallow depth to bedrock, sheetpile installation in this section is not possible. Water depths range from 1 to 4 ft. Sediment thickness ranges from 0 to 2 ft, except in the deeper pockets where it can exceed 4 ft. The percent fines in this section are also the lowest in the EE/CA Reach at about 5 to 10%.

While sampling banks and sediment in June 1999 for the EE/CA Report, NAPL was observed coming from the west bank at approximately Transect 122. Analysis of this material showed no detectable PCBs. It must be noted, however, that there was an increased detection limit on the PCB analysis because of the presence of NAPL. The analysis did indicate that the material was probably a residual from the thermal production of gas. Further investigation to determine the nature and extent of this NAPL source is scheduled by both the state and EPA. The presence of NAPL within the existing sediments makes wet excavation the option with the greatest risk of allowing the NAPL to migrate downstream. The presence of NAPL in the banks and sediments will also likely increase the response costs over previous estimates. Response actions to address NAPL encountered in the EE/CA Reach may include soil and sediment excavation, NAPL removal, and/or capping. Furthermore, if others do not address the source of the NAPL, then additional bank excavation and source control response actions will be necessary, and additional costs will be incurred.

From Transect 154 to Transect 168, the river consists of residential properties on both sides. Sheetpiling is not recommended between these transects because of the limited access. Access requirements for pumping bypass are less than for sheetpiling and, therefore, will result in slightly less impact to the residents. Although wet excavation is possible for this section, this option presents a greater risk of allowing sediments to migrate downstream.

EPA will conduct deeper Appendix IX sediment sampling, as described in Section 6.4.2.5. For the portion of the EE/CA Reach below Dawes Avenue, if there are Appendix IX exceedances below the 3 ft previously sampled, EPA will consider implementing additional response actions such as deeper sediment excavation or capping of contaminated sediments.

6.3.4 Removal Recommendation: Transect 168 to Confluence

Sheetpiling is recommended from Transect 168 to the confluence with the West Branch, except under the Pomeroy Avenue Bridge, where wet excavation will be used. Bypass pumping could also be used in this section, including under the Pomeroy Avenue Bridge. However, the discharge for the bypass pump operation will have to be constructed below the confluence with or in the West Branch of the Housatonic River.

Wet excavation is not recommended below Transect 168 because water depth begins to rise, making depth of excavation and sediment movement more difficult to control and also presents a potential problem with trying to minimize the amount of contamination that migrates downstream of the confluence during removal activities. The proximity to the confluence also presents a potential problem with trying to contain any movement of fines within the EE/CA Reach during the removal activities.

6.3.5 Disposal Recommendation

Disposal Option A, consolidation of 50,000 yd^3 of material at the GE facility and disposal of excess material at an off-site disposal facility, is recommended. As bank soil and sediment are excavated, the material will be staged, based on pre-construction sampling data, as either non-RCRA-regulated waste (below 50 ppm PCBs), TSCA-regulated waste (above 50 ppm PCBs), or as RCRA-regulated waste. All TSCA-and RCRA-regulated waste (approximately 14,900 yd^3) and approximately 35,100 yd^3 of non-RCRA/non-TSCA regulated waste will be disposed of at the GE On-Plant Consolidation Areas. The remaining non-RCRA-regulated waste soils (approximately 43,400 yd^3) will be sent to an off-site disposal facility. The actual off-site disposal volume may change based upon results of the supplementary investigation described in Subsection 6.4.

Disposal Option B (Off-Site Disposal of All Excavated Material) is effective and implementable. It is estimated that Disposal Option B would cost $15.9 million more than Disposal Option A. EPA does not recommend using Disposal Option B.

Disposal Options C (Thermal Desorption Treatment with Off-Site Disposal) and D (Solvent Extraction Treatment with Off-Site Disposal) would be conducted on GE's plant site. Both treatment processes are effective and implementable for the removal of organic constituents from soil. There are potential hazards associated with these treatment processes (e.g., chemical exposure or air emissions) that can be minimized by both managerial and engineered controls. The estimated costs of Options C and D are respectively $42.2 million and $31.3 million more than Disposal Option A. EPA does not recommend Disposal Options C and D.

6.3.6 Disposal Volume Reduction

To reduce the volume of material sent to an off-site disposal facility, EPA recommends that, as part of the design, an evaluation be performed to determine if the sediments removed from the cobble reach can be screened effectively and efficiently to remove the cobbles (more than 2 inches in diameter). The cobbles can then be mechanically cleaned or power washed and returned to the river. This could reduce the volume of soils sent off-site by as much as 5,000 yd^3 or greater. The screening operation could also be used during excavation in other parts of the streambed if significant amounts of cobble are found.

6.3.7 Summary

A summary of the recommended alternative by transect along with the alternate alternative is as follows:

Recommended Alternative	Alternate Alternative
Sheetpiling from Transect 64 to Transect 96 with wet excavation under the Lyman Street Bridge	Pump bypass from Transect 64 to Transect 106
Pump bypass from Transect 96 to Transect 168	Wet excavation from Transect 106 to Transect 168
Sheetpiling from Transect 168 to Transect 212 with wet excavation under the Pomeroy Avenue Bridge	Pump bypass from Transect 168 to Transect 212

6.3.8 Estimated Cost

The estimated cost for the recommended alternative is $40.7 million. This cost includes a base alternative cost of $27.6 million and an Option A disposal cost of $13.1 million. In accordance with the Action Memorandum Guidance Document (OSWER Directive 9360.3-01) (00-0467), these costs will be increased in the final Action Memorandum by 20% for extramural contingency costs ($8.1 million) as well as an adjustment for EPA costs ($1.5 million). Costs in the final Action Memorandum may be further increased based on the results of the supplemental investigations discussed in Subsection 6.4 and upon any NAPL response actions. A cost estimate for the excavation alternative was not performed but is expected to be slightly less because the cost for pump bypass is slightly less than the cost for sheetpiling.

The recommended remedy will take approximately 3 to 5 years to complete based on observations of progress on the first 0.5-mile reach and depending on weather conditions and unanticipated field conditions. Work on the 1.5-mile reach cannot begin until GE has completed excavation in the 0.5-mile reach, which is currently projected for June 2001.

6.4 SUPPLEMENTAL INVESTIGATIONS

Based on the findings in Sections 1 through 5 of this report, and identified data gaps, additional investigation activities within the EE/CA Reach are currently being performed. These activities are described in the Supplemental Work Plan (SWP) for the Engineering Evaluation/Cost Analysis (EE/CA) (07-0032).

The purpose of the additional investigation to be conducted at the EE/CA Reach is to collect data and information to further assess potential NAPL sources, obtain additional geotechnical data, and assess contamination in banks and sediments at depth. The main objectives of the investigation are as follows:

- Investigate the nature and extent of potential NAPL in the Oxbow A, B, and C areas (south of Lyman Street), and further determine the nature and extent of the NAPL previously observed in the cobble reach (Elm Street to Dawes Avenue), where evidence of NAPL was observed during the 1999 sampling.
- Further define the nature and extent of PCB and Appendix IX constituent contamination at depth (3 to 6 ft) in the riverbanks on nonresidential properties and in aggrading bars in the river.
- Obtain PCB and Appendix IX constituent data from riverbank soils on a previously unaccessed property.
- Further define soil and sediment geotechnical parameters that may affect the selection of response actions and/or design parameter values for bank stability, sheetpile depth, or restoration method.
- Collect data on groundwater quality and flux into the river using seepage meters.
- Deeper sediment sampling at Appendix IX exceedances.

A description of the specific tasks to be completed to achieve the objectives is provided in the following subsections. The data from the additional field work could result in an increase in the total volume of soil and sediment excavation for all the alternatives and lead to increased costs. These increased costs, if any, will be reflected in EPA's final Action Memorandum.

Field work for the additional investigation was initiated in May 2000 and is scheduled to continue through July 2000. Data validation and analysis will continue through August 2000. The results of the supplemental investigation will be reported in an Addendum to the EE/CA anticipated in September 2000.

6.4.1 NAPL Investigation

6.4.1.1 Oxbow Investigation

Soil borings will be advanced along the base of the riverbank to evaluate the presence of nonaqueous phase liquids (NAPL) at former oxbows. The borings will be advanced approximately 50 ft apart along banks where former oxbow areas are located in the portion of the river between the Lyman and Elm Street bridges. The borings will be advanced to a depth of approximately 10 ft below the river bottom using direct-push or other suitable drilling methodology.

Sediment samples will be collected from the base of the riverbank to the bottom of the borehole. Upon removal from the borehole, each sample will be screened in the field for VOCs using a photoionization detector (PID). The PID readings, lithology, and any pertinent features such as odors and/or staining will be recorded.

Samples collected at each location will be initially screened visually for NAPL and subsequently screened for NAPL using SUDAN IV dye. Shake tests will also be conducted on samples at the discretion of the geologist as an additional NAPL screening method.

Based on the results of the dye tests and visual observations for NAPL, selected boring locations will be completed as piezometers. If sufficient NAPL is encountered, up to three samples of free-flowing NAPL will be collected and analyzed for PCBs and Appendix IX parameters.

6.4.1.2 Cobble Reach Investigation

Results of the cobble reach "test plot" excavations performed in June 1999 indicated the presence of NAPL along the west bank of the river in the "cobble reach" between Elm Street and Dawes Avenue. To supplement this information and further define the extent of NAPL, an additional NAPL screening investigation is planned.

Two "test plots" are planned just upstream of the Elm Street Bridge, and will be located approximately 50 ft apart. Previous information indicated the presence of NAPL at the Elm Street Bridge; however, the investigation did not define the upstream limit of the NAPL. These "test plots" will be excavated by hand, sampled, and screened for the presence of NAPL. Additional "test plots" could be excavated upstream of the Elm Street Bridge, depending on the results of the two planned excavations. Observations regarding the presence of sheens, NAPL, and coal tar will be made. Based on these observations, sediment samples will be selected for a SUDAN IV dye test. The dye will change color if NAPL is present in the sample. If sufficient NAPL is encountered, a sample will be collected and analyzed for PCBs and Appendix IX parameters. In addition, a 1-inch-diameter piezometer may be installed in the excavated area prior to backfilling in order to allow subsequent monitoring for NAPL.

"Test plots" within the cobble reach between Elm Street and Dawes Avenue will be excavated by hand, sampled, and screened for the presence of NAPL. The test plots will be located approximately every 50 to 100 ft along the west bank of the river. In addition, up to five "test plots" will be excavated below Dawes Avenue to further define the extent of NAPL contamination. The location and frequency of the test plots will be adjusted based on field observations.

6.4.2 Appendix IX and PCB Sampling

6.4.2.1 Deeper Riverbank Sampling at Nonresidential Transects

To assess the levels of PCBs at depths greater than 3 ft on nonresidential properties, soil samples will be collected from the middle bank location. Middle bank locations will be sampled from the 3- to 3.5-ft, 4- to 4.5-ft, and 5- to 5.5-ft-bgs intervals. Each sample will be analyzed for PCBs. Ten percent of these samples will be analyzed for total organic carbon and grain size. Field personnel will record if the boring extends into the water table. The results of the deeper riverbank sampling will be used to determine if an ERE or other response action is necessary for the riverbanks.

6.4.2.2 Riverbank Soil Sampling at Previously Unaccessed Areas

During previous sampling efforts for the 1.5-mile reach, USACE was unable to sample the riverbank soils along the west bank of the Housatonic, just north of Elm Street. The transects that were not sampled include transects numbered 090 through 106. Bank samples will be collected from the west bank at each of the predefined transects. Sampling locations on each transect will include the following:

- Bottom of bank (water's edge).
- Midbank.
- Top of bank.

Samples will be collected from hand-auger borings drilled perpendicular to the slope of the riverbank. At each location, samples will be collected at depths of 0 to 6 inches, 12 to 18 inches, and 24 to 30 inches and analyzed for PCBs. In addition, 10% of all bank samples will be analyzed for Appendix IX SVOCs, organochlorine pesticides, dioxins, furans, inorganics, grain size, and total organic carbon. Two percent of all samples (every fifth Appendix IX sample collected) will be analyzed for Appendix IX organophosphate pesticides and herbicides in addition to the other parameters. The samples to be analyzed for the full suite of parameters will vary, with one sample selected per transect at varying locations (bottom, midbank, top) and depths. The location and depth of the full suite analysis sample will vary by transect to ensure that adequate characterization has been performed both horizontally and vertically.

At the midbank location, in addition to the above sampling, samples will be collected from the 3- to 3.5-ft, 4- to 4.5-ft, and 5- to 5.5-ft-bgs intervals. Each sample will be analyzed for PCBs. The sample from the 4- to 4.5-ft interval will also be analyzed for Appendix IX parameters, total organic carbon, and grain size. Every fifth sample from this interval (20%) will be analyzed for the Appendix IX organophosphate pesticides and herbicides in addition to the other Appendix IX parameters.

The total bank excavation volume of 46,507 yd^3 assumes that the bank along this property will be excavated to a depth of 3 ft. Results from the ongoing sampling could reduce this total volume.

6.4.2.3 Deeper Riverbank Sampling at Appendix IX Exceedances

A total of seven soil samples will be collected at nonresidential riverbank transects that previously had an Appendix IX exceedance. The soil samples will be collected from the 4- to 4.5-ft interval at the midbank location. Each sample will be analyzed for Appendix IX parameters, total organic carbon, and grain size. Every fifth sample from this interval will be analyzed for the Appendix IX organophosphate pesticides and herbicides in addition to the other parameters. This sample is necessary in order to determine if additional response actions are necessary to address Appendix IX exceedance below 3 ft in the riverbank in this area.

6.4.2.4 Aggrading Bars and Terraces

Sampling of aggrading bars and terraces will be conducted to characterize potentially contaminated sediments that are exposed during low-flow conditions. This investigation is to determine if additional excavation beyond that already proposed is necessary for the aggrading bars. Samples will be collected from aggrading bars and terraces in the reach between Dawes Avenue and the confluence with the West Branch.

Aggrading bar deposits, or small islands or mounds, are typically composed of coarse-grained material (i.e., sands and gravels) and usually occur along the inner sides of channel curves. Based on the MADEP maps (dated 1997), there are approximately 12 terraces and aggrading bars in this portion of the EE/CA Reach. Due to the dynamic nature of these features, actual locations to be sampled may vary considerably from those shown on the MADEP maps. Actual sampling locations will be decided upon at the time of sampling.

Two soil borings will be conducted at each terrace and aggrading bar. One of the borings will be advanced at the portion of the bar or terrace that represents the maximum depth of accumulated sediment. The second boring will be advanced at a location equidistant from the first boring and the farthest end of the bar or terrace. The soil borings will be advanced using direct-push or other suitable drilling methodology. Sediment samples will be collected from the surface of the aggrading bar to a depth of 6 ft. Upon removal from the borehole, each sample will be screened in the field for VOCs using a PID. The PID readings, and any pertinent features such as odors and/or staining, will be recorded.

The borings will be advanced to a maximum depth of 6 ft bgs or until refusal, whichever occurs first. The sediment cores will then be divided into 6-inch sections, starting with the first interval occurring below the depths proposed for excavation in the EE/CA Report, typically 2 to 3 ft bgs. Each section will be analyzed for PCBs (total), grain size, and total organic carbons. It is estimated that approximately 24 cores will be collected with an average sampled length of 3 ft, resulting in a total of approximately 144 samples.

In addition, approximately 10% of the samples will be analyzed for the modified Appendix IX parameters. Approximately 2% of these samples (every fifth Appendix IX sample) will be analyzed for Appendix IX organophosphate pesticides and herbicides.

6.4.2.5 Deeper Sediment Sampling at Appendix IX Exceedances

One sediment sampling location will be sampled for Appendix IX parameters based on a previous exceedance. The sample will be collected using the direct push method at the 4.0- to 4.5-ft-bgs interval. This sampling is necessary in order to determine if additional response actions, such as excavation or capping, are necessary to address Appendix IX exceedances below 3 ft in the sediments.

6.4.3 Geotechnical Investigation

6.4.3.1 Riverbanks

Soil borings will be drilled along the top of the riverbanks for the purpose of collecting geotechnical information. The borings will be spaced approximately 500 ft apart along both banks and will be drilled to a depth of 20 ft below the river bottom (approximately 25 to 50 ft total depth, depending on bank height). If bedrock is encountered prior to a depth of 20 ft below the elevation of the river bottom, then the boring will be considered complete at that depth.

Soil samples will be collected at 5-ft intervals until the elevation of the river bottom is reached, then at 10-ft intervals to the bottom of the borehole. Each sample will be submitted for grain size, moisture content, Atterberg limits, organic content, and specific gravity analyses. In addition, up to 20% of the samples may be submitted for drained and undrained triaxial compression testing if fine-grained soils are encountered. If visual observations of contamination such as odor, free product, and/or unusual staining are noted during the drilling of the soil borings, then the boring may be converted into an overburden monitoring well.

6.4.3.2 Riverbed

Soil borings will be drilled in the middle of the river for the purpose of collecting geotechnical information from the riverbed. The borings will be spaced approximately 500 ft apart and will be drilled to a depth of 20 ft below the river bottom.

Soil samples will be collected at 5-ft intervals, or at changes in lithology. Upon removal from the borehole, each sample will be screened in the field for VOCs using a PID. The PID readings, lithology, and any pertinent features such as odors and/or staining will be recorded. Each sample will be submitted to a materials testing laboratory for grain size, moisture content, Atterberg limits, organic content, specific gravity, and drained and undrained triaxial compression testing.

6.4.4 Seepage Meters

Seepage meters will be installed in order to collect sediment pore water samples and measure the flux of groundwater through the sediment. Information from the seepage meters will be used to determine how much groundwater may need to be treated during bank excavation and to determine if or where a sorptive layer may be needed in the bank backfill. The seepage meters will be installed at locations on both sides of the river and will be spaced evenly throughout the EE/CA Reach.

Sediment pore water will be collected by capturing groundwater seeping into surface waters by covering an area of the streambed with a bottomless cylinder vented to a deflated plastic bag. Analyses to be performed on the groundwater include VOCs, SVOCs, Appendix IX metals (including mercury), cyanide, sulfide, hardness, alkalinity, and PCBs.

SECTION 1

TABLES

Table 1.1-1

Comparison of EE/CA to RI/FS

EE/CA PROCESS	RI/FS PROCESS*
1. EE/CA Approval Memorandum ▪ Secure management approval and funding for EE/CA ▪ Include finding of actual or threatened release and, if present, an imminent and substantial endangerment and general site information and costs ▪ Document that situation meets NCP criteria and action is non-time-critical	**1a. Pre-RI/FS Scoping** ▪ Collect existing data ▪ Visit site/identify areas of concern ▪ Generate statement of work
	1b. RI/FS Scoping ▪ Collect/analyze existing data ▪ Determine need for/implement additional studies ▪ Develop preliminary remedial action alternatives/objectives ▪ Evaluate need for treatability studies ▪ Begin preliminary identification of ARARs ▪ Identify data needs/data quality objectives ▪ Design data collection program ▪ Develop work plan ▪ Identify health and safety protocols
EE/CA	**REMEDIAL INVESTIGATION**
2. EE/CA Executive Summary ▪ Identifies threat ▪ Describes removal action objectives ▪ Summarizes recommended action	
3. Site Characterization ▪ Collect site description and background ▪ Identify previous removal actions ▪ Determine source, nature, and extent of contamination ▪ Collect analytical data ▪ Perform streamlined risk evaluation ▪ Identify contaminant- and location-specific ARARs	**2. Site Characterization** ▪ Investigate site physical characteristics ▪ Define sources of contamination ▪ Determine nature and extent of contamination ▪ Conduct laboratory analyses ▪ Conduct data analyses ▪ Conduct baseline risk assessment ▪ Identify contaminant- and location-specific ARARs ▪ Define remedial action goals ▪ Draft RI Report
4. Identification of Removal Action Objectives ▪ Evaluate statutory limits ▪ Determine scope of removal action ▪ Determine schedule of removal action	

Table 1.1-1

Comparison of EE/CA to RI/FS (Continued)

EE/CA PROCESS	RI/FS PROCESS*
	FEASIBILITY STUDY
5. Identification and Analysis of Removal Action Alternatives ▪ Identify treatment technologies (presumptive remedy and treatability studies, as appropriate) ▪ Evaluate effectiveness – Overall protection of human health and the environment – Compliance with ARARs – Long-term effectiveness and permanence – Reduction of toxicity, mobility, or volume through treatment – Short-term effectiveness ▪ Evaluate implementability – Technical feasibility – Administrative feasibility – Availability of services and materials – State acceptance – Community acceptance ▪ Evaluate cost	**3a. Development of Alternatives** ▪ Remedial action objectives ▪ General response actions ▪ Volumes or areas of media ▪ Screen technology and process options ▪ Process options identification ▪ Technology alternatives ▪ Action-specific ARARs **3b. Screening of Alternatives** ▪ Effectiveness ▪ Implementability ▪ Cost ▪ Innovative technologies **3c. Performance of Treatability Studies** ▪ Data requirements ▪ Bench- or pilot-scale study ▪ Treatability test work plan ▪ Documentation of results **4. Detailed Analysis of Alternatives** ▪ Overall protection of human health and environment ▪ Compliance with ARARs ▪ Long-term effectiveness and performance ▪ Reduction of toxicity, mobility, or volume through treatment ▪ Short-term effectiveness ▪ Implementability ▪ Cost ▪ State acceptance ▪ Community acceptance (analyze alternatives against these nine criteria)
6. Comparative Analysis of Removal Action Alternatives (See criteria above) Compare alternatives	**5. Comparative Analysis**: (See criteria above) Compare alternatives
7. Recommended Removal Action Alternative (summarized in Action Memorandum) [Public comment period on EE/CA of at least 30 days]	**6. Preferred Remedial Alternative (summarized in Proposed Plan)** [Public comment period of at least 30 days]

* OSWER Publication 9355.3-01. *Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA*. (October 1988). EPA/540-G-89/004. PB89-184626. (99-0001).

Source: *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (99-0012).

SECTION 2

TABLES

Table 2.1-1

Summary of Physical Characteristics
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Subreach	Total Distance (ft)	Average Width (ft)	Transects Included	Average Sediment Thickness (ft)	Predominant Habitat	Water Depth (ft)	Predominant Substrate Grain Size[a]	Bank Height (ft)	Bank Slope[b]	West Bank Development	East Bank Development	Average PCB Conc. (ppm)	River Bottom Grade Start/ End/Slope(%)
3-8	800	36	(Lyman St)T064-T080	2-4	Run	2-3	SP/SW	8-10	3:1 4:1	Comm/Ind	Rec/Undev	8.8	968/968/flat
3-9	600	46	T081-T092	2-3	Run	2-3	SP/SW	8-12	2.5 :1 5:1	Res/Comm	Rec/Undev	102.4	968/968/flat
3-10	700	43	T093-T106(Elm St)	2-4	Run	2-3	SP/SW	10-18	1.5 :1 4:1	Comm/Undev	Comm/Res	14.2	968/968/flat
4-1	400	40	T107-T114	0-2	Riffle/Run	1-2/2-4	Cobbles	18-20	1 :1 2 :1	Road	Res	74.4	968/966/0.5
4-2	800	43	T115-T130	0-4	Riffle	1-3	Cobbles	20-28	2 :1 3.5 :1	Road	Res	17.5	966/962/0.5
4-3	1000	43	T131-T150 (Dawes Ave)	0-2	Riffle	0.5-1.5	Cobbles	16-18	1.5 :1 6.5 :1	Res	Road	81.1	962/960/0.2
4-4A	300	38	T151-T156	1-3	Riffle	1-1.5	SW/SP	6-14	1.5 :1 6.5 :1	Res	Res	6.3	960/960/flat
4-4B	600	32	T157-T168	1-3	Run	2-3	SW/SP	6-14	1.5 :1 6.5 :1	Res	Undev	18.7	960/958/0.3
4-5A	800	42	T169-T184 (Pomeroy Ave)	1-3	Run	2-3	SW/SP	4-12	1 :1 6.5 :1	Undev/Res	Res/Comm	9.7	958/958/flat
4-5B	600	44	T185-T196	1-4	Run	2-3	SW/SP	4-12	1 :1 6.5 :1	Rec	Res	35.9	958/958/flat
4-6	800	47	T197-T212(confluence)	1-6	Run	2-3	SP/GP	6-20	1 :1 5 :1	Undev	Undev	9.1	958/958/flat

Notes: [a] Grain size classifications are defined as follows: SP = poorly graded sand, SW = well-graded sand, GP = poorly graded gravel.

[b] Bank slope is highly variable in most areas so a range of slopes has been provided.

Table 2.1-2
Summary of Grain Size Distribution Results
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Grain Size Distribution in Sediments

Subreach	Gravel (> 2mm) %	Coarse Sand (2 - 0.85 mm) %	Medium Sand (0.85 - 0.25 mm) %	Fine Sand (0.25 - 0.05 mm) %	Clay and Silt (<0.05 mm) %
3-8	21.4	27.4	28.3	17.0	4.5
3-9	16.5	26.0	28.7	23.0	4.9
3-10	9.6	24.3	36.6	23.5	5.0
4-1	20.0	27.0	29.3	23.7	0.0
4-2	15.7	43.2	29.4	5.8	4.6
4-3	33.0	38.0	23.0	4.8	0.8
4-4A	32.5	27.3	29.2	9.4	0.9
4-4B	14.3	33.2	35.8	14.5	1.6
4-5A	24.3	38.7	28.8	8.1	0.1
4-5B	24.6	40.4	26.3	8.3	0.4
4-6	26.3	35.5	28.6	9.4	0.0

Grain Size Distribution in Riverbank Soils

Subreach	Gravel (> 2mm) %	Coarse Sand (2 - 0.85 mm) %	Medium Sand (0.85 - 0.25 mm) %	Fine Sand (0.25 - 0.05 mm) %	Clay and Silt (<0.05 mm) %
3-10	16.1	9.4	13.7	40.9	16.5
3-8	5.6	7.2	10.8	53.9	20.8
3-9	12.8	6.6	13.2	44.2	20.4
4-1	29.7	11.7	22.9	17.8	13.4
4-2	14.6	7.7	13.0	39.6	20.4
4-3	5.6	2.2	21.2	50.9	17.1
4-4A	0.8	1.6	9.1	60.2	28.3
4-4B	8.1	7.3	19.2	45.1	20.3
4-5A	5.3	0.4	4.4	57.4	26.7
4-5B	0.4	0.8	13.1	69.5	13.1
4-6	1.4	3.1	11.2	65.9	15.8

Note: Sediment grain size data apply only to the sediment between cobbles. Material larger than approximately 0.25 inch was manually removed from the sample before analysis.

Table 2.1-3

Summary of Cobble Sampling Results
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Transect	Subreach	Depth of Excavation (inches)	Volume of Sediment (ft^3) (measured)	Volume of Excavation (ft^3) (measured)	Volume of Cobbles (ft^3) (calculated)	Percent Sediment (%)	Percent Cobbles (%)	Cobble Description	Cobble Wipe Sample Results [a] (μg/100 cm^2 of PCB)	Sediment Thickness (inches)	Total PCBs in Sediment (ppm)	Observations
106	4-1	15	5.9	11.3	5.4	52	48	6" to 12" near surface, 2" to 6" at depth.	0.8 0.5 U	23	15.5	Two asphalt pipes containing oily sediment were found
110	4-1	10	9.1	7.5	na	approx. 80%	approx. 20%	6" to 12" near surface, 2" to 4" at depth.	1.3 0.5 U	27	649	Tar globules noted at 10", moderate sheen noted from 4" to 10". Sediment entering excavation from outside the test box via sluffing. Percentages based on visual observations.
110	4-1	14	3.2	10.5	7.3	30	70	Variable cobble size from 6" to 12".	0.74 0.5 U	22	3.34	Moderate sheen noted at 8"
112	4-1	14	3.5	10.5	7.0	33	67	Variable cobble size from 4" to 12".	4.1 0.5 U	22	5.0	Moderate sheen observed at 8"
116	4-1	12	4.0	9.0	5.0	44	56	Variable cobble size from 4" to 12".	0.59 0.60	24	20.4	Heavy sheen/free oil throughout
122	4-2	12	4.3	9.0	4.7	48	52	Variable cobble size from 2" to 8".	3.8 0.5 U	31	0.5 U	Heavy sheen/free oil throughout, strong coal-tar creosote odor
126	4-2	14	8.0	10.5	2.5	76	24	Variable cobble size from 4" to 10".	0.60 0.5 U	24	5.34	Oil/sheen observed at 14"
130	4-2	14	4.3	10.5	6.2	41	59	Mostly small cobbles 2" to 4" with brick fragments.	2.7 3.8	41	4.4	Slight sheen from rebar
136	4-3	12	4.3	9.0	4.7	48	52	Variable cobble size from 4" to 10".	14.0 0.6	36	6.84	Minor sheen observed at 12"
144	4-3	17	3.5	12.8	9.3	27	73	Mostly small cobbles 2" to 6" with abundant coal slag.	9.4 0.57	34	111.0 / 13.9 [b]	Heavy sheen/free oil throughout
146	4-3	14	8.6	10.5	1.9	82	18	Mostly small cobbles 2" to 4".	0.5 U 0.5 U	25	93.3	No sheen or odor observed
152	4-4A	18	12.8	13.5	0.7	95	5	Mostly small cobbles 2" to 6" with some brick fragments.	0.62 0.5 U	50	3.22	Minor sheen observed at 10.5"

U = Non-detect result at reporting limit shown.

[a] Upper value represents result from top of cobble wipe sample, while bottom value represents result from bottom of cobble wipe sample.

[b] Result listed first represents shallow sample, while second result represents the deep sample.

Table 2.3-1

Summary of Average PCB Concentrations
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Sediment Data

Subreach	All Depths			0 to 1 ft			1 to 2 ft			2 to 3 ft			3 to 4 ft			> 4 ft		
	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples
Total Reach	28.5	58%	764	21.3	72%	381	59.9	60%	215	6.5	34%	76	1.9	7%	58	2.8	9%	34
3-8	8.8	54%	121	13.4	83%	53	5.8	40%	40	7.7	31%	16	0.3	0%	10	0.3	0%	2
3-9	102.4	37%	89	9.4	60%	40	312.0	32%	28	0.3	0%	8	0.3	0%	7	0.3	0%	6
3-10	14.2	59%	80	13.9	78%	40	18.1	46%	24	14.6	43%	7	0.4	0%	4	9.9	40%	5
4-1	74.4	83%	12	86.5	80%	10	13.7	100%	2	refusal			refusal			refusal		
4-2	17.5	65%	37	12.6	60%	25	29.9	67%	6	21.4	67%	3	30.5	100%	2	29.0	100%	1
4-3	81.1	93%	28	93.2	96%	24	8.0	75%	4	refusal			refusal			refusal		
4-4A	6.3	46%	26	14.2	100%	11	3.2	100%	1	ns			0.4	0%	3	0.3	0%	11
4-4B	18.7	65%	81	25.5	85%	40	22.2	74%	19	5.7	33%	15	0.3	0%	6	0.3	0%	1
4-5A	9.7	61%	92	6.6	64%	47	17.9	77%	30	3.8	30%	10	0.3	0%	4	0.3	0%	1
4-5B	35.9	60%	86	29.3	65%	40	69.7	81%	26	12.5[a]	50%[a]	8	0.5[b]	10%[b]	10	0.3[c]	0%[c]	2
4-6	9.1	55%	112	7.8	59%	51	15.7	71%	35	6.0[a]	67%[a]	9	1.7[b]	8%[b]	12	0.3[c]	0%[c]	5

Notes:
All PCB concentrations given in mg/kg.
"ns" indicates there were no samples collected from this interval.
"refusal" indicates bedrock was encountered at or above that depth interval.
[a] value represents samples collected from the 2- to 2.5-ft interval within that subreach.
[b] value represents samples collected from the 2.5- to 3.5-ft interval within that subreach.
[c] value represents samples collected from >3.5-ft interval within that subreach.

Table 2.3-1

Summary of Average PCB Concentrations
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts
(Continued)

East River Bank Data

Subreach	Recreational						Residential		
	0 to 1 ft			1 to 3 ft			0 to 3 ft		
	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples
3-8	18.1	35%	17	25.2	33%	30	dna		
3-9	22.1	72%	18	21.3	67%	33	dna		
3-10	14.0	50%	12	1.5	0%	8	5.6	52%	27
4-1	dna			dna			17.5	45%	20
4-2	23.1	41%	22	26.5	24%	34	dna		
4-3	16.2	50%	50	17.1	29%	93	62.0	100%	1
4-4A	dna			dna			46.6	96%	45
4-4B	dna			dna			62.0	88%	72
4-5A	18.2	67%	9	15.0	50%	16	46.2	74%	168
4-5B	62.7	100%	1	78.3	100%	3	9.3	23%	93
4-6	24.9	40%	25	24.2	52%	46	dna		

West River Bank Data

Subreach	Recreational						Residential		
	0 to 1 ft			1 to 3 ft			0 to 3 ft		
	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples	Aver. Conc.	% Exceed	No. Samples
3-8	15.9	39%	26	25.1	44%	45	dna		
3-9	21.1	63%	8	13.7	36%	14	38.0	100%	1
3-10	dna			dna			dna		
4-1	5.5	22%	9	1.2	0%	7	dna		
4-2	30.2	21%	24	2.8	8%	26	8.8	83%	6
4-3	16.6	53%	15	31.1	67%	12	1.2	40%	5
4-4A	dna			dna			32.3	92%	106
4-4B	dna			dna			41.4	32%	144
4-5A	6.4	33%	3	3.1	0%	6	71.5	97%	33
4-5B	18.9	59%	34	51.3	52%	62	dna		
4-6	16.8	37%	35	49.1	37%	60	dna		

Notes:
"dna" indicates this category does not apply to the data set.

Table 2.3-2

Summary of 95% UCL PCB Concentrations
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Sediment Data

Subreach	All Depths	0 to 1 ft	1 to 2 ft	2 to 3 ft	3 to 4 ft	> 4 ft
Total Reach	19.8	25.7	33.2	9.4	1.2	1.8
3-8	16.3	30.0	17.7	42.6	0.4	0.3 (M)
3-9	9.9	17.1	76.1	0.5	0.3	0.3
3-10	23.2	26.2	52.5	79.8 (M)	0.8 (M)	45.7 (M)
4-1	649 (M)	649 (M)	25 (M)	refusal	refusal	refusal
4-2	110 (M)	74.9	110 (M)	32 (M)	40 (M)	29 (M)
4-3	266.0	362	13.9 (M)	refusal	refusal	refusal
4-4A	8.1	45 (M)	3.2 (M)	ns	0.6 (M)	0.3
4-4B	62.9	87.5	153 (M)	30 (M)	0.4	0.3 (M)
4-5A	14.8	13.2	53.5	18 (M)	0.4	0.3 (M)
4-5B	66.2	162	647	81 (M)[a]	0.8[b]	0.3 (M)[c]
4-6	18.1	19.6	58.8	30 (M)[a]	5.4[b]	0.5[c]

Note: All concentrations are in mg/kg.
"M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were less than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.
"ns" indicates there were no samples collected from this interval.
"refusal" indicates bedrock was encountered at or above that depth interval.
[a] value represents samples collected from the 2- to 2.5-ft interval within that subreach.
[b] value represents samples collected from the 2.5- to 3.5-ft interval within that subreach.
[c] value represents samples collected from >3.5-ft interval within that subreach.

Table 2.3-2

Summary of 95% UCL PCB Concentrations
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

East River Bank Data

	Recreational		Residential
Subreach	0 to 1 ft	1 to 3 ft	0 to 3 ft
3-8	100 (M)	238 (M)	dna
3-9	38.3	32.4	dna
3-10	53.3 (M)	7.1 (M)	18.1
4-1	dna	dna	33.6
4-2	109.9	104.8	dna
4-3	82.9 (M)	140.5	62.0 (M)
4-4A	dna	dna	85.2
4-4B	dna	dna	209.4
4-5A	37.0 (M)	76.0 (M)	154.8
4-5B	62.7 (M)	95.0 (M)	8.0
4-6	96.0	87.9	dna

West River Bank Data

	Recreational		Residential
Subreach	0 to 1 ft	1 to 3 ft	0 to 3 ft
3-8	35.9	73.1	dna
3-9	72.7 (M)	52 (M)	38 (M)
3-10	dna	dna	dna
4-1	16.4 (M)	5.2 (M)	dna
4-2	127.5	4.9	20 (M)
4-3	43 (M)	170 (M)	2.4 (M)
4-4A	dna	dna	46.9
4-4B	dna	dna	137.9
4-5A	13.0 (M)	5.2 (M)	129.7
4-5B	36.6	437 (M)	dna
4-6	117 (M)	566 (M)	dna

Note: All concentrations are in mg/kg.
"M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were less than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.
"dna" indicates this category does not apply to the data set.

Table 2.3-3

Summary of PCB Mass Distribution
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

PCB Mass in Sediment (kg)

Subreach	All Depths	0 to 1 ft	1 to 2 ft	2 to 3 ft	3 to 4 ft	> 4 ft
Total Reach	1,702	495	877	177	69	84
3-8	67	30	15	20	1	1
3-9	573	20	550	1	1	1
3-10	116	30	35	30	1	20
4-1	80	70	10	na	na	na
4-2	245	25	60	40	60	60
4-3	285	210	20	55	na	na
4-4A	12	10	2	na	< 1	< 1
4-4B	73	35	30	8	< 1	< 1
4-5A	49	10	30	7	1	1
4-5B	145	40	95	10	< 1	< 1
4-6	57	15	30	6	5	1

PCB Mass in Riverbank Soils (kg)

Subreach	0 to 3 ft	0 to 1 ft	1 to 2 ft	2 to 3 ft
Total Reach	1,440	380	537	523
3-8	160	40	60	60
3-9	110	40	40	30
3-10	27	15	5	7
4-1	23	20	2	1
4-2	180	75	35	70
4-3	165	50	75	40
4-4A	80	15	30	35
4-4B	220	35	95	90
4-5A	195	35	75	85
4-5B	130	25	65	40
4-6	150	30	55	65

Notes: na = no data available for this interval.
PCB mass estimates for Subreaches 4-1, 4-2, and 4-3 include sediment mass only (no cobbles).
The total mass of PCBs associated with the cobbles in Subreaches 4-1, 4-2, and 4-3 is less than 85 grams, assuming an average cobble diameter of 2 inches.

Table 2.3-4

Summary of DRET and Pore Water Results
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Sample Location	Pore Water PCB Concentration (µg/L)	Unfiltered Elutriate PCB Concentration (µg/L)	Filtered Elutriate PCB Concentration (µg/L)
H2-SE000011	na	0.44 J	0.01 UJ
H2-SE000011 (duplicate)	na	4.6 J	0.36 J
H2-SE000011 (triplicate)	na	1.1 J	0.01 UJ
H2-SE000018	1.9 J	13.0 J	0.09 J
H2-SE000021	na	2.6 J	0.04 J
H2-SE000022	na	130 J	2.3 J
H2-SE000025	11.0 J	4.2 J	0.02 J
H2-SE000025 (duplicate)	16.0 J	na	na
H2-SE000032	6.8 J	1.9 J	0.01 UJ

U = below detection limit. J = estimated value (detected below quantitation limit).
na = Not analyzed

Table 2.3-5

Summary of PCB Fractionation Data
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Field Sample Number	Location Compared to	Parameter	Gravel	Sand & Fine Gravel	Silt & Clay
H2-SD010701-0-0000	H2-SE000011	PCB, mg/kg	0.18	3.9	5.6
		% of total soil	12.1	84.3	3.6
		% of total PCB	1%	94%	6%
H2-SD010701-0-0010	H2-SE000011	PCB, mg/kg	0.18	3.9	5.6
		% of total soil	7.1	81.0	11.9
		% of total PCB	0%	82%	17%
H2-SD010701-0-0015	H2-SE000011	PCB, mg/kg	0.18	3.9	5.6
		% of total soil	39.2	57.0	3.8
		% of total PCB	3%	89%	8%
H2-SD011003-0-0000	H2-SE000018	PCB, mg/kg	3.20	36.0	26.0
		% of total soil	0.0	75.1	24.9
		% of total PCB	0%	81%	19%
H2-SD011003-0-0010	H2-SE000018	PCB, mg/kg	3.20	36.0	26.0
		% of total soil	0.0	81.2	18.8
		% of total PCB	0%	86%	14%
H2-SD021401-0-0005	H2-SE000022	PCB, mg/kg	0.22	180.0	1.9
		% of total soil	32.7	66.2	1.1
		% of total PCB	0%	100%	0%
H2-SD021522-0-0000	H2-SE000021	PCB, mg/kg	0.41	9.7	5.1
		% of total soil	24.7	74.7	0.6
		% of total PCB	1%	98%	0%
H2-SD021603-0-0000	H2-SE000025	PCB, mg/kg	2.40	50.0	47.0
		% of total soil	35.8	62.4	1.8
		% of total PCB	3%	95%	3%
H2-SD021603-0-0010	H2-SE000025	PCB, mg/kg	2.40	50.0	47.0
		% of total soil	14.7	84.3	1.0
		% of total PCB	1%	98%	1%
H2-SD021881-0-0000	H2-SE000032	PCB, mg/kg	na	20.0	17.0
		% of total soil	3.0	96.0	1.0
		% of total PCB	na	99%	1%
H2-SD021881-0-0005	H2-SE000032	PCB, mg/kg	na	20.0	17.0
		% of total soil	1.0	98.0	1.0
		% of total PCB	na	99%	1%
H2-SD021881-0-0010	H2-SE000032	PCB, mg/kg	na	20.0	17.0
		% of total soil	6.9	85.2	7.9
		% of total PCB	na	93%	7%
H2-SD021881-0-0015	H2-SE000032	PCB, mg/kg	na	20.0	17.0
		% of total soil	13.0	78.0	9.0
		% of total PCB	na	91%	9%
H2-SD021881-0-0020	H2-SE000032	PCB, mg/kg	na	20.0	17.0
		% of total soil	49.0	50.0	1.0
		% of total PCB	na	98%	2%
	Average	PCB, mg/kg	1.28	49.9	17.1
		% of total soil	17.1	76.7	6.2
		% of total PCB	1%	97%	3%

Notes: "na" indicates PCB analysis was not conducted on this grain size type. "Gravel" represents the fraction of soil that did not pass a nominal 1/4-inch sieve. "Sand and fine gravel" represents the fraction of soil that passed the 1/4-inch sieve, but did not pass the #200 sieve. "Silt and clay" represents the fraction of soil that passed the #200 sieve.

Table 2.3-6

Summary of Appendix IX Results for Sediment
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Subreach 3-8		Subreach 3-9		Subreach 3-10		Subreach 4-1	
		Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.
BETA-BHC	mg/kg					0.0031	0.0031		
DELTA-BHC	mg/kg					0.0029	0.0029		
4,4'-DDD	mg/kg								
1,2,4,5-TETRACHLOROBENZENE	mg/kg	0.05	0.07	0.04	0.04	0.02	0.02		
1,2,4-TRICHLOROBENZENE	mg/kg	0.64	1.7	0.06	0.1	0.22	0.31		
1,2-DICHLOROBENZENE	mg/kg	0.04	0.04						
1,3-DICHLOROBENZENE	mg/kg	0.21	0.21	0.03	0.03	0.05	0.05	0.03	0.03
1,4-DICHLOROBENZENE	mg/kg	0.21	0.72	0.1	0.17	0.08	0.18	0.13	0.13
2,6-DINITROTOLUENE	mg/kg							0.06	0.08
2-METHYLNAPHTHALENE	mg/kg	0.06	0.06	0.08	0.14	0.03	0.03		
2-METHYLPHENOL (O-CRESOL)	mg/kg								
3-METHYLCHOLANTHRENE	mg/kg								
4-METHYLPHENOL	mg/kg								
ACENAPHTHENE	mg/kg	0.11	0.37	0.04	0.08	0.03	0.03		
ACENAPTHYLENE	mg/kg	0.04	0.04	0.05	0.08				
ANTHRACENE	mg/kg	0.06	0.14	0.06	0.12	0.06	0.08	0.05	0.05
ARAMITE	mg/kg	0.08	0.08						
BENZO(A)ANTHRACENE	mg/kg	0.27	0.6	0.32	0.96	0.18	0.3	0.28	0.35
BENZO(A)PYRENE	mg/kg	0.24	0.51	0.33	1.1	0.17	0.29	0.3	0.38
BENZO(B)FLUORANTHENE	mg/kg	0.18	0.35	0.23	0.66	0.16	0.3	0.3	0.37
BENZO(GHI)PERYLENE	mg/kg	0.2	0.37	0.31	0.69	0.12	0.15	0.21	0.28
BENZO(K)FLUORANTHENE	mg/kg	0.22	0.46	0.29	0.81	0.16	0.27	0.27	0.35
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	3.6	3.6			0.09	0.16		
BUTYLBENZYLPHTHALATE	mg/kg								
CHRYSENE	mg/kg	0.34	0.78	0.38	1.1	0.2	0.33	0.33	0.4
DIBENZO(A,H)ANTHRACENE	mg/kg	0.05	0.1	0.07	0.19	0.06	0.08	0.07	0.1
DIBENZOFURAN	mg/kg			0.02	0.04	0.02	0.02		
DI-N-BUTYL PHTHALATE	mg/kg					0.09	0.11		
DI-N-OCTYL PHTHALATE	mg/kg							0.04	0.04
FLUORANTHENE	mg/kg	0.53	1.3	0.72	1.6	0.37	0.52	0.41	0.71
FLUORENE	mg/kg	0.07	0.26	0.06	0.1	0.03	0.04	0.02	0.03
INDENO(1,2,3-C,D)PYRENE	mg/kg	0.19	0.35	0.27	0.6	0.12	0.16	0.22	0.29
NAPHTHALENE	mg/kg	0.09	0.14	0.18	0.3	0.08	0.14	0.03	0.03
PENTACHLOROBENZENE	mg/kg	0.13	0.13	0.08	0.13	0.06	0.07		
PHENANTHRENE	mg/kg	0.29	0.7	0.43	0.91	0.25	0.4	0.32	0.36
PHENOL	mg/kg								
PYRENE	mg/kg	0.62	1.5	0.96	2.4	0.41	0.71	0.59	1.2
PYRIDINE	mg/kg								
TEQ 2,3,7,8-TCDD (EPA)	mg/kg	0.000019	0.00005	0.000012	0.000051	0.00005	0.00021		
TEQ 2,3,7,8-TCDD (MADEP)	mg/kg	0.000032	0.000073	0.000019	0.000076	0.000006	0.000026		
SULFIDE	mg/kg	20.78	32.6			335	335	406.25	793
ANTIMONY	mg/kg	70.1	70.1			1.4	1.4		
ARSENIC	mg/kg	1.57	2.6	1.23	1.6	1.84	3.6	3.87	6.6
BARIUM	mg/kg	8.24	12.4	7.42	12.1	15.33	33.7	20.27	31.2
BERYLLIUM	mg/kg	0.09	0.12	0.12	0.12	0.14	0.2	0.19	0.24
CHROMIUM	mg/kg	7.48	11.7	5.02	7.2	6.03	8.1	9.87	15.8
COBALT	mg/kg	4.59	5.6	3.83	5.7	5.26	7.2	7.97	13.9
COPPER	mg/kg	40.23	232	10.97	15.9	11.23	15.1	31.9	47.5
LEAD	mg/kg	122.29	869	12.84	20	9.39	13.4	34.67	63
MERCURY	mg/kg	0.04	0.07	0.04	0.05	0.06	0.06	0.14	0.23
NICKEL	mg/kg	9.15	9.8	7.08	10.4	8.43	12.6	10.97	17.6
SELENIUM	mg/kg			0.55	0.62				
SILVER	mg/kg			0.1	0.1				
THALLIUM	mg/kg					0.58	0.58	1.2	1.2
TIN	mg/kg	100.67	290	2.25	3.5	10.6	10.6	15.2	15.2
VANADIUM	mg/kg	5.29	6.1	3.8	6.1	5.64	9.4	8.53	14
ZINC	mg/kg	59.05	146	35.63	54.3	43.56	77	54.6	72.1

Notes: Blank cells indicate that the compound was not detected in that subreach above the laboratory detection limit. Laboratory detection levels for each compound are presented in Appendix J of this report.

Table 2.3-6

Summary of Appendix IX Results for Sediment
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Subreach 4-2		Subreach 4-3		Subreach 4-4A		Subreach 4-4B	
		Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.	Average Conc.	Maximum Conc.
BETA-BHC	mg/kg								
DELTA-BHC	mg/kg								
4,4'-DDD	mg/kg	0.02	0.02						
1,2,4,5-TETRACHLOROBENZENE	mg/kg								
1,2,4-TRICHLOROBENZENE	mg/kg			0.03	0.03			0.05	0.11
1,2-DICHLOROBENZENE	mg/kg								
1,3-DICHLOROBENZENE	mg/kg							0.03	0.03
1,4-DICHLOROBENZENE	mg/kg			0.06	0.06			0.1	0.16
2,6-DINITROTOLUENE	mg/kg							0.07	0.07
2-METHYLNAPHTHALENE	mg/kg			0.08	0.08	0.05	0.09	0.09	0.18
2-METHYLPHENOL (O-CRESOL)	mg/kg								
3-METHYLCHOLANTHRENE	mg/kg							0.03	0.03
4-METHYLPHENOL	mg/kg							0.03	0.04
ACENAPHTHENE	mg/kg			0.12	0.12	0.08	0.14	0.17	0.47
ACENAPTHYLENE	mg/kg			0.17	0.17	0.08	0.14	0.07	0.12
ANTHRACENE	mg/kg			0.98	0.98	0.61	1	0.54	1.1
ARAMITE	mg/kg								
BENZO(A)ANTHRACENE	mg/kg			1.3	1.3	0.86	1.6	1.4	3.6
BENZO(A)PYRENE	mg/kg			0.98	0.98	0.66	1.2	1.19	3.1
BENZO(B)FLUORANTHENE	mg/kg			0.63	0.63	0.52	0.96	0.96	2.5
BENZO(GHI)PERYLENE	mg/kg			0.45	0.45	0.33	0.6	0.63	1.3
BENZO(K)FLUORANTHENE	mg/kg			0.93	0.93	0.61	1.1	1	2.6
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg								
BUTYLBENZYLPHTHALATE	mg/kg							0.51	0.51
CHRYSENE	mg/kg			1.1	1.1	0.78	1.4	1.33	3.3
DIBENZO(A,H)ANTHRACENE	mg/kg			0.19	0.19	0.13	0.25	0.25	0.57
DIBENZOFURAN	mg/kg			0.33	0.33	0.13	0.17	0.12	0.18
DI-N-BUTYL PHTHALATE	mg/kg								
DI-N-OCTYL PHTHALATE	mg/kg								
FLUORANTHENE	mg/kg			2.8	2.8	1.83	3.4	2.33	4.6
FLUORENE	mg/kg			0.59	0.59	0.25	0.36	0.25	0.43
INDENO(1,2,3-C,D)PYRENE	mg/kg			0.51	0.51	0.36	0.67	0.68	1.5
NAPHTHALENE	mg/kg			0.16	0.16	0.09	0.15	0.16	0.36
PENTACHLOROBENZENE	mg/kg					0.05	0.05	0.04	0.06
PHENANTHRENE	mg/kg			2.8	2.8	1.63	2.6	1.78	3.4
PHENOL	mg/kg								
PYRENE	mg/kg			3.2	3.2	2.15	4.2	2.6	4.8
PYRIDINE	mg/kg								
TEQ 2,3,7,8-TCDD (EPA)	mg/kg			0.0000047	0.0000047	0.000014	0.000034	8.8E-06	0.00002
TEQ 2,3,7,8-TCDD (MADEP)	mg/kg			0.0000079	0.0000079	0.000023	0.000054	1.77E-05	3.77E-05
SULFIDE	mg/kg							69.75	132
ANTIMONY	mg/kg							0.69	0.76
ARSENIC	mg/kg			1.6	1.6	2.33	4	2.6	3.9
BARIUM	mg/kg			6.8	6.8	9.9	15.7	15.88	24.7
BERYLLIUM	mg/kg			0.09	0.09	0.12	0.13	0.25	0.77
CHROMIUM	mg/kg			5	5	8.1	9.5	8.82	11.9
COBALT	mg/kg					3.87	4.9	43.9	200
COPPER	mg/kg			14.9	14.9	17.3	26	28.58	65.2
LEAD	mg/kg			12.6	12.6	23.8	30.6	20.58	27.4
MERCURY	mg/kg					0.07	0.07	0.04	0.05
NICKEL	mg/kg			6.4	6.4	7.57	8.9	31.75	142
SELENIUM	mg/kg					0.24	0.24	0.46	0.46
SILVER	mg/kg								
THALLIUM	mg/kg								
TIN	mg/kg							10.2	10.2
VANADIUM	mg/kg								
ZINC	mg/kg			33.9	33.9	40.07	42.5	72.32	163

Notes: Blank cells indicate that the compound was not detected in that subreach above the laboratory detection limit. Laboratory detection levels for each compound are presented in Appendix J of this report.

Table 2.3-6

Summary of Appendix IX Results for Sediment
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Subreach 4-5A Average Conc.	Subreach 4-5A Maximum Conc.	Subreach 4-5B Average Conc.	Subreach 4-5B Maximum Conc.	Subreach 4-6 Average Conc.	Subreach 4-6 Maximum Conc.
BETA-BHC	mg/kg						
DELTA-BHC	mg/kg						
4,4'-DDD	mg/kg						
1,2,4,5-TETRACHLOROBENZENE	mg/kg	0.03	0.04			0.08	0.12
1,2,4-TRICHLOROBENZENE	mg/kg	0.08	0.16	0.05	0.07	0.33	0.81
1,2-DICHLOROBENZENE	mg/kg			0.02	0.02		
1,3-DICHLOROBENZENE	mg/kg					0.09	0.16
1,4-DICHLOROBENZENE	mg/kg	0.05	0.09	0.04	0.06	0.23	0.66
2,6-DINITROTOLUENE	mg/kg	0.07	0.07				
2-METHYLNAPHTHALENE	mg/kg	0.15	0.52	1.21	6.3	0.68	2.6
2-METHYLPHENOL (O-CRESOL)	mg/kg			0.18	0.18		
3-METHYLCHOLANTHRENE	mg/kg						
4-METHYLPHENOL	mg/kg			0.32	0.61		
ACENAPHTHENE	mg/kg	0.17	0.39	1.8	10	1.03	2.8
ACENAPTHYLENE	mg/kg	0.1	0.22	0.15	0.36	0.2	0.64
ANTHRACENE	mg/kg	0.59	2.1	2.72	14	1.7	5.3
ARAMITE	mg/kg						
BENZO(A)ANTHRACENE	mg/kg	1.12	3	7.42	40	2.61	6.5
BENZO(A)PYRENE	mg/kg	0.91	2.5	7.44	41	2.07	5.3
BENZO(B)FLUORANTHENE	mg/kg	0.7	1.9	7.14	40	1.47	3.8
BENZO(GHI)PERYLENE	mg/kg	0.49	1.3	5.31	25	1.12	3.4
BENZO(K)FLUORANTHENE	mg/kg	0.83	2.2	6.4	35	1.73	4.3
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	0.08	0.08	0.17	0.32		
BUTYLBENZYLPHTHALATE	mg/kg	0.02	0.02	0.02	0.02		
CHRYSENE	mg/kg	1.07	3	8.35	46	2.48	6.5
DIBENZO(A,H)ANTHRACENE	mg/kg	0.17	0.44	1.37	7.6	0.36	0.94
DIBENZOFURAN	mg/kg	0.21	0.62	2.33	13	0.87	2.2
DI-N-BUTYL PHTHALATE	mg/kg	0.17	0.18	0.19	0.23	0.04	0.04
DI-N-OCTYL PHTHALATE	mg/kg			0.03	0.03		
FLUORANTHENE	mg/kg	2.11	5.8	17.77	99	5	13
FLUORENE	mg/kg	0.33	0.81	2.96	16	1.14	3.8
INDENO(1,2,3-C,D)PYRENE	mg/kg	0.51	1.3	4.65	26	1.18	3.3
NAPHTHALENE	mg/kg	0.19	0.54	3.51	20	0.9	2.9
PENTACHLOROBENZENE	mg/kg	0.07	0.13	0.12	0.25	0.15	0.5
PHENANTHRENE	mg/kg	1.93	6	19.73	110	5.85	22
PHENOL	mg/kg			0.51	0.51		
PYRENE	mg/kg			19.62	110	5.29	16
PYRIDINE	mg/kg	1.78	6				
TEQ 2,3,7,8-TCDD (EPA)	mg/kg	0.0000105	0.0000266	0.000005	0.0000081	0.0000076	0.0000236
TEQ 2,3,7,8-TCDD (MADEP)	mg/kg	0.0000185	0.0000473	0.0000089	0.0000142	0.0000129	0.0000369
SULFIDE	mg/kg	10.17	15.5	9.28	14.3	13.93	57.2
ANTIMONY	mg/kg	1.1	1.1			4.11	7.7
ARSENIC	mg/kg	1.77	4.3	1.83	4.2	1.21	2.1
BARIUM	mg/kg	9.01	24.1	7.83	11.6	8.82	12.7
BERYLLIUM	mg/kg	0.11	0.16			0.08	0.15
CHROMIUM	mg/kg	6.33	10.1	5.25	6.9	6.4	12.8
COBALT	mg/kg	4.03	5.6	3.53	5.9	3.78	5.7
COPPER	mg/kg	20.81	47	8.28	12.6	14.82	30.2
LEAD	mg/kg	23.33	57	13.52	18.9	17.72	26.4
MERCURY	mg/kg	0.03	0.04			0.05	0.08
NICKEL	mg/kg	5.91	9	6.07	10.6	6.73	9.7
SELENIUM	mg/kg						
SILVER	mg/kg	0.38	0.38				
THALLIUM	mg/kg					0.43	0.43
TIN	mg/kg	14.25	17.4	17.4	17.4	43.3	62
VANADIUM	mg/kg	5	6.4	4	5.8	4.54	7
ZINC	mg/kg	42.07	85.5	35.5	54.4	42.13	80.3

Notes: Blank cells indicate that the compound was not detected in that subreach above the laboratory detection limit. Laboratory detection levels for each compound are presented in Appendix J of this report.

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB010705 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
ACENAPTHYLENE	MG/KG	0.04			0.127		0.24			1000		No
BENZO(A)ANTHRACENE	MG/KG	0.22	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.30	0.56		0.718		1.8			0.07	Exceeds	No
BENZO(B)FLUORANTHENE	MG/KG	0.17	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.38			0.223	Exceeds	0.49		Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.27	5.6		0.778		1.8			10		No
CHRYSENE	MG/KG	0.29	56		0.814		0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.08	0.056	Exceeds	0.121		0.22			0.7		No
FLUORANTHENE	MG/KG	0.18	2000		1.266		2.8			1000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.30	0.56		0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.03	55		0.085		0.099			1000		No
PHENANTHRENE	MG/KG	0.05			0.043	Exceeds	0.056			100		No
PYRENE	MG/KG	0.33	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000001	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000001								0.008		No
ARSENIC	MG/KG	2.20	21		5.48		17.4			30		No
BARIUM	MG/KG	43.90	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.30	150		0.04	Exceeds	0.83		Exceeds	0.8		No
CHROMIUM	MG/KG	11.60	210		16.96		47.7			2500		No
COBALT	MG/KG	9.00	3300		8.89	Exceeds	21.8					No
COPPER	MG/KG	14.30	2800		31.14		144					No
LEAD	MG/KG	9.60	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.05	22		0.19		0.35					No
NICKEL	MG/KG	12.20	1500		16.55		38.5			700		No
THALLIUM	MG/KG	0.71			1.63		2.8			30		No
VANADIUM	MG/KG	11.90	520		31.21		182			2000		No
ZINC	MG/KG	59.10	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Apendix IX Riverbank Soil Comparison to Standards, Location RB020985 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.60			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
ACENAPHTHENE	MG/KG	0.37	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ACENAPTHYLENE	MG/KG	2.20			0.127	Exceeds	0.24	Exceeds	Exceeds	1000		No
ANTHRACENE	MG/KG	2.70	14000		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	6.80	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	7.40	0.056	Exceeds	0.718	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	5.20	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	5.90			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	5.80	5.6	Exceeds	0.778	Exceeds	1.8	Exceeds	Exceeds	10		No
CHRYSENE	MG/KG	7.10	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	1.90	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	0.96	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	12.00	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	1.90	1800		0.108	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	5.60	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
METHAPYRILENE	MG/KG	0.55										No
NAPHTHALENE	MG/KG	1.00	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	12.00			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	13.00	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000020	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000028								0.08		No
ANTIMONY	MG/KG	0.61	30		1.85		3			40		No
ARSENIC	MG/KG	6.40	21		5.48	Exceeds	17.4			30		No
BARIUM	MG/KG	39.50	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	9.60	210		16.96		47.7			2500		No
COBALT	MG/KG	8.40	3300		8.89		21.8					No
COPPER	MG/KG	27.90	2800		34.14		144					No
LEAD	MG/KG	72.70	0.04	Exceeds	56.78	Exceeds	112			600		No
MERCURY	MG/KG	0.10	22		0.19		0.35			60		No
NICKEL	MG/KG	15.70	1500		16.55		38.5			700		No
THALLIUM	MG/KG	1.00			1.63		2.8			30		No
VANADIUM	MG/KG	11.40	520		31.21		182			2000		No
ZINC	MG/KG	82.10	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021026 (1 to 1.5 ft)
EE/CA Reach of the Houstonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG		480		0.071		0.08			800		No
1,3-DICHLOROBENZENE	MG/KG		41							500		No
1,4-DICHLOROBENZENE	MG/KG		3		0.08		0.09			60		No
2-METHYLNAPHTHALENE	MG/KG				0.082		0.08			1000		No
4-METHYLPHENOL	MG/KG		270									No
ACENAPHTHENE	MG/KG		2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG				0.127		0.24			1000		No
ANTHRACENE	MG/KG		14000		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.05	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.05	0.056		0.718		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.06	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG				0.223		0.49			2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.07	5.6		0.778		1.8			10		No
BIS(2-ETHYLHEXYL) PHTHALATE	MG/KG		32		0.113		0.27			300		No
BUTYLBENZYLPHTHALATE	MG/KG		930		0.074		0.41					No
CHRYSENE	MG/KG	0.06	56		0.814		0.18			10		No
DIBENZO(A,H)ANTHRACENE	MG/KG		0.056		0.121		0.22			0.7		No
DIBENZOFURAN	MG/KG		210		0.08		0.13					No
DI-N-OCTYL PHTHALATE	MG/KG		1100									No
FLUORANTHENE	MG/KG	0.08	2000		1.266		2.8			1000		No
FLUORENE	MG/KG		1800		0.108		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG		0.56		0.247		0.053			1		No
METHAPYRILENE	MG/KG											No
NAPHTHALENE	MG/KG		55		0.085		0.099			1000		No
PHENANTHRENE	MG/KG	0.03			0.043		0.056			100		No
PYRENE	MG/KG	0.09	1500							2000		No
TCDF (TOTAL)	MG/KG											No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG		0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000001								0.08		No
SULFIDE	MG/KG	0.000001			165.88		284					No
ANTIMONY	MG/KG		30		1.85		3			40		No
ARSENIC	MG/KG	4.00	21		5.48		17.4			30		No
BARIUM	MG/KG	19.80	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.26	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	7.80	210		16.96		47.7			2500		No
COBALT	MG/KG	7.90	3300		8.89		21.8					No
COPPER	MG/KG	12.40	2800		34.14		144					No
LEAD	MG/KG	8.40	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG		22		0.19		0.35			60		No
NICKEL	MG/KG	14.20	1500		16.55		38.5			700		No
SELENIUM	MG/KG		370		0.48		1.3			2500		No
THALLIUM	MG/KG	1.00			1.63		2.8			30		No
VANADIUM	MG/KG	10.10	520		31.21		182			2000		No
ZINC	MG/KG	53.90	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021065 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observe dConc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.11			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
4-METHYLPHENOL	MG/KG	0.09	270									No
ACENAPHTHENE	MG/KG	0.29	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ACENAPTHYLENE	MG/KG	0.18			0.127	Exceeds	0.24			1000		No
ANTHRACENE	MG/KG	2.40	14000		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	4.10	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	2.60	0.056	Exceeds	0.718	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	2.20	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	1.10			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	2.60	5.6		0.778	Exceeds	1.8	Exceeds	Exceeds	10		No
CHRYSENE	MG/KG	3.40	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACEN	MG/KG	0.75	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	0.35	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	5.60	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	0.85	1800		0.108	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	1.00	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.19	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	5.30			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	5.50	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000005	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000013								0.08		No
ANTIMONY	MG/KG	0.93	30		1.85		3			40		No
ARSENIC	MG/KG	4.70	21		5.48		17.4			30		No
BARIUM	MG/KG	45.40	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.33	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	22.60	210		16.96	Exceeds	47.7			2500		No
COBALT	MG/KG	12.30	3300		8.89	Exceeds	21.8					No
COPPER	MG/KG	85.60	2800		34.14	Exceeds	144		Exceeds			No
LEAD	MG/KG	69.90	0.04	Exceeds	56.78	Exceeds	112			600		No
MERCURY	MG/KG	0.24	22		0.19	Exceeds	0.35			60		No
NICKEL	MG/KG	23.50	1500		16.55	Exceeds	38.5			700		No
THALLIUM	MG/KG	0.87			1.63		2.8			30		No
VANADIUM	MG/KG	14.70	520		31.21		182			2000		No
ZINC	MG/KG	94.10	2200		90.43	Exceeds	145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021044 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.04	480		0.071		0.08			800		No
1,3-DICHLOROBENZENE	MG/KG	0.04	41							500		No
1,4-DICHLOROBENZENE	MG/KG	0.18	3		0.08	Exceeds	0.09	Exceeds	Exceeds	60		No
2-METHYLNAPHTHALENE	MG/KG	0.02			0.082		0.08			1000		No
4-METHYLPHENOL	MG/KG	0.03	270									No
ACENAPHTHENE	MG/KG	0.08	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.05			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.11	14000		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.53	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.54	0.056	Exceeds	0.718		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.52	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.45			0.223	Exceeds	0.49		Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.51	5.6		0.778		1.8			10		No
CHRYSENE	MG/KG	0.66	56		0.814		0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENI	MG/KG	0.11	0.056	Exceeds	0.121		0.22			0.7		No
DIBENZOFURAN	MG/KG	0.03	210		0.08		0.13					No
FLUORANTHENE	MG/KG	1.00	2000		1.266		2.8			1000		No
FLUORENE	MG/KG	0.05	1800		0.108		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.33	0.56		0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.05	55		0.085		0.099			1000		No
PHENANTHRENE	MG/KG	0.54			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	1.30	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000104	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000397								0.08		No
SULFIDE	MG/KG	20.00			165.88		284					No
ANTIMONY	MG/KG	0.67	30		1.85		3			40		No
ARSENIC	MG/KG	1.90	21		5.48		17.4			30		No
BARIUM	MG/KG	17.50	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	7.70	210		16.96		47.7			2500		No
COBALT	MG/KG	4.70	3300		8.89		21.8					No
COPPER	MG/KG	13.40	2800		34.14		144					No
LEAD	MG/KG	18.10	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.06	22		0.19		0.35			60		No
NICKEL	MG/KG	8.00	1500		16.55		38.5			700		No
VANADIUM	MG/KG	6.80	520		31.21		182			2000		No
ZINC	MG/KG	52.70	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021244 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.03	480		0.071		0.08			800		No
2-METHYLNAPHTHALENE	MG/KG	0.02			0.082		0.08			1000		No
4-METHYLPHENOL	MG/KG	0.42	270									No
ACENAPHTHENE	MG/KG	0.02	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.03			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.09	1400		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.33	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.26	0.056	Exceeds	0.708		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.24	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.20			0.223		0.49			2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.25	5.6		0.778		1.8			10		No
BIS(2-ETHYLHEXYL) PHTHALAT	MG/KG	9.80	32		0.113	Exceeds	0.27	Exceeds	Exceeds	300		No
CHRYSENE	MG/KG	0.35	56		0.814		0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.06	0.056	Exceeds	0.121		0.22			0.7		No
DIBENZOFURAN	MG/KG	0.04	210		0.08		0.13					No
DI-N-OCTYL PHTHALATE	MG/KG	0.02	1100									No
FLUORANTHENE	MG/KG	0.67	2000		1.266		2.8			1000		No
FLUORENE	MG/KG	0.07	1800		1.8		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.19	0.56		0.247		0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.02	55		0.085		0.099			1000		No
PENTACHLOROBENZENE	MG/KG	0.06			0.059		0.065					No
PHENANTHRENE	MG/KG	0.71			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	0.68	1500							2000		No
ARSENIC	MG/KG	2.00	21		5.48		17.4			30		No
BARIUM	MG/KG	8.40	5200		51.96		90.2			2500		No
CADMIUM	MG/KG	0.41	37		0.54		1.1			80		No
CHROMIUM	MG/KG	8.50	210		16.96		47.7			2500		No
COBALT	MG/KG	3.30	3300		8.89		21.8					No
COPPER	MG/KG	94.00	2800		31.14	Exceeds	144		Exceeds			No
LEAD	MG/KG	23.80	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.03	22		0.19		0.35			60		No
NICKEL	MG/KG	7.30	1500		16.55		38.5			700		No
TIN	MG/KG	2.60	4500		6.61		22					No
VANADIUM	MG/KG	4.70	520		31.21		182			2000		No
ZINC	MG/KG	42.90	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021265 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.02	480		0.071		0.08			800		No
4-METHYLPHENOL	MG/KG	0.43	270									No
ANTHRACENE	MG/KG	0.03	1400		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.16	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.16	0.056	Exceeds	0.708		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.10	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.13			0.223		0.49			2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.15	5.6		0.778		1.8			10		No
CHRYSENE	MG/KG	0.17	56		0.814		0.18			10		No
FLUORANTHENE	MG/KG	0.25	2000		1.266		2.8			1000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.14	0.56		0.247		0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.03	55		0.085		0.099			1000		No
PHENANTHRENE	MG/KG	0.14			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	0.25	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000026	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000049								0.008		No
ARSENIC	MG/KG	3.00	21		5.48		17.4			30		No
BARIUM	MG/KG	30.40	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.21	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	13.70	210		16.96		47.7			2500		No
COBALT	MG/KG	8.20	3300		8.89		21.8					No
COPPER	MG/KG	18.80	2800		31.14		144					No
LEAD	MG/KG	23.90	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.06	22		0.19		0.35			60		No
SELENIUM	MG/KG	0.55	370		0.48	Exceeds	1.3			2500		No
VANADIUM	MG/KG	10.50	520		31.21		182			2000		No
ZINC	MG/KG	72.80	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021183 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observe dConc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.03			0.082		0.08			1000		No
ACENAPHTHENE	MG/KG	0.37	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	0.05	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.05	0.056		0.708		1.8			0.7		No
BENZO(GHI)PERYLENE	MG/KG	0.03			0.223		0.49			2500		No
CHRYSENE	MG/KG	0.04	56		0.814		0.18			10		No
DIBENZOFURAN	MG/KG	0.04	210		0.08		0.13					No
FLUORANTHENE	MG/KG	0.06	2000		1.266		2.8			1000		No
FLUORENE	MG/KG	0.47	1800		1.8		0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.03	0.56		0.247		0.053			1		No
NAPHTHALENE	MG/KG	0.34	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	0.05			0.043	Exceeds	0.056			100		No
PYRENE	MG/KG	0.08	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000001	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000002								0.008		No
ARSENIC	MG/KG	2.40	21		5.48		17.4			30		No
BARIUM	MG/KG	31.70	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.23	150		0.4		0.83			0.8		No
CADMIUM	MG/KG	0.73	37		0.54	Exceeds	1.1			80		No
CHROMIUM	MG/KG	9.90	210		16.96		47.7			2500		No
COBALT	MG/KG	8.70	3300		8.89		21.8					No
COPPER	MG/KG	14.40	2800		31.14		144					No
LEAD	MG/KG	13.90	0.04	Exceeds	56.78		112			600		No
NICKEL	MG/KG	13.60	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.74	370		0.48	Exceeds	1.3		Exceeds	2500		No
TIN	MG/KG	1.70	4500		6.61		22					No
VANADIUM	MG/KG	11.70	520		31.21		182			2000		No
ZINC	MG/KG	68.40	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021202 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.72			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
4-METHYLPHENOL	MG/KG	0.21	270									No
ACENAPHTHENE	MG/KG	5.00	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ANTHRACENE	MG/KG	5.60	1400		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	6.30	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	4.50	0.056	Exceeds	0.708	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	2.80	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	2.10			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	4.40	5.6		0.778	Exceeds	1.8	Exceeds	Exceeds	10		No
CHRYSENE	MG/KG	5.60	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.83	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	4.60	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	10.00	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	7.60	1800		1.8	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	2.60	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
NAPHTHALENE	MG/KG	0.90	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	19.00			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	9.50	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000001	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000001								0.008		No
ARSENIC	MG/KG	3.40	21		5.48		17.4			30		No
BARIUM	MG/KG	48.20	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.36	150		0.4		0.83			0.8		No
CADMIUM	MG/KG	0.85	37		0.54	Exceeds	1.1		Exceeds	80		No
CHROMIUM	MG/KG	17.30	210		16.96	Exceeds	47.7			2500		No
COBALT	MG/KG	11.60	3300		8.89	Exceeds	21.8					No
COPPER	MG/KG	35.90	2800		31.14	Exceeds	144					No
LEAD	MG/KG	46.30	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.55	22		0.19	Exceeds	0.35	Exceeds	Exceeds	60		No
NICKEL	MG/KG	16.20	1500		16.55		38.5			700		No
SELENIUM	MG/KG	1.10	370		0.48	Exceeds	1.3		Exceeds	2500		No
SILVER	MG/KG	0.21	370		0.41		0.8			200		No
TIN	MG/KG	6.50	4500		6.61		22					No
VANADIUM	MG/KG	15.70	520		31.21		182			2000		No
ZINC	MG/KG	86.70	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparision to Standards, Location RB021221 (0 to 0.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.11			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
ACENAPHTHENE	MG/KG	0.10	2600		0.089	Exceeds	0.18			2500		No
ACENAPTHYLENE	MG/KG	0.16			0.127	Exceeds	0.24			1000		No
ANTHRACENE	MG/KG	0.52	1400		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	3.70	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	4.40	0.056	Exceeds	0.708	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	3.50	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	4.20			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	3.90	5.6		0.778	Exceeds	1.8	Exceeds	Exceeds	10		No
BUTYLBENZYLPHTHALATE	MG/KG	0.10	930		0.074	Exceeds	0.41					No
CHRYSENE	MG/KG	4.40	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENI	MG/KG	1.30	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	0.09	210		0.08	Exceeds	0.13					No
FLUORANTHENE	MG/KG	7.50	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	0.14	1800		1.8		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	3.70	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
NAPHTHALENE	MG/KG	0.30	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	2.60			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	9.60	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000020	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000035								0.008		No
ARSENIC	MG/KG	5.80	21		5.48	Exceeds	17.4			30		No
BARIUM	MG/KG	35.20	5200		51.96		90.2			2500		No
CADMIUM	MG/KG	1.50	37		0.54	Exceeds	1.1	Exceeds	Exceeds	80		No
CHROMIUM	MG/KG	14.80	210		16.96		47.7			2500		No
COBALT	MG/KG	9.60	3300		8.89	Exceeds	21.8					No
COPPER	MG/KG	41.20	2800		31.14	Exceeds	144					No
LEAD	MG/KG	118.00	0.04	Exceeds	56.78	Exceeds	112	Exceeds	Exceeds	600		No
MERCURY	MG/KG	0.08	22		0.19		0.35			60		No
NICKEL	MG/KG	17.10	1500		16.55	Exceeds	38.5			700		No
TIN	MG/KG	3.00	4500		6.61		22					No
VANADIUM	MG/KG	16.40	520		31.21		182			2000		No
ZINC	MG/KG	168.00	2200		90.43	Exceeds	145	Exceeds	Exceeds	2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021263 (1 to 1.5 ft)
EE/CA Reach of the Houstonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	2.20	480		0.071	Exceeds	0.08	Exceeds	Exceeds	800		No
2-METHYLNAPHTHALENE	MG/KG	1.30			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
4-METHYLPHENOL	MG/KG	0.38	270									No
ACENAPHTHENE	MG/KG	12.00	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ACENAPTHYLENE	MG/KG	8.70			0.127	Exceeds	0.24	Exceeds	Exceeds	1000		No
ANTHRACENE	MG/KG	32.00	1400		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	31.00	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	21.00	0.056	Exceeds	0.708	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	13.00	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	10.00			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	18.00	5.6	Exceeds	0.778	Exceeds	1.8	Exceeds	Exceeds	10	Exceeds	Yes
CHRYSENE	MG/KG	25.00	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10	Exceeds	Yes
DIBENZO(A,H)ANTHRACEN	MG/KG	4.20	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	20.00	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	53.00	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	25.00	1800		1.8	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	12.00	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
NAPHTHALENE	MG/KG	4.60	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	84.00			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	59.00	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000002	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000003								0.008		No
ARSENIC	MG/KG	5.80	21		5.48	Exceeds	17.4			30		No
BARIUM	MG/KG	25.00	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.26	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	14.40	210		16.96		47.7			2500		No
COBALT	MG/KG	11.10	3300		8.89	Exceeds	21.8					No
COPPER	MG/KG	26.60	2800		31.14		144					No
LEAD	MG/KG	25.70	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.11	22		0.19		0.35			60		No
NICKEL	MG/KG	20.40	1500		16.55	Exceeds	38.5			700		No
SELENIUM	MG/KG	0.71	370		0.48	Exceeds	1.3			2500		No
TIN	MG/KG	21.30	4500		6.61	Exceeds	22		Exceeds			No
VANADIUM	MG/KG	13.50	520		31.21		182			2000		No
ZINC	MG/KG	71.30	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021282 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
4-METHYLPHENOL	MG/KG	0.39	270									No
ACENAPHTHENE	MG/KG	0.04	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.03			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.18	1400		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.63	0.56	Exceeds	0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.49	0.056	Exceeds	0.708		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.33	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.25			0.223	Exceeds	0.49			2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.54	5.6		0.778		1.8			10		No
CHRYSENE	MG/KG	0.57	56		0.814		0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.09	0.056	Exceeds	0.121		0.22			0.7		No
DIBENZOFURAN	MG/KG	0.03	210		0.08		0.13					No
FLUORANTHENE	MG/KG	1.00	2000		1.266		2.8			1000		No
FLUORENE	MG/KG	0.05	1800		1.8		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.28	0.56		0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.06	55		0.085		0.099			1000		No
PHENANTHRENE	MG/KG	0.38			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	0.92	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000001	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000002								0.008		No
ARSENIC	MG/KG	1.80	21		5.48		17.4			30		No
BARIUM	MG/KG	5.90	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.17	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	6.00	210		16.96		47.7			2500		No
COBALT	MG/KG	2.00	3300		8.89		21.8					No
COPPER	MG/KG	9.00	2800		31.14		144					No
LEAD	MG/KG	6.20	0.04	Exceeds	56.78		112			600		No
VANADIUM	MG/KG	3.70	520		31.21		182			2000		No
ZINC	MG/KG	33.30	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021324 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
4,4'-DDE	MG/KG	0.02	1.7		0.008	Exceeds	0.015	Exceeds	Exceeds	2		No
ALDRIN	MG/KG	0.01	0.026							60		No
ENDRIN	MG/KG	0.02	16							1		No
2-METHYLNAPHTHALENE	MG/KG	230.00			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
4-METHYLPHENOL	MG/KG	0.23	270									No
ACENAPHTHENE	MG/KG	150.00	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	32.00	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	28.00	0.056	Exceeds	0.718	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	14.00	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	20.00			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	20.00	5.6	Exceeds	0.778	Exceeds	1.8	Exceeds	Exceeds	10	Exceeds	Yes
CHRYSENE	MG/KG	29.00	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10	Exceeds	Yes
DIBENZO(A,H)ANTHRACENE	MG/KG	4.40	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	8.80	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	50.00	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	61.00	1800		0.108	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	16.00	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
NAPHTHALENE	MG/KG	620.00	55	Exceeds	0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	180.00			0.043	Exceeds	0.056	Exceeds	Exceeds	100	Exceeds	Yes
PYRENE	MG/KG	120.00	1500							2000		No
SULFIDE	MG/KG	65.10			165.88		284					No
ANTIMONY	MG/KG	0.90	30		1.85		3			40		No
ARSENIC	MG/KG	6.00	21		5.48	Exceeds	17.4			30		No
BARIUM	MG/KG	52.40	5200		51.96	Exceeds	90.2			2500		No
BERYLLIUM	MG/KG	0.21	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	31.10	210		16.96	Exceeds	47.7		Exceeds	2500		No
COBALT	MG/KG	8.70	3300		8.89		21.8					No
COPPER	MG/KG	86.60	2800		31.14	Exceeds	144		Exceeds			No
LEAD	MG/KG	105.00	0.04	Exceeds	56.78	Exceeds	112		Exceeds	600		No
MERCURY	MG/KG	0.32	22		0.19	Exceeds	0.35		Exceeds	60		No
NICKEL	MG/KG	15.30	1500		16.55		38.5			700		No
SELENIUM	MG/KG	1.30	370		0.48	Exceeds	1.3		Exceeds	2500		No
SILVER	MG/KG	0.32	370		0.41		0.8			200		No
THALLIUM	MG/KG	0.96			1.63		2.8			30		No
TIN	MG/KG	11.30	4500		6.61		22		Exceeds			No
VANADIUM	MG/KG	12.60	520		31.21		182			2000		No
ZINC	MG/KG	140.00	2200		90.43	Exceeds	145		Exceeds	2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021364 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	1.00			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
2-METHYLPHENOL (O-CRESOL	MG/KG	0.10	2700									No
4-METHYLPHENOL	MG/KG	0.28	270									No
ACENAPHTHENE	MG/KG	8.10	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ACENAPTHYLENE	MG/KG	1.00			0.127	Exceeds	0.24	Exceeds	Exceeds	1000		No
ANTHRACENE	MG/KG	19.00	14000		0.191	Exceeds	0.39	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	30.00	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	23.00	0.056	Exceeds	0.718	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	14.00	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	13.00			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	16.00	5.6	Exceeds	0.778	Exceeds	1.8	Exceeds	Exceeds	10	Exceeds	Yes
CHRYSENE	MG/KG	27.00	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10	Exceeds	Yes
DIBENZO(A,H)ANTHRACENE	MG/KG	4.50	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.7	Exceeds	Yes
DIBENZOFURAN	MG/KG	3.30	210		0.08	Exceeds	0.13	Exceeds	Exceeds			No
FLUORANTHENE	MG/KG	47.00	2000		1.266	Exceeds	2.8	Exceeds	Exceeds	1000		No
FLUORENE	MG/KG	7.30	1800		0.108	Exceeds	0.24	Exceeds	Exceeds	2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	14.00	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1	Exceeds	Yes
NAPHTHALENE	MG/KG	3.30	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	43.00			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	48.00	1500							2000		No
SULFIDE	MG/KG	24.40			165.88		284					No
ANTIMONY	MG/KG	0.67	30		1.85		3			40		No
ARSENIC	MG/KG	1.00	21		5.48		17.4			30		No
BARIUM	MG/KG	5.70	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.11	150		0.4		0.83			0.8		No
CHROMIUM	MG/KG	5.30	210		16.96		47.7			2500		No
COBALT	MG/KG	4.70	3300		8.89		21.8					No
COPPER	MG/KG	8.50	2800		31.14		144					No
LEAD	MG/KG	9.70	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.02	22		0.19		0.35			60		No
NICKEL	MG/KG	7.80	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.62	370		0.48	Exceeds	1.3			2500		No
VANADIUM	MG/KG	3.10	520		31.21		182			2000		No
ZINC	MG/KG	42.00	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021385 (1 to 1.5 ft)
EE/CA Reach of the Houstonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLPHENOL (O-CRESOL)	MG/KG	0.38	2700									No
4-METHYLPHENOL	MG/KG	0.38	270									No
BENZO(A)ANTHRACENE	MG/KG	0.03	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.03	0.056		0.718		1.8			0.7		No
BENZO(B)FLUORANTHENE	MG/KG	0.02	0.56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.03			0.223		0.49			2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.02	5.6		0.778		1.8			10		No
BIS(2-ETHYLHEXYL) PHTHALATE	MG/KG	2.80	32		0.113	Exceeds	0.27	Exceeds	Exceeds	300		No
CHRYSENE	MG/KG	0.04	56		0.814		0.18			10		No
DI-N-OCTYL PHTHALATE	MG/KG	0.03	1100									No
FLUORANTHENE	MG/KG	0.05	2000		1.266		2.8			1000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.03	0.56		0.247		0.053			1		No
PHENANTHRENE	MG/KG	0.04			0.043		0.056			100		No
PYRENE	MG/KG	0.07	1500							2000		No
ARSENIC	MG/KG	7.60	21		5.48	Exceeds	17.4			30		No
BARIUM	MG/KG	40.70	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	9.20	210		16.96		47.7			2500		No
COBALT	MG/KG	15.50	3300		8.89	Exceeds	21.8		Exceeds			No
COPPER	MG/KG	21.30	2800		31.14		144					No
LEAD	MG/KG	10.00	0.04	Exceeds	56.78		112			600		No
NICKEL	MG/KG	23.60	1500		16.55	Exceeds	38.5			700		No
SELENIUM	MG/KG	0.71	370		0.48	Exceeds	1.3			2500		No
SILVER	MG/KG	0.12	370		0.41		0.8			200		No
THALLIUM	MG/KG	1.60			1.63		2.8			30		No
VANADIUM	MG/KG	8.70	520		31.21		182			2000		No
ZINC	MG/KG	75.10	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021406 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
BENZO(GHI)PERYLENE	MG/KG	0.02			0.223		0.49		2500		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.02	0.56		0.247		0.053		1		No
PYRENE	MG/KG	0.02	1500						2000		No
ARSENIC	MG/KG	8.60	21		5.48	Exceeds	17.4	Exceeds	30		No
BARIUM	MG/KG	38.60	5200		51.96		90.2		2500		No
BERYLLIUM	MG/KG	0.13	150		0.4		0.83		0.8		No
CHROMIUM	MG/KG	11.00	210		16.96		47.7		2500		No
COBALT	MG/KG	16.50	3300		8.89	Exceeds	21.8	Exceeds			No
COPPER	MG/KG	25.90	2800		31.14		144				No
LEAD	MG/KG	13.10	0.04	Exceeds	56.78		112		600		No
NICKEL	MG/KG	28.70	1500		16.55	Exceeds	38.5	Exceeds	700		No
SELENIUM	MG/KG	0.52	370		0.48	Exceeds	1.3		2500		No
THALLIUM	MG/KG	1.60			1.63		2.8		30		No
VANADIUM	MG/KG	10.70	520		31.21		182		2000		No
ZINC	MG/KG	95.40	2200		90.43	Exceeds	145		2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location SL0220 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.08	480		0.071	Exceeds	0.08	Exceeds	Exceeds	800		No
1,4-DICHLOROBENZENE	MG/KG	0.08	3		0.08	Exceeds	0.09			60		No
2-METHYLNAPHTHALENE	MG/KG	0.10			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
ACENAPHTHENE	MG/KG	0.09	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.15			0.127	Exceeds	0.24			1000		No
ANTHRACENE	MG/KG	0.49	14000		0.191	Exceeds	0.039	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	1.30	0.56	Exceeds	0.709	Exceeds	1.6		Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	1.10	0.056	Exceeds	0.718	Exceeds	1.8		Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	0.81	0.56	Exceeds	0.715	Exceeds	2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.55			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.94	5.6		0.778	Exceeds	1.8			10		No
CHRYSENE	MG/KG	1.10	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.21	0.056	Exceeds								No
DIBENZOFURAN	MG/KG	0.11	210									No
FLUORANTHENE	MG/KG	2.20	2000									No
FLUORENE	MG/KG	0.23	1800									No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.59	470									No
ISOPHORONE	MG/KG	0.15										No
NAPHTHALENE	MG/KG	0.31	55									No
PENTACHLOROBENZENE	MG/KG	0.20										No
PHENANTHRENE	MG/KG	1.80			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	2.60	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000055	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000092								0.008		No
ANTIMONY	MG/KG	0.62	30		1.85		3			40		No
BARIUM	MG/KG	19.70	5200		51.96		90.2			2500		No
BERYLLIUM	MG/KG	0.14	150		0.04	Exceeds	0.83		Exceeds	0.08	Exceeds	Yes
CHROMIUM	MG/KG	10.70	210		16.96		47.7			2500		No
COBALT	MG/KG	5.60	3300		8.89		21.8					No
COPPER	MG/KG	22.80	2800		31.14		144					No
LEAD	MG/KG	30.10	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.07	22		0.19		0.35			60		No
NICKEL	MG/KG	10.90	1500		16.55		38.5			700		No
SILVER	MG/KG	0.16	370		0.41		0.8			200		No
TIN	MG/KG	3.60	4500		6.61		22					No
VANADIUM	MG/KG	8.30	520		31.21		182			2000		No
ZINC	MG/KG	63.70	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021802 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
2-METHYLNAPHTHALENE	MG/KG	0.25			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
4-METHYLPHENOL	MG/KG	2.60	270									No
ACENAPHTHENE	MG/KG	0.53	2600		0.089	Exceeds	0.18	Exceeds	Exceeds	2500		No
ACENAPTHYLENE	MG/KG	0.33			0.127	Exceeds	0.24	Exceeds	Exceeds	1000		No
ANTHRACENE	MG/KG	1.80	14000		0.191	Exceeds	0.039	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	8.40	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	7.50	0.056	Exceeds	0.718	Exceeds	1.8	Exceeds	Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	5.00	0.56	Exceeds	0.715	Exceeds	2	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	4.00			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	7.50	5.6	Exceeds	0.778	Exceeds	1.8	Exceeds	Exceeds	10		No
CHRYSENE	MG/KG	7.60	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	1.50	0.056	Exceeds								No
DIBENZOFURAN	MG/KG	0.28	210									No
FLUORANTHENE	MG/KG	12.00	2000									No
FLUORENE	MG/KG	0.86	1800									No
INDENO(1,2,3-C,D)PYRENE	MG/KG	4.20	470									No
NAPHTHALENE	MG/KG	0.69	55									No
PHENANTHRENE	MG/KG	5.40			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PHENOL	MG/KG	2.60	33000							500		No
PYRENE	MG/KG	12.00	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000008	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000017								0.008		No
ARSENIC	MG/KG	2.70	21		5.48		17.4			30		No
BARIUM	MG/KG	20.80	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	16.70	210		16.96		47.7			2500		No
COBALT	MG/KG	5.90	3300		8.89		21.8					No
COPPER	MG/KG	25.90	2800		31.14		144					No
LEAD	MG/KG	34.90	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.15	22		0.19		0.35			60		No
NICKEL	MG/KG	9.80	1500		16.55		38.5			700		No
SILVER	MG/KG	0.13	370		0.41		0.8			200		No
TIN	MG/KG	20.00	4500		6.61	Exceeds	22		Exceeds			No
VANADIUM	MG/KG	6.60	520		31.21		182			2000		No
ZINC	MG/KG	66.50	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021702 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.06	480		0.071		0.08			800		No
1,4-DICHLOROBENZENE	MG/KG	0.15	3		0.08	Exceeds	0.09	Exceeds	Exceeds	60		No
2-METHYLNAPHTHALENE	MG/KG	0.10			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
ACENAPHTHENE	MG/KG	0.15	2600		0.089	Exceeds	0.18		Exceeds	2500		No
ACENAPTHYLENE	MG/KG	0.12			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.32	14000		0.191	Exceeds	0.039	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	1.70	0.56	Exceeds	0.709	Exceeds	1.6	Exceeds	Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	1.60	0.056	Exceeds	0.718	Exceeds	1.8		Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	1.30	0.56	Exceeds	0.715	Exceeds	2		Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	1.30			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	1.50	5.6		0.778	Exceeds	1.8		Exceeds	10		No
CHRYSENE	MG/KG	2.00	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.32	0.056	Exceeds								No
DIBENZOFURAN	MG/KG	0.13	210									No
FLUORANTHENE	MG/KG	3.50	2000									No
FLUORENE	MG/KG	0.32	1800									No
INDENO(1,2,3-C,D)PYRENE	MG/KG	1.30	470									No
NAPHTHALENE	MG/KG	0.23	55									No
PENTACHLOROBENZENE	MG/KG	0.10										No
PHENANTHRENE	MG/KG	2.50			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PHENOL	MG/KG	0.14	33000							500		No
PYRENE	MG/KG	3.80	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000051	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000137								0.008		No
ARSENIC	MG/KG	2.50	21		5.48		17.4			30		No
BARIUM	MG/KG	28.90	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	15.80	210		16.96		47.7			2500		No
COBALT	MG/KG	5.60	3300		8.89		21.8					No
COPPER	MG/KG	26.40	2800		31.14		144					No
LEAD	MG/KG	38.10	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.18	22		0.19		0.35			60		No
NICKEL	MG/KG	11.30	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.67	370		0.48	Exceeds	1.3			2500		No
SILVER	MG/KG	0.28	370		0.41		0.8			200		No
VANADIUM	MG/KG	9.00	520		31.21		182			2000		No
ZINC	MG/KG	70.20	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021781 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.11	480		0.071	Exceeds	0.08	Exceeds	Exceeds	800		No
1,4-DICHLOROBENZENE	MG/KG	0.07	3		0.08		0.09			60		No
2-METHYLNAPHTHALENE	MG/KG	0.08			0.082		0.08	Exceeds		1000		No
4-METHYLPHENOL	MG/KG	0.67	270									No
ACENAPHTHENE	MG/KG	0.11	2600		0.089	Exceeds	0.18			2500		No
ACENAPTHYLENE	MG/KG	0.09			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.31	14000		0.191	Exceeds	0.039	Exceeds	Exceeds	2500		No
BENZO(A)ANTHRACENE	MG/KG	1.50	0.56	Exceeds	0.709	Exceeds	1.6		Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	1.30	0.056	Exceeds	0.718	Exceeds	1.8		Exceeds	0.7	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	0.99	0.56	Exceeds	0.715	Exceeds	2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.82			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	1.30	5.6		0.778	Exceeds	1.8		Exceeds	10		No
CHRYSENE	MG/KG	1.40	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.23	0.056	Exceeds								No
DIBENZOFURAN	MG/KG	0.09	210									No
FLUORANTHENE	MG/KG	2.60	2000									No
FLUORENE	MG/KG	0.21	1800									No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.86	470									No
NAPHTHALENE	MG/KG	0.22	55									No
PENTACHLOROBENZENE	MG/KG	0.08										No
PHENANTHRENE	MG/KG	1.40			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PHENOL	MG/KG	0.67	33000							500		No
PYRENE	MG/KG	3.30	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000761	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.001173								0.008		No
ARSENIC	MG/KG	2.10	21		5.48		17.4			30		No
BARIUM	MG/KG	29.10	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	12.30	210		16.96		47.7			2500		No
COBALT	MG/KG	5.60	3300		8.89		21.8					No
COPPER	MG/KG	24.80	2800		31.14		144					No
LEAD	MG/KG	36.90	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.12	22		0.19		0.35			60		No
NICKEL	MG/KG	10.60	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.70	370		0.48	Exceeds	1.3			2500		No
SILVER	MG/KG	0.23	370		0.41		0.8			200		No
VANADIUM	MG/KG	10.20	520		31.21		182			2000		No
ZINC	MG/KG	66.60	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021865 (2 to 2.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.04	480		0.071		0.08			800		No
1,4-DICHLOROBENZENE	MG/KG	0.03	3		0.08		0.09			60		No
2,4-DIMETHYLPHENOL	MG/KG	0.02	1100							10		No
2-METHYLNAPHTHALENE	MG/KG	0.13			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
2-METHYLPHENOL (O-CRESOL	MG/KG	0.03	2700									No
4-METHYLPHENOL	MG/KG	0.05	270									No
ACENAPHTHENE	MG/KG	0.04	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.12			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.19	14000		0.191		0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	1.20	0.56	Exceeds	0.709	Exceeds	1.6		Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	1.40	0.56	Exceeds	0.718	Exceeds	1.8		Exceeds	0.07	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	1.10	56		0.715	Exceeds	2		Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	1.10			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	1.10	5.6		0.778	Exceeds	1.8			10		No
CHRYSENE	MG/KG	1.30	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.33	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.07	Exceeds	Yes
DIBENZOFURAN	MG/KG	0.05	210		0.08		0.13					No
FLUORANTHENE	MG/KG	1.80	2000		1.266	Exceeds	2.8			1000		No
FLUORENE	MG/KG	0.07	1800		0.108		0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.98	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.21	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PHENANTHRENE	MG/KG	0.86			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	3.40	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000158	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000274								0.008		No
ARSENIC	MG/KG	4.70	21		5.48		17.4			30		No
BARIUM	MG/KG	39.00	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	16.90	210		16.96		47.7			2500		No
COBALT	MG/KG	7.90	3300		8.89		21.8					No
COPPER	MG/KG	62.80	2800		31.14	Exceeds	144		Exceeds			No
LEAD	MG/KG	88.10	0.04	Exceeds	56.78	Exceeds	112		Exceeds	600		No
MERCURY	MG/KG	0.25	22		0.19	Exceeds	0.35			60		No
NICKEL	MG/KG	15.20	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.76	370		0.48	Exceeds	1.3		Exceeds	2500		No
SILVER	MG/KG	0.15	370		0.41		0.8			200		No
TIN	MG/KG	8.90	4500		6.61	Exceeds	22					No
VANADIUM	MG/KG	10.40	520		31.21		182			2000		No
ZINC	MG/KG	101.00	2200		90.43	Exceeds	145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021906 (0 to 0.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.03	480		0.071		0.08			800		No
1,4-DICHLOROBENZENE	MG/KG	0.04	3		0.08		0.09			60		No
ACENAPHTHENE	MG/KG	0.04	2600		0.089		0.18			2500		No
BENZO(A)ANTHRACENE	MG/KG	0.47	0.56		0.709		1.6			1		No
BENZO(A)PYRENE	MG/KG	0.46	0.56		0.718		1.8			0.07	Exceeds	No
BENZO(B)FLUORANTHENE	MG/KG	0.42	56		0.715		2			1		No
BENZO(GHI)PERYLENE	MG/KG	0.34			0.223	Exceeds	0.49		Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	0.47	5.6		0.778		1.8			10		No
CHRYSENE	MG/KG	0.52	56		0.814		0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.10	0.056	Exceeds	0.121		0.22			0.07	Exceeds	No
INDENO(1,2,3-C,D)PYRENE	MG/KG	0.33	0.56		0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
PHENANTHRENE	MG/KG	0.53			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000038	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000074								0.008		No
ARSENIC	MG/KG	2.30	21		5.48		17.4			30		No
BARIUM	MG/KG	27.20	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	12.40	210		16.96		47.7			2500		No
COBALT	MG/KG	5.70	3300		8.89		21.8					No
COPPER	MG/KG	20.50	2800		31.14		144					No
LEAD	MG/KG	25.80	0.04	Exceeds	56.78		112			600		No
MERCURY	MG/KG	0.07	22		0.19		0.35			60		No
NICKEL	MG/KG	10.80	1500		16.55		38.5			700		No
SILVER	MG/KG	0.21	370		0.41		0.8			200		No
VANADIUM	MG/KG	9.70	520		31.21		182			2000		No
ZINC	MG/KG	62.00	2200		90.43		145			2500		No

BKG = Background

Table 2.3-7

Appendix IX Riverbank Soil Comparison to Standards, Location RB021965 (1 to 1.5 ft)
EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Analyte Name	Units	Observed Conc.	EPA Region IX PRG Conc.	Exceeds EPA Region IX PRG Conc.	BKG Average Conc.	Exceeds BKG Average Conc.	BKG Maximum Conc.	Exceeds BKG Maximum Conc.	Exceeds both BKG Concs. or >150% one BKG Conc.	MCP S-2 Conc.	Exceeds MCP S-2 Conc.	Exceeds both or >150% one BKG Conc. and Exceeds MCP S-2 Conc.
1,2,4-TRICHLOROBENZENE	MG/KG	0.21	480		0.071	Exceeds	0.08	Exceeds	Exceeds	800		No
1,4-DICHLOROBENZENE	MG/KG	0.34	3		0.08	Exceeds	0.09	Exceeds	Exceeds	60		No
2,4-DIMETHYLPHENOL	MG/KG	0.03	1100							10		No
2-METHYLNAPHTHALENE	MG/KG	0.14			0.082	Exceeds	0.08	Exceeds	Exceeds	1000		No
2-METHYLPHENOL (O-CRESOL)	MG/KG	0.04	2700									No
4-METHYLPHENOL	MG/KG	0.08	270									No
ACENAPHTHENE	MG/KG	0.08	2600		0.089		0.18			2500		No
ACENAPTHYLENE	MG/KG	0.09			0.127		0.24			1000		No
ANTHRACENE	MG/KG	0.24	14000		0.191	Exceeds	0.39			2500		No
BENZO(A)ANTHRACENE	MG/KG	1.20	0.56	Exceeds	0.709	Exceeds	1.6		Exceeds	1	Exceeds	Yes
BENZO(A)PYRENE	MG/KG	1.30	0.56	Exceeds	0.718	Exceeds	1.8		Exceeds	0.07	Exceeds	Yes
BENZO(B)FLUORANTHENE	MG/KG	1.20	56		0.715	Exceeds	2		Exceeds	1	Exceeds	Yes
BENZO(GHI)PERYLENE	MG/KG	1.10			0.223	Exceeds	0.49	Exceeds	Exceeds	2500		No
BENZO(K)FLUORANTHENE	MG/KG	1.00	5.6		0.778	Exceeds	1.8			10		No
CHRYSENE	MG/KG	1.50	56		0.814	Exceeds	0.18	Exceeds	Exceeds	10		No
DIBENZO(A,H)ANTHRACENE	MG/KG	0.37	0.056	Exceeds	0.121	Exceeds	0.22	Exceeds	Exceeds	0.07	Exceeds	Yes
DIBENZOFURAN	MG/KG	0.10	210		0.08	Exceeds	0.13					No
FLUORANTHENE	MG/KG	2.70	2000		1.266	Exceeds	2.8		Exceeds	1000		No
FLUORENE	MG/KG	0.16	1800		0.108	Exceeds	0.24			2000		No
INDENO(1,2,3-C,D)PYRENE	MG/KG	1.00	0.56	Exceeds	0.247	Exceeds	0.053	Exceeds	Exceeds	1		No
NAPHTHALENE	MG/KG	0.24	55		0.085	Exceeds	0.099	Exceeds	Exceeds	1000		No
PENTACHLOROBENZENE	MG/KG	0.04			0.059		0.065					No
PHENANTHRENE	MG/KG	1.80			0.043	Exceeds	0.056	Exceeds	Exceeds	100		No
PYRENE	MG/KG	4.30	1500							2000		No
TEQ 2,3,7,8-TCDD (EPA)	MG/KG	0.000172	0.001									No
TEQ 2,3,7,8-TCDD (MADEP)	MG/KG	0.000364								0.008		No
ARSENIC	MG/KG	3.20	21		5.48		17.4			30		No
BARIUM	MG/KG	36.60	5200		51.96		90.2			2500		No
CHROMIUM	MG/KG	21.30	210		16.96	Exceeds	47.7			2500		No
COBALT	MG/KG	6.50	3300		8.89		21.8					No
COPPER	MG/KG	35.50	2800		31.14	Exceeds	144					No
LEAD	MG/KG	58.70	0.04	Exceeds	56.78	Exceeds	112			600		No
MERCURY	MG/KG	0.37	22		0.19	Exceeds	0.35	Exceeds	Exceeds	60		No
NICKEL	MG/KG	12.70	1500		16.55		38.5			700		No
SELENIUM	MG/KG	0.78	370		0.48	Exceeds	1.3		Exceeds	2500		No
SILVER	MG/KG	0.36	370		0.41		0.8			200		No
TIN	MG/KG	3.80	4500		6.61		22					No
VANADIUM	MG/KG	10.50	520		31.21		182			2000		No
ZINC	MG/KG	92.70	2200		90.43	Exceeds	145			2500		No

BKG = Background

Table 2.3-8

Summary of Appendix IX Riverbank Soil Samples that Exceed Standards EE/CA Reach of the Houstonic River, Pittsfield, Massachusetts

Subreach	Location ID	Transect	Bank	Location on Bank	Depth Interval	Compounds that Exceed Criteria
3-10	RB020985	T098	East	Middle	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE
3-10	RB021065	T106	East	Middle	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE
4-2	RB021202	T120	West	Middle	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE
4-2	RB021221	T122	West	Top	0-0.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE
4-2	RB021263	T126	West	Bottom	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(K)FLUORANTHENE CHRYSENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE
4-3	RB021324	T132	East	Bottom	2-2.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(K)FLUORANTHENE CHRYSENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE PHENANTHRENE
4-3	RB021364	T136	East	Bottom	2-2.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(K)FLUORANTHENE CHRYSENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-C,D)PYRENE
4-5A	BT28		West		1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BERYLLIUM

Table 2.3-8

Summary of Appendix IX Riverbank Soil Samples that Exceed Standards
EE/CA Reach of the Houstonic River, Pittsfield, Massachusetts

Subreach	Location ID	Transect	Bank	Location on Bank	Depth Interval	Compounds that Exceed Criteria
4-5A	RB021702	T170	West	Middle	2-2.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE
4-5A	RB021781	T178	West	Top	2-2.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE
4-5A	RB021802	T180	West	Middle	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE
4-5B	RB021865	T186	East	Middle	2-2.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE
4-5B	RB021965	T196	East	Middle	1-1.5	BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE DIBENZO(A,H)ANTHRACENE

SECTION 3

TABLES

Table 3.4-1

Summary of Excavation Depths and Sediment and Riverbank Soil Volumes To Be Removed EE/CA Reach of the Housatonic River, Pittsfield, Massachusetts

Subreach	Sediment		Riverbank Soils		Total Volume (yd^3)
	Volume (yd^3)	Depth (ft)	Volume (yd^3)	Depth (ft)	
3-8	5,630	3.0	4,174	3	9,804
3-9	3,065	2.0	4,655	3	7,720
3-10	5,838	3.0	5,229	varies	11,067
4-1	2,275	bedrock (2)	2,268	varies	4,543
4-2	3,928	bedrock (2)	5,145	varies	9,073
4-3	5,054	bedrock (2)	6,532	varies	11,586
4-4A	2,185	3.0	2,226	3	4,411
4-4B	3,228	3.0	3,682	3	6,910
4-5A	3,972	3.0	4,042	varies	8,014
4-5B	3,387	2.5	3,707	varies	7,094
4-6 (T198-T210) (T210-T212)	4,663	 2.5 3.5	4,847	3	9,510
TOTAL	43,225		46,507		89,732

Table 3.4-2

Summary of Excavation Areas and Depths
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Subreach	Sediment	East Bank	West Bank
3-8	0 to 3 ft	0 to 3 ft	0 to 3 ft
3-9	0 to 2 ft	0 to 3 ft	0 to 3 ft
3-10	0 to 3 ft	0 to 1 ft	0 to 3 ft
4-1	0 to bedrock	0 to 3 ft	0 to 1 ft
4-2	0 to bedrock	0 to 3 ft except for T116-T122 remove only 0 to 1 ft	0 to 2 ft*
4-3	0 to bedrock	0 to 3 ft except for T132-T140 remove only 0 to 1 ft on top 1/3 of bank and 0 to 3 ft on lower 2/3 of bank *	0 to 3 ft
4-4A	0 to 3 ft	0 to 3 ft	0 to 3 ft
4-4B	0 to 3 ft	0 to 3 ft	0 to 3 ft
4-5A	0 to 3 ft	0 to 3 ft	0 to 3 ft
4-5B	0 to 2.5 ft	0 to 3 ft*	0 to 3 ft
4-6	0 to 2.5 ft between T198 and T210, 0 to 3.5 ft between T210 and T212	0 to 3 ft	0 to 3 ft

T### Refers to specific transect number (see Figure 2.1-2).

For sediment in Subreaches 4-1, 4-2, and 4-3, assume a 2-ft average sediment depth.

* Excavation summary includes additional excavation required to address Appendix IX constituent exceedances as summarized in Table 2.3-8.

Table 3.4-3

95% UCL PCB Concentrations for Sediments Remaining After Excavation to Cleanup Goals EE/CA Reach of the Housatonic River Pittsfield, Massachusetts

Subreach	Depth of Excavation to Cleanup Goals (ft)	95% UCL PCB Concentration (ppm)		
		0 to 1 ft Below Excavation	1 to 2 ft Below Excavation	2 to 3 ft Below Excavation
3-8	3.0	0.4	0.3 (M)	ns
3-9	2.0	0.5	0.3	0.3
3-10	3.0	0.8 (M)	0.7 (M)	0.9 (M)
4-1	Bedrock	na	na	na
4-2	Bedrock	na	na	na
4-3	Bedrock	na	na	na
4-4A	3.0	ns	0.6 (M)	0.3
4-4B	3.0	0.4	0.3 (M)	ns
4-5A	3.0	0.4	0.3 (M)	ns
4-5B	2.5	0.8	0.3 (M)	ns
4-6 (T198-T210)*	2.5	0.6	0.3 (M)	ns
4-6 (T210-T212)*	3.5	0.6	ns	ns

Notes:

"M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were fewer than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.
"ns" indicates there were no samples collected from this interval.
"bedrock" indicates all sediment above bedrock will be removed.
"na" indicates the criteria is not applicable to this subreach.
*The upper portion of Subreach 4-6 between Transects 198 and 210 will be excavated to 2.5 ft.
The lower portion between Transects 210 and 212 will be excavated to 3.5 ft.

Table 3.4-4

Summary of Non-Subreach-Specific Area PCB Data
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Arithmetic Average PCB Concentrations

Supplemental Reach	Recreational		Residential
	0 to 1 ft	1 to 3 ft	0 to 3 ft
East Bank T070 - T078	13.3 (14)	4.7 (24)	dna
East Bank T116 - T128	18.5 (19)	8.0 (29)	dna
East Bank T132 - T140	13.2 (27)	3.2 (51)	dna
West Bank T162 - 168	dna	dna	10.1 (104)

Note: Number of samples used for the calculation of each average is given in ( ).
All PCB concentrations given in mg/kg.
"dna" indicates this category does not apply to the data set.

95% UCL PCB Concentrations

Supplemental Reach	Recreational		Residential
	0 to 1 ft	1 to 3 ft	0 to 3 ft
East Bank T070 - T078	67.5 (M)	16.6	dna
East Bank T116 - T128	54.9	19.0	dna
East Bank T132 - T140	80.4 (M)	6.2	dna
West Bank T162 - 168	dna	dna	14.6

Note: All PCB concentrations are in mg/kg.
"M" indicates the calculated 95% UCL exceeded the maximum value for the data set, and so the maximum value was substituted for the 95% UCL.
"dna" indicates this category does not apply to the data set.

Table 3.4-5

Evaluation of Areas with Exceedance Percentages <25%
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Subreach/Bank/Depth with Exceedance Freq. <25%			Addressed by Subreach UCL Comparison?	Addressed by Non-Subreach UCL Comparison?	Suitable for Hotspot Removal?	Hotspot Removal Plan
Subreach	Bank	Depth				
3-8	East	1-3 ft	No	No	No	None
3-10	East	1-3 ft	Yes	--	--	--
4-1	West	0-1 ft	No	No	No	None
4-1	West	1-3 ft	Yes	--	--	--
4-2	East	1-3 ft	No	No	Yes	T116-T122: remove 0-1ft only.
4-2	West	0-1 ft	No	No	Yes	T118-T122: no removal required.
4-2	West	1-3 ft	Yes	--	--	--
4-3	East	1-3 ft	No	Yes	--	--
4-5A	East	1-3 ft	No	No	No	None
4-5A	West	1-3 ft	Yes	--	--	--
4-5B	East	0-3 ft	No	No	Yes	Full Subreach: no removal top 2/3 bank.

Notes: "--" indicates the location has been addressed by a previous comparison and thus was not considered under this category.

Table 3.4-6

Summary of PCB Data for Riverbank Soils
Remaining After Hotspot Removal
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Hotspot Removal Area	Depth Interval of Remaining Soil	Number of Samples Used in Calculations	Maximum PCB Concentration (mg/kg)	Average PCB Concentration (mg/kg)	95% UCL of the Average Concentration (mg/kg)
East Bank T116 - T122	1 to 3 ft	12	7.8	3.0	7.8 (M)
West Bank T118 - T122	0 to 3 ft	22	8.4	1.1	1.6
Subreach 4-5B	0 to 3 ft top 2/3 of bank	63	1.6	0.4	0.4

Note: "M" indicates the calculated 95% UCL exceeded the maximum value for the data set, and so the maximum value was substituted for the 95% UCL.

The 95% UCL was calculated for the 0- to 3-ft depth interval for the areas where the 95% UCL for the 1- to 3-ft depth exceeded 10 mg/kg to assess whether an ERE would be required at those locations. Those calculations were performed assuming that clean fill would be used to backfill the 0- to 1-ft interval. As such, samples representing the 0- to 1-ft interval were replaced (one for one) with a value of 1/2 the average detection level (0.25 mg/kg). The resulting 95% UCLs for the 0- to 3-ft depth interval in each area were all less than 5 mg/kg, indicating that EREs would not be required.

SECTION 4

TABLES

Table 4.1-1

Screening of River Diversion Technologies

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Description	Sheetpile would be installed along centerline of river. Flow diverted to ½ of river channel. Work in river completed in cells.	Flow in river diverted to less than ½ of the channel using a series of diversions. Work in river completed in cells.	River dammed and flow channeled into pipe placed in riverbed. Gravity conveys water to point downstream of active work area.	River dammed. Water pumped through piping placed above river channel on bank. Water discharged downstream of active work area.	A new channel, above or below ground would be constructed to carry river flow.
IMPLEMENTABILITY CRITERIA					
Technical Feasibility					
▪ Construction considerations					
Size of work area	Sheetpile installed from bank along area to be sheetpiled. Large crane needed to install sheetpile. Can be constructed from within riverbed if access ramps down banks can be constructed for crane. Need areas for equipment to operate and staging areas for sheetpiles pending installation.	Ideally installed from bank along length of river. Equipment must reach from banks to install. Can be installed from within riverbed if access ramps to riverbed can be constructed. Need areas for equipment to operate from and staging areas for diversion structures pending installation.	Pipe placed on riverbed would interfere with sediment excavation. Therefore, a second pipe is required to maintain flow when removing first pipe. Need areas for equipment to operate from and staging areas for piping pending installation.	Area needed in the river for wet wells and area needed for placement of pumps. Discharge piping does not need to be placed in river channel so the entire channel is available for excavation/restoration. Need areas for installation equipment to operate from and staging areas for pumps and piping pending installation.	**Large areas needed to stage equipment and construct a new diversion channel are not available along the river beginning at the cobble reaches and continuing downstream.**

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Depth/ type of overburden in river channel	Requires substantial penetration to install effectively. **Will not work in areas with boulders or shallow bedrock, specifically the cobble Subreaches 4-1, 4-2, 4-3, and 4-4A.**	Works best on silty/sandy bottoms and in relatively shallow water (e.g., 2 feet for jersey barriers or bin blocks, 10 feet for portable dams). Will not effectively seal out river in cobble areas without first removing cobbles.	Does not affect gravity feed bypass piping except a smooth pipe bed in river would need to be established before installation and could require removal of boulders/large cobbles.	Shallow bedrock in the cobble reaches will potentially impact depth of wet wells. A small increase in the river depth, via a dam, may be needed to prevent vortexing at the pump suction.	Does not affect river diversion activities except that shallow overburden in the river may be indicative of shallow bedrock in the general area of the diversion channel.
Accessibility of channel from bank	More difficult to install in areas with steep, high banks.	More difficult to install in areas with steep, high banks.	More difficult to install in areas with steep, high banks, but much of the work will occur within the channel.	More difficult to install in areas with steep, high banks, but much of the work will occur within the channel. Pipes can be placed outside of river channel along banks.	Has little impact on river diversion activities.
Adequate riverbank area for piping, equipment	Extensive access areas needed along riverbanks to install.	Barriers must be placed from access areas along channel (at top or bottom of bank).	Limited area is needed, pipe installed within river channel, but equipment needed along banks to install.	Limited area is available at steep bank areas. Pipes may need to be placed at edges of roadways. Pumps may be placed on structure mounted in the river.	Diversion channel would likely be installed on or near the existing riverbanks. Significant space would be required.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Ability to respond to storm events	Little effort to remove equipment. Sheetpiling can remain in place and will not interfere with storm flow. Overtopping can be controlled by height of sheetpiles but not prevented. Overtopping may cause recontamination of active cell area. Sheetpiling will cause the river to rise slightly higher during a storm event when compared to the open river.	**Relatively small rise in river will result in overtopping of barriers. Overtopping may cause recontamination of active cell area**.	**Pipe sized to handle normal flow rate but cannot handle storm flows without causing significant increases in the river depth upstream of the inlet because the design reduces the flood capacity of the river.** Overtopping would be allowed to relieve flood levels and may cause recontamination of active cell area.	Pumps/piping to be sized to handle design flow with some reserve capacity. River flow greater than reserve capacity will cause overtopping of the dam and possible recontamination of active work area.	Good. Temporary channel/ conduit will be sized to handle large flows.
Time required for construction	Moderate to long because numerous mobilizations would be required along the EE/CA Reach.	Short to moderate because of the ease of installation. However, numerous mobilizations would be required along the EE/CA Reach.	Moderate because each bypass would need to be short to minimize the impact on the river depth and numerous mobilizations would be required along the EE/CA Reach.	Moderate to long because of the complexity of each mobilization. However, the number of mobilizations would be significantly less than for other technologies.	Long because of the complexity and difficulties expected to be encountered in creating another river channel.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
▪ Operational considerations					
Seasonal considerations	Height of sheetpiling can be left to handle higher seasonal flows. Higher flows could cause overtopping.	Higher flows could cause overtopping.	Possible difficulty due to freezing in winter. Higher flows could cause overtopping and flooding upstream.	Possible difficulty due to freezing in winter. Higher flows could cause overtopping.	Possible difficulty due to freezing in winter.
Water depth/ velocity of stream	Stability of sheetpile limited by how deep it can be installed into sediment/bedrock and water depth.	**Not practical for deeper water depths because this technology relies primarily on the mass of the diversion structure to create stability**.	Only impacts the height and mass of the dam used to divert the river to the bypass pipe.	Impacts the height and mass of the dam used to divert the river to the bypass pumps. Shallow water depth could create vortexing at the pump suction.	Can be used for any depth/velocity of water.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Other factors	Cannot place sheetpile beneath bridges. Pre-trenching may be required. Dewaters only ½ of river at once, must excavate river in halves. River will not be interrupted so fish can continue to move up and down river.	Dewaters only ½ of river at once. To excavate second half of river, barriers must be moved. May not fully block river flow in cobble areas without removal of the cobbles.	**River needs to be dammed to raise its level and channeled into pipe. Slope of riverbed very gentle, requiring large-size pipe. Debris floating down the river will require monitoring and will need to be kept out of diversion. Flooding of river area upstream of dammed locations is a potential concern because of the reduced flood capacity caused by the dam. Because of depth concerns, many dam installations will be required along the EE/CA Reach**.	Wet well excavation may be difficult due to shallow bedrock at some areas. Debris floating down the river will require monitoring and will need to be kept out of diversion. Pump efficiency reduced at areas of high banks due to increased suction required, depending on where pumps can be located. Only bypass a portion of the EE/CA Reach at any one time. Need to move system several times. No safe passage for fish.	**Large volume of soils/sediments/rock generated. Contaminated material will require disposal. Temporary channel must be backfilled and restored following remediation. Property acquisition required. Topography may not be conducive to diversion. Interference with utilities and infrastructure is likely**.
▪ Adaptable to environmental conditions	No. Vegetation must be cleared to allow access for equipment to install sheetpile.	Yes. Smaller installation equipment is needed, so land clearing is less than other activities. More passive approach.	Yes. Smaller installation equipment is needed, so land clearing is less than other activities. More passive approach.	No. Vegetation must be cleared to install discharge pipe. Staging areas for pumps can be placed in less sensitive areas.	No. Aboveground diversion channel would require extensive land clearing activities.
▪ Can be implemented within schedule limits	Yes. Adequate timeframe to implement.	Yes. Relatively short timeframe to implement. Can only be operated in times of relatively low flow	Yes. Adequate timeframe to implement. Can only be operated in times of relatively low flow	Yes. Lead time for ordering and installing pumps may be significant. Can only be operated in times of relatively low flow.	Uncertain. Longest timeframe to implement.
▪ Demonstrated performance	Yes	Yes	Yes	Yes	Yes

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Availability of Services and Materials					
▪ Services/ equipment/ materials available	Commonly used construction method, materials and services are readily available.	Commonly used construction method, materials and services are readily available.	Commonly used construction method, materials and services are readily available.	Commonly used construction method, materials and services are readily available.	Construction materials and services are readily available. Method not commonly used.
Administrative Feasibility					
▪ Access Agreements required	Extensive access agreements required if sheetpiling installed from top of banks.	Extensive access agreements required.	Access agreements mainly needed at dam locations.	Access agreements needed primarily at dam locations and possibly along the riverbanks for piping.	Significant access agreements needed where installation of diversion channel is to occur.
▪ Impact on adjoining property	Will impact numerous properties during installation.	Will impact numerous properties during installation.	Will impact numerous properties during installation, but likely less than other options. Possible negative impacts from flooding above dammed locations.	Will impact numerous properties during installation, but likely less than other options.	Aboveground diversion will significantly impact numerous properties during installation. Underground conduit will impact fewer properties.
EFFECTIVENESS CRITERIA					
Protective of Human Health and tbe Environment					
▪ Protective of environment	Removal of trees required for access road to install sheetpile. Flow maintained in ½ of channel. Impacts along riverbanks.	Limited vegetation removal for access. Maintains river flow during remediation in ½ of channel. Impacts along riverbanks.	Limited vegetation removal for access. Maintains river flow in pipe rather than in channel. Impacts along riverbanks.	Maintains river flow in pipe rather than in channel. Large impact at pump/wet well area. Pipe has relatively low impact on environment. No safe passage for fish.	Flow maintained in new channel. No flow in existing channel. Impacts to areas in addition to the river.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Ability to Achieve Removal Objectives					
▪ Prevent recontamination of previously remediated areas and further contamination of other areas	Will cause some disturbance of contaminated sediments during installation. Decrease in channel width may increase water velocity and potential for scour. Potential for recontamination of active cell area when removing sheetpile and during storm events.	Not likely to cause significant disturbance of contaminated sediments during installation. Decrease in channel width may increase water velocity and potential for scour. Significant risk of overtopping and potential recontamination of active cell during storm events.	Engineering controls required at pipe inlet and outfall to minimize scour. Damming of river required to create diversion will reduce flood capacity and increase potential for erosion upstream. Potential for recontamination of active cell from overtopping during storm events.	Engineering controls required at pipe inlet and outfall to minimize scour. Potential for recontamination of active work area during storm events.	Not likely to cause significant disturbance of contaminated sediments during installation. Recontamination unlikely.
▪ Prevent downstream migration of contaminated sediments	May mobilize contaminated sediment due to increased water velocities. Sediments mobilized during installation of sheetpile.	May mobilize contaminated sediment due to increased water velocities.	Engineering controls required at pipe inlet and outfall to minimize scour and resuspension of sediments.	Engineering controls required at pipe inlet and outfall to minimize scour and resuspension of sediments.	Will not cause downstream migration of contaminated sediments.
▪ Minimize impacts on wetland areas and floodplain	Minimal impacts expected.	Minimal impacts expected.	Increased river depth caused by dam will reduce flood capacity with potential adverse effects during flood conditions. Higher river depth will cause some loss of habitat along riverbanks.	Minimal impacts expected.	No impacts expected from river itself; however, diversion channel construction could cause large disruption to affected areas.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
▪ Potential impacts on community	Unmitigated noise and vibration. Extensive access agreements needed.	Extensive access agreements needed.	Limited access agreements needed.	Noise. Diesel exhaust. Limited access agreements needed. Electric pumps would reduce noise and eliminate air pollution impacts.	Noise. Extensive access agreements needed.
Short-Term Impacts					
▪ Potential impacts on worker	Noise. Potential for contact with contaminated sediments.	Potential for contact with contaminated sediments during barrier installation.	Potential for contact with contaminated sediments during pipe installation.	Noise. Potential for contact with contaminated sediments during pipe installation and wet well construction.	Noise.
▪ Potential impacts on downstream water quality	Limited, but increased water velocities and sheetpile installation and removal could resuspend sediments.	Minimal, but increased water velocities could increase scour and resuspension of sediments.	Minimal, but engineering controls required at inlet and outlet of bypass pipe to minimize scour and effects on water quality.	Minimal, but engineering controls required at inlet and outlet of bypass pipe to minimize scour and effects on water quality.	Minimal, but engineering controls required at inlet and outlet of by-pass channel to minimize scour and effects on water quality.
▪ Potential impact on downstream sediment	Limited, but increased water velocities and installation and removal of sheetpiles could resuspend sediments, resulting in deposition further downstream.	Minimal, but increased water velocities could increase scour and resuspension of sediments, resulting in deposition further downstream.	Engineering controls required at pipe outlet to minimize scour and resuspension of contaminated sediments.	Engineering controls required at pipe outlet to minimize scour and resuspension of contaminated sediments.	Would have minimal or no effect.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
▪ Potential impact on aquatic receptors in work area	Minimal, increased velocities could increase water turbidity. Riverbed is relatively dry in active work area.	Minimal, increased velocities could increase water turbidity.	Water will be removed from active cells in the diverted river sections altering habitat. Fish passage would be maintained through gravity pipes.	Water will be removed from active cells in the diverted river sections, altering habitat. Fish passage would be eliminated by pumping.	Riverbed will become dry. Fish passage would be maintained through alternate channel.
COST CRITERIA					
Direct Capital Costs					
▪ Labor costs	Moderate	Low to Moderate	Moderate	Moderate to High	**Extremely High**
▪ Equipment and material costs	Moderate to high	Moderate	Moderate	High	**Very High**

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-1

Screening of River Diversion Technologies (Continued)

Category/Criteria	Open Channel Diversion (Intrusive)	Open Channel Diversion (Non-Intrusive, Jersey Barrier/Concrete Blocks/Portable Dams)	Gravity Feed Bypass Piping	Bypass Pump/Piping	Alternate River Channel (new channel above-ground or underground bypass tunnel)
Indirect Capital Costs					
▪ Engineering and design	Moderate, engineering and design required.	Low, minimal engineering and design required.	Moderate, engineering and design required.	Moderate, engineering and design required.	**High, extensive engineering and design required.**
SCREENING STATUS					
	Retained for subreaches where bedrock is deep enough to allow sheetpile installation (3-8, 3-9, 3-10, 4-4B, 4-5A, 4-5B, and 4-6).	**Not retained.** Significant risk of overtopping will impact schedule and potentially cause recontamination of the active cell. Inability to effectively seal work areas from river infiltration in cobble areas without cobble removal. Some open-channel diversion structures may be applicable to wet excavation to reduce the impacts of river velocity.	**Not retained**. Increased river depth required to bypass flow will reduce flood capacity of the river and damage habitat along the riverbanks. Potential to alter groundwater flow directions due to higher river depth.	**Retained** for all subreaches of the EE/CA.	**Not retained**. Limited space/access available to construct diversion, very high cost.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
Description	Excavate sediment using standard excavation equipment without river diversion.	Dredge using barge-mounted mechanical or hydraulic equipment.	Divert river, excavate using standard excavation equipment in the dry.
IMPLEMENTABILITY CRITERIA			
Technical Feasibility			
▪ Construction considerations			
Placement of equipment	Need to construct access road from top of bank to riverbed for trucks and excavation equipment to remove material and perform restoration. Access needed intermittently for trucks to haul material out of river. Alternatively, access through the river along the riverbank may be possible.	Equipment placed by crane from top of bank. Support area can be larger distance from unit. Support area does not need to be at top of bank, depending on type of dredging.	Need to construct access at top of bank, partially down bank, or in river. Need support areas at top of bank. Haul roads needed for trucks to remove material.
Ability to respond to storm events	Equipment can be removed from river before storm events. Access roads could be damaged during storms. Work impeded with any significant increased river flow.	It is less critical to remove equipment from river in anticipation of storm. Minimal interruption of work at increased flow rates.	Equipment can be removed from river before storm events. Access roads could be lost during storms if overtopping occurs. Work can proceed with caution under moderate increased flow conditions until the diversion is overtopped.
▪ Operational considerations			
Ease of cap construction	Difficult to construct cap accurately beneath water surface.	Difficult to construct cap accurately beneath water surface.	Most compatible with cap construction. Dry construction produces fewer quality control problems.
Compatibility with bank excavation.	Same equipment could excavate banks in some areas. Stability of bank during excavation must be controlled.	**Not compatible. Other equipment needed to excavate banks.**	Same equipment used to excavate banks. Stability of bank during excavation must be controlled.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies (Continued)

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
Excavation and backfill rates	Low to moderate	Low to moderate	Moderate
Dewatering of sediments	Large amount of water generated from dewatering of saturated sediments and free water carried with sediments.	**Very large amount of water generated from dewatering of sediments and free water. Eddy pump can generate up to 2,000 gpm.**	Water generated from dewatering of saturated sediments.
Water depth	Not practical in deep water; however, normal river depth is shallow enough for technology to be practical. Most suitable for shallow waters of cobble Subreaches 4-1, 4-2, 4-3, and 4-4A.	**Water depth not adequate to float a barge-mounted dredge. Likely significant controlled flooding of work area required with potential negative impacts.**	Requires river diversion and removal of infiltrating groundwater and river water to work in the dry.
Sediment resuspension	Resuspension of sediment and PCBs will occur; however, coarser particles will redeposit quickly. Control of fines, especially near the end of the EE/CA Reach, will require engineering controls.	Resuspension of sediment and PCBs will occur; however, coarser particles will redeposit quickly. Control of fines, especially near the end of the EE/CA Reach, will require engineering controls.	No suspension of fines during low flow/dry work related to excavation method but may occur from diversion method. During overtoping events, engineering controls will be required to control resuspension of sediment and transport downstream of fines and PCBs.
Access sufficient to place equipment in work area	Difficult at steep banks, if done from bank. Alternative of using a river route is possible.	Typically, fewer access areas needed compared to other technologies.	Difficult at steep banks if working from bank. Dry riverbed allows more space for equipment to be staged in riverbed.
Bank height	Multiple excavators/ bank access roads needed at higher banks. Steep banks may require significant reworking for work pads and placement of equipment using crane. Bank height less of an issue if working in river.	Not an issue for barge-mounted dredging equipment.	Multiple excavators/ bank access roads needed at higher banks. More work would be accomplished directly in riverbed, although haul roads would need to be constructed to remove material. Bank height less of an issue if working in river.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies (Continued)

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
▪ Can be implemented within schedule limits	Yes, excavation rates likely to be lower than dry excavation; however, overall productivity expected to be generally comparable to dry excavation.	Yes, overall productivity expected to be comparable to dry and wet excavation. Additional time may be needed for handling large volumes of water.	Yes, excavation rates likely to be higher than wet excavation; however, overall productivity expected to be generally comparable to wet excavation.
▪ Demonstrated performance	Yes	Yes, except for coarser materials to be encountered. **Not feasible in cobble areas.**	Yes
Availability of Services and Materials			
▪ Services/equipment/ materials available	Standard equipment readily available.	Specialty equipment available from specialty suppliers.	Standard equipment readily available.
Administrative Feasibility			
▪ Access agreements required	Access agreements required at various points along reach. Riverbed will be used as major haul route/access.	Access agreements required at various points along reach.	Variable, depending on river diversion method. Frequent access agreements needed along banks to excavate active cells in the dry with open channel diversion. Less frequent access needed for piped bypass diversion.
▪ Impact on adjoining property	Moderate to low, most work to occur within river. Properties at access points will be affected.	Moderate to low, most work to occur within river. Properties at access points will be affected.	Variable, from low to high, depending on river diversion method and character of the river along the EE/CA Reach.
EFFECTIVENESS CRITERIA			
Protective of Human Health and the Environment			
▪ Protective of environment	Potential for release of sediments and PCBs to downstream locations. Potential for release and migration of oil present at cobble reaches. Releases can be managed by engineering controls.	Potential for release of sediments and PCBs to downstream locations. Potential for release and migration of oil present at cobble reaches. Releases can be managed by engineering controls.	Potential for release of sediments and PCBs to downstream locations. Limited potential for release and migration of oil at cobble reaches.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies (Continued)

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
Ability to Achieve Removal Objectives			
▪ Prevent recontamination of previously remediated areas and further contamination of other areas	Recontamination not likely. Potential for further contamination of other areas, especially from oil present at cobble reaches.	Recontamination possible. Potential for further contamination of other areas, especially from oil present at cobble reaches.	Recontamination possible within individual cell areas during storm events. Release of oil from cobble areas not likely.
▪ Prevent downstream migration of contaminated sediments	Potential for downstream migration of resuspended sediment is likely but engineering controls would minimize impacts.	Potential for downstream migration of resuspended sediment is likely but engineering controls would minimize impacts.	This excavation method minimizes resuspension and downstream migration of sediment under normal operating conditions, but not during overtopping events. However, diversion method may contribute to resuspension and migration of sediment. Engineering controls would be required to minimize impacts.
▪ Minimize impacts on wetland areas and floodplain	Within the context of the removal action required, this technology minimizes secondary impacts.	**Because the river depth is expected to be increased to execute this remedy, wetland habitat would be impacted and flood capacity would be reduced.**	Because flow will be diverted from the river to execute this technology, some temporary adverse impact on the wetland habitat is expected.
Short-Term Impacts			
▪ Potential impacts on community	Access agreements needed. With access road in river, need for access agreements could be minimized.	Limited access agreements needed. (Potentially less than wet and dry excavation)	Access agreements needed. Will vary with river diversion method.
▪ Potential impacts on worker	Working with heavy equipment, contact with contaminated sediment and soil, riverbank instability, flowing river.	Working with heavy equipment, contact with contaminated sediment, flowing river.	Working with heavy equipment, contact with contaminated sediment and soil, riverbank instability, flowing river.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies (Continued)

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
▪ Potential impacts on downstream water quality	Potential for resuspension and migration of sediments, increase in turbidity possible.	Potential for resuspension and migration of sediments, increase in turbidity possible.	Resuspension minimized by excavation method but possible during storm flows. More significant potential possible due to diversion method.
▪ Potential impact on downstream sediment	Resuspended sediments could be carried downstream and redeposited. Redeposits within the EE/CA Reach will be subsequently removed. Engineering controls will minimize migration outside the EE/CA Reach.	Resuspended sediments could be carried downstream and redeposited. Redeposits within the EE/CA Reach will be subsequently removed. Engineering controls will minimize migration outside the EE/CA Reach.	Resuspended sediments could be carried downstream and redeposited. Redeposits within the EE/CA Reach will be subsequently removed. Engineering controls will minimize migration outside the EE/CA Reach.
▪ Potential impact on aquatic receptors in work area	Disrupted by excavation activities.	Disrupted by excavation activities.	Riverbed becomes dry, temporarily but significantly altering habitat.
COST CRITERIA			
Direct Capital Costs			
▪ Labor costs	Moderate to High	Moderate to High	Moderate to high considering the need for river diversion
▪ Equipment and material costs	Moderate	Moderate to High	Moderate to high considering the need for river diversion.
Indirect Capital Costs			
▪ Engineering and design	Moderate	Low to Moderate	Moderate to high considering the need for river diversion.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-2

Screening of Sediment and Riverbank Soil Removal Technologies (Continued)

Category/Criteria	Wet Excavation (Riverbed Only)	Barge-Mounted Dredging (Riverbed Only)	Dry Excavation (Riverbed and Riverbank)
Screening Status	**Retained.**	**Not Retained.** Likely negative impacts due to flooding of areas upstream of dams required to raise the river level. Reduced flood storage capacity increasing the probability of additional upstream flooding during storm events. Large volume of water to handle, different equipment required for bank excavation, not suitable for cobble reaches because of volume of large cobbles.	**Retained.**

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Description	Removal of PCBs and other contaminants using extraction solutions. The process equipment will be located temporarily at the GE facility.	Separation and/or removal of PCBs and other contaminants using physical separation techniques and chemical surfactants. The process equipment will be located temporarily at the GE facility.	Destruction of PCBs and other contaminants at high temperatures using a transportable process located temporarily at the GE facility.	Removal of PCBs and other contaminants at elevated temperatures (not as high as for incineration) using a transportable process located temporarily at the GE facility.	Containment of PCBs by placement of a cap over contaminated riverbank soils and riverbed sediments. This technology will require some excavation of the river cross section so that there is no decrease in the capacity of the river channel.
IMPLEMENTABILITY CRITERIA					
Technical Feasibility					
▪ Construction/siting considerations	1. Basic components are commercially available, but system would have to be adapted to site specific requirements. 2. Requires adequate space for treatment system. 3. Height and noise issues may affect siting. 4. Requires adequate space and facilities for dewatering of excavated sediment to meet treatment requirements, including management and disposal of the water and treatment residuals including concentrated contaminant streams. 5. Control of air emissions may be required.	1. Basic components are commercially available, but system would have to be adapted to site specific requirements. 2. Requires adequate space for treatment system. 3. Height and noise issues may affect siting. 4. Requires adequate space and facilities for dewatering of treated sediment to meet transport and redisposal requirements, including management and disposal of the washwater. 5. May require post-treatment (i.e., stabilization to meet disposal criteria, either on site or at the disposal facility).	1. Conventional technology, transportable systems are available. 2. Requires adequate space for treatment system. 3. Height and noise issues may affect siting. 4. Control of air emissions will be required	1. Conventional technology, transportable systems are available. 2. Requires adequate space for treatment system. 3. Requires space for management and/or storage of treatment residuals including condensed contaminant streams.	Adequate space for staging areas for capping materials will be required. Difficult to perform if river is not dry.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
▪ Operational Considerations					
Treatment rates	Varies with the specific treatment unit and with site and waste characteristics. Typically treatment rates of several tons per hour can be achieved.	Varies with the specific treatment unit and with site and waste characteristics. Typically treatment rates of several tons per hour can be achieved.	Varies with the specific treatment unit and with site and waste characteristics. Typically treatment rates in tens of tons per hour can be achieved.	Varies with the specific treatment unit and with site and waste characteristics, including moisture content. Typically treatment rates of 10 to 20 tons per hour can be achieved.	Not applicable
Ability of technology to treat all types and concentrations of wastes present	Oversize debris can sometimes be treated but pre-screening may be required. Solvent extraction is most practical for materials with a large percentage of coarse material. Solvent extraction requires multiple extraction cycles for fine-grained materials. Site- and waste-specific testing may be required to establish performance for PCBs and Appendix IX compounds.	Oversize debris cannot be treated so pre-screening will be required. Soil washing is most practical for materials with a large percentage of coarse material. Soil washing would be less effective for fine-grained materials. Site- and waste-specific testing may be required to establish performance for PCBs and Appendix IX compounds. Multiple treatment steps may be required for wastes containing multiple contaminants. Further study of grain size versus PCB concentration is required.	Large rocks or debris can not be treated by incineration, so pre-screening will be required. Incineration is applicable and demonstrated for PCBs. Incineration will likely destroy many other organic constituents. Metals and most inorganics will not be destroyed and the ash may require post-treatment prior to disposal. Some metals may be volatilized. Offgas treatment will depend on the nature of the waste incinerated.	In general oversize debris cannot be treated so pre-screening will be required. Pre-screening requirements will be based on the particular treatment unit configuration. Thermal desorption would be expected to effectively treat PCBs and will also remove many other volatile and some semivolatile constituents. Metals and inorganics will not be effectively treated and post-treatment for inorganics may be required prior to disposal.	In-situ capping would provide a physical barrier as well as a treatment layer that would be effective for the contaminants in the EE/CA reach. This technology will require long-term monitoring and maintenance.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Degree of dewatering required prior to disposal/treatment	Although dewatering is not required for some solvent extraction processes, dewatering would be necessary for transportation to the treatment facility. Generally sediments must be dewatered to the point of no free liquid for transport and disposal.	Although dewatering is not required for the soil washing process, dewatering would be necessary for transportation to the treatment facility. Generally sediments must be dewatered to the point of no free liquid for transport and disposal. The washwater or washwater and solvents resulting from the dewatering operation would require treatment and disposal.	Dewatering would be required for transportation to and treatment by incineration. Generally sediments for transport and disposal must be dewatered to the point of no free liquid. The amount of moisture remaining may affect the treatment rate.	Dewatering will be required prior to treatment in order to reduce treatment time and costs as well as for transportation to the treatment unit. Generally sediments for transport and disposal must be dewatered to the point of no free liquid. The amount of moisture remaining may affect the treatment rate and additional mechanical dewatering may be needed. The water resulting from the dewatering operation may require treatment and disposal. The volume of water to be treated would depend on the selected excavation/dredging approach	Not applicable
Pre- or post-treatment required	Basic pretreatment dewatering may reduce treatment costs. Screening for oversize particles necessary for some processes. Water and organics addition is required if treated soil is to be reused.	Additional treatment may be required for fine-grained material, depending on the plan for reuse or disposal of this material. Post treatment such as stabilization for inorganics may be needed.	Pre-screening of large materials will be required. Ash stabilization for inorganics may be required prior to disposal.	Pre-screening of large materials may be required depending on the configuration of the unit chosen Post-treatment may be needed to stabilize inorganics which are not removed by thermal desorption.	Long-term monitoring and maintenance of the cap will be required.
Residuals treatment	Water from dewatering operations may require treatment prior to discharge. Extracted water may require treatment. Concentrated PCB stream will require off-site disposal/treatment. Air emissions treatment may be required.	Water from dewatering operations may require treatment prior to discharge. Washwater and a sludge stream containing contaminated fines will require appropriate treatment/ disposal. Air emissions treatment may be required.	Water from dewatering operations may require treatment prior to discharge. Air emissions treatment will be required.	Water from dewatering operations may require treatment prior to discharge. Air emissions treatment will be required. Treatment and/or disposal of condensate will be needed.	Water from dewatering operations may require treatment prior to discharge. Removed sediments will require appropriate treatment or disposal.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Constraints on disposal or reuse of treated materials	Assuming the oversize particles are clean or able to be treated, they would be suitable for reuse after treatment and confirmation analysis. Treated soil would require water and organic addition if it was to be reused since water and organics are extracted during the treatment.	Assuming the cobbles are clean, the cobbles would be suitable for reuse after treatment and confirmation analysis. Fine-grained materials may require additional treatment prior to reuse or require appropriate disposal. Soil washing will affect the physical and geotechnical properties of the treated soil and sediment. The suitability for reuse in light of habitat restoration will require evaluation.	Large materials (including cobbles) would be suitable for reuse after treatment and confirmation analysis. Incinerated materials would be available for reuse or disposal after appropriate confirmation sampling. If re-use is pursued, ecological effects must be considered. Incineration will affect the physical and geotechnical properties of the treated sediment and their suitability for reuse in light of habitat restoration would require evaluation.	Depending on the treatment levels achieved, treated materials may be suitable for reuse after appropriate confirmation sampling. Desorption may affect the physical and geotechnical properties of the treated soil and sediment. The suitability for reuse in light of habitat restoration will require evaluation.	Not applicable.
▪ Can be implemented within schedule limits	Yes, significant time to set up system	Yes, significant time to set up system	Yes, but significant time required to set up and perform test burn.	Yes, significant time to set up system.	Yes
▪ Demonstrated performance	Solvent extraction has been successfully demonstrated to remove PCBs from soil/sediment. The process is more efficient on coarse materials than on finer particles.	Soil washing has been successfully used to remove PCBs from sediment in bench and pilot tests only. The process is more effective on coarse materials than on finer particles. Limited full-scale applications have been designed and implemented for PCB treatment.	Incineration has been successfully used to remove PCBs from sediment.	Thermal desorption has been demonstrated to effectively remove PCBs from soil/sediment.	Capping has been successfully implemented in marine environments, and is proposed for use in the upper 1/2 mile removal reach.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Availability of Services and Materials					
▪ Services/equipment/ materials available	An on-site treatment system will be constructed. The specific configuration would likely be customized to site conditions. Required equipment and services are available.	An on-site treatment system will be constructed. The specific configuration would likely be customized to site conditions. Required equipment and services are available.	An on-site treatment system will be used. Transportable field erected systems are available. Required equipment and services are available.	An on-site treatment system will be required. Transportable field erected systems are available. Required equipment and services are available.	Necessary services and equipment are available.
▪ Treatment or disposal capacity available	Treatment rate will be dictated by the capacity of the on-site treatment plant.	Treatment rate will be dictated by the capacity of the on-site treatment plant.	Treatment rate will be dictated by the capacity of the on-site treatment plant.	Treatment rate will be dictated by the capacity of the on-site treatment plant.	Not applicable.
Administrative Feasibility					
▪ Permits or waivers required	No permits or waivers are required for on-site activities, but treatment system must comply with ARARs.	No permits or waivers are required for on-site activities, but treatment system must comply with ARARs.	No permits or waivers are required for on-site activities, but treatment system must comply with ARARs.	No permits or waivers are required for on-site activities, but treatment system must comply with ARARs.	No permits or waivers are required for on-site activities, but capping must comply with ARARs.
▪ Impact on adjoining property	Noise, traffic, and visual impact on properties adjoining the treatment facility and properties along the truck route to the treatment facility are likely.	Noise, traffic, and visual impact on properties adjoining the treatment facility and properties along the truck route to the treatment facility are likely.	Noise, traffic, and visual impact on properties adjoining the treatment facility and properties along the truck route to the treatment facility are likely.	Noise, traffic, and visual impacts on properties adjoining the treatment facility and properties along the truck route to the treatment facility are likely.	Impact on properties adjoining the removal action itself and the staging areas is likely. Also, properties may be impacted by truck traffic associated with removal of excavated sediments and importation of materials for capping.
EFFECTIVENESS CRITERIA					
Protective of Human Health and the Environment					
▪ Protective of human health	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper design, installation, and monitoring.
▪ Protective of environment	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.	Protective with proper design, installation, and monitoring.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Ability to Achieve Removal Objectives					
▪ Level of treatment/ containment expected	Solvent extraction is expected to provide a removal efficiency for PCBs and most organics.	The degree of treatment achievable will be to some extent site and waste-specific and testing may be required.	Incineration is expected to provide a high destruction efficiency for PCBs and most organics.	Desorption is expected to provide a high removal efficiency for PCBs, volatile and some semivolatile organics.	Containment and treatment are expected, although long-term permanence requires monitoring.
Long-Term Effectiveness and Permanence					
▪ Magnitude of risk from remaining waste and residuals	Risk posed by reuse of treated soil on-site (i.e. for river restoration) would depend on residual levels of contamination achieved by the process. Residual materials could be disposed or destroyed at an appropriate facility.	Risk posed by reuse of treated soil on-site (i.e. for river restoration). Would depend on residual levels of contamination achieved by the process. Residual materials could be disposed of at an appropriate facility.	Risk posed by reuse of treated soil on-site (i.e. for river restoration) would depend on residual levels on contamination achieved by the process Since incineration achieves high destruction efficiency this process may result in less residual risk than other treatment processes. Residual materials could be disposed of at an appropriate facility.	Risk posed by reuse of treated soil on-site (i.e. for river restoration) would depend on residual levels on contamination achieved by the process. Residual materials could be disposed of at an appropriate facility.	The risk of release over the long-term can only be approximated by modeling.
▪ Anticipated long-term effectiveness of controls to manage risk	Solvent extraction will effectively remove PCBs from the soil and sediment.	Soil washing may effectively remove PCBs from the soil and sediment only in bench and pilot tests.	Incineration will effectively destroy PCBs from the soil and sediment.	Thermal desorption will effectively remove PCBs from the soil and sediment.	The cap integrity and effectiveness would be monitored long-term.
▪ Adequacy and reliability of controls	Solvent extraction has been successfully used to remove PCB contamination from soil and sediment at the full-scale.	Soil washing has been successfully used to remove PCB contamination from soil and sediment only in bench and pilot tests.	Incineration has been successfully used to destroy PCB contamination from soil and sediment.	Thermal desorption has been successfully used to remove PCB contamination from soil and sediment.	Capping is a proven technology but due to limited experience with a river system where groundwater flow through the cap must be maintained, long-term monitoring will be required.
▪ Permanence of solution and potential need for replacement	PCBs would be permanently removed from soil and sediment. Some contaminated materials will be left in place.	PCBs would be permanently removed from soil and sediment. Some contaminated materials will be left in place.	PCBs would be permanently removed from soil and sediment. Some contaminated materials will be left in place.	PCBs would be permanently removed from the soil and sediment. Some contaminated materials will be left in place.	Long-term monitoring and maintenance will be required.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
Reduction of Toxicity, Mobility, or Volume Through Treatment					
▪ Toxicity	The toxicity of the treated residual will be reduced. Contaminants sent off-site for disposal/treatment.	The toxicity of the treated residual will be reduced, although no contaminants are destroyed.	Toxicity of the media will be reduced.	The toxicity of the treated residual will be reduced, although no contaminants are destroyed.	The toxicity of the media will not be reduced.
▪ Mobility	Contaminant mobility reduced since contaminants will be destroyed off-site.	No reduction in mobility is anticipated since contaminants will not be destroyed.	Contaminant mobility will be reduced through destruction of the contaminants.	No reduction in mobility is anticipated since contaminants will not be destroyed.	Contaminant mobility will be reduced through placement of a physical barrier.
▪ Volume	The volume of contaminated material will be reduced.	The volume of contaminated material will be reduced. Further study is required to determine the relationship between grain size and PCB content and therefore the reduction of volume of materials requiring treatment.	The volume of contaminated material will be reduced.	The volume of contaminated material will be reduced.	No volume reduction will occur.
▪ Amount of hazardous materials to be treated or destroyed	Hazardous constituents will be removed from the treated material, and disposed/treated off-site.	Hazardous constituents will be removed from the treated material, but not destroyed.	Hazardous constituents will be destroyed or, in the case of inorganic constituents, retained in the ash for subsequent stabilization (if required) and disposal.	Hazardous constituents will be removed from the treated material, but not destroyed.	Treatment will occur only for contaminants migrating through the cap.
Short-Term Effectiveness					
▪ Time until RAOs are achieved	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA reach.	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA reach.	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA reach.	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA reach.	RAOs will be achieved with proper design, installation, and monitoring.
▪ Potential impacts to workers during implementation	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
▪ Potential impacts to the environment during implementation	Engineering controls will be used to prevent releases of contaminants and solvents to the environment during implementation.	Engineering controls will be used to prevent releases of contaminants to the environment during implementation.	Engineering controls will be used to prevent releases of contaminants to the environment during implementation.	Engineering controls will be used to prevent releases of contaminants to the environment during implementation.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.
COST CRITERIA					
Direct Capital Costs					
▪ Construction costs	Moderate to high, due to treatment plant equipment and site construction costs.	Moderate to high, due to treatment plant equipment and site construction costs.	**High, due to cost of incineration unit and site construction costs.**	Moderate to high, due to equipment and site construction costs.	Low, capping costs are only slightly higher than conventional backfilling.
▪ Potential access agreement costs	Since treatment will be at the GE facility, the only potential access agreement costs would be associated with the dewatering facility (if required) and river access.	Since treatment will be at the GE facility, the only potential access agreement costs would be associated with the dewatering facility (if required) and river access.	Since treatment will be at the GE facility, the only potential access agreement costs would be associated with the dewatering facility and river access.	Since treatment will be at the GE facility, the only potential access agreement costs would be associated with the dewatering facility and river access.	Potential access agreement costs will be associated with staging and dewatering facilities and river access.
▪ Transportation and disposal costs	Transportation costs to the GE facility for treatment will be low due to the relatively small distance involved. Transportation and disposal of the residuals will be moderate.	Transportation costs to the GE facility for treatment will be low due to the relatively small distance involved. Transportation and disposal of the residuals will be moderate.	Transportation costs to the GE facility for treatment will be low due to the relatively small distance involved. Transportation and disposal of the residuals will be moderate.	Transportation costs to the GE facility for treatment will be low due to the relatively small distance involved. Transportation and disposal of the residuals will be moderate.	No additional costs over those required to transport backfill materials to the site.
Annual Costs	Low. Residuals disposal will be included as a monthly cost during treatment. No further treatment cost will be required. Low annual costs of monitoring and maintenance of restored river sections	Low. Residuals disposal will be included as a one-time expenditure during treatment. No further treatment cost will be required. Low annual costs of monitoring and maintenance of restored river sections	Residuals disposal will be included as a one-time expenditure during treatment. No further treatment cost will be required. Low annual costs of monitoring and maintenance of restored river sections	Residuals disposal will be included as a one-time expenditure during treatment. No further treatment cost will be required. Low annual costs of monitoring and maintenance of restored river sections	High. Long-term monitoring and maintenance of the cap is required.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3a

Screening of Treatment/In Situ Containment Technologies (Continued)

Category/Criteria	Solvent Extraction	Soil Washing	Incineration	Thermal Desorption	In Situ Capping
SCREENING STATUS					
▪ Retained or Not Retained	**Retained** as a proven technology at the site. Solvent extraction will be incorporated into a removal alternative as a representative process option for physical/ chemical treatment methods.	**Retained** due to its potential applicability to the site; however, due to limited applications performed at full-scale for PCB removal, this technology will not be incorporated into a removal alternative.	**Not retained** due to cost and public opposition.	**Retained** as a proven technology at the site.	**Retained** as an effective method isolating/retarding contamination for the lower riverbanks only.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3b

Screening of Consolidation/Disposal Technologies

Category/Criteria	On-Site Consolidation	Off-Site Disposal
Description	Consolidation at the GE Facility in accordance with the Consent Decree (00-0388)	Disposal at an existing permitted facility (or facilities)
IMPLEMENTABILITY CRITERIA		
Technical Feasibility		
▪ Construction/siting considerations	1. On-site consolidation capacity is determined by the space available at the GE site for each category of materials to be placed per the Consent Decree. 2. Requires adequate space and facilities for dewatering of sediment to allow transport and placement, including management and disposal of the water. 3. May require pretreatment (i.e., drying agent) to meet consolidation criteria if gravity dewatering is not sufficient to remove all free water.	1. Adequate space and facilities for dewatering of sediment to allow transport, including management and disposal of the water. 2. May require pretreatment (i.e. stabilization to meet disposal criteria, either on site or at the disposal facility.
▪ Operational considerations		
Treatment rates	May have limited consolidation capacity per the Consent Decree.	The disposal facility would identify any limits on acceptance rates, however this is not typically expected to be a major constraint.
Ability of technology to treat all types and concentrations of wastes present	No waste treatment is provided. Types and concentrations of materials that can be consolidated will depend on Consent Decree terms. Both PCB and Appendix IX concentrations will be considered.	All types and concentrations of wastes may be disposed. However, several different disposal facilities may be required based on PCB concentrations detected and whether the materials are RCRA hazardous.
Degree of dewatering required prior to disposal/treatment	Dewatering of sediments would be required prior to transport and consolidation. Generally sediments for transport and consolidation must be dewatered to the point of no free liquid. The water resulting from the dewatering operation may require treatment and disposal. The volume of water to be treated would depend on the selected excavation/dredging approach	Dewatering of sediments would be required prior to transport and disposal. Generally sediments for transport and disposal must be dewatered to the point of no free liquid. The water resulting from the dewatering operation may require treatment and disposal. The volume of water to be treated would depend on the selected excavation/dredging approach.
Pre- or post-treatment required	Pre-treatment may be required (i.e. drying agent) depending upon consolidation site acceptance criteria. It may be desirable to reduce volume of material to be consolidated if the allowable volume is limited under the Consent Decree.	Pre-treatment may be required (such as stabilization) depending upon disposal site acceptance criteria. Such treatment could be accomplished at the Site or by the Disposal Facility.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3b

Screening of Consolidation/Disposal Technologies (Continued)

Category/Criteria	On-Site Consolidation	Off-Site Disposal
Residuals Treatment	Water from dewatering operations may require treatment prior to discharge.	Water from dewatering operations may require treatment prior to discharge.
Constraints on disposition of materials	On-site restrictions are stated in the Consent Decree. Materials that are classified as RCRA hazardous or have PCB concentrations >50 mg/kg will be limited to placement at the Building 71 consolidation area. Non-RCRA and non-TSCA wastes can be disposed of at the Hill 78 Consolidation area. The total volume of material to be disposed of at the consolidation areas cannot exceed 50,000 yd^3, without GE approval.	Materials with PCB concentrations <2 mg/kg, >2 but <50 mg/kg, and >50 mg/kg may be disposed at different disposal facilities or cells. RCRA hazardous materials may be disposed at an alternate facility.
▪ Can be implemented within schedule limits	Yes	Yes
▪ Demonstrated performance	This is a demonstrated means of handling of contaminated materials.	This is a demonstrated means of disposal of contaminated materials.
Availability of Services and Materials		
▪ Services/equipment/ materials available	Necessary services and equipment are available.	Necessary services and equipment are available.
▪ Treatment or disposal capacity available	On-site consolidation area capacity is limited and is specified in the Consent Decree.	Off-site disposal capacity expected to be available.
Administrative Feasibility		
▪ Permits or waivers required	No permits are required, but consolidation areas must comply with ARARs.	The disposal facilities must have permits as required by applicable regulations.
▪ Impact on adjoining property	Visual impact on properties adjoining the consolidation facility. Noise and traffic will impact properties along the truck route to the facility are likely.	Noise and traffic impacts to properties along the truck route to the disposal facility are likely.
EFFECTIVENESS CRITERIA		
Protective of Human Health and the Environment		
▪ Protective of human health	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.
▪ Protective of environment	Protective with proper construction, operation, and controls.	Protective with proper construction, operation, and controls.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3b

Screening of Consolidation/Disposal Technologies (Continued)

Category/Criteria	On-Site Consolidation	Off-Site Disposal
Ability to Achieve Removal Objectives		
▪ Level of containment expected	Wastes will be contained in the consolidation facility with minimal risk of release.	Wastes will be contained in an appropriate disposal facility with minimal risk of release.
Long-Term Effectiveness and Permanence		
▪ Magnitude of risk from remaining waste and residuals	Wastes will be contained in a permanent consolidation facility with minimal risk of release.	Wastes will be contained in an appropriate permitted disposal facility with minimal risk of release.
▪ Anticipated long-term effectiveness of controls to manage risk	On-site consolidation facilities are anticipated to be an effective means of managing the contaminated soil and sediments.	Off-site disposal facilities are anticipated to be an effective means of managing the contaminated soil and sediments.
▪ Adequacy and reliability of controls	Consolidation at an appropriately designed and constructed on-site facility is a reliable means of managing waste.	Disposal at a permitted off-site facility is a common and reliable means of managing waste.
▪ Permanence of solution and potential need for replacement	Permanent maintenance is required for the consolidation facility. Some contaminated materials will be left in place.	Contaminated material will be removed from the site. Some contaminated materials will be left in place.
Short-Term Effectiveness		
▪ Time until RAOs are achieved	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA Reach.	RAOs will be achieved following removal of soil and sediment exceeding cleanup goals from the EE/CA Reach.
▪ Potential impacts to workers during implementation	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.
▪ Potential impacts to the environment during implementation	Engineering controls will be used to prevent releases of contaminants to the environment during implementation.	Engineering controls, PPE, and monitoring will be used to minimize the potential for worker exposure to contaminants.
COST CRITERIA		
Direct Capital Costs		
▪ Construction costs	Low to moderate costs relating to construction activities required for consolidation cell construction and associated with dewatering facilities.	Low costs limited construction activities associated with dewatering facilities.
▪ Potential access agreement costs	None.	None.
▪ Transportation and disposal costs	Transportation costs to the GE facility will be low due to the relatively short distance involved.	Transportation costs will vary depending on the distances to the various facilities. Disposal costs will range from low to high depending on the type of disposal facility required.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-3b

Screening of Consolidation/Disposal Technologies (Continued)

Category/Criteria	On-Site Consolidation	Off-Site Disposal
Annual Costs	Low to moderate costs of monitoring and maintenance of the on-site consolidation facility.	None.
SCREENING STATUS		
▪ Retained or Not Retained	**Retained** subject to the restrictions imposed by the Consent Decree and construction of the on-site facilities.	**Retained**, some volume of material will require off-site disposal because the total volume of material to be disposed of exceeds the maximum allowed for disposal at the on-site consolidation facilities.

Note: Bolded information indicates a critical factor in not retaining a technology.

Table 4.1-4

Potential Bank Restoration Technologies

Category/Criteria	Revegetation	Bioengineered Structures	Hard Structures
Description	Banks are revegetated to stabilize slopes and reduce erosion to provide a natural appearance.	Banks are reinforced with live and dead vegetation to provide scour protection and conditions favorable to revegetation.	Engineered structures are used to stabilize slopes, examples include riprap, concrete revetment, and retaining walls.
IMPLEMENTABILITY CRITERIA			
Technical Feasibility			
▪ Design/construction considerations			
Complexity of planning and design	Low to moderate level of planning/design required.	Moderate to high level of planning/design required.	Moderate to high level of planning/design required.
Vegetation present following removal action	May be used in conjunction with natural vegetation remaining following removal action.	May be used in conjunction with natural vegetation remaining following removal action.	Hard structures may not be preferred in areas where a large percentage of natural vegetation remains. Existing vegetation must be removed. Natural vegetation may be used to partially conceal some structures such as retaining walls or concrete or polyethylene cells.
Bank slope following removal action	Generally applicable to slopes 2:1 or less steep. Mulch nettings and turf reinforcement may be used on steeper slopes. Steep slopes may hinder routine maintenance.	Varies, depending on structure design. Live cribwalls or vegetated gabions may be used on slopes approaching vertical. Structures such as brushmattress or fabric-encapsulated soil are more applicable to slopes 1.5:1 or less steep. Stabilization of toe of slope is essential to project success.	Applicable to unstable or very steep slopes. Large rocks (riprap) and other types of stone armor are generally used for slopes 1.5:1 or less steep. Armoring systems consisting of concrete or polyethylene cells can be used on slopes approximately 1.5:1 or less steep and still allow for revegetation within the cells. Other hard armoring structures may be used on steeper slopes approaching vertical (e.g., gabion baskets, retaining walls). If regrading of the slope is not possible due to available bank space, utilities, roads, etc., hard structures may be the only feasible alternative.
Bank height	May not be feasible to regrade tall, steep banks in order to revegetate. Banks greater than 10 feet high may hinder routine maintenance.	Applicable to all bank heights found in the EE/CA Reach.	Applicable to all bank heights found in the EE/CA reach.

Table 4.1-4

Potential Bank Restoration Technologies (Continued)

Category/Criteria	Revegetation	Bioengineered Structures	Hard Structures
River velocity	Typically applicable to design velocities less than 3-4 feet per second (fps) and shear forces less than 4 pounds per square foot (psf).	Typically applicable to design velocities less than 6 fps and shear forces less than 6 psf. Specific design velocity depends on structure type.	Applicable to all velocities but generally used when design velocities exceed 6 fps and shear forces greater than 6 psf. Rigid armor is generally able to withstand higher velocities than flexible materials.
Degree of anticipated potential bank erosion	Not applicable in areas subject to erosion, unless used in conjunction with hard or bioengineered structures.	Applicable to areas susceptible to moderate erosion. May be used in conjunction with hard structures in areas susceptible to erosion.	Applicable to areas susceptible to erosion. Solid, rigid materials (such as a retaining wall) offer a higher degree of protection against erosion than more flexible or less solid materials (such as rip rap).
Susceptibility to ice scour and jab impacts	Susceptible to failures and erosion caused by ice scour and jab impacts.	Susceptible to failures and erosion caused by ice scour and jab impacts.	Can withstand scour and jab impacts, depending on design conditions.
Other climatic conditions (freeze/thaw, heaving, etc.)	Weather conditions (drought, frosts, high winds, etc.) may reduce survivability of plantings.	Moderate potential for damage to bioengineered structures from heaving. Weather conditions (drought, frosts, high winds, etc.) may reduce survivability of plantings.	Can withstand variations in climatic conditions, depending on design. Rigid armors are susceptible to heaving. Flexible materials less subject to heaving. Potential for damage to stone armor from freeze/thaw cycles if high quality stone is not used.
Presence of bridges, storm drains, roads, utilities, adjacent structures, etc. which present an unacceptable risk should slope failure occur.	Not preferred, due to potential for erosion.	Generally higher risk for failure than hard structures. May be used in these areas, depending on slope and hydraulic conditions.	Applicable where bridges, storm drains, roads, utilities, or structures are located adjacent to the river to prevent erosion.
▪ Operational considerations	Periodic inspections and maintenance required. Moderate potential for replacement. Need for replacement dependent on environmental conditions (e.g., severe weather events). If trees are planted, maintenance would include removal of fallen trees and associated root mass and uprooted soil, and revegetation.	Periodic inspections and maintenance required by qualified personnel. Moderate potential for replacement. Need for replacement dependent on environmental conditions (e.g., severe weather events. etc.).	Little to no maintenance anticipated, depending on method selected. Low potential for replacement. Heavy equipment required for installation.
▪ Adaptable to environmental conditions	Generally adaptable to environmental conditions, however may be impacted by seasonal variations and weather conditions.	Generally adaptable to environmental conditions, however may be impacted by seasonal variations and weather conditions.	Yes.

Table 4.1-4

Potential Bank Restoration Technologies (Continued)

Category/Criteria	Revegetation	Bioengineered Structures	Hard Structures
▪ Can be implemented within schedule limits	Yes, however seasonal constraints and availability of materials may restrict the schedule.	Yes, however seasonal constraints and availability of materials may restrict the schedule.	Yes.
▪ Demonstrated performance	Yes.	Yes.	Yes.
Availability of Services and Materials			
▪ Services/equipment/ materials available	Desirable vegetation (species, size, and quantity) may not be readily available. Advance planning and ordering of plants required.	Bioengineering materials may not be readily available (e.g., crib logs, desirable vegetation, etc.) in great quantities. Advance planning and ordering of materials required.	Services, equipment, and materials required are readily available.
Administrative Feasibility			
▪ Access agreements required	In areas with low banks and slopes 3:1 or less, access agreements are not likely required if access can be obtained from the river. In areas of steep banks, access agreements would be required inland to the toe of the slope.	Construction and maintenance access agreements may be required.	Construction and maintenance access agreements may be required.
▪ Impact on adjoining property	Minimal potential for impacts to adjoining properties.	Potential for minor impacts to adjoining property due to construction.	Potential for minor impacts to adjoining property due to construction.
▪ Used previously at site	Revegetation has been used previously in this river system.	Bioengineered structures have been used previously in this river system.	Hard structures have been used previously in this river system.
EFFECTIVENESS CRITERIA			
Ability to Achieve Habitat Restoration Objectives (HROs)			
▪ Increase the diversity and productivity to support a mid-reach stream community	Expected to achieve objective.	Expected to achieve objective.	Does not achieve objective.

Table 4.1-4

Potential Bank Restoration Technologies (Continued)

Category/Criteria	Revegetation	Bioengineered Structures	Hard Structures
▪ Provide an overlying cover as required to support the mid-reach stream community and to enhance the bank vegetation by reestablishing plantings with native species.	Expected to achieve objective, depending on success of vegetative growth.	Expected to achieve objective, depending on success of vegetative growth.	Does not achieve objective.
▪ Prevent erosion of residual PCB-contaminated bank soils.	Ability to achieve objective depends on revegetation design, success of plantings, and climatic factors. For example, revegetation may not prevent natural incision of banks by the river. Erosion will also occur in areas where runoff is allowed to discharge to the bank. When trees are uprooted, contaminated bank soils will be exposed.	Expected to achieve objective, depending on structures used, success of plantings, and climatic factors. Generally more stable lower bank slopes than for revegetated slopes. Upper bank slopes may be susceptible to erosion depending on revegetation design employed.	Expected to achieve objective.
Long-Term Effectiveness and Permanence	Moderate degree of long-term effectiveness and permanence anticipated, depending on erosion of bank. Effectiveness also largely dependent on continued monitoring and maintenance of vegetation. Expected to improve water quality and habitat.	Moderate degree of long-term effectiveness and permanence anticipated, depending on erosion of bank. Effectiveness also largely dependent on continued monitoring and maintenance of structures and vegetation. Expected to improve water quality and habitat.	High degree of long-term effectiveness and permanence anticipated in preventing erosion of contaminated soil. Will not enhance habitat.
Short-Term Effectiveness	HROs would not be achieved in the short-term, due to time required for establishment of vegetation. Minor impacts to community, workers, and environment during implementation.	HROs would not be achieved in the short-term, due to time required for establishment of vegetation. Short-term effectiveness greater than for revegetated slopes due to use of stabilizing materials. Minor impacts to community and workers during implementation. Potential for impacts to river environment during installation, including changes in water quality and fish and terrestrial habitats.	In general, HROs would not be achieved on a short-term basis. Containment of residual contamination would be achieved following implementation. Minor impacts to community during installation of structures. Potential for impacts to river environment during installation, including changes in water quality and fish and terrestrial habitats.

Table 4.1-4

Potential Bank Restoration Technologies (Continued)

Category/Criteria	Revegetation	Bioengineered Structures	Hard Structures
COST CRITERIA			
Capital Costs	Low to moderate due to minimal equipment and design required. Costs will depend on species selected.	Moderate to high, due to design costs, equipment, and materials. Heavy equipment may not be required, however installation is labor-intensive. Design costs expected to be moderate. Costs will depend on structures selected and revegetation strategy.	High, due to design costs, use of heavy equipment, and materials.
Annual Costs	High. Frequent inspections of the vegetation would be required, especially during the initial years following implementation. Maintenance required for maintaining and replacing vegetation. The use of large trees will provide an overlying cover, however maintenance costs are increased due to need to remove fallen trees and associated root mass and uprooted soil, and revegetation.	Moderate. Frequent inspections of the bioengineered structures would be required, especially during the initial years following implementation. Some structural replacement may be needed. Maintenance required for maintaining and replacing vegetation.	Low. Periodic inspections of the structures would be required. Little to no maintenance anticipated during the design life of the structure (100 years).

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4. USDA, et al. 1998. *Stream Corridor Restoration Handbook, Principles, Practices, and Processes*. Chapters 6,7,8 and Appendix A. (99-0229)
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Table 4.1-5

Potential Riverbed Restoration Technologies

Category/Criteria	Pool/Riffle Construction	Aquatic Cover and Bank-Side Cover	Armoring	Improve Substrate Conditions
Description	Current deflectors, low profile dams, and rock weirs are used to create pools and riffles necessary for aquatic species.	Logs, rocks, turbulence, aquatic plants, and overhanging vegetation are used to provide shelter and feeding areas for fish and aquatic macroinvertebrates.	Riprap, stones, or various forms of concrete are used to reinforce riverbed to prevent erosion.	Substrate is improved using silty mud, vegetation, gravel and rocks to enhance conditions for a variety of species.
IMPLEMENTABILITY CRITERIA				
Technical Feasibility				
▪ Design/construction considerations				
Complexity of planning and design	High level of planning and design required.	Moderate level of planning and design required.	Moderate level of planning and design required.	Moderate level of planning and design required.
River velocity	Feasible for all velocities in the EE/CA reach. Type of structure used (e.g., excavated pool, rock weir, etc.) will depend on site conditions and design velocities. Pools will be constructed as deeper areas in the riverbed where the reduction of river velocities is desired. Riffles will be constructed where areas of swift flowing water (typically 4 fps or greater) are desired.	The use of in-stream cover (boulders) is feasible at all velocities in the EE/CA reach. Boulders of significant size would be expected to withstand high velocities. Bank-side cover material would be subject to erosion under high flow rates depending on its location and anchoring system relative to design flows.	Feasible for all velocities in the EE/CA reach. Armoring may be designed to withstand high velocities. Degree of protection against high river velocities will depend on size and shape of stone and stream morphology.	Fine grained substrate material subject to movement under higher velocities and will only be attempted in areas with flow velocities less than 2 fps. Gravel would typically be placed in areas of slower flow velocities while riprap would be used in areas of higher velocity. Gravel would not be placed in locations where the design velocities exceed 3 fps.
Riverbed materials present following removal action	Construction of pools in areas of fine-grained sediments or cobbles may be restricted due to the potential for excessive sedimentation in the pools. The degree of sedimentation will depend on locations of created pools and riffles, structures used, and characteristics of riverbed material.	In general, may be used for all riverbed materials. However, the use of boulders is not practical in fine-grained sediments due to the potential for excessive scouring.	May be used on all riverbed materials. In fine-grained materials, a geotextile may be required beneath the armor layer.	In general, may be used for all riverbed materials. However, the addition of fine-grained materials in cobble/riffle areas is not practical due to the high potential for washout.

Table 4.1-5

Potential Riverbed Restoration Technologies (Continued)

Category/Criteria	Pool/Riffle Construction	Aquatic Cover and Bank-Side Cover	Armoring	Improve Substrate Conditions
Physical limitations (Note: The riverbed will be restored to existing riverbed conditions or better where conditions allow.)	Riverbed substrate consisting of bedrock or boulders, steep gradients (greater than 5%), and stream morphology (e.g., meanders, bar development) would limit extent of pools and riffles.	Boulders will need to be secured to the streambed, while bank cover materials will need to be secured to the bank. Shallow bedrock and stream morphology (e.g., pools) would limit sites for boulder placement. Locations for bank cover materials will be limited by bank conditions (stability, anchor features, etc.), stream morphology, and the method selected for bank restoration (e.g., retaining walls, rip-rap, etc.).	Additional excavation of sediments (i.e., sediment that meets cleanup goals) may be required in order to stabilize the channel cross-section.	Additional excavation of sediments (i.e., sediment that meets cleanup goals) may be required in order to stabilize the channel cross-section. Design flows may not permit gravel in slower velocity locations.
Potential for scour	High potential for scour in created pools. Low potential for scour in riffle areas. The pools/riffles must be carefully designed in order not to cause scour in undesirable locations. Pools and riffles will be constructed with designed allowances for scour and sedimentation.	Bank-side cover not practical in areas susceptible to scour. Tree revetments and cover logs have a high risk of failure in areas subject to scour. Some additional scour may occur downstream of the cover materials and boulders. Boulders must be located to avoid local bank scour.	May be used in areas susceptible to scour. Low potential to increase local scour. If channel structure and form altered (e.g., grade increased or large woody material removed) armoring may reduce overall channel roughness, and subsequently increase scour in downstream reach.	Low potential for scour where riprap is placed. Slower velocity locations where gravel is positioned have a high potential to erode at project design flows.
▪ Operational considerations	Periodic inspections required to ensure that scour is not increased and pool depths are maintained. Replacement may be required following large storm events. On-site inspections by a qualified person required.	Periodic inspections required by a qualified person to ensure the integrity of bank-side cover and to ensure that excessive scour is not occurring. Replacement may be required following large storm events.	Periodic inspections required to ensure integrity of armor. Low potential for replacement.	Periodic inspections required to ensure that substrate depth is maintained. High potential to replace gravel due to losses during storm events.
▪ Adaptable to environmental conditions	Yes.	Yes.	Yes.	Yes.
▪ Can be implemented within schedule limits	Yes.	Yes.	Yes.	Yes.
▪ Demonstrated performance	Yes.	Yes.	Yes.	Yes.

Table 4.1-5

Potential Riverbed Restoration Technologies (Continued)

Category/Criteria	Pool/Riffle Construction	Aquatic Cover and Bank-Side Cover	Armoring	Improve Substrate Conditions
Availability of Services and Materials				
▪ Services/equipment/ materials available	Services, equipment, and materials are readily available.	Services, equipment, and materials are readily available.	Services, equipment, and materials are generally readily available. Rounded or weathered stone would be less available than manufactured stone.	Services, equipment, and materials are readily available.
Administrative Feasibility	Technology is administratively feasible. Any impacts on adjoining properties would be minimal.	Technology is administratively feasible. Any impacts on adjoining properties would be minimal.	Technology is administratively feasible. Any impacts on adjoining properties would be minimal.	Technology is administratively feasible. Any impacts on adjoining properties would be minimal.
EFFECTIVENESS CRITERIA				
Ability to Achieve Habitat Restoration Objectives (HROs)				
▪ Increase the diversity and productivity to support a mid-reach stream community.	High potential to achieve objective.	Expected to achieve objective.	Low potential to achieve objective. The technology would provide some habitat but would not necessarily increase the diversity.	Expected to achieve objective if diverse substrate materials are used.
▪ Prevent erosion of residual PCB-contaminated river sediments.	Moderate potential to achieve objective. Potential increases if other technologies are used (e.g., armoring of excavated pools).	Would not achieve objective if implemented as the sole technology.	High potential to achieve objective.	Would not achieve objective if implemented as the sole technology.
Long-Term Effectiveness and Permanence	Moderate long-term effectiveness anticipated. Permanence subject to the behavior of the river system and storm events. Depending on design, bed sediment may be subject to scour, with ultimate exposure of contaminants in deeper sediment (if present).	Moderate long-term effectiveness anticipated. Permanence subject to the behavior of the river system and storm events. In-stream cover using boulders would be permanent. Scour downstream of boulders would need to be monitored. Bank-side cover using trees or limbs would not be permanent without significant maintenance or rigid anchoring system (e.g., cables, boulders).	High long-term effectiveness anticipated in preventing erosion of sediments. Degree of permanence subject to severe storm events (greater than 25 year storm). Diversity and productivity are not likely to be achieved in the long-term, unless the technology is combined with habitat components (tree revetments, etc.).	Low to moderate long-term effectiveness anticipated in preventing erosion of sediments. The long-term effectiveness in gravel areas may be limited by the susceptibility for these areas to be eroded. An increase in diversity and productivity would be achieved if diverse substrate materials are used. Permanence subject to the behavior of the river system and storm events.

Table 4.1-5

Potential Riverbed Restoration Technologies (Continued)

Category/Criteria	Pool/Riffle Construction	Aquatic Cover and Bank-Side Cover	Armoring	Improve Substrate Conditions
Short-Term Effectiveness	An increase in diversity and productivity would be achieved. The degree of erosion prevention will depend on design and river dynamics. Any impacts to the community or workers during implementation would be minimal. Short-term changes in water quality (i.e., turbidity increases) are expected due to construction of pools and riffles.	HROs would not be achieved in the short-term. Safety hazards to humans and animals posed by cables used to secure revetments. Any additional impacts to the community, workers, or the environment during implementation would be minimal.	Armoring would prevent the erosion of residual contaminated sediments following implementation. Diversity and productivity would not be increased. Any impacts to the community or workers during implementation would be minimal. Short-term changes in water quality (i.e., turbidity increases) are expected due to positioning of armor.	HROs would not be achieved in the short-term. Any impacts to the community or workers during implementation would be minimal. Short-term changes in water quality (i.e., turbidity increases) are expected due to positioning of substrate.
COST CRITERIA				
Capital Costs	Moderate. Costs impacted by increased excavation and disposal costs for pool construction. High level of planning and design.	Low. Low costs for materials and implementation. Moderate level of planning and design.	Moderate. High costs for materials and implementation. Low level of planning and design.	Moderate. Moderate costs for materials and implementation. Moderate level of planning and design.
Annual Costs	Low to moderate. Maintenance may be required following large storm events. Periodic inspections required to ensure that scour is not increased and pool depths are maintained.	Low. Maintenance may be required following large storm events. Periodic inspections required to ensure integrity of bank-side cover and to ensure that excessive scour is not occurring.	Low. Little maintenance expected to be required. Periodic inspections required to ensure integrity of armor and potential downstream geomorphic effects.	Low. Maintenance may be required following large storm events to ensure substrate depth is maintained.

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Table 4.1-6

Summary of Retained Technologies Following Technology Screening

River Diversion	Sediment Removal	Treatment/In Situ Containment	Consolidation/ Disposal	Restoration	
				Riverbanks	Riverbed
▪ Sheetpile (non-cobble subreaches) ▪ Pumped Bypass (all subreaches)	▪ Wet Excavation[a] ▪ Dry Excavation	▪ In Situ Capping (lower river banks only) ▪ Solvent Extraction ▪ Soil Washing[b] ▪ Thermal Desorption	▪ Consolidation at designated areas at GE facility ▪ Off-Site Disposal	▪ Revegetation with native species ▪ Bioengineered structures ▪ Hard structures	▪ Improving substrate conditions ▪ Armoring systems ▪ Pool/riffle construction ▪ Aquatic cover

Note: [a]Wet excavation sediment removal technology does not require river diversion.

[b]Technology was retained as potentially feasible. However, because insufficient information is currently available for applications of this technology for this site, soil washing will not be incorporated into the alternatives developed in Section 5.

Table 4.3-1

95% UCL PCB Concentrations for Comparison of Capping versus Excavation to Cleanup Goal EE/CA Reach of the Housatonic River Pittsfield, Massachusetts

Subreach	Depth of Excavation to Cleanup Goal (ft)	95% UCL PCB Concentration (ppm)	
		2.5 to 3.5 ft Depth Interval	3 to 4 ft Depth Interval
3-8	3.0	4.3	0.4
3-9	2.0	0.3	0.3
3-10	3.0	18.7 (M)	0.8 (M)
4-1	Bedrock	na	na
4-2	Bedrock	na	na
4-3	Bedrock	na	na
4-4A	3.0		0.6(M)
4-4B	3.0	3.6	0.4
4-5A	3.0	12 (M)	0.4
4-5B	2.5	0.8	0.3
4-6 (T198-T210)*	2.5	0.3 (M)	0.3 (M)
4-6 (T210-T212)*	3.5	17 (M)	17 (M)

Notes:

1. "M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were fewer than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.
2. "ns" indicates there were no samples collected from this interval.
3. "bedrock" indicates all sediment above bedrock will be removed.
4. "na" indicates the criteria is not applicable to this subreach.
5. * The upper portion of Subreach 4-6 between Transects 198 and 210 will be excavated to 2.5 ft. The lower portion between Transects 210 and 212 will be excavated to 3.5 ft.
6. At subreaches where continuous 6-inch interval sediment sample results are not available, the excavation depth was selected based on the next available result. For example, for subreach 4-4A, an excavation depth of 3.0 ft is selected because data confirming that 95% UCL PCB concentrations are less than 1 ppm are not available until the 3.0- to 3.5-ft depth interval.

SECTION 5

TABLES

Table 5.5-1

Summary of Detailed Comparison of Base Alternatives 1, 2, and 3

Base Alternative	Effectiveness	Implementability	Cost
Alternative 1 (Wet Excavation)	This alternative is potentially the least effective because of quality control issues associated with accuracy of excavation and backfill depths when working below water. Excavation of sediments from pockets in bedrock in the cobble reaches will be problematic. Downstream migration of contaminated sediment will be an ongoing concern.	Installation of a sorptive cap on the lower riverbanks will be the most difficult to implement for this alternative. This alternative is expected to have the shortest construction time but is more susceptible to fluctuations in the river depth than other alternatives. Access requirements are likely to be the least for this alternative.	This alternative has the lowest estimated cost. Although confirmation sampling is not included for any alternative, limited confirmation sampling may be justified for this alternative because of uncertainty associated with the accuracy of excavations.
Alternative 2 (Dry Excavation/Sheetpiling)	This alternative is expected to provide the greatest control over construction quality and most assurance that cleanup goals will be achieved. The height of the sheetpile will minimize overtopping during storm events. Adverse short-term impacts from noise and vibration are significant. Downstream migration of contaminated sediment will be a concern during sheetpile installation and removal.	This alternative relies on the presence of sufficient overburden to support the load on the sheetpiles. A pumped bypass system would be used in areas found unsuitable for sheetpiling. Access requirements are likely to be the greatest for this alternative to facilitate sheetpile installation needs.	This alternative has the highest estimated cost. However, this alternative is the least susceptible to cost increases associated with wet weather during construction.
Alternative 3 (Dry Excavation/Bypass Pumping)	This alternative is expected to provide good control over construction quality and assurance that cleanup goals will be achieved. However, overtopping during storm events, which adversely impacts construction quality control, is most likely for this alternative. Adverse short-term impacts from noise and air pollution are potentially significant. Downstream migration of contaminated sediment is least likely for this alternative, however, fish migration will be impeded.	This alternative is expected to have a construction time comparable to Alternative 1, but is the most susceptible to fluctuations in the river depth. If diesel pumps are used, frequent monitoring and refueling will be required. Access requirements will be greater for this alternative than for Alternative 1. Land will be required, probably along the riverbanks, for the pumps and the bypass piping.	The cost of this alternative is less than Alternative 2 but more than Alternative 1. However, this alternative may be the most susceptible to cost increases associated with wet weather during construction.

Table 5.5-2

Summary of Detailed Comparison of Disposal Options A, B, C, and D

Disposal Option	Effectiveness	Implementability	Cost
Option A (Consolidation at GE/Off-Site Disposal)	The effectiveness of this option depends to a large degree on the design and operation of the consolidation areas. EPA has approved the ARARs and design for the consolidation areas. GE is responsible for achieving the ARARs. No reduction in toxicity, volume, and mobility by treatment would occur. Potential long-term exposure to odors and contaminants by local residents would be greatest for this option. This option would create the least impact from truck traffic.	The Consent Decree allows the consolidation of excavated materials at the designated areas at GE. Required capacity at the consolidation areas has been assumed, but some risk exists that capacity will not be available. Off-site facilities are expected to be available when needed for excess material beyond the consolidation areas' capacities.	This is the least expensive option. This option assumes that 50,000- yd^3 capacity will be available at the GE consolidation areas. If it is not available, the cost for off-site disposal will be borne by GE.
Option B (Off-Site Disposal)	No reduction in toxicity, volume, and mobility by treatment would occur. Potential short- and long-term exposure to odors and contaminants by local residents would be least for this option. However, risks of trucking untreated material long distances would be greatest. Off-site treatment/disposal would provide a reliable disposal option.	Off-site facilities are expected to be available when needed.	The cost of this option is significantly greater than Option A. The estimated costs are subject to change based on market fluctuations.
Option C (Thermal Desorption/Off-Site Disposal)	This option reduces toxicity, volume, and mobility by destroying contamination by treatment. Disposal of treated and untreated materials at properly designed off-site facilities provides the highest degree of long-term effectiveness and permanence. Short-term noise and exposure to contaminants during treatment could be mitigated by engineering controls. Transport of small volumes of concentrated PCB residuals would create a short-term risk of spill or exposure.	The technology is proven at full-scale for treating PCB contaminated soil and sediments. Additional land area would be required at the GE facility to locate equipment and for associated material handling. Equipment and services to conduct treatment are readily available through several vendors.	This option has the greatest estimated cost, which is significantly greater than non-treatment options. Although this cost is likely to decrease with competitive bids, it would still remain significantly greater than the cost for non-treatment options.
Option D (Solvent Extraction/Off-Site Disposal)	The effectiveness of this option is similar to Option C. In addition, potential short-term spill and exposure risks from storage and use of solvents would exist.	The implementability of this option is similar to Option C.	The cost of this option is significantly greater than non-treatment options. Although this cost is likely to decrease with competitive bids, it would still remain significantly greater than the cost for non-treatment options.

Table 5.5-3

Detailed Cost Summary Base Alternatives 1, 2, and 3
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Costs	Alternative 1 Subsection 5.2	Alternative 2 Subsection 5.3	Alternative 3 Subsection 5.4
Direct Capital Costs			
Pre-Design Investigations	$ 577,257	$ 577,257	$ 577,257
Mobilization/Demobilization	$ 1,954,182	$ 2,197,162	$ 2,083,579
Install Sheetpile	n/a	$ 2,492,378	n/a
Pumping Bypass	n/a	$ 1,853,218	$ 3,642,773
Dewatering of Riverbed	n/a	$ 1,614,382	$ 999,464
Excavate & Transport Soil/Sediment	$ 2,831,922	$ 2,037,389	$ 1,777,165
Dewatering of Excavated Material	$ 814,857	$ 1,453,473	$ 825,917
Characterization Sampling	$ 328,766	$ 328,766	$ 328,766
Soil/Sediment Treatment & Ancillary Costs	n/a	n/a	n/a
Restoration of Riverbed	$ 1,721,223	$ 1,341,052	$ 1,308,050
Restoration of Riverbank	$ 5,780,315	$ 5,785,482	$ 5,751,551
On-Site Consolidation (Transportation)	n/a	n/a	n/a
Off-Site Transportation & Disposal	n/a	n/a	n/a
Total Direct Capital Costs	$ 14,008,522	$ 19,680,559	$ 17,294,522
Indirect Capital Costs			
Escalation (0%)	$ -	$ -	$ -
Contingency (25%)	$ 3,502,131	$ 4,920,140	$ 4,323,631
Engineering and Design (6%)	$ 1,050,639	$ 1,476,042	$ 1,297,089
USACE Construction Management (8%)	$ 1,484,903	$ 2,086,139	$ 1,833,219
Total Indirect Capital Costs	$ 6,037,673	$ 8,482,321	$ 7,453,939
Total Capital Costs (Rounded)	**$ 20,046,200**	**$ 28,162,900**	**$ 24,748,500**
Direct O & M Costs			
Restoration Monitoring	$ 546,000	$ 546,000	$ 546,000
Cap Monitoring	$ 180,000	$ 180,000	$ 180,000
Annual Maintenance	$ 550,000	$ 550,000	$ 550,000
Total Direct O&M Costs	$ 1,276,000	$ 1,276,000	$ 1,276,000
Indirect O&M Costs			
Escalation (0%)	$ -	$ -	$ -
Contingency (25%)	$ 319,000	$ 319,000	$ 319,000
Engineering and Design (6%)	$ 95,700	$ 95,700	$ 95,700
USACE Construction Management (8%)	$ 135,256	$ 135,256	$ 135,256
Total Indirect O&M Costs	$ 549,956	$ 549,956	$ 549,956
Total O & M Costs (Rounded)	**$ 1,826,000**	**$ 1,826,000**	**$ 1,826,000**
TOTAL COSTS (Rounded)	**$ 21,872,200**	**$ 29,988,900**	**$ 26,574,500**
Present Value Costs			
Present Value of Capital Costs	$ 18,803,807	$ 25,511,439	$ 23,080,042
Present Value of O&M Costs	$ 1,140,801	$ 1,140,801	$ 1,140,801
TOTAL PRESENT VALUE COSTS (Rounded)	**$ 19,944,600**	**$ 26,652,200**	**$ 24,220,800**

Table 5.5-4

Detailed Cost Summary for Consolidation/Disposal/Treatment Options A, B, C, and D
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Costs		Disposal Option A Section 5.2.1.9.1	Disposal Option B Section 5.2.1.9.2	Disposal Option C Section 5.2.1.9.3	Disposal Option D Section 5.2.1.9.4
Direct Costs					
Soil/Sediment Treatment & Ancillary Costs		n/a	n/a	$ 28,297,569	$ 21,443,002
On-Site Consolidation (Transportation)		$ 422,384	n/a	n/a	n/a
Off-Site Transportation & Disposal		$ 8,000,295	$ 19,537,912	$ 8,467,233	$ 8,467,233
Total Direct Costs		$ 8,422,679	$ 19,537,912	$ 36,764,802	$ 29,910,235
Indirect Costs					
Escalation (0%)		$ -	$ -	$ -	$ -
Contingency (25%)		$ 2,105,670	$ 4,884,478	$ 9,191,201	$ 7,477,559
Engineering and Design (6%)		$ 631,701	$ 1,465,343	$ 2,757,360	$ 2,243,268
USACE Construction Management (8%)		$ 892,804	$ 2,071,019	$ 3,897,069	$ 3,170,485
Total Indirect Costs		$ 3,630,175	$ 8,420,840	$ 15,845,630	$ 12,891,311
Total Costs (Rounded)		**$ 12,052,900**	**$ 27,958,800**	**$ 52,610,400**	**$ 42,801,500**

Table 5.5-5

Comparative Cost Summary for Alternatives Incorporating Disposal Options
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Alternative	CAPITAL COSTS[a] (ACTUAL)	O&M COSTS (ACTUAL)	TOTAL COSTS (ACTUAL)	TOTAL COSTS (PRESENT VALUE)[b]
Alternative 1A - Wet Excavation & Consolidation at GE	$32,099,100	$1,826,000	$33,925,100	$31,251,000
Alternative 2A - Dry Excavation/Sheetpiling & Consolidation at GE	$40,215,800	$1,826,000	$42,041,800	$37,570,000
Alternative 3A - Dry Excavation/Pump Bypass & Consolidation at GE	$36,801,400	$1,826,000	$38,627,400	$35,461,000
Alternative 1B - Wet Excavation & Off-Site Disposal	$48,005,000	$1,826,000	$49,831,000	$46,171,000
Alternative 2B - Dry Excavation/Sheetpiling & Off-Site Disposal	$56,121,700	$1,826,000	$57,947,700	$51,979,000
Alternative 3B - Dry Excavation/Pump Bypass & Off-Site Disposal	$52,707,300	$1,826,000	$54,533,300	$50,295,000
Alternative 1C - Wet Excavation & Thermal Desorption Treatment	$72,656,600	$1,826,000	$74,482,600	$69,294,000
Alternative 2C - Dry Excavation/Sheetpiling & Thermal Desorption Treatment	$80,773,300	$1,826,000	$82,599,300	$74,309,000
Alternative 3C - Dry Excavation/Pump Bypass & Thermal Desorption Treatment	$77,358,900	$1,826,000	$79,184,900	$73,284,000
Alternative 1D - Wet Excavation & Solvent Extraction Treatment	$62,847,700	$1,826,000	$64,673,700	$60,093,000
Alternative 2D - Dry Excavation/Sheetpiling & Solvent Extraction Treatment	$70,964,400	$1,826,000	$72,790,400	$65,424,000
Alternative 3D - Dry Excavation/Pump Bypass & Solvent Extraction Treatment	$67,550,000	$1,826,000	$69,376,000	$64,137,000

Notes:

[a] The capital costs include the treatment costs for alternatives using Options C and D.

[b] The present worth of the capital costs was determined by assuming that all capital costs were incurred at the midpoint of the construction schedule and discounting (@7%) back to the beginning of the construction schedule.

SECTION 6

TABLES

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000103	BS000103	BS000103	BS000104	BS000104
Field Sample ID	H2-BS000103-0-0030	H2-BS000103-0-0040	H2-BS000103-0-0050	H2-BS000104-0-0030	H2-BS000104-0-0040
Date Collected	12/13/1999	12/13/1999	12/13/1999	12/13/1999	12/13/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.502 U	.503 U	.501 U	2.51 U	.503 U
AROCLOR-1254 (mg/kg)	.502 U	.503 U	.501 U	2.51 U	**8.55**
AROCLOR-1260 (mg/kg)	**17.3 J**	**14.7**	**14.8**	**31.8**	**5.69**
PCB, TOTAL (mg/kg)	**17.3 J**	**14.7**	**14.8**	**31.8**	**14.2**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000104	BS000105	BS000105	BS000105	BS000106
Field Sample ID	H2-BS000104-0-0050	H2-BS000105-0-0030	H2-BS000105-0-0040	H2-BS000105-0-0050	H2-BS000106-0-0030
Date Collected	12/13/1999	12/13/1999	12/13/1999	12/13/1999	12/13/1999
Depth	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.502 U	5.03 U	5.01 U	5 U	25.1 U
AROCLOR-1254 (mg/kg)	.502 U	5.03 U	5.01 U	5 U	25.1 U
AROCLOR-1260 (mg/kg)	**.757**	**69.6**	**42.9**	**77.3**	**383**
PCB, TOTAL (mg/kg)	**.757**	**69.6**	**42.9**	**77.3**	**383**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000106	BS000106	BS000107	BS000107	BS000107
Field Sample ID	H2-BS000106-0-0040	H2-BS000106-0-0050	H2-BS000107-0-0030	H2-BS000107-0-0040	H2-BS000107-0-0050
Date Collected	12/13/1999	12/13/1999	12/13/1999	12/13/1999	12/13/1999
Depth	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	5.03 U	5.78 U	5.02 U	.502 U	.501 U
AROCLOR-1254 (mg/kg)	5.03 U	5.78 U	5.02 U	.502 U	.501 U
AROCLOR-1260 (mg/kg)	**53.9**	**66.1**	**60.1**	**4.04**	**1.89**
PCB, TOTAL (mg/kg)	**53.9**	**66.1**	**60.1**	**4.04**	**1.89**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000108	BS000108	BS000108	BS000109	BS000109
Field Sample ID	H2-BS000108-0-0030	H2-BS000108-1-0030	H2-BS000108-0-0040	H2-BS000109-0-0030	H2-BS000109-1-0030
Date Collected	12/13/1999	12/13/1999	12/13/1999	12/13/1999	12/13/1999
Depth	3.0-3.5	3.0-3.5	4.0-4.5	3.0-3.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.501 U	.501 U	.501 U	.501 U
AROCLOR-1254 (mg/kg)	.5 U	.501 U	.501 U	.501 U	.501 U
AROCLOR-1260 (mg/kg)	.5 U	.501 U	**.382 J**	**2.64**	**2.59**
PCB, TOTAL (mg/kg)	.5 U	.501 U	**.382 J**	**2.64**	**2.59**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000109	BS000109	BS000110	BS000110	BS000110
Field Sample ID	H2-BS000109-0-0040	H2-BS000109-0-0050	H2-BS000110-0-0030	H2-BS000110-0-0040	H2-BS000110-0-0050
Date Collected	12/13/1999	12/13/1999	12/14/1999	12/14/1999	12/14/1999
Depth	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.5 U	5.02 U	.503 U	.502 U
AROCLOR-1254 (mg/kg)	.5 U	.5 U	5.02 U	.503 U	.502 U
AROCLOR-1260 (mg/kg)	**1.05**	**1.4**	**53.4**	**7.86**	**13**
PCB, TOTAL (mg/kg)	**1.05**	**1.4**	**53.4**	**7.86**	**13**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000111	BS000111	BS000111	BS000112	BS000112
Field Sample ID	H2-BS000111-0-0030	H2-BS000111-0-0040	H2-BS000111-0-0050	H2-BS000112-0-0030	H2-BS000112-0-0040
Date Collected	12/14/1999	12/14/1999	12/14/1999	12/14/1999	12/14/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	5.01 U	2.51 U	.506 U	.503 U	.502 U
AROCLOR-1254 (mg/kg)	5.01 U	2.51 U	**15.1**	.503 U	.502 U
AROCLOR-1260 (mg/kg)	**54.8**	**33.4**	**5.57**	**20.2**	**.991**
PCB, TOTAL (mg/kg)	**54.8**	**33.4**	**20.6**	**20.2**	**.991**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000112	BS000113	BS000113	BS000113	BS000113
Field Sample ID	H2-BS000112-0-0050	H2-BS000113-0-0030	H2-BS000113-1-0030	H2-BS000113-0-0040	H2-BS000113-0-0050
Date Collected	12/14/1999	12/14/1999	12/14/1999	12/14/1999	12/14/1999
Depth	5.0-5.5	3.0-3.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.501 U	.507 U	.502 U	.502 U	5.03 U
AROCLOR-1254 (mg/kg)	.501 U	.507 U	.502 U	.502 U	5.03 U
AROCLOR-1260 (mg/kg)	**2.18**	**.544**	.502 U	**15.5**	**42.5**
PCB, TOTAL (mg/kg)	**2.18**	**.544 J**	.502 U	**15.5**	**42.5**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000114	BS000114	BS000114	BS000115	BS000115
Field Sample ID	H2-BS000114-0-0030	H2-BS000114-0-0040	H2-BS000114-0-0050	H2-BS000115-0-0030	H2-BS000115-0-0040
Date Collected	12/14/1999	12/14/1999	12/14/1999	12/14/1999	12/14/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.502 U	.503 U	.503 U	5.02 U	.502 U
AROCLOR-1254 (mg/kg)	.502 U	.503 U	.503 U	5.02 U	**15.7**
AROCLOR-1260 (mg/kg)	**.768**	**2.4**	**7.18**	**58.6**	**16.6**
PCB, TOTAL (mg/kg)	**.768**	**2.4**	**7.18**	**58.6**	**32.3**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000115	BS000116	BS000116	BS000116	BS000116
Field Sample ID	H2-BS000115-0-0050	H2-BS000116-0-0030	H2-BS000116-1-0030	H2-BS000116-0-0040	H2-BS000116-0-0050
Date Collected	12/14/1999	12/15/1999	12/15/1999	12/15/1999	12/15/1999
Depth	5.0-5.5	3.0-3.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.501 U	5 U	5.01 U	.5 U	5.01 U
AROCLOR-1254 (mg/kg)	.501 U	5 U	5.01 U	.5 U	5.01 U
AROCLOR-1260 (mg/kg)	**4.38**	**55.9**	**83.1**	**18.6**	**62.4**
PCB, TOTAL (mg/kg)	**4.38**	**55.9**	**83.1**	**18.6**	**62.4**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000117	BS000117	BS000117	BS000118	BS000118
Field Sample ID	H2-BS000117-0-0030	H2-BS000117-0-0040	H2-BS000117-0-0050	H2-BS000118-0-0030	H2-BS000118-0-0040
Date Collected	12/15/1999	12/15/1999	12/15/1999	12/15/1999	12/15/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	2.51 U	.501 U	.501 U	.502 U	.502 U
AROCLOR-1254 (mg/kg)	2.51 U	.501 U	.501 U	.502 U	.502 U
AROCLOR-1260 (mg/kg)	**29.7**	**2.44**	**1.37**	**3.7**	**6.84**
PCB, TOTAL (mg/kg)	**29.7**	**2.44**	**1.37**	**3.7**	**6.84**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000118	BS000119	BS000119	BS000119	BS000119
Field Sample ID	H2-BS000118-0-0050	H2-BS000119-0-0030	H2-BS000119-0-0040	H2-BS000119-1-0040	H2-BS000119-0-0050
Date Collected	12/15/1999	12/15/1999	12/15/1999	12/15/1999	12/15/1999
Depth	5.0-5.5	3.0-3.5	4.0-4.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.501 U	.501 U	.502 U	.501 U	.501 U
AROCLOR-1254 (mg/kg)	.501 U	.501 U	.502 U	.501 U	.501 U
AROCLOR-1260 (mg/kg)	**1.41**	**1.43**	**5.95**	**5.1**	**5.53**
PCB, TOTAL (mg/kg)	**1.41**	**1.43**	**5.95**	**5.1**	**5.53**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000120	BS000120	BS000120	BS000121	BS000121
Field Sample ID	H2-BS000120-0-0030	H2-BS000120-0-0040	H2-BS000120-0-0050	H2-BS000121-0-0030	H2-BS000121-0-0040
Date Collected	12/15/1999	12/15/1999	12/15/1999	12/15/1999	12/15/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.5 U	.5 U	.501 U	.503 U
AROCLOR-1254 (mg/kg)	.5 U	.5 U	.5 U	**5.78**	.503 U
AROCLOR-1260 (mg/kg)	**2.58**	.5 U	**1.83**	**10.8**	**5.26**
PCB, TOTAL (mg/kg)	**2.58**	.5 U	**1.83**	**16.5**	**5.26**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000121	BS000122	BS000122	BS000122	BS000123
Field Sample ID	H2-BS000121-0-0050	H2-BS000122-0-0030	H2-BS000122-0-0040	H2-BS000122-0-0050	H2-BS000123-0-0030
Date Collected	12/15/1999	12/16/1999	12/16/1999	12/16/1999	12/16/1999
Depth	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.501 U	.5 U	.501 U	.501 U	.5 U
AROCLOR-1254 (mg/kg)	.501 U	.5 U	.501 U	.501 U	.5 U
AROCLOR-1260 (mg/kg)	**5.28**	**3.88**	**5.91**	**8.97**	.5 U
PCB, TOTAL (mg/kg)	**5.28**	**3.88**	**5.91**	**8.97**	.5 U

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000124	BS000124	BS000125	BS000125	BS000125
Field Sample ID	H2-BS000124-0-0030	H2-BS000124-0-0040	H2-BS000125-0-0030	H2-BS000125-1-0030	H2-BS000125-0-0040
Date Collected	12/16/1999	12/16/1999	12/16/1999	12/16/1999	12/16/1999
Depth	3.0-3.5	4.0-4.5	3.0-3.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.5 U	.5 U	.5 U	.5 U
AROCLOR-1254 (mg/kg)	.5 U	.5 U	.5 U	.5 U	.5 U
AROCLOR-1260 (mg/kg)	**6.31**	**2.1**	**11.4**	**10.4**	**19.8**
PCB, TOTAL (mg/kg)	**6.31**	**2.1**	**11.4**	**10.4**	**19.8**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000125	BS000126	BS000126	BS000126	BS000127
Field Sample ID	H2-BS000125-0-0050	H2-BS000126-0-0030	H2-BS000126-0-0040	H2-BS000126-0-0050	H2-BS000127-0-0030
Date Collected	12/16/1999	12/16/1999	12/16/1999	12/16/1999	12/16/1999
Depth	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.5 U	.5 U	.5 U	10 U
AROCLOR-1254 (mg/kg)	.5 U	.5 U	.5 U	.5 U	10 U
AROCLOR-1260 (mg/kg)	**3.6**	**3.66**	**2.52**	**.858**	**77.8**
PCB, TOTAL (mg/kg)	**3.6**	**3.66**	**2.52**	**.858**	**77.8**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000127	BS000127	BS000128	BS000128	BS000128
Field Sample ID	H2-BS000127-0-0040	H2-BS000127-0-0050	H2-BS000128-0-0030	H2-BS000128-0-0040	H2-BS000128-0-0050
Date Collected	12/16/1999	12/16/1999	12/17/1999	12/17/1999	12/17/1999
Depth	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.5 U	2.51 U	2.51 U	.501 U
AROCLOR-1254 (mg/kg)	.5 U	.5 U	2.51 U	2.51 U	**9.79**
AROCLOR-1260 (mg/kg)	**9.59 J**	**12.4**	**32.8**	**36.9**	**13.6**
PCB, TOTAL (mg/kg)	**9.59 J**	**12.4**	**32.8**	**36.9**	**23.4**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000129	BS000129	BS000129	BS000129	BS000130
Field Sample ID	H2-BS000129-0-0030	H2-BS000129-0-0040	H2-BS000129-1-0040	H2-BS000129-0-0050	H2-BS000130-0-0030
Date Collected	12/17/1999	12/17/1999	12/17/1999	12/17/1999	12/17/1999
Depth	3.0-3.5	4.0-4.5	4.0-4.5	5.0-5.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.502 U	.503 U	.503 U	.503 U	.515 U
AROCLOR-1254 (mg/kg)	**6.91**	.503 U	.503 U	.503 U	.515 U
AROCLOR-1260 (mg/kg)	**5.44**	**3.76**	**4.24**	**1.62**	**16.2**
PCB, TOTAL (mg/kg)	**12.4**	**3.76**	**4.24**	**1.62**	**16.2**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000130	BS000130	BS000131	BS000131	BS000132
Field Sample ID	H2-BS000130-0-0040	H2-BS000130-0-0050	H2-BS000131-0-0030	H2-BS000131-0-0040	H2-BS000132-0-0030
Date Collected	12/17/1999	12/17/1999	12/17/1999	12/17/1999	12/20/1999
Depth	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	5.03 U	2.52 U	.502 U	.502 U	.505 U
AROCLOR-1254 (mg/kg)	5.03 U	2.52 U	.502 U	.502 U	**7.92**
AROCLOR-1260 (mg/kg)	**67**	**32.2**	**3.15**	**7.92**	**15.7**
PCB, TOTAL (mg/kg)	**67**	**32.2**	**3.15**	**7.92**	**23.6**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000132	BS000132	BS000132	BS000133	BS000133
Field Sample ID	H2-BS000132-1-0030	H2-BS000132-0-0040	H2-BS000132-0-0050	H2-BS000133-0-0030	H2-BS000133-0-0040
Date Collected	12/20/1999	12/20/1999	12/20/1999	12/20/1999	12/20/1999
Depth	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5	4.0-4.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.505 U	5.26 U	.504 U	.506 U	.502 U
AROCLOR-1254 (mg/kg)	**9.84**	**59.9**	**4.3**	.506 U	.502 U
AROCLOR-1260 (mg/kg)	**20.2**	**30.4**	**5.22**	**.282 J**	**.322 J**
PCB, TOTAL (mg/kg)	**30**	**90.2**	**9.52**	**.282 J**	**.322 J**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000133	BS000134	BS000134	BS000134	BS000136
Field Sample ID	H2-BS000133-0-0050	H2-BS000134-0-0030	H2-BS000134-0-0040	H2-BS000134-0-0050	H2-BS000136-0-0030
Date Collected	12/20/1999	12/20/1999	12/20/1999	12/20/1999	12/21/1999
Depth	5.0-5.5	3.0-3.5	4.0-4.5	5.0-5.5	3.0-3.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.502 U	.507 U	.504 U	.502 U	.501 U
AROCLOR-1254 (mg/kg)	.502 U	.507 U	.504 U	.502 U	.501 U
AROCLOR-1260 (mg/kg)	.502 U	.507 U	.504 U	**.477 J**	.501 U
PCB, TOTAL (mg/kg)	.502 U	.507 U	.504 U	**.477 J**	.501 U

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000136	BS000136	BS000137	BS000137	BS000137
Field Sample ID	H2-BS000136-0-0040	H2-BS000136-1-0040	H2-BS000137-0-0030	H2-BS000137-0-0040	H2-BS000137-0-0050
Date Collected	12/21/1999	12/21/1999	12/21/1999	12/21/1999	12/21/1999
Depth	4.0-4.5	4.0-4.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.501 U	.501 U	.501 U	.501 U	.501 U
AROCLOR-1254 (mg/kg)	.501 U	.501 U	.501 U	.501 U	.501 U
AROCLOR-1260 (mg/kg)	.501 U	.501 U	.501 U	**.513**	**.405 J**
PCB, TOTAL (mg/kg)	.501 U	.501 U	.501 U	**.513**	**.405 J**

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-1

Housatonic River Project
EE/CA PCB Analytical Results

Transect ID					
Location ID	BS000138	BS000138	BS000139	BS000139	BS000139
Field Sample ID	H2-BS000138-0-0030	H2-BS000138-0-0040	H2-BS000139-0-0030	H2-BS000139-0-0040	H2-BS000139-0-0050
Date Collected	12/21/1999	12/21/1999	12/21/1999	12/21/1999	12/21/1999
Depth	3.0-3.5	4.0-4.5	3.0-3.5	4.0-4.5	5.0-5.5
Source	EPA_COE	EPA_COE	EPA_COE	EPA_COE	EPA_COE
Analyte					
PCBS					
AROCLOR-1248 (mg/kg)	.5 U	.501 U	.501 U	.502 U	.502 U
AROCLOR-1254 (mg/kg)	.5 U	.501 U	.501 U	.502 U	.502 U
AROCLOR-1260 (mg/kg)	.5 U	.501 U	.501 U	.502 U	.502 U
PCB, TOTAL (mg/kg)	.5 U	.501 U	.501 U	.502 U	.502 U

U = Not detected at reported value.
J = Estimated detected value.

Table 6.1-2

Summary of Total PCB Results
Supplemental Residential Riverbank Soil Samples
EE/CA Reach of the Housatonic River
Pittsfield, Massachusetts

Depth Interval (ft below grade surface)	Number of Samples	Number of Samples Exceeding Cleanup Goal of 2 ppm	Average Total PCB Concentration (ppm)
0.0 – 0.5	30	29	46.0
1.0 – 1.5	31	30	131.1
2.0 – 2.5	28	27	147.4
3.0 – 3.5	35	24	29.9
4.0 – 4.5	34	24	14.5
5.0 – 5.5	29	17	14.5
All Depths	187	151	61.7

Table 6.1-3

Total PCB by Depth and Required Excavation Depth

Location ID	Depth Interval	Total PCB (ppm)	Replace 3-4 ft Interval	Replace 3-5 ft Interval	Required Depth to Reach Revised Cleanup Criteria
BS000103	3-3.5	17.3	0.6	0.6	
	4-4.5	14.7	14.7	0.6	
	5-5.5	14.8	14.8	14.8	
	Avg	15.6	10.0	5.3	4
BS000104	3-3.5	31.8	0.6	0.6	
	4-4.5	14.2	14.2	0.6	
	5-5.5	0.8	0.8	0.8	
	Avg	15.6	5.2	0.7	4
BS000105	3-3.5	69.6	0.6	0.6	
	4-4.5	42.9	42.9	0.6	
	5-5.5	77.3	77.3	77.3	
	Avg	63.3	40.3	26.2	6
BS000106	3-3.5	383.0	0.6	0.6	
	4-4.5	53.9	53.9	0.6	
	5-5.5	66.1	66.1	66.1	
	Avg	167.7	40.2	22.4	6
BS000107	3-3.5	60.1	0.6	0.6	
	4-4.5	4.0	4.0	0.6	
	5-5.5	1.9	1.9	1.9	
	Avg	22.0	2.2	1.0	4
BS000108	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	0.4	0.4	0.4	
	Avg	0.5	0.5	0.5	3
BS000109	3-3.5	2.6	0.6	0.6	
	4-4.5	1.1	1.1	0.6	
	5-5.5	1.4	1.4	1.4	
	Avg	1.7	1.0	0.9	3
BS000110	3-3.5	53.4	0.6	0.6	
	4-4.5	7.9	7.9	0.6	
	5-5.5	13.0	13.0	13.0	
	Avg	24.8	7.2	4.7	4

Table 6.1-3

Total PCB by Depth and Required Excavation Depth (Continued)

Location ID	Depth Interval	Total PCB (ppm)	Replace 3-4 ft Interval	Replace 3-5 ft Interval	Required Depth to Reach Revised Cleanup Criteria
BS000111	3-3.5	54.8	0.6	0.6	
	4-4.5	33.4	33.4	0.6	
	5-5.5	20.6	20.6	20.6	
	Avg	36.3	18.2	7.3	5
BS000112	3-3.5	20.2	0.6	0.6	
	4-4.5	1.0	1.0	0.6	
	5-5.5	2.2	2.2	2.2	
	Avg	7.8	1.3	1.1	3
BS000113	3-3.5	0.5	0.6	0.6	
	4-4.5	15.5	15.5	0.6	
	5-5.5	42.5	42.5	42.5	
	Avg	19.5	19.5	14.6	6
BS000114	3-3.5	0.8	0.6	0.6	
	4-4.5	2.4	2.4	0.6	
	5-5.5	7.2	7.2	7.2	
	Avg	3.4	3.4	2.8	3
BS000115	3-3.5	58.6	0.6	0.6	
	4-4.5	32.3	32.3	0.6	
	5-5.5	4.4	4.4	4.4	
	Avg	31.8	12.4	1.9	5
BS000116	3-3.5	83.1	0.6	0.6	
	4-4.5	18.6	18.6	0.6	
	5-5.5	62.4	62.4	62.4	
	Avg	54.7	27.2	21.2	6
BS000117	3-3.5	29.7	0.6	0.6	
	4-4.5	2.4	2.4	0.6	
	5-5.5	1.4	1.4	1.4	
	Avg	11.2	1.5	0.9	4
BS000118	3-3.5	3.7	0.6	0.6	
	4-4.5	6.8	6.8	0.6	
	5-5.5	1.4	1.4	1.4	
	Avg	4.0	3.0	0.9	3

Table 6.1-3

Total PCB by Depth and Required Excavation Depth (Continued)

Location ID	Depth Interval	Total PCB (ppm)	Replace 3-4 ft Interval	Replace 3-5 ft Interval	Required Depth to Reach Revised Cleanup Criteria
BS000119	3-3.5	1.4	0.6	0.6	
	4-4.5	6.0	6.0	0.6	
	5-5.5	5.5	5.5	5.5	
	Avg	4.3	4.0	2.2	3
BS000120	3-3.5	2.6	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	1.8	1.8	1.8	
	Avg	1.6	1.0	1.0	3
BS000121	3-3.5	16.5	0.6	0.6	
	4-4.5	5.3	5.3	0.6	
	5-5.5	2.3	2.3	2.3	
	Avg	8.0	2.7	1.2	3
BS000122	3-3.5	3.9	0.6	0.6	
	4-4.5	5.9	5.9	0.6	
	5-5.5	9.0	9.0	9.0	
	Avg	6.3	5.2	3.4	3
BS000123	3-3.5	0.5	0.6	0.6	
	4-4.5	No sample*	No sample*	0.6	
	5-5.5	No sample*	No sample*	No sample*	
	Avg	0.5	0.6	0.6	3
BS000124	3-3.5	6.3	0.6	0.6	
	4-4.5	2.1	2.1	0.6	
	5-5.5	No sample*	No sample*	No sample*	
	Avg	4.8	1.4	0.6	3
BS000125	3-3.5	11.4	0.6	0.6	
	4-4.5	19.8	19.8	0.6	
	5-5.5	3.6	3.6	3.6	
	Avg	11.6	8.0	1.6	4
BS000126	3-3.5	3.7	0.6	0.6	
	4-4.5	2.5	2.5	0.6	
	5-5.5	0.9	0.9	0.9	
	Avg	2.3	1.3	0.7	3

Table 6.1-3

Total PCB by Depth and Required Excavation Depth (Continued)

Location ID	Depth Interval	Total PCB (ppm)	Replace 3-4 ft Interval	Replace 3-5 ft Interval	Required Depth to Reach Revised Cleanup Criteria
BS000127	3-3.5	77.8	0.6	0.6	
	4-4.5	9.6	9.6	0.6	
	5-5.5	12.4	12.4	12.4	
	Avg	33.3	7.5	4.5	4
BS000128	3-3.5	32.8	0.6	0.6	
	4-4.5	36.9	36.9	0.6	
	5-5.5	23.4	23.4	23.4	
	Avg	31.0	20.3	8.2	5
BS000129	3-3.5	12.4	0.6	0.6	
	4-4.5	4.2	4.2	0.6	
	5-5.5	1.6	1.6	1.6	
	Avg	6.1	2.2	0.9	3
BS000130	3-3.5	16.2	0.6	0.6	
	4-4.5	67.0	67.0	0.6	
	5-5.5	32.2	32.2	32.2	
	Avg	38.5	33.3	11.1	6
BS000131	3-3.5	3.2	0.6	0.6	
	4-4.5	7.9	7.9	0.6	
	5-5.5	No sample*	No sample*	No sample*	
	Avg	5.6	4.3	0.6	3
BS000132	3-3.5	30.0	0.6	0.6	
	4-4.5	90.2	90.2	0.6	
	5-5.5	9.5	9.5	9.5	
	Avg	43.2	33.4	3.6	5
BS000133	3-3.5	0.3	0.6	0.6	
	4-4.5	0.3	0.3	0.6	
	5-5.5	0.5	0.5	0.5	
	Avg	0.4	0.5	0.6	3
BS000134	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	0.5	0.5	0.5	
	Avg	0.5	0.5	0.6	3

Table 6.1-3

Total PCB by Depth and Required Excavation Depth (Continued)

Location ID	Depth Interval	Total PCB (ppm)	Replace 3-4 ft Interval	Replace 3-5 ft Interval	Required Depth to Reach Revised Cleanup Criteria
BS000136	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	0.5	0.5	0.5	
	Avg	0.5	0.5	0.6	3
BS000137	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	0.4	0.4	0.4	
	Avg	0.5	0.5	0.5	3
BS000138	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	No sample*	No sample*	No sample*	
	Avg	0.5	0.6	0.6	3
BS000139	3-3.5	0.5	0.6	0.6	
	4-4.5	0.5	0.5	0.6	
	5-5.5	0.5	0.5	0.5	
	Avg	0.5	0.5	0.6	3

* No sample due to refusal of equipment.

Table 6.2-1

List of Evaluation Criteria

Effectiveness ▪ Overall Protection of Human Health and the Environment ▪ Compliance with ARARs ▪ Long-Term Effectiveness and Permanence ▪ Reduction of Toxicity, Mobility, or Volume Through Treatment ▪ Short-Term Effectiveness
Implementability ▪ Technical Feasibility ▪ Availability of Services and Materials ▪ Administrative Feasibility ▪ State Acceptance ▪ Community Acceptance
Cost ▪ Direct Capital Costs ▪ Indirect Capital Costs ▪ Annual Costs

SECTION 1

FIGURES

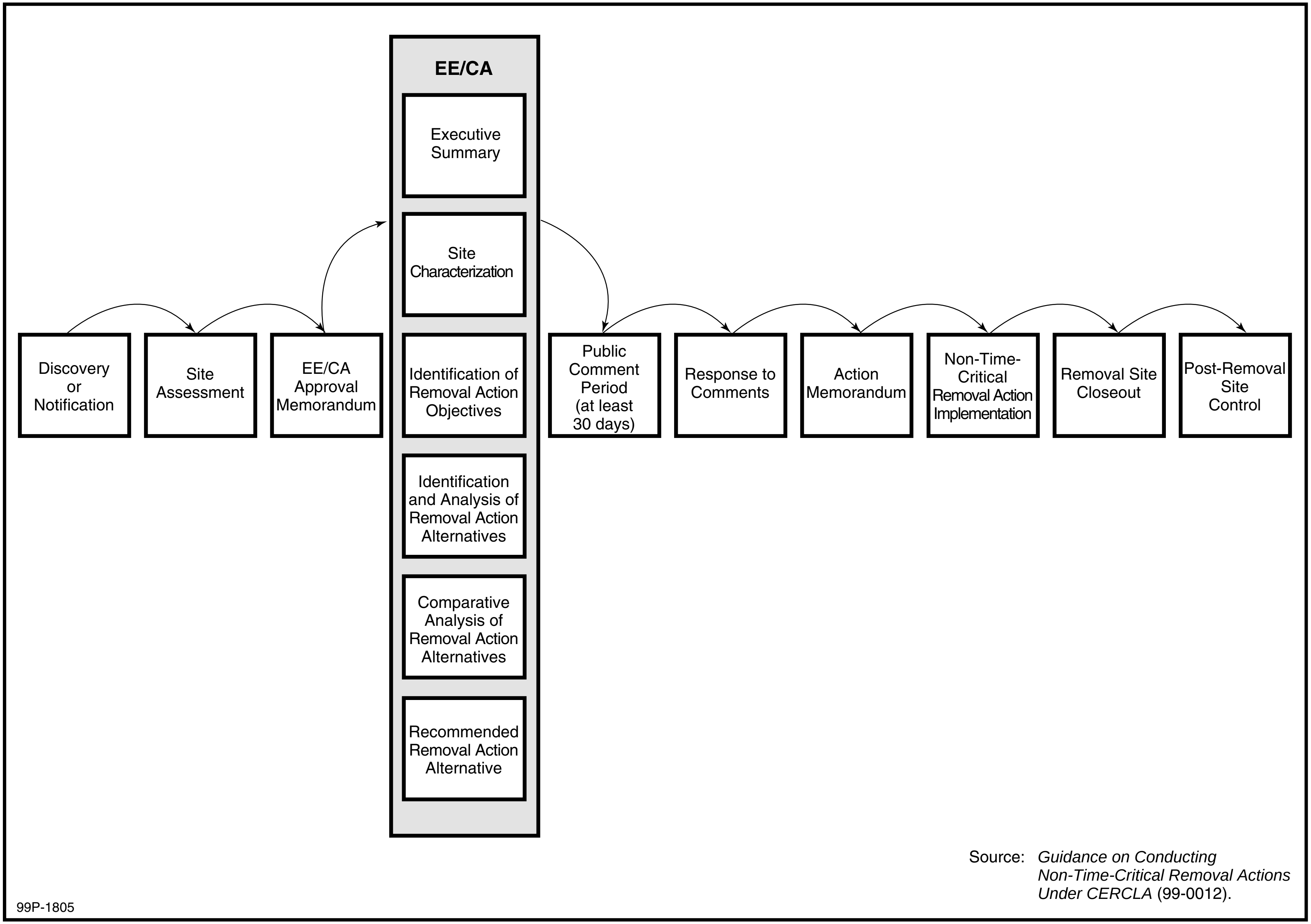
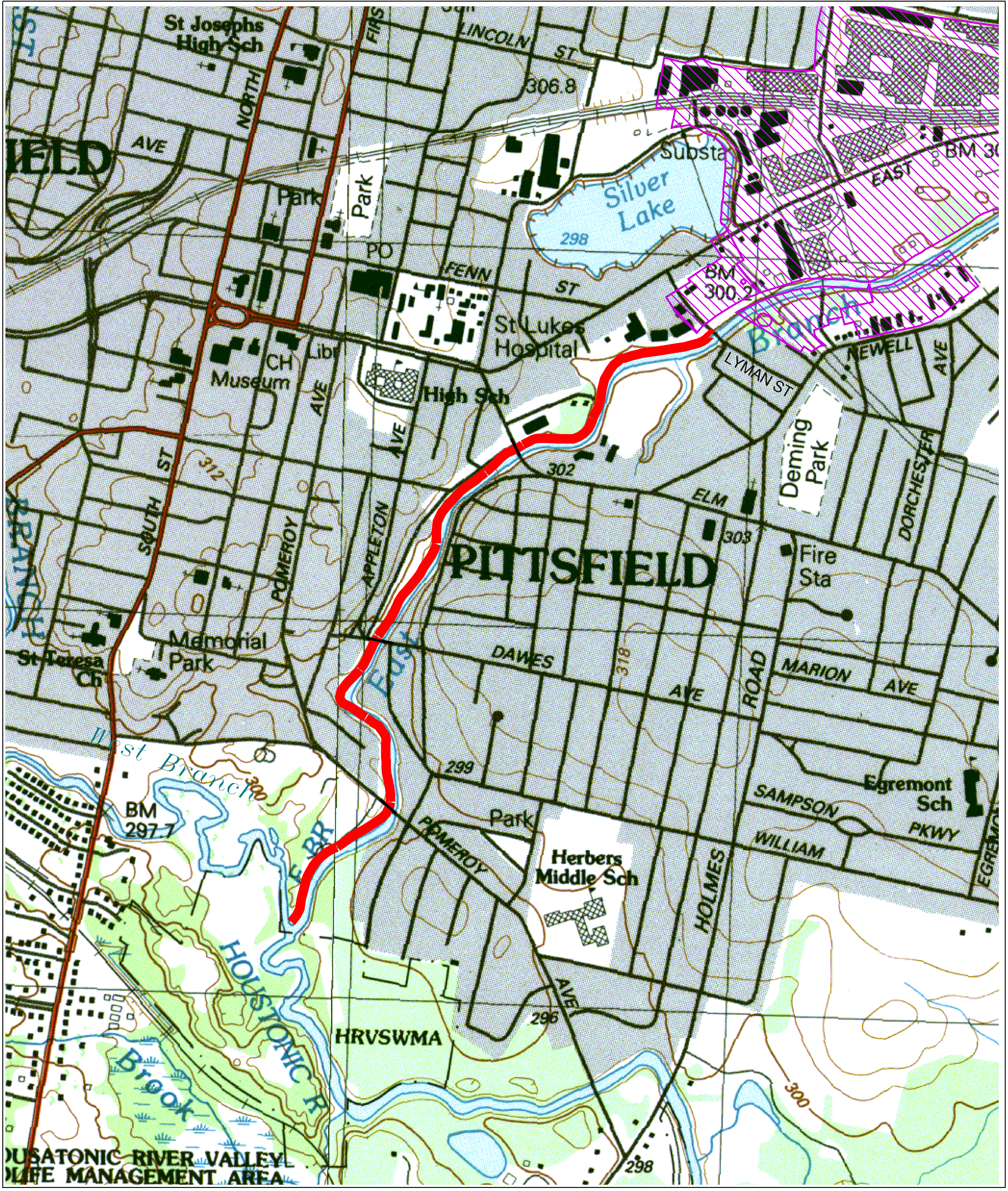


FIGURE 1.1-1 EE/CA DEVELOPMENT PROCESS

SECTION 2

FIGURES



LEGEND:

EE/CA Reach

GE Facility

NOTE: Base features derived from USGS Pittsfield East and West 1:24,000 quadrangles.

N

Scale In Feet

600 0 600 1200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

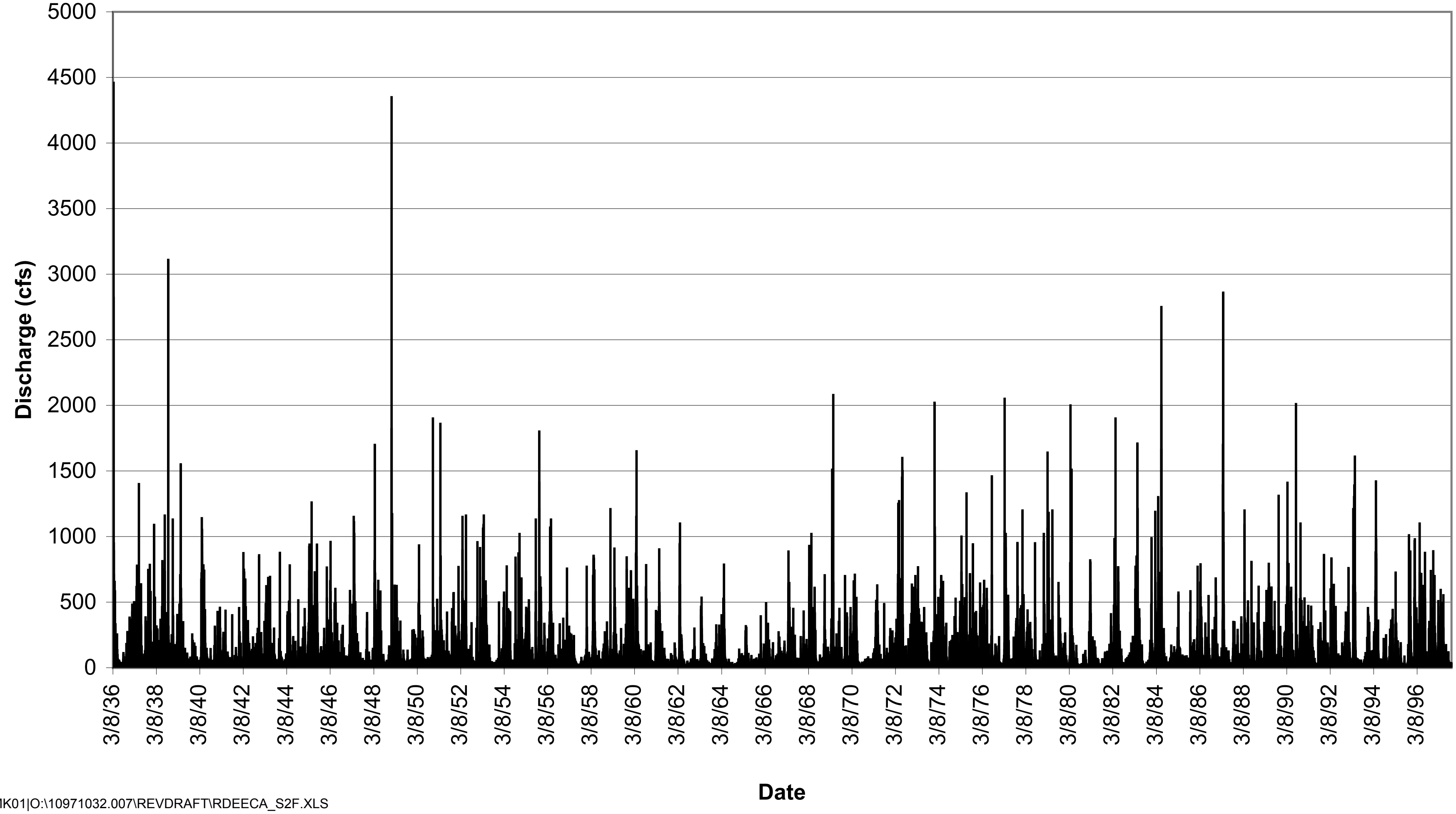
FIGURE 2.1-1
LOCATION MAP

| o:\gepitt\aprs\eeca_region.apr | layout-eeca_loc | o:\gepitt\epsfiles\in\eeca_loc.eps | 5:41 PM, 8/16/1999 |

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.1-2
SUBREACH LOCATION MAP

Figure 2.1-3
Average Daily Discharge: 1936-1996
Housatonic River, Coltsville Station



MK01|O:\10971032.007\REVDRAFT\RDEECA_S2F.XLS

Figure 2.1-4
Annual Peak Discharge: 1936-1996
Houstonic River, Coltsville Station

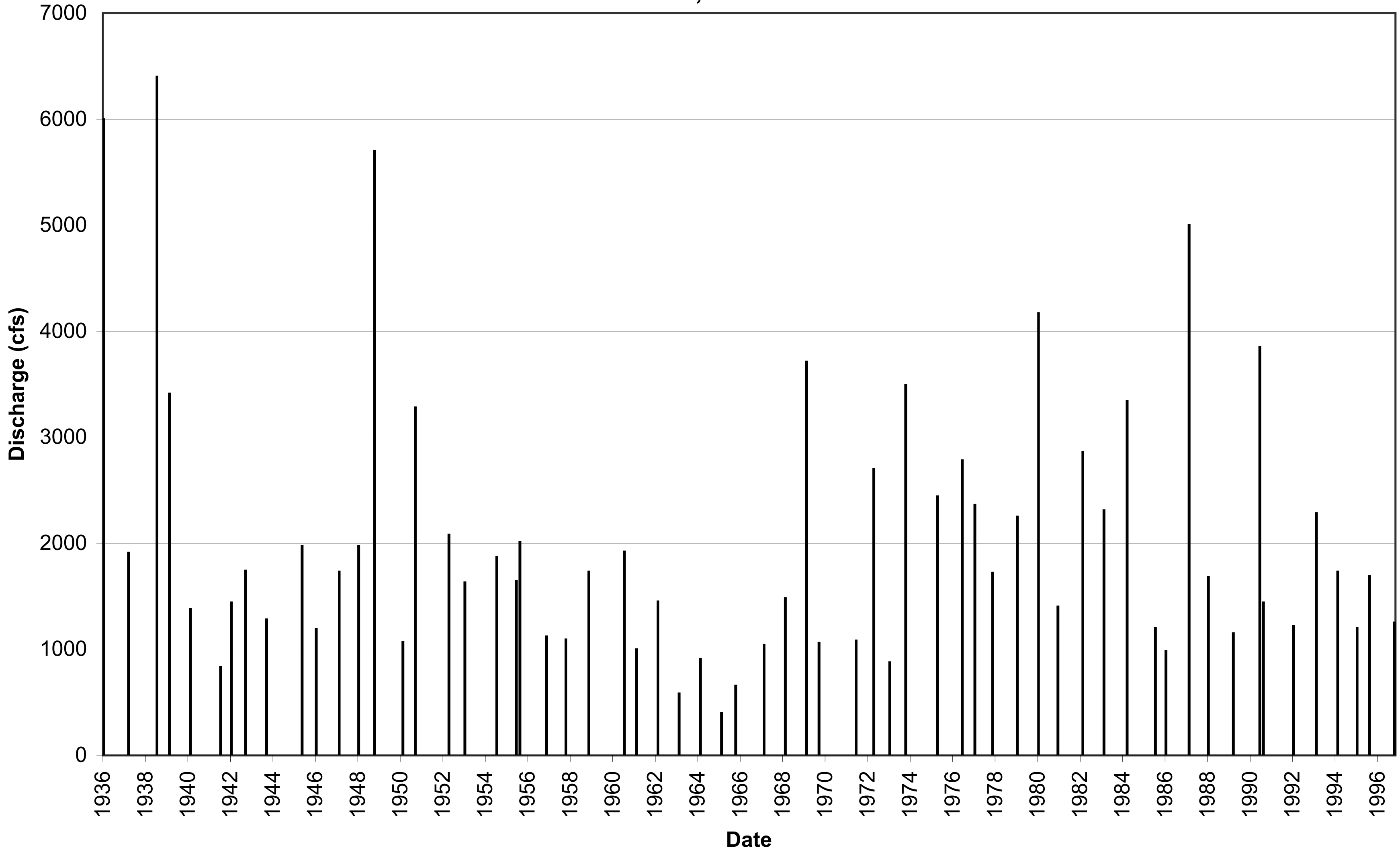
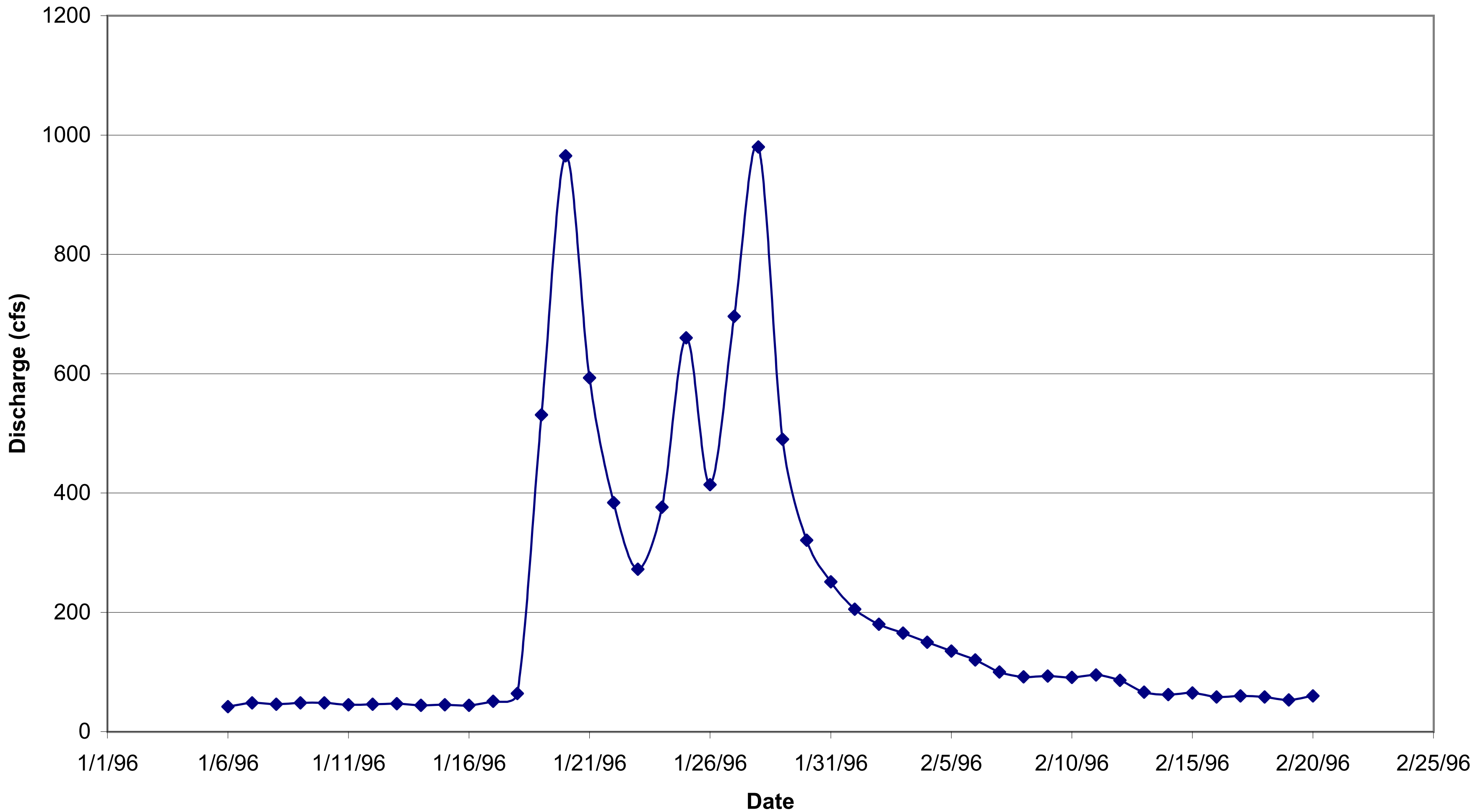
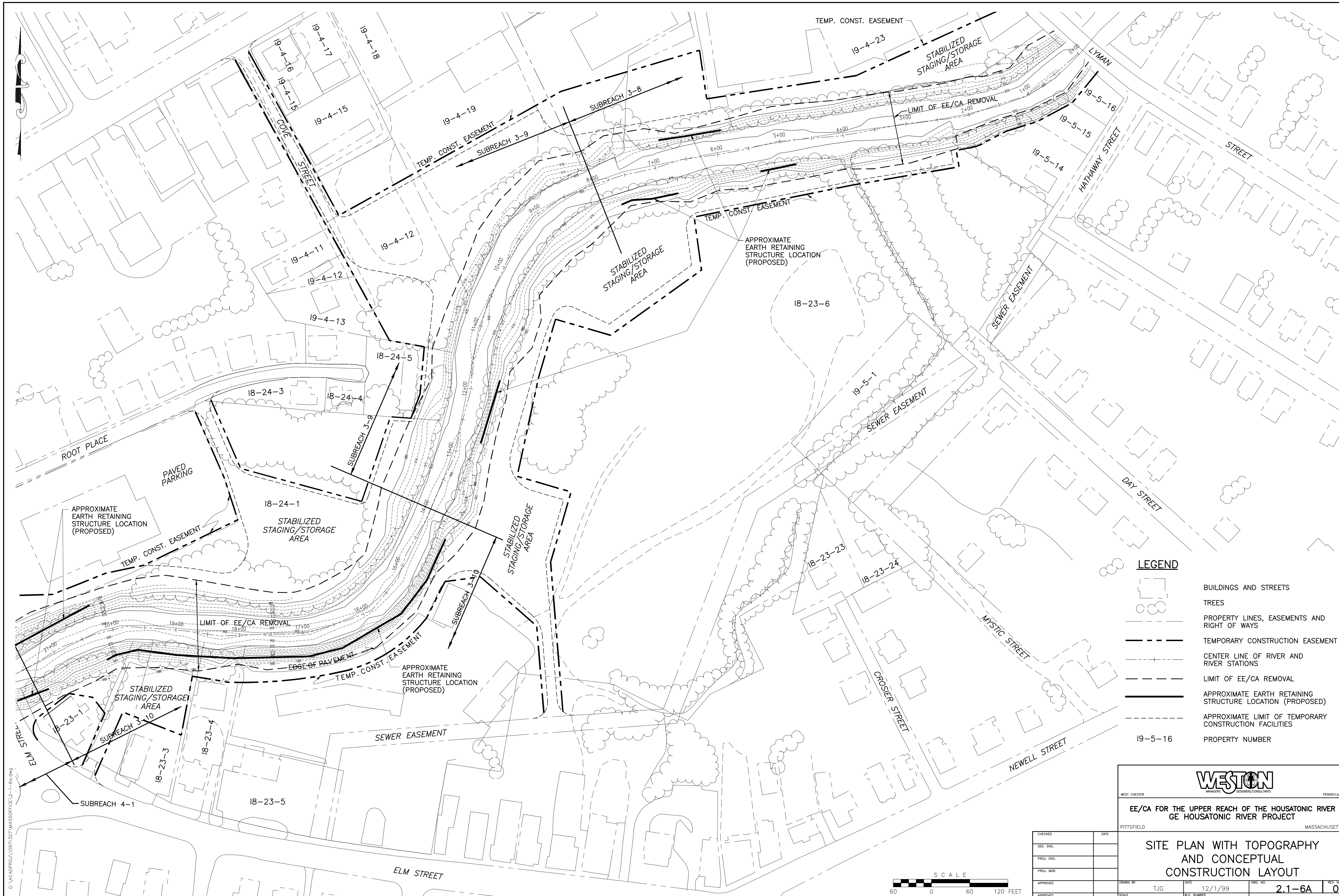


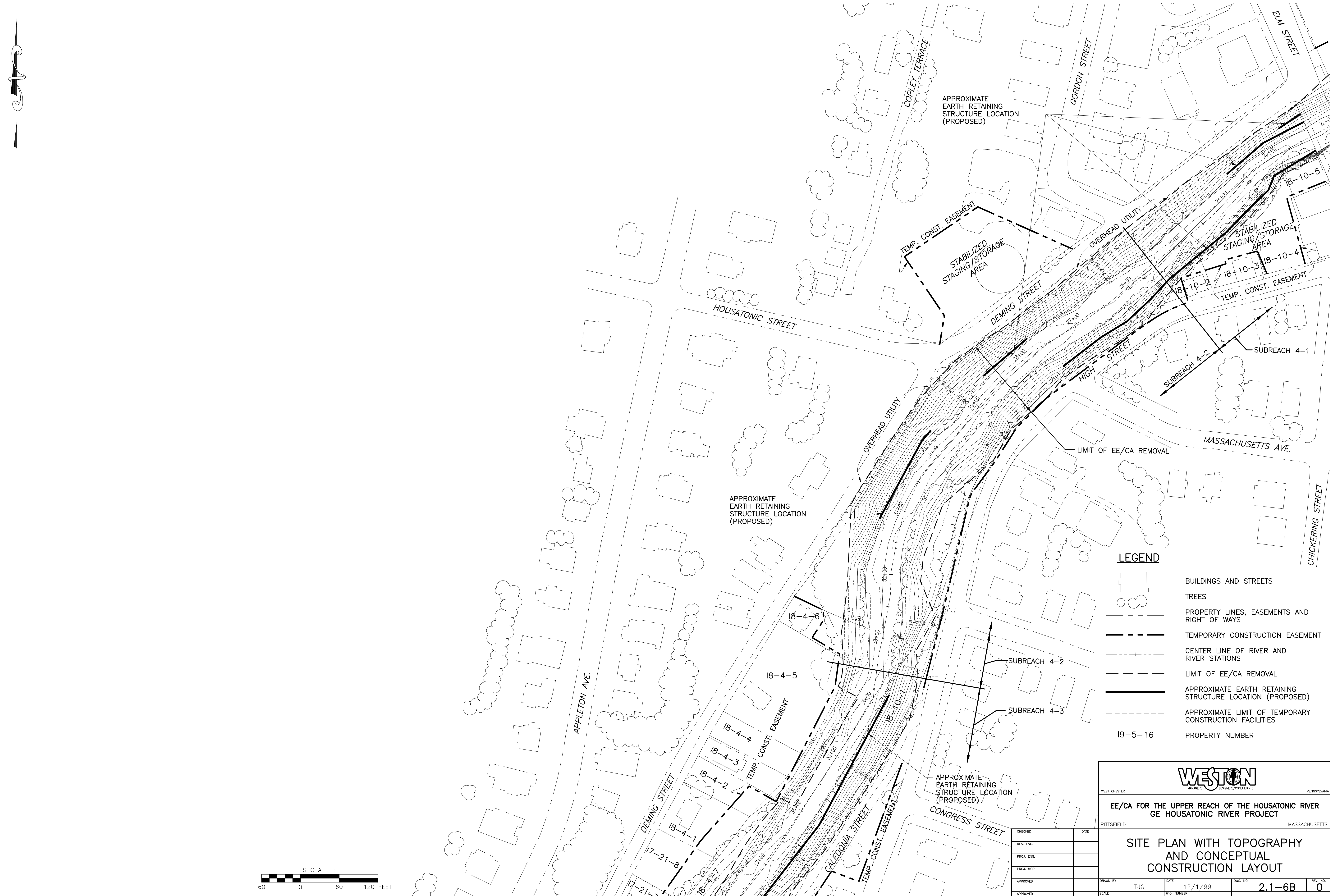
Figure 2.1-5
Response to Precipitation
Housatonic River, Coltsville Station



MK01|O:\10971032.007\REVDRAFT\RDEECA_S2F.XLS



TEMP. CONST. EASEMENT
STABILIZED STAGING/STORAGE AREA
LIMIT OF EE/CA REMOVAL
SUBREACH 3-8
SUBREACH 3-9
SUBREACH 3-10
SUBREACH 4-1
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
EDGE OF PAVEMENT
PAVED PARKING
COVE STREET
ROOT PLACE
LYMAN STREET
HATHAWAY STREET
SEWER EASEMENT
DAY STREET
MYSTIC STREET
CROSIER STREET
NEWELL STREET
ELM STREET
19-4-23
19-4-18
19-4-17
19-4-16
19-4-15
19-4-19
19-4-12
19-4-11
19-4-13
19-5-16
19-5-15
19-5-14
19-5-1
18-23-6
18-24-5
18-24-3
18-24-4
18-24-1
18-23-23
18-23-24
18-23-1
18-23-3
18-23-4
18-23-5
LEGEND
BUILDINGS AND STREETS
TREES
PROPERTY LINES, EASEMENTS AND RIGHT OF WAYS
TEMPORARY CONSTRUCTION EASEMENT
CENTER LINE OF RIVER AND RIVER STATIONS
LIMIT OF EE/CA REMOVAL
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
APPROXIMATE LIMIT OF TEMPORARY CONSTRUCTION FACILITIES
19-5-16 PROPERTY NUMBER
SCALE
60 0 60 120 FEET
WESTON
WEST CHESTER PENNSYLVANIA
EE/CA FOR THE UPPER REACH OF THE HOUSATONIC RIVER
GE HOUSATONIC RIVER PROJECT
PITTSFIELD MASSACHUSETTS
SITE PLAN WITH TOPOGRAPHY AND CONCEPTUAL CONSTRUCTION LAYOUT
DRAWN BY TJG
DATE 12/1/99
DWG. NO. 2.1-6A
REV. NO. 0
SCALE 1"=60'
SHEET 1 OF 4



WESTON
MANAGERS DESIGNERS/CONSULTANTS

WEST CHESTER PENNSYLVANIA

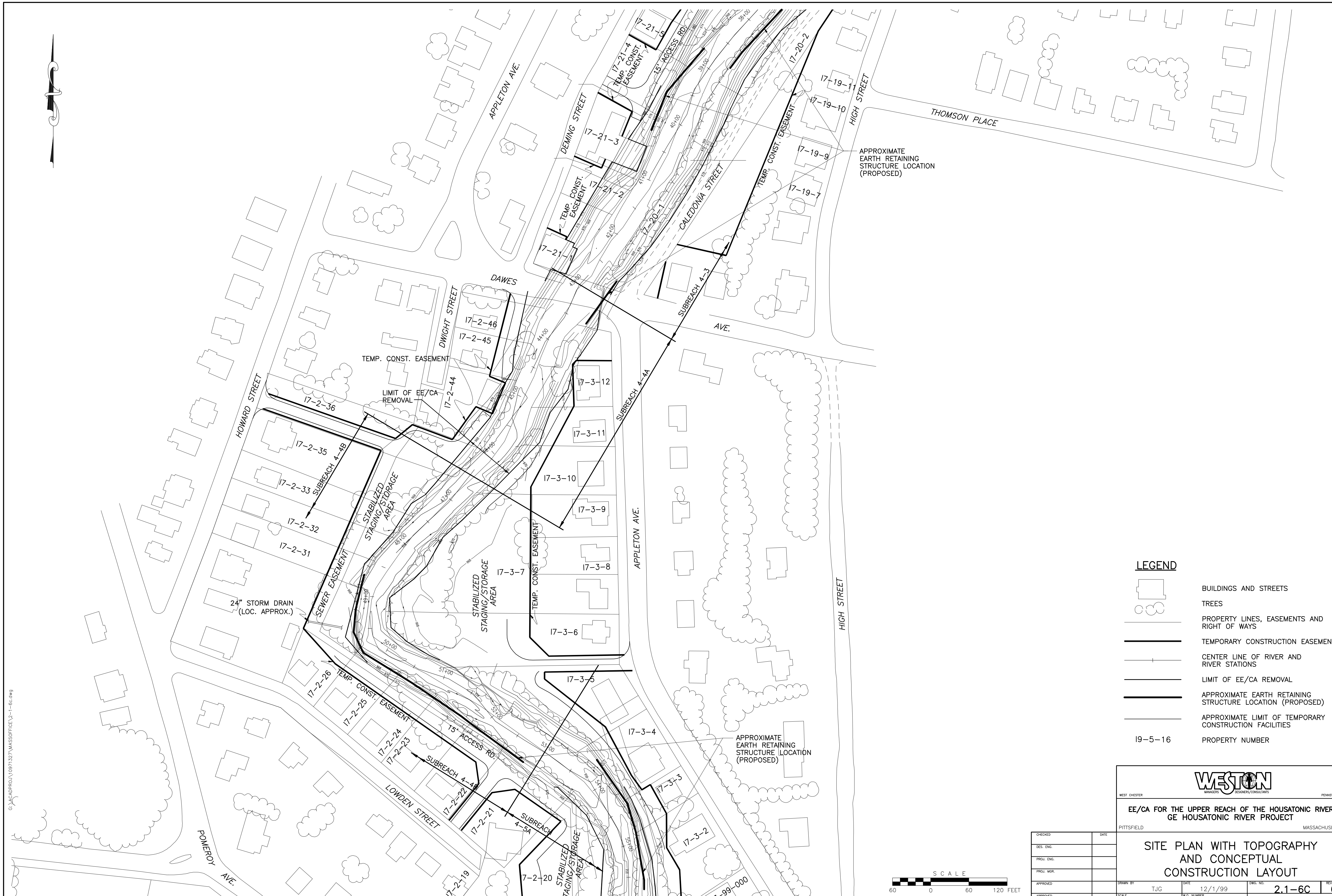
EE/CA FOR THE UPPER REACH OF THE HOUSATONIC RIVER
GE HOUSATONIC RIVER PROJECT

PITTSFIELD MASSACHUSETTS

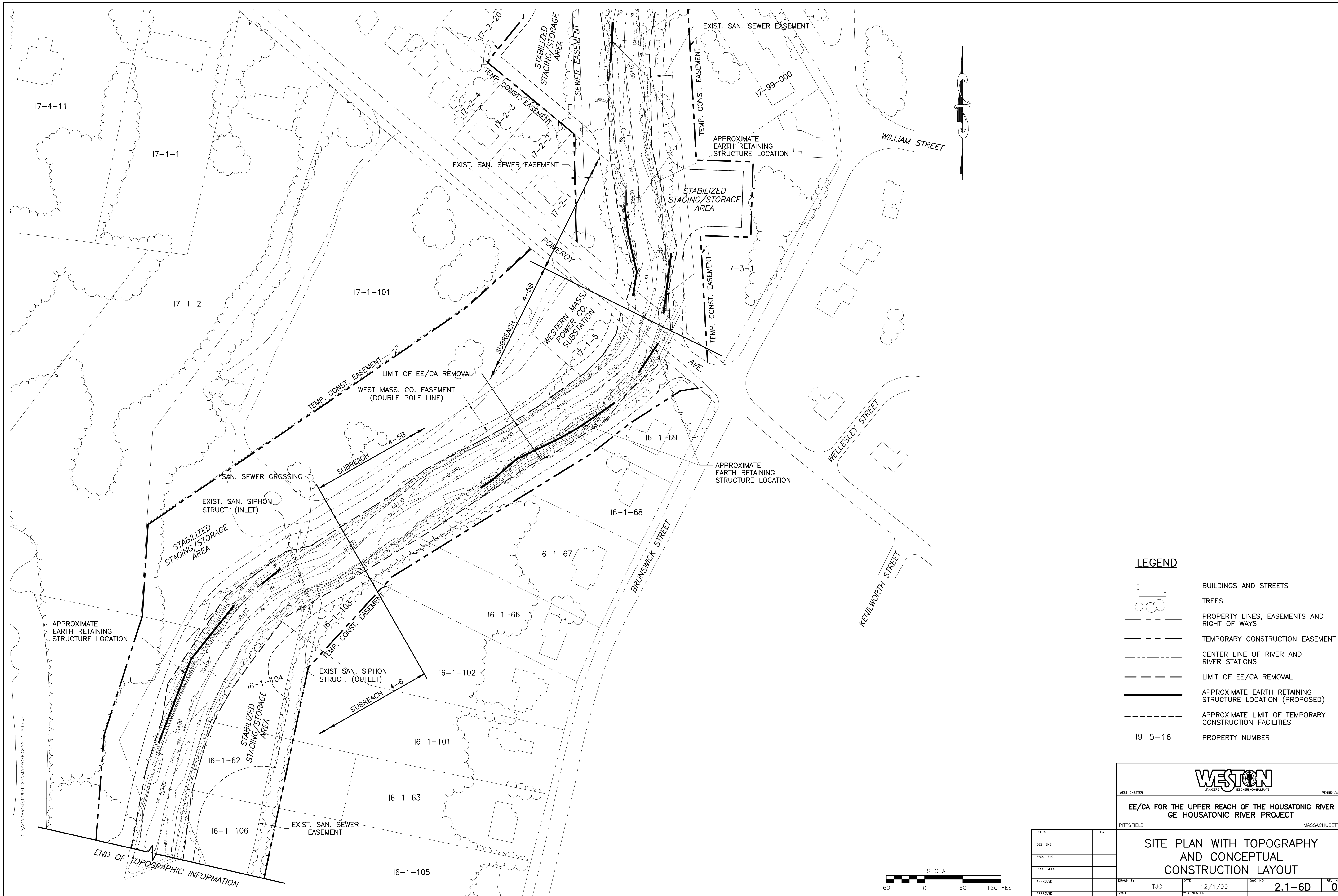
CHECKED		DATE
DES. ENG.		
PROJ. ENG.		
PROJ. MGR.		
APPROVED		
APPROVED		

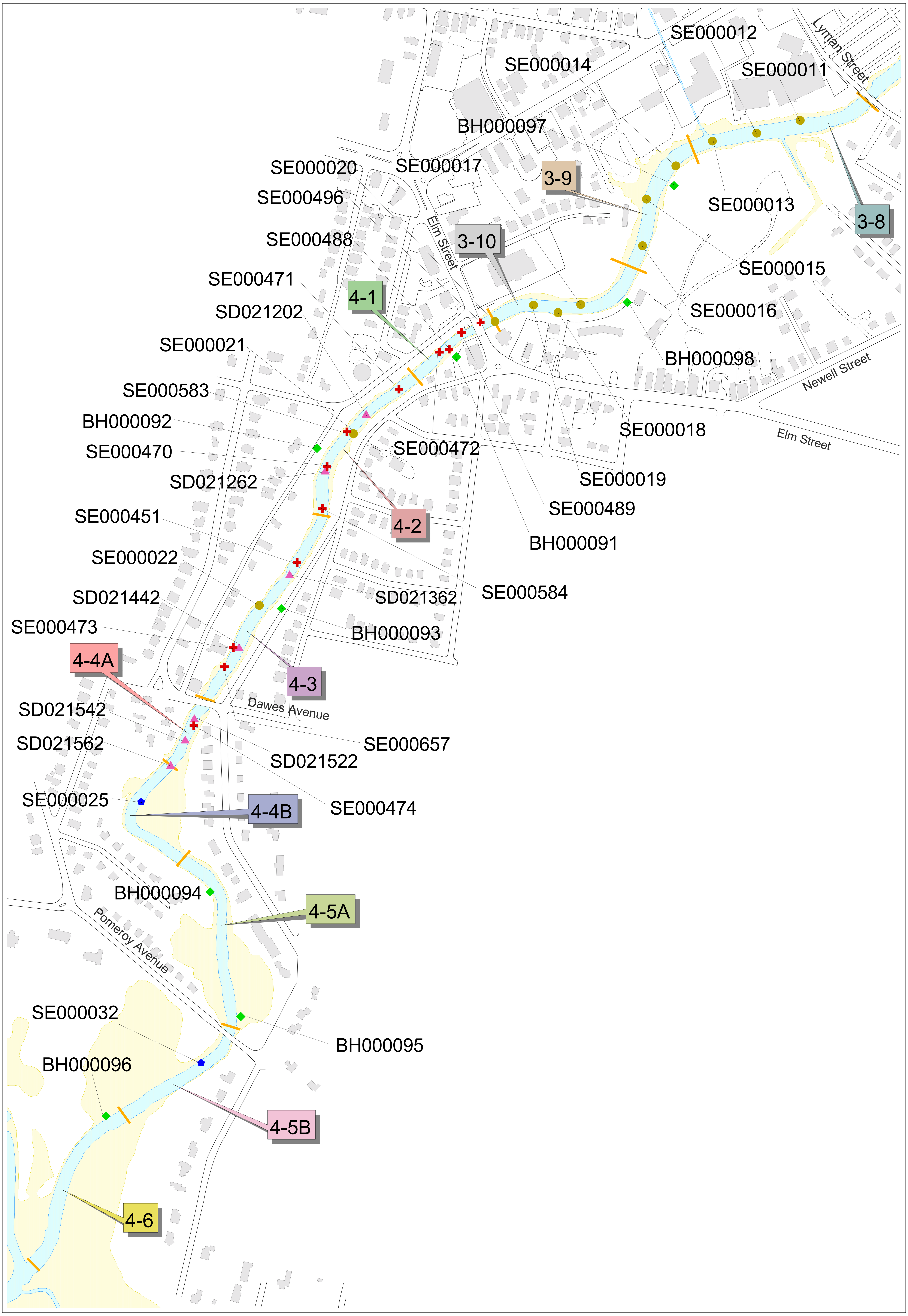
SITE PLAN WITH TOPOGRAPHY AND CONCEPTUAL CONSTRUCTION LAYOUT

DRAWN BY	DATE	DWG. NO.	REV. NO.
TJG	12/1/99	2.1-6B	0
SCALE 1"=60'	W.O. NUMBER	SHEET 2 OF 4	



APPLETON AVE.
DEMING STREET
15' ACCESS RD.
TEMP. CONST. EASEMENT
I7-21-4
I7-21-3
I7-21-2
I7-21-1
I7-20-1
I7-20-2
CALEDONIA STREET
HIGH STREET
THOMSON PLACE
I7-19-11
I7-19-10
I7-19-9
I7-19-7
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
DAWES AVE.
DWIGHT STREET
I7-2-46
I7-2-45
I7-2-44
TEMP. CONST. EASEMENT
LIMIT OF EE/CA REMOVAL
SUBREACH 4-3
SUBREACH 4-4A
SUBREACH 4-4B
I7-3-12
I7-3-11
I7-3-10
I7-3-9
I7-3-8
I7-3-7
I7-3-6
I7-3-5
I7-3-4
I7-3-3
I7-3-2
HOWARD STREET
I7-2-36
I7-2-35
I7-2-33
I7-2-32
I7-2-31
STABILIZED STAGING/STORAGE AREA
SEWER EASEMENT
24" STORM DRAIN (LOC. APPROX.)
I7-2-26
I7-2-25
I7-2-24
I7-2-23
I7-2-22
I7-2-21
I7-2-20
I7-2-19
SUBREACH 4-4C
SUBREACH 4-5A
LOWDEN STREET
POMEROY AVE.
I7-99-000
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
LEGEND
BUILDINGS AND STREETS
TREES
PROPERTY LINES, EASEMENTS AND RIGHT OF WAYS
TEMPORARY CONSTRUCTION EASEMENT
CENTER LINE OF RIVER AND RIVER STATIONS
LIMIT OF EE/CA REMOVAL
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
APPROXIMATE LIMIT OF TEMPORARY CONSTRUCTION FACILITIES
I9-5-16 PROPERTY NUMBER
SCALE
60 0 60 120 FEET
WESTON
WEST CHESTER PENNSYLVANIA
EE/CA FOR THE UPPER REACH OF THE HOUSATONIC RIVER
GE HOUSATONIC RIVER PROJECT
PITTSFIELD MASSACHUSETTS
SITE PLAN WITH TOPOGRAPHY AND CONCEPTUAL CONSTRUCTION LAYOUT
DRAWN BY TJG
DATE 12/1/99
DWG. NO. 2.1-6C
REV. NO. 0
SCALE 1"=60'
SHEET 3 OF 4


EXIST. SAN. SEWER EASEMENT
STABILIZED STAGING/STORAGE AREA
SEWER EASEMENT
TEMP. CONST. EASEMENT
I7-2-20
I7-2-4
I7-2-3
I7-2-2
I7-2-1
I7-99-000
I7-4-11
I7-1-1
I7-1-2
I7-1-101
I7-3-1
I7-1-5
WILLIAM STREET
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION
EXIST. SAN. SEWER EASEMENT
STABILIZED STAGING/STORAGE AREA
POMEROY
AVE.
SUBREACH 4-5B
WESTERN MASS. POWER CO. SUBSTATION
TEMP. CONST. EASEMENT
LIMIT OF EE/CA REMOVAL
WEST MASS. CO. EASEMENT (DOUBLE POLE LINE)
SUBREACH 4-5B
SAN. SEWER CROSSING
EXIST. SAN. SIPHON STRUCT. (INLET)
STABILIZED STAGING/STORAGE AREA
I6-1-69
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION
WELLESLEY STREET
I6-1-68
I6-1-67
BRUNSWICK STREET
KENILWORTH STREET
I6-1-103
I6-1-66
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION
TEMP. CONST. EASEMENT
EXIST SAN. SIPHON STRUCT. (OUTLET)
I6-1-102
I6-1-104
SUBREACH 4-6
STABILIZED STAGING/STORAGE AREA
I6-1-101
I6-1-62
I6-1-63
I6-1-106
EXIST. SAN. SEWER EASEMENT
I6-1-105
END OF TOPOGRAPHIC INFORMATION
LEGEND
BUILDINGS AND STREETS
TREES
PROPERTY LINES, EASEMENTS AND RIGHT OF WAYS
TEMPORARY CONSTRUCTION EASEMENT
CENTER LINE OF RIVER AND RIVER STATIONS
LIMIT OF EE/CA REMOVAL
APPROXIMATE EARTH RETAINING STRUCTURE LOCATION (PROPOSED)
APPROXIMATE LIMIT OF TEMPORARY CONSTRUCTION FACILITIES
I9-5-16 PROPERTY NUMBER
SCALE
60 0 60 120 FEET
WESTON
WEST CHESTER PENNSYLVANIA
EE/CA FOR THE UPPER REACH OF THE HOUSATONIC RIVER
GE HOUSATONIC RIVER PROJECT
PITTSFIELD MASSACHUSETTS
SITE PLAN WITH TOPOGRAPHY AND CONCEPTUAL CONSTRUCTION LAYOUT
DRAWN BY TJG
DATE 12/1/99
SCALE 1"=60'
DWG. NO. 2.1-6D
REV. NO. 0
SHEET 4 OF 4



LEGEND:

- USACE/USEPA Barge Borings
- TCLP Samples
- Geotechnical Borings
- Cobble Test Plot Locations
- DRET, SBLT, Pore Water and Fractionation Samples
- Sub-Reach Divider
- Roads
- 10-year Floodplain
- Surface Hydrology
- Building Footprints

N

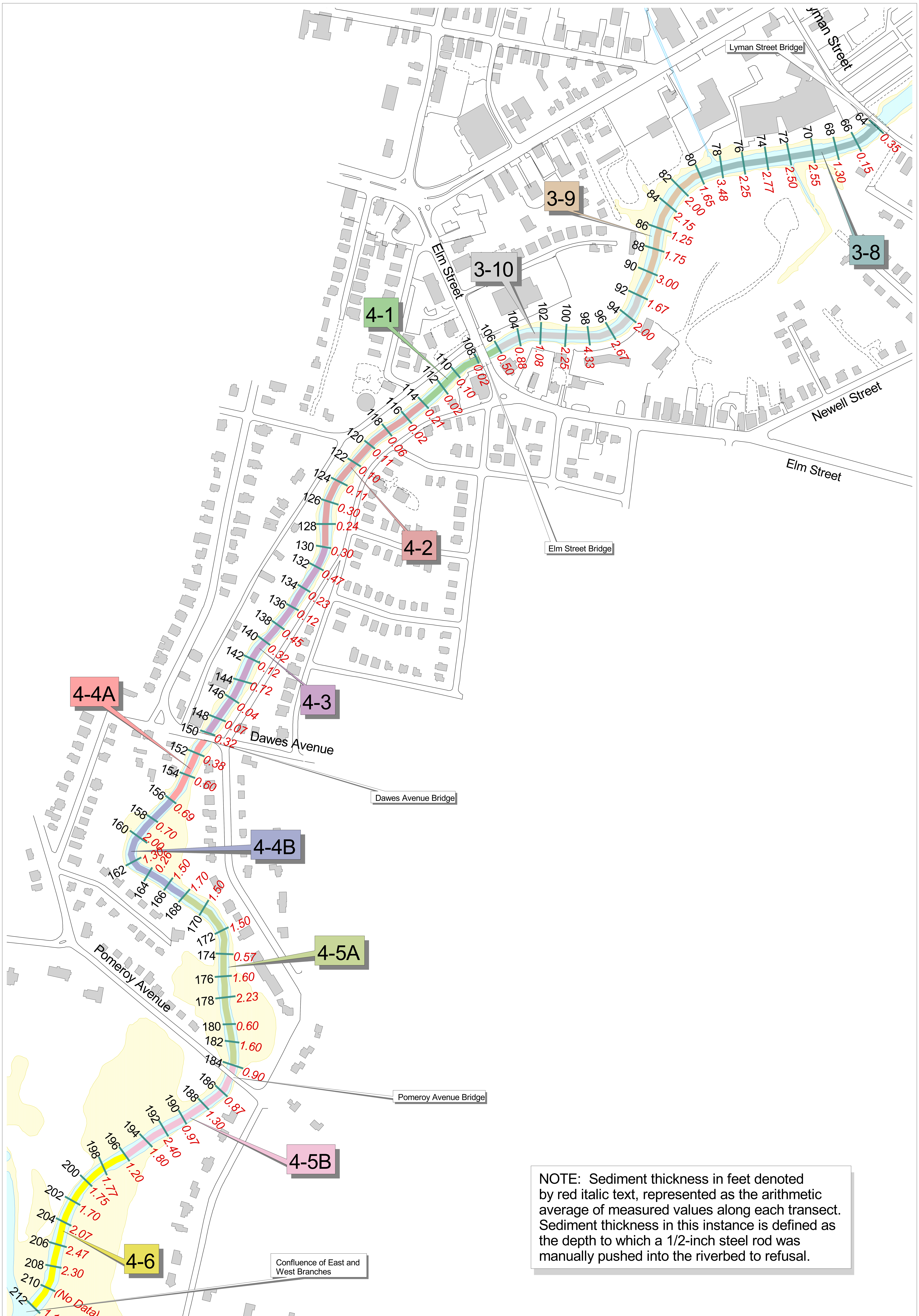
Scale in Feet

200 0 200 400 600

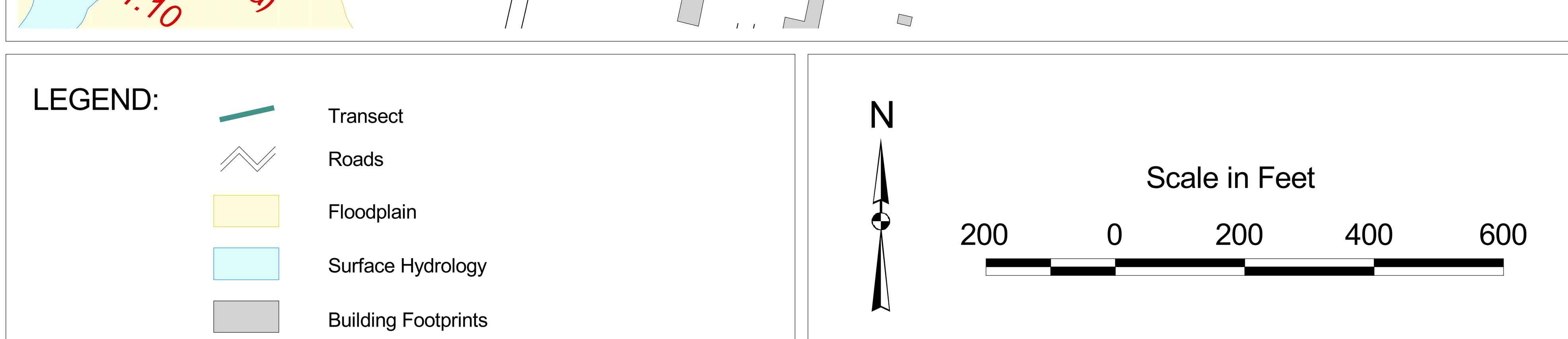
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.1-7
SPECIALTY SAMPLE LOCATIONS

| o:/gepitt/aprs/eeca_sub.apr | layout-EECA_speciality _samples | o:\gepitt\epsfiles\portrait24x36\in\eecaspecialty_samples.eps | 2:12 PM, 11/24/1999 |

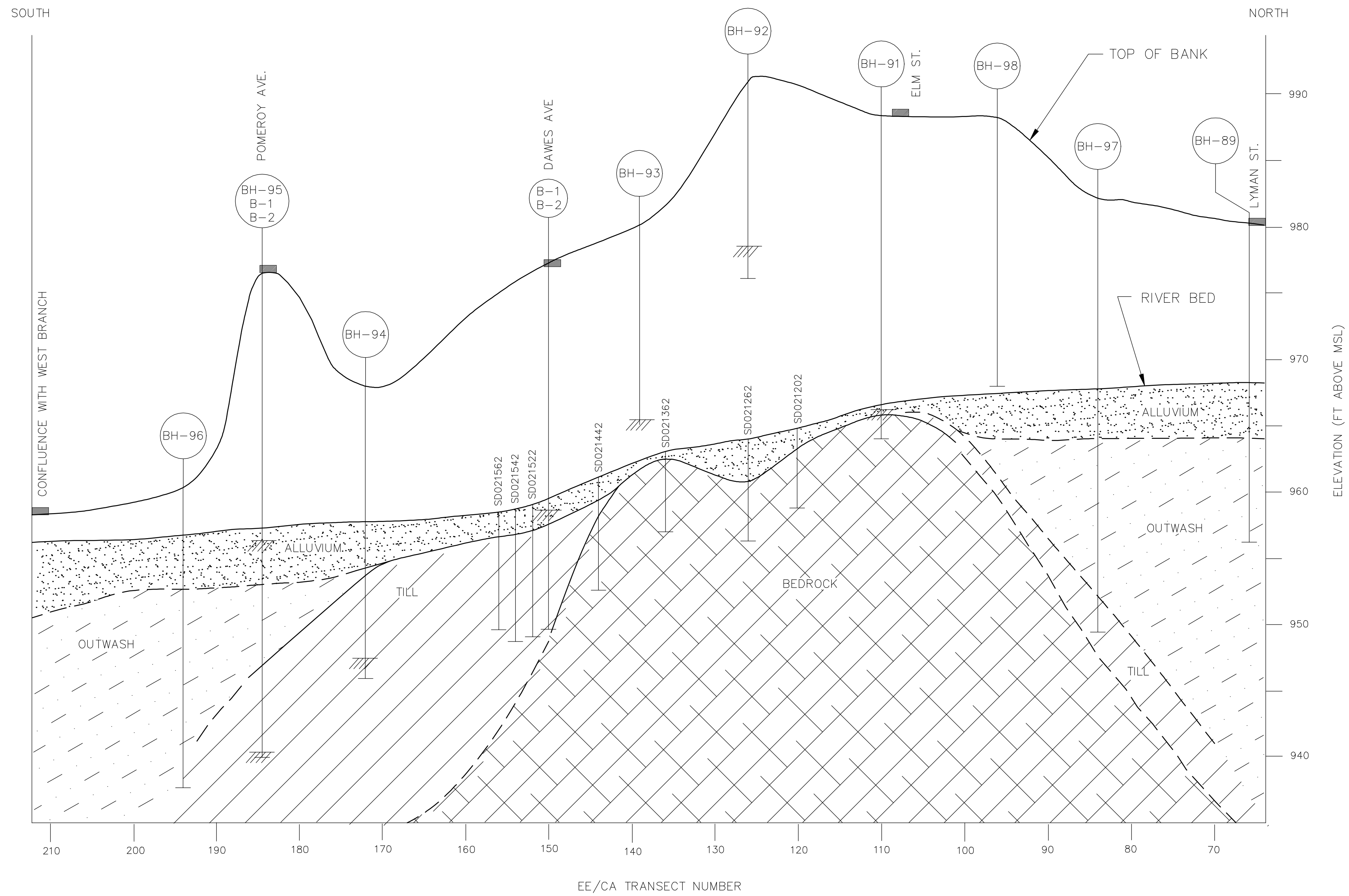


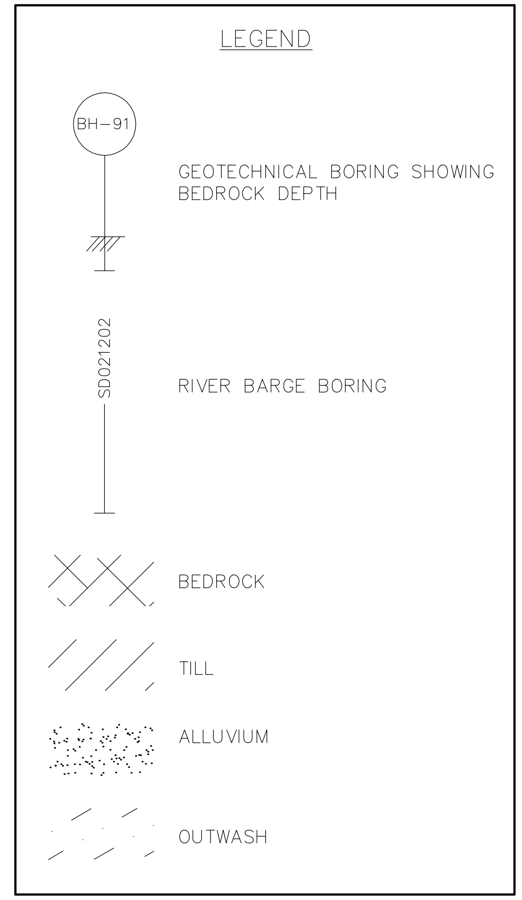
NOTE: Sediment thickness in feet denoted by red italic text, represented as the arithmetic average of measured values along each transect. Sediment thickness in this instance is defined as the depth to which a 1/2-inch steel rod was manually pushed into the riverbed to refusal.



ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.1-8
SEDIMENT THICKNESS





NOTES:

1. CROSS-SECTION LOCATION IS BASED ON RIVER CENTERLINE AS SHOWN ON FIGURES 2.1-6A THROUGH 2.1-6D.
2. TOP OF BANK ELEVATIONS ESTIMATED FROM USACOE TOPOGRAPHIC MAPPING DATA.

HORIZONTAL SCALE 1" = 400'

VERTICAL SCALE 1" = 5'

VERTICAL EXAGGERATION = 80X

FILE NAME: G:\ACADPROJ\10971327\MASSOFFICE\Transect.dwg

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

ENGINEERING EVALUATION/COST ANALYSIS
UPPER REACH OF THE HOUSATONIC RIVER

PITTSFIELD MASSACHUSETTS

WESTON
MANAGERS DESIGNERS/CONSULTANTS

MANCHESTER NEW HAMPSHIRE

CHECKED	DATE	CLIENT APPROVALS	DATE
DES. ENG.			
PROJ. ENG.			
PROJ. MGR.			
APPROVED			
APPROVED		ISSUED FOR	DATE

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

SCHEMATIC GEOLOGICAL CROSS-SECTION OF THE EE/CA REACH

DRAWN	DATE	DWG. NO.	REV. NO.
CDT	JUNE 1999	2.1-9	
SCALE	W.O. NO.	SHT. OF	
AS NOTED	10971-032-007		

LEGEND:

- Roads
- Floodplain
- Surface Hydrology
- Building Footprints

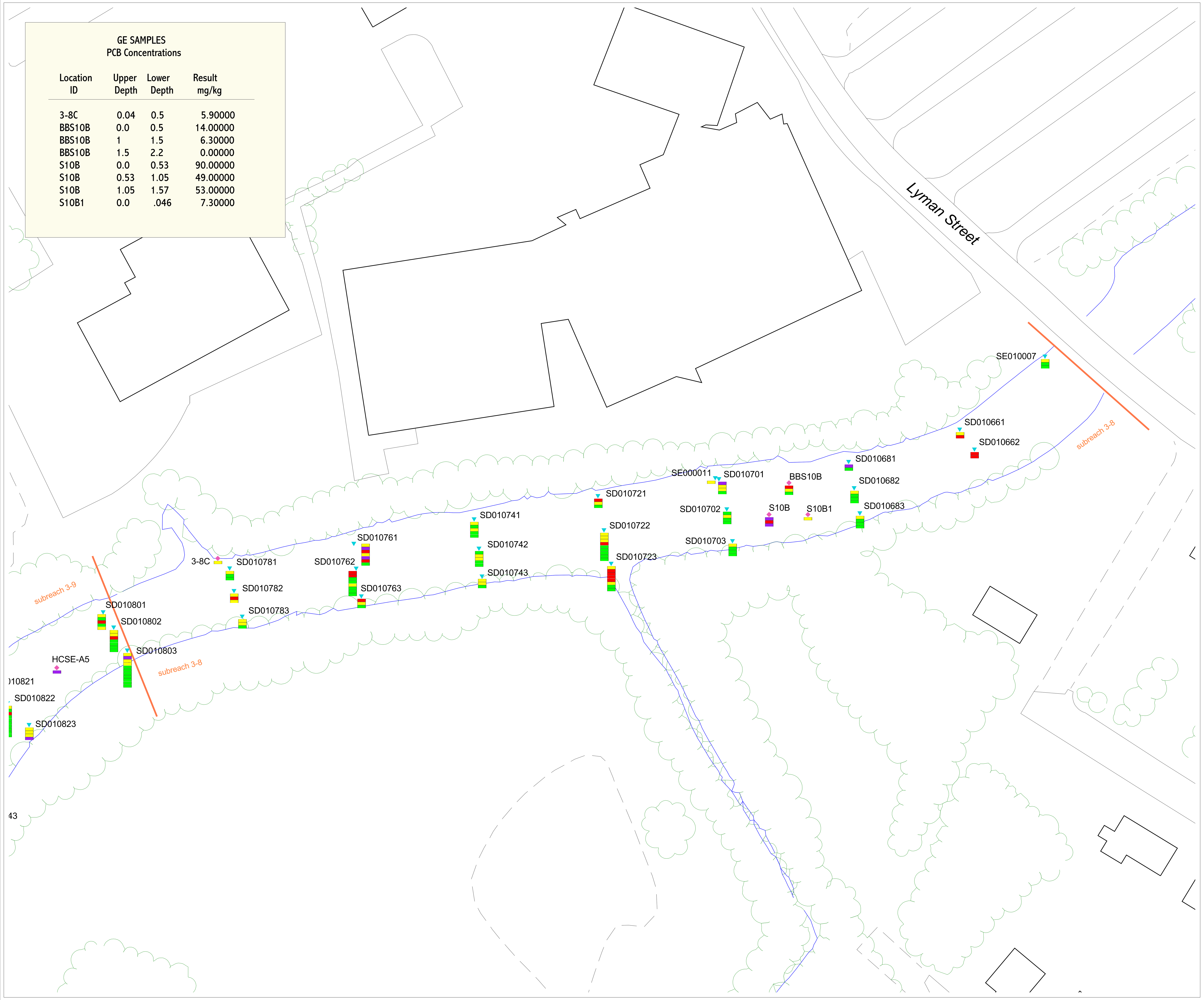
N

Scale in Feet

200 0 200 400 600

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3-1
SOURCE AREAS WITHIN THE EE/CA REACH



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
3-8C	0.04	0.5	5.90000
BBS10B	0.0	0.5	14.00000
BBS10B	1	1.5	6.30000
BBS10B	1.5	2.2	0.00000
S10B	0.0	0.53	90.00000
S10B	0.53	1.05	49.00000
S10B	1.05	1.57	53.00000
S10B1	0.0	.046	7.30000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

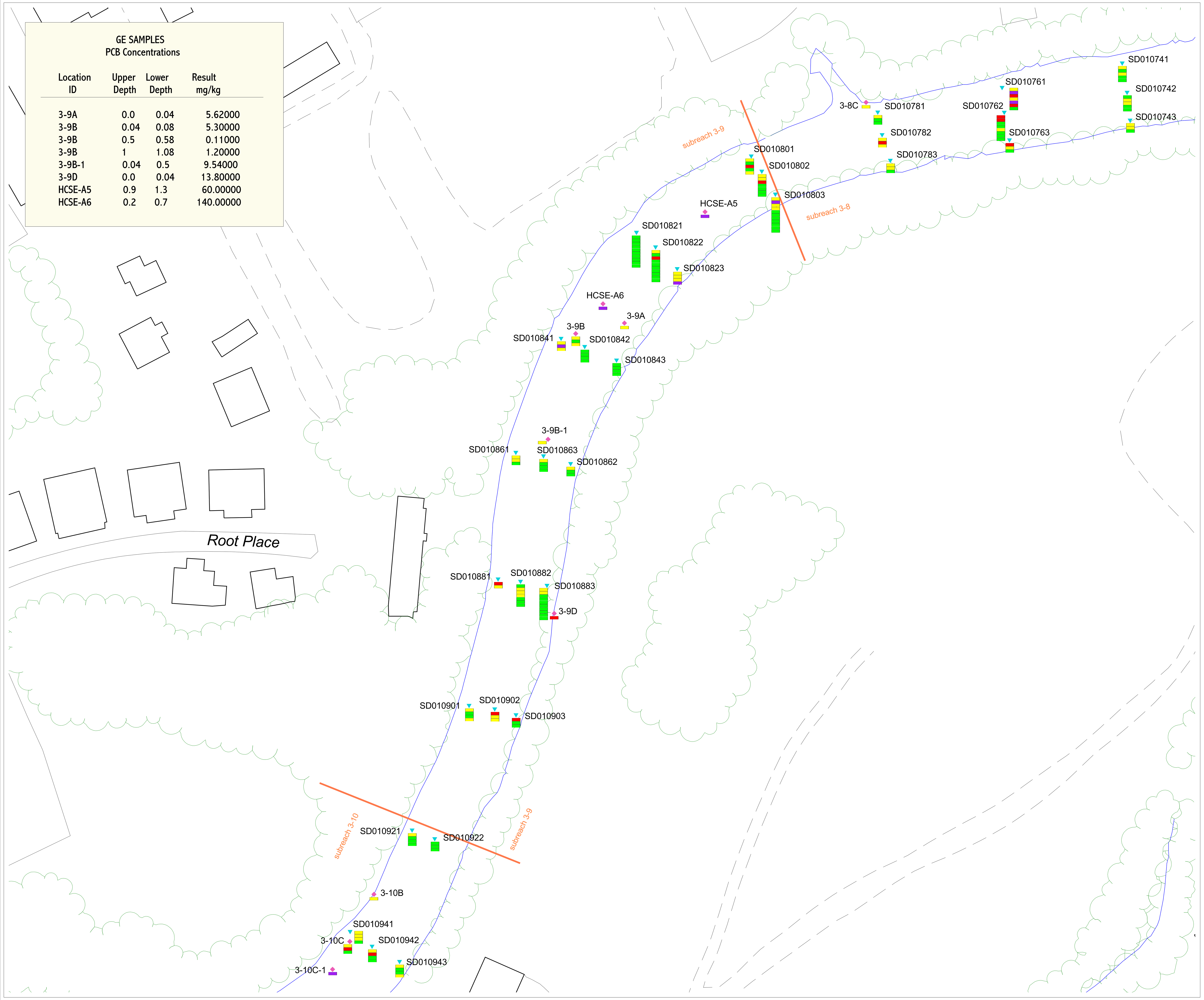
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2A
SEDIMENT PCB DATA
SUBREACH 3-8

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 3-8 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed3-8.eps | 10:30 AM, 11/29/1999 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
3-9A	0.0	0.04	5.62000
3-9B	0.04	0.08	5.30000
3-9B	0.5	0.58	0.11000
3-9B	1	1.08	1.20000
3-9B-1	0.04	0.5	9.54000
3-9D	0.0	0.04	13.80000
HCSE-A5	0.9	1.3	60.00000
HCSE-A6	0.2	0.7	140.00000



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow

Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

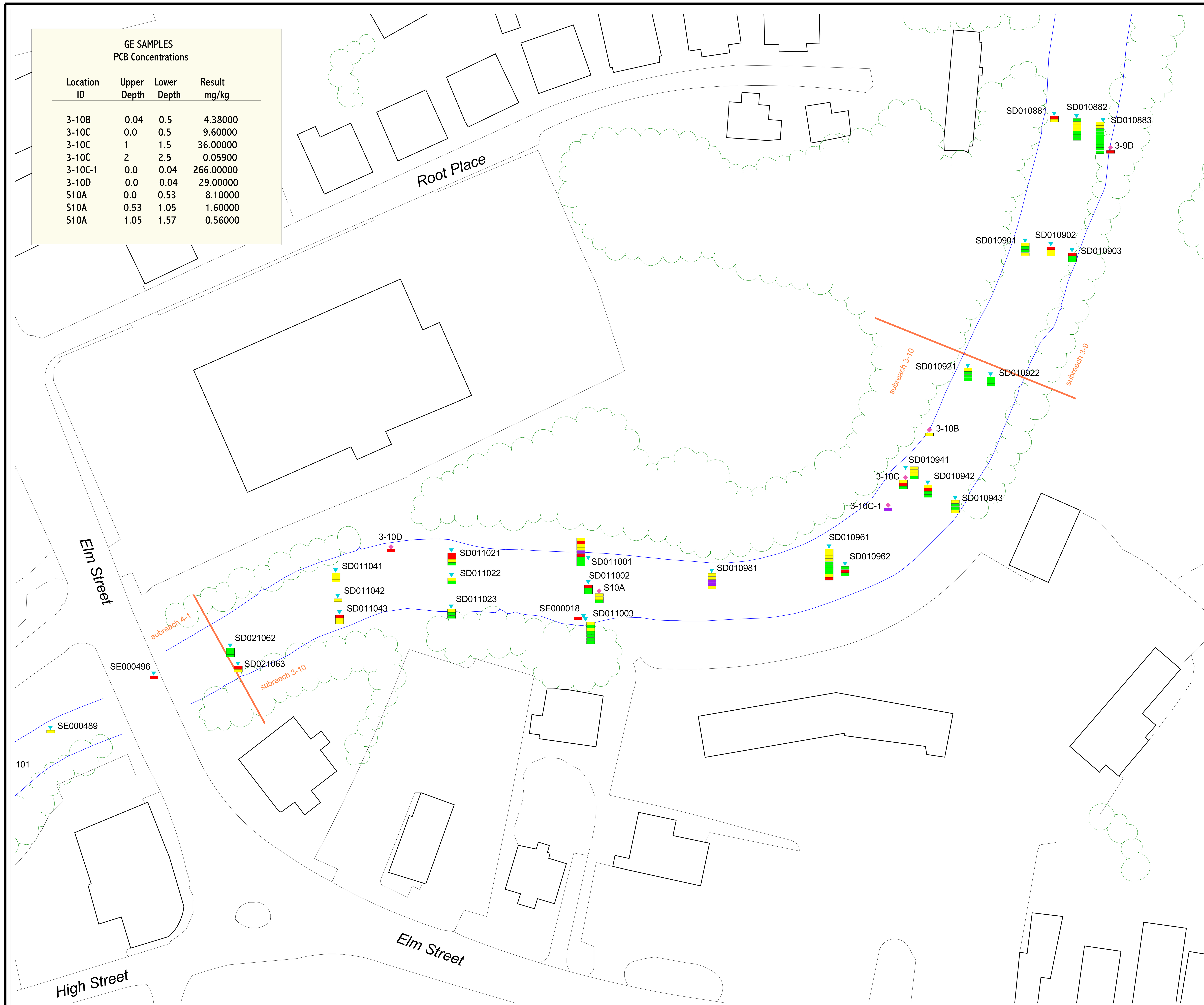
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2B
SEDIMENT PCB DATA
SUBREACH 3-9

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 3-9 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed3-9.eps | 10:35 AM, 11/29/1999 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
3-10B	0.04	0.5	4.38000
3-10C	0.0	0.5	9.60000
3-10C	1	1.5	36.00000
3-10C	2	2.5	0.05900
3-10C-1	0.0	0.04	266.00000
3-10D	0.0	0.04	29.00000
S10A	0.0	0.53	8.10000
S10A	0.53	1.05	1.60000
S10A	1.05	1.57	0.56000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow

Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

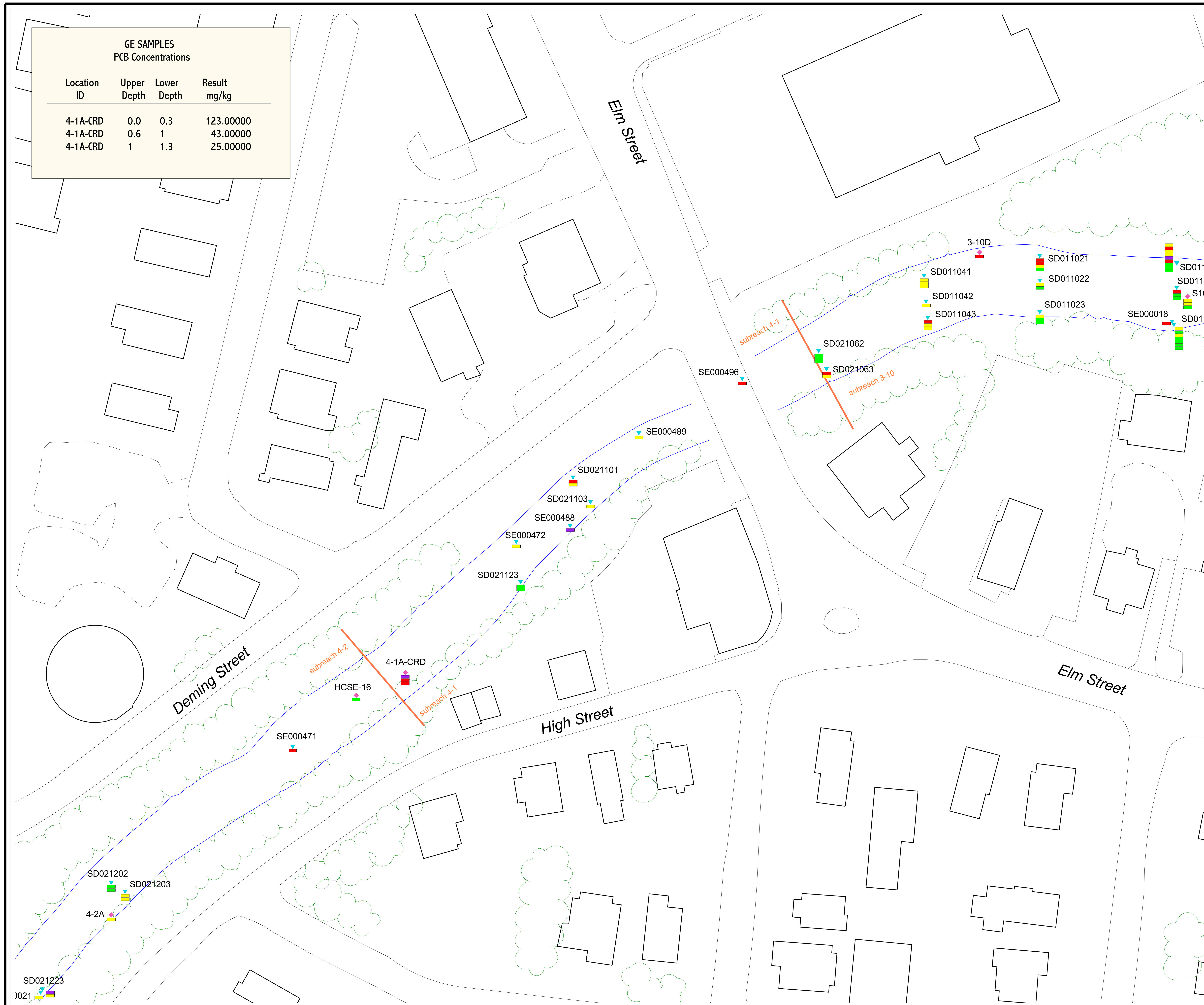
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2C
SEDIMENT PCB DATA
SUBREACH 3-10

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 3-10 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed3-10.eps | 10:46 AM, 11/29/1999 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-1A-CRD	0.0	0.3	123.00000
4-1A-CRD	0.6	1	43.00000
4-1A-CRD	1	1.3	25.00000



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow

Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

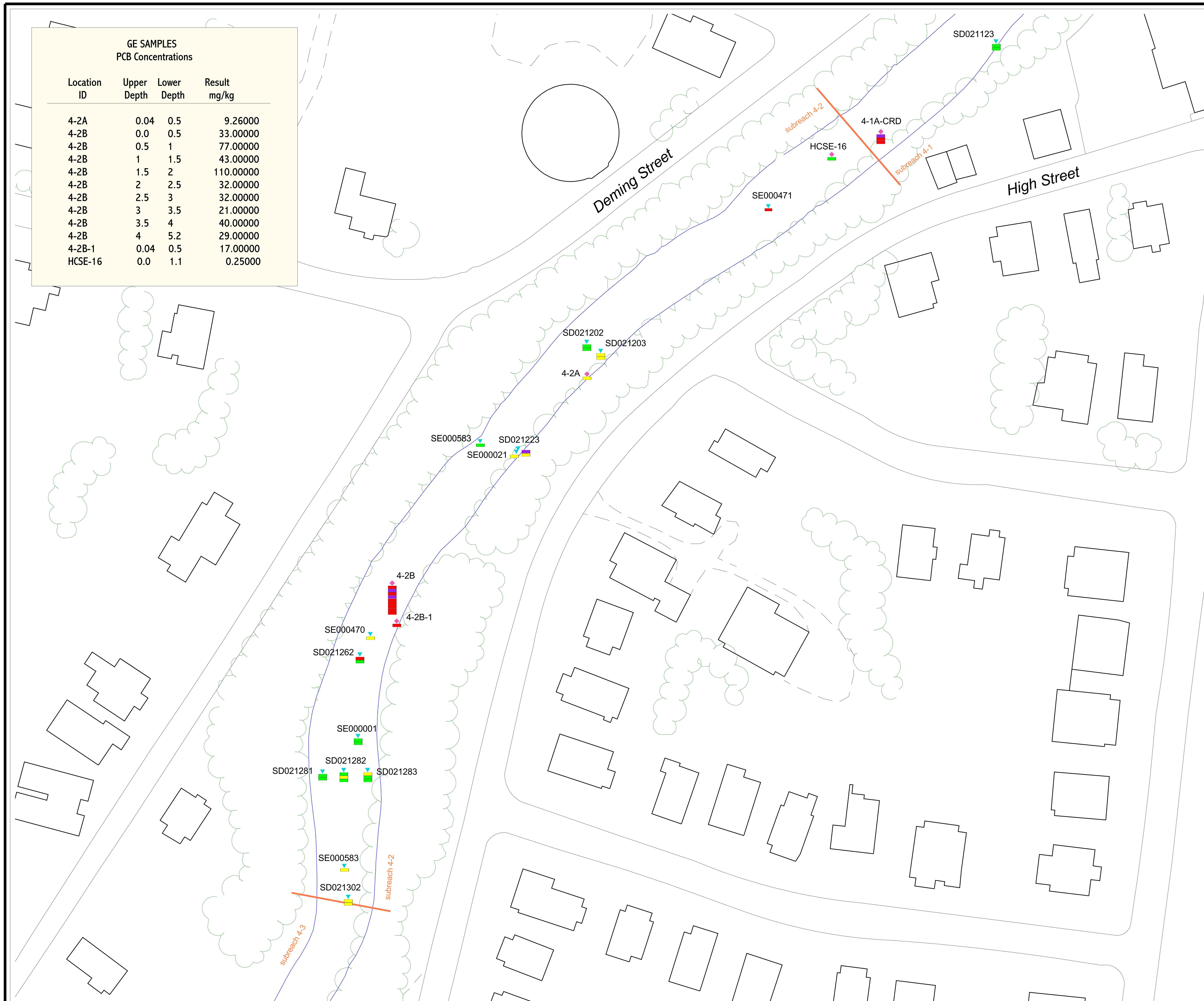
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2D
SEDIMENT PCB DATA
SUBREACH 4-1

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-1 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-1.eps | 10:49 AM, 11/29/1999 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-2A	0.04	0.5	9.26000
4-2B	0.0	0.5	33.00000
4-2B	0.5	1	77.00000
4-2B	1	1.5	43.00000
4-2B	1.5	2	110.00000
4-2B	2	2.5	32.00000
4-2B	2.5	3	32.00000
4-2B	3	3.5	21.00000
4-2B	3.5	4	40.00000
4-2B	4	5.2	29.00000
4-2B-1	0.04	0.5	17.00000
HCSE-16	0.0	1.1	0.25000



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

GE Sediment Samples
EPA Sediment Samples
Subreach Dividers

Total PCB Concentrations in Sediments

0 - 1 ppm
1 - 10
10 - 50
>50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2E
SEDIMENT PCB DATA
SUBREACH 4-2

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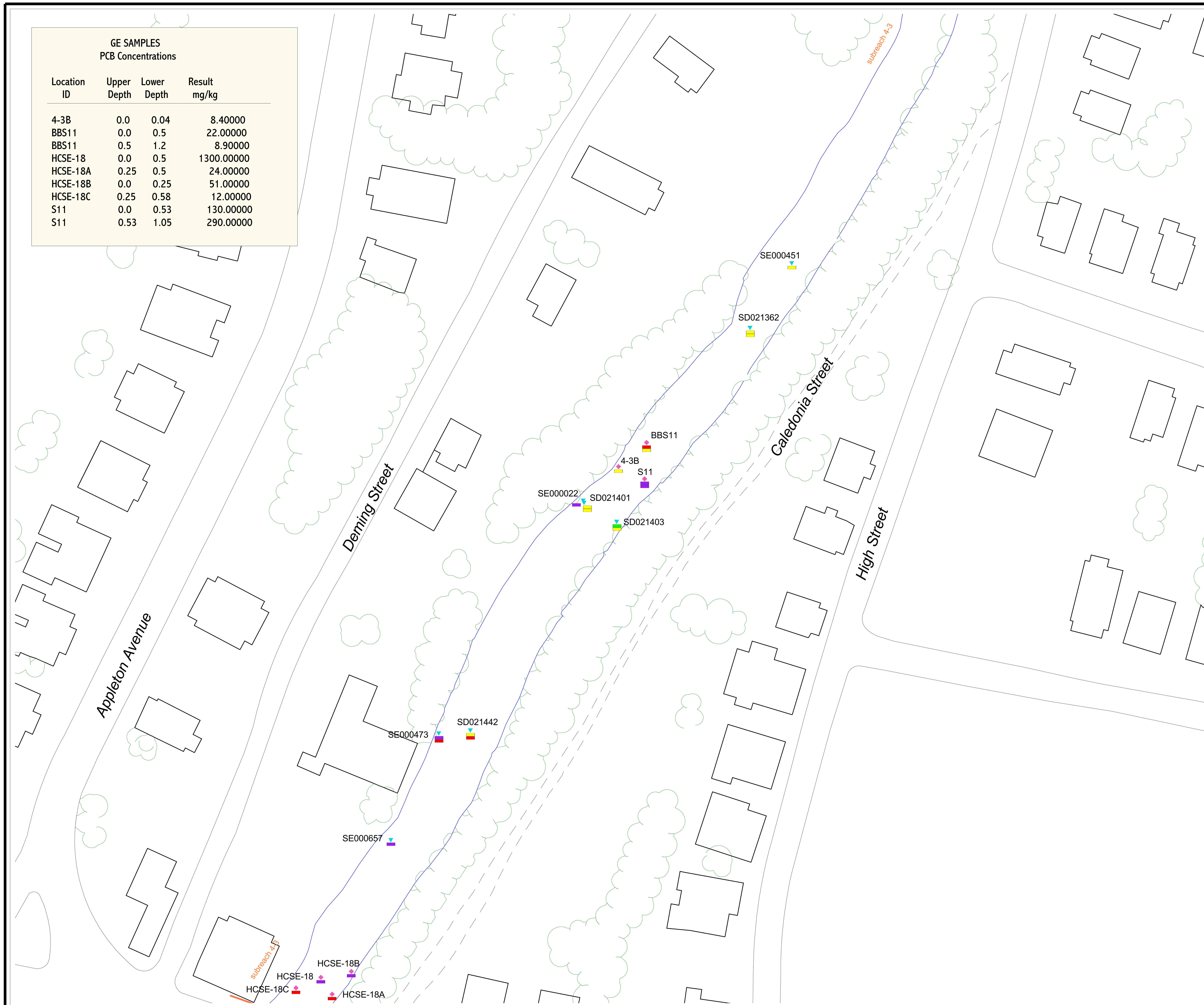


GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-3B	0.0	0.04	8.40000
BBS11	0.0	0.5	22.00000
BBS11	0.5	1.2	8.90000
HCSE-18	0.0	0.5	1300.00000
HCSE-18A	0.25	0.5	24.00000
HCSE-18B	0.0	0.25	51.00000
HCSE-18C	0.25	0.58	12.00000
S11	0.0	0.53	130.00000
S11	0.53	1.05	290.00000

WESTON

LEGEND:

GE Sediment Samples
EPA Sediment Samples
Subreach Dividers

Total PCB Concentrations in Sediments

0 - 1 ppm
1 - 10
10 - 50
>50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

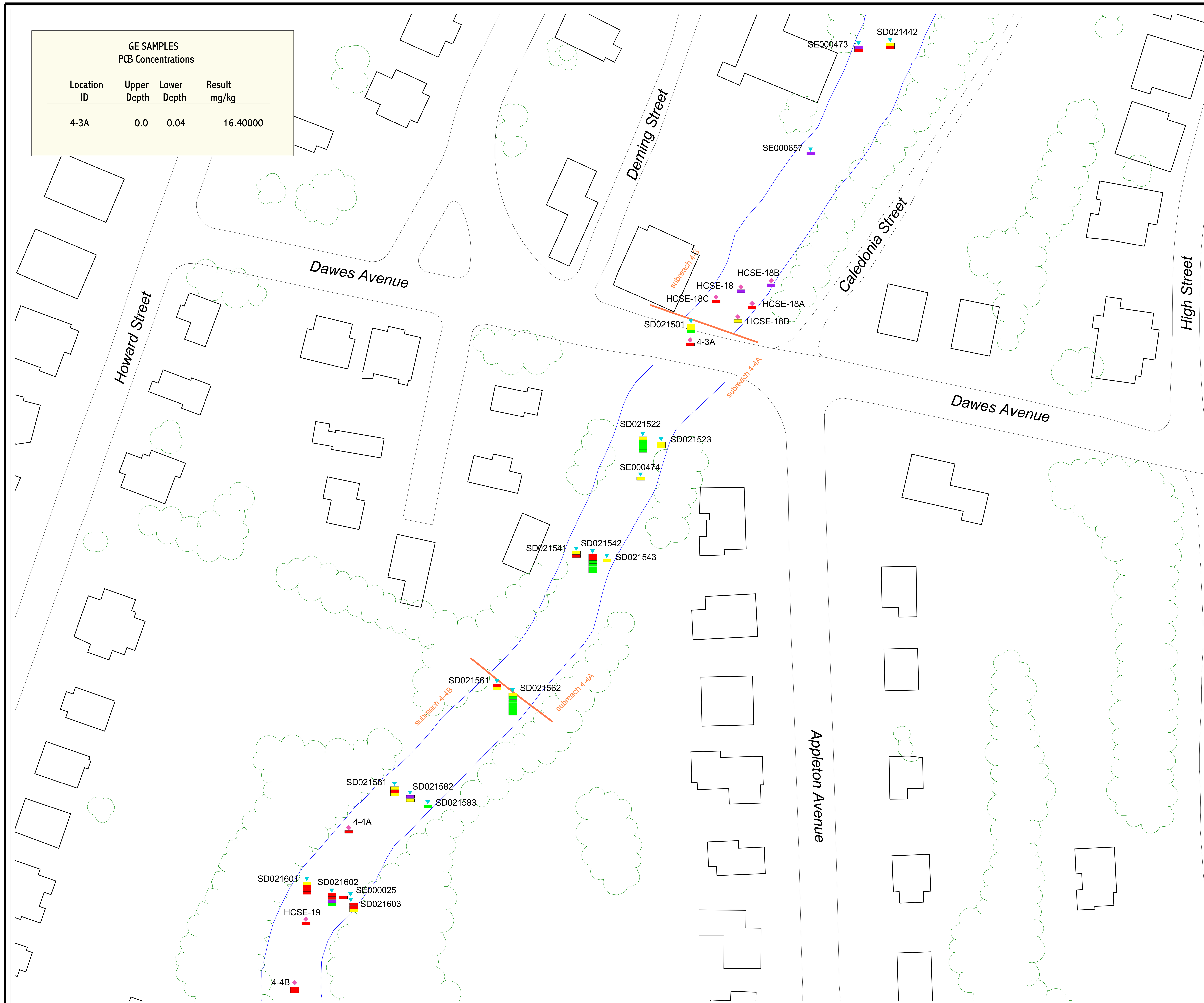
N

Scale in Feet
40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2F
SEDIMENT PCB DATA
SUBREACH 4-3

| o:/gepitt/aprs/eeca_sedsnov.apr | layout-reach 4-3 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-3.eps | 5:16 PM, 11/29/1999 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-3A	0.0	0.04	16.40000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

GE Sediment Samples
EPA Sediment Samples
Subreach Dividers

Total PCB Concentrations
in Sediments

0 - 1 ppm
1 - 10
10 - 50
>50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

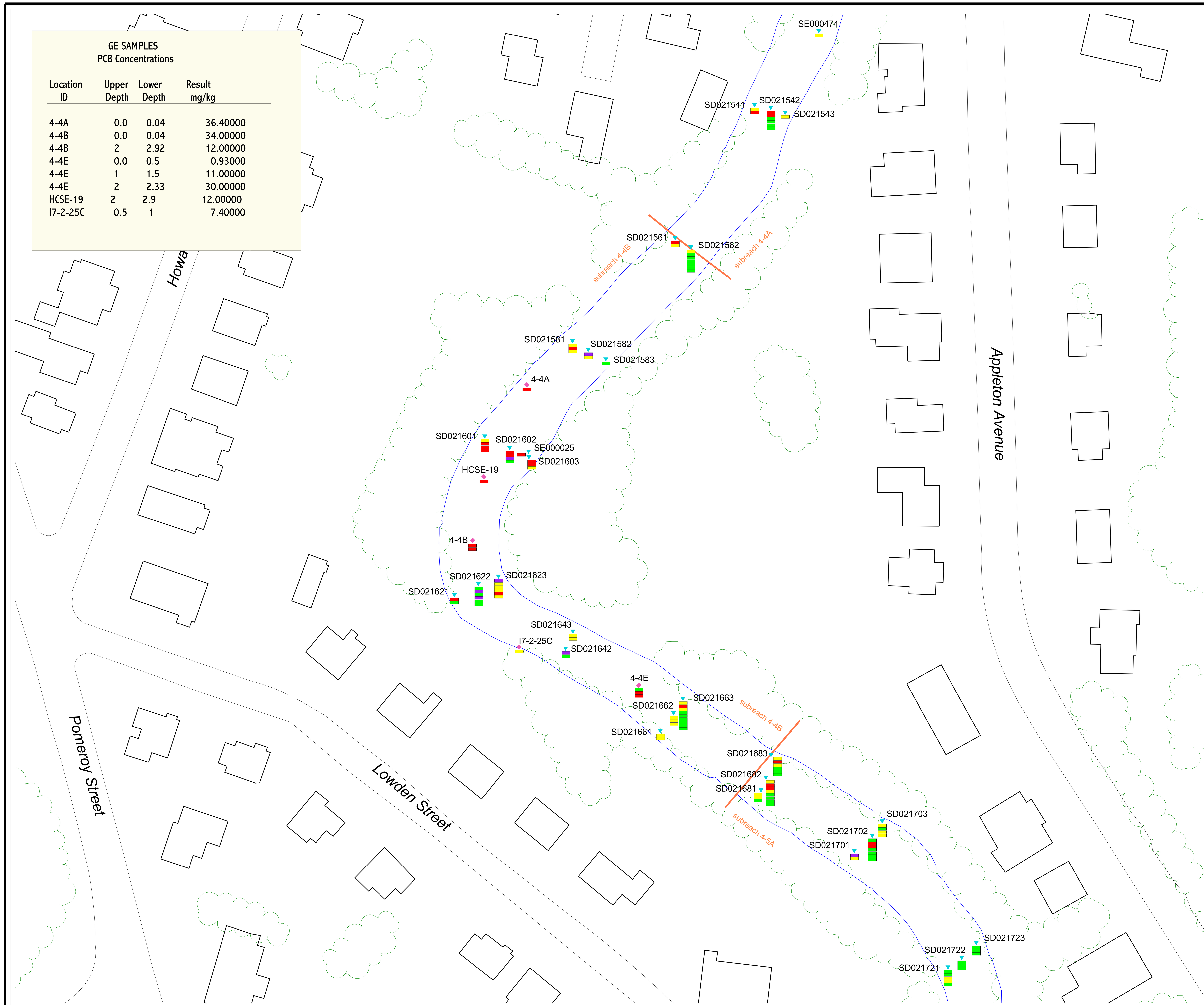
N

Scale in Feet
40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2G
SEDIMENT PCB DATA
SUBREACH 4-4A

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-4A | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-4a.eps | 5:20 PM, 11/29/1999 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-4A	0.0	0.04	36.40000
4-4B	0.0	0.04	34.00000
4-4B	2	2.92	12.00000
4-4E	0.0	0.5	0.93000
4-4E	1	1.5	11.00000
4-4E	2	2.33	30.00000
HCSE-19	2	2.9	12.00000
I7-2-25C	0.5	1	7.40000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

GE Sediment Samples
EPA Sediment Samples
Subreach Dividers

Total PCB Concentrations in Sediments

0 - 1 ppm
1 - 10
10 - 50
>50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

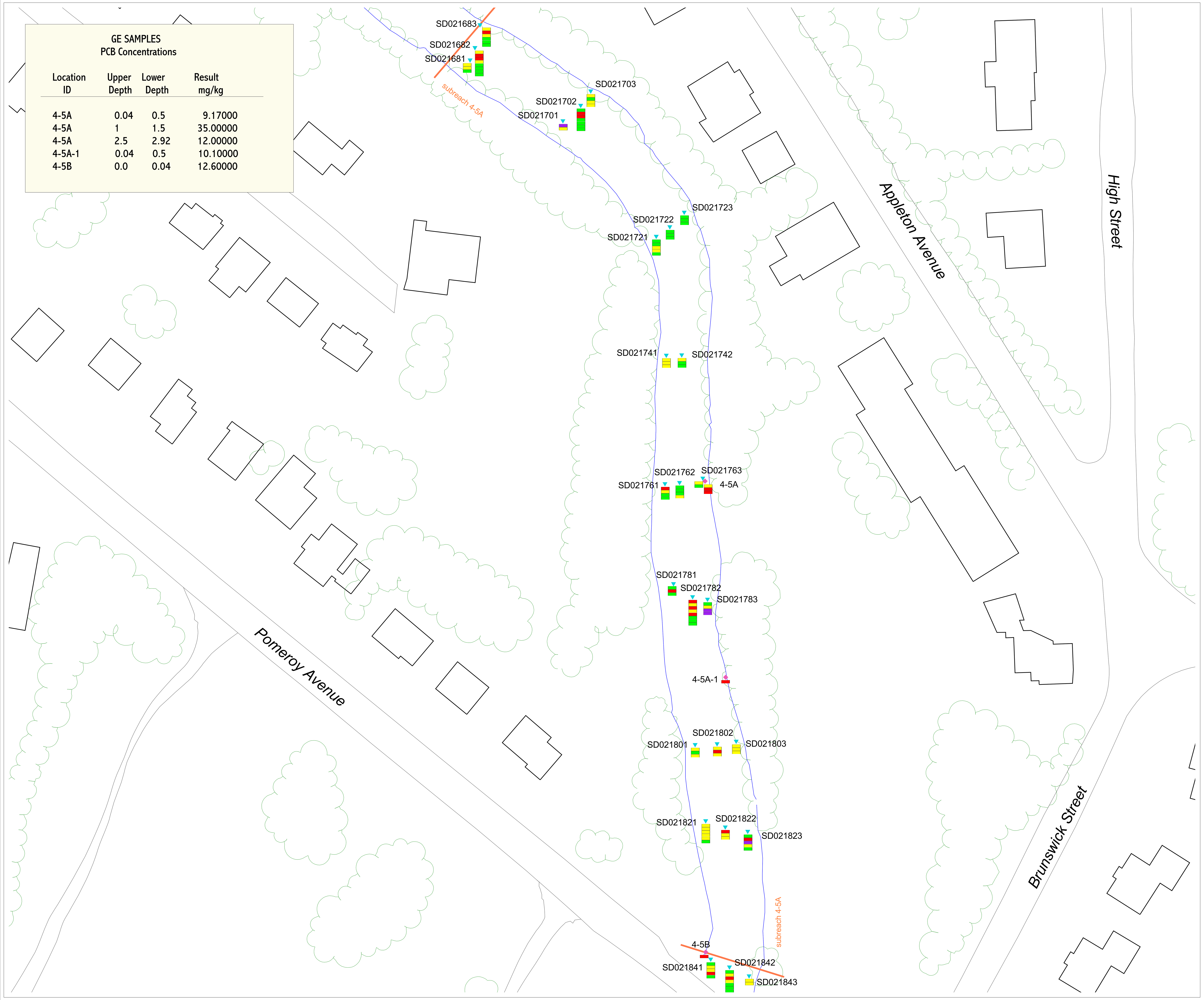
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2H
SEDIMENT PCB DATA
SUBREACH 4-4B

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-4B | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-4b.eps | 5:22 PM, 11/29/1999 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-5A	0.04	0.5	9.17000
4-5A	1	1.5	35.00000
4-5A	2.5	2.92	12.00000
4-5A-1	0.04	0.5	10.10000
4-5B	0.0	0.04	12.60000



WESTON

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow

Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

Scale in Feet

40 0 40 80 120 160 200

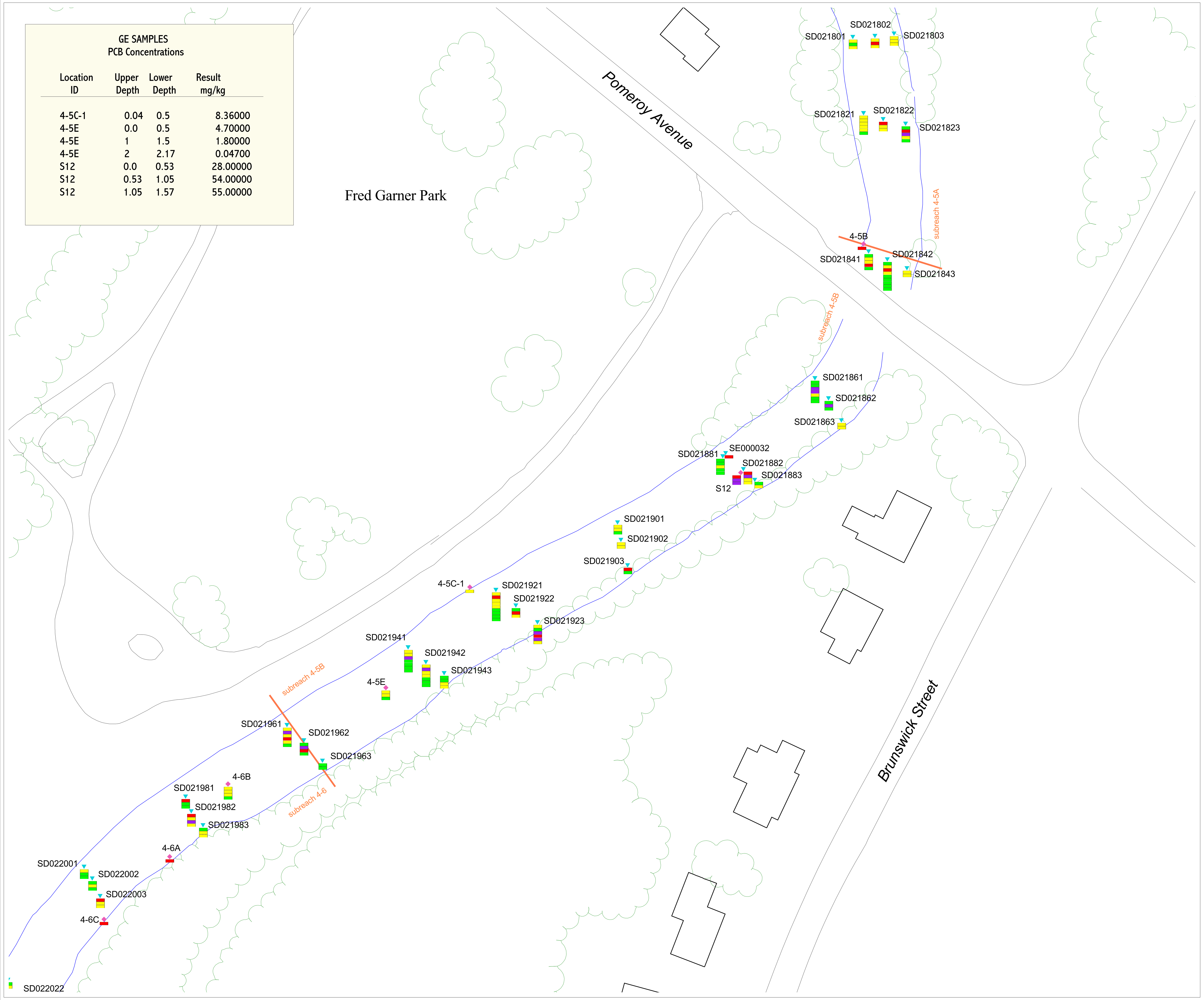
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2I
SEDIMENT PCB DATA
SUBREACH 4-5A

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-5A | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-5a.eps | 5:24 PM, 11/29/1999 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-5C-1	0.04	0.5	8.36000
4-5E	0.0	0.5	4.70000
4-5E	1	1.5	1.80000
4-5E	2	2.17	0.04700
S12	0.0	0.53	28.00000
S12	0.53	1.05	54.00000
S12	1.05	1.57	55.00000



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

GE Sediment Samples

EPA Sediment Samples

Subreach Dividers

Total PCB Concentrations in Sediments

0 - 1 ppm

1 - 10

10 - 50

>50

Sediment Depth Rank Key

Shallow

Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

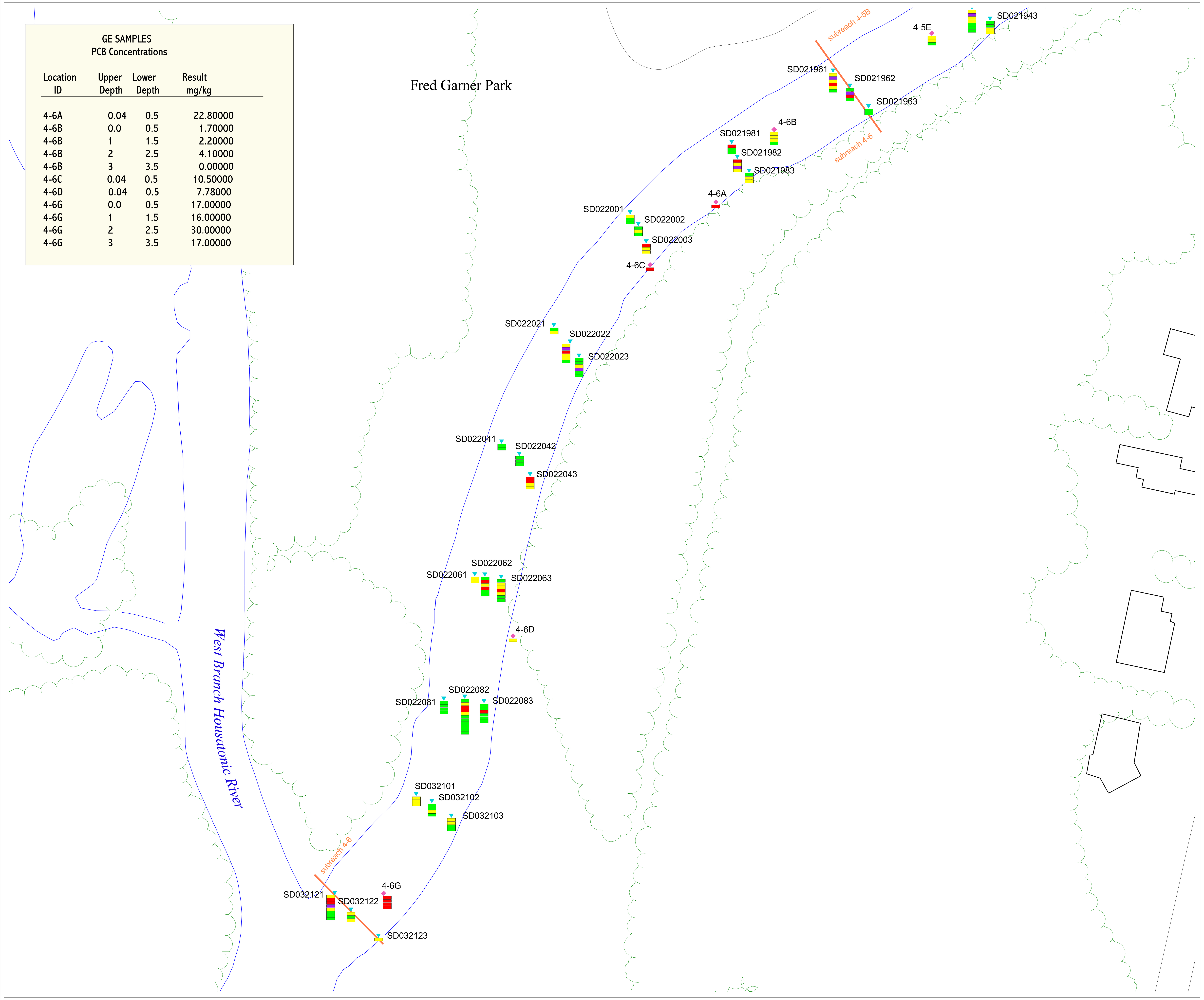
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2J
SEDIMENT PCB DATA
SUBREACH 4-5B

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-5B | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-5b.eps | 5:27 PM, 11/29/1999 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-6A	0.04	0.5	22.80000
4-6B	0.0	0.5	1.70000
4-6B	1	1.5	2.20000
4-6B	2	2.5	4.10000
4-6B	3	3.5	0.00000
4-6C	0.04	0.5	10.50000
4-6D	0.04	0.5	7.78000
4-6G	0.0	0.5	17.00000
4-6G	1	1.5	16.00000
4-6G	2	2.5	30.00000
4-6G	3	3.5	17.00000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

- GE Sediment Samples
- EPA Sediment Samples
- Subreach Dividers

Total PCB Concentrations in Sediments

- 0 - 1 ppm
- 1 - 10
- 10 - 50
- >50

Sediment Depth Rank Key

Shallow
Deep

NOTE: Depth key is relative and dependent on source, location, and datamart status at the time of map compilation. The user is referred to data summary tables to get actual depth intervals.

N

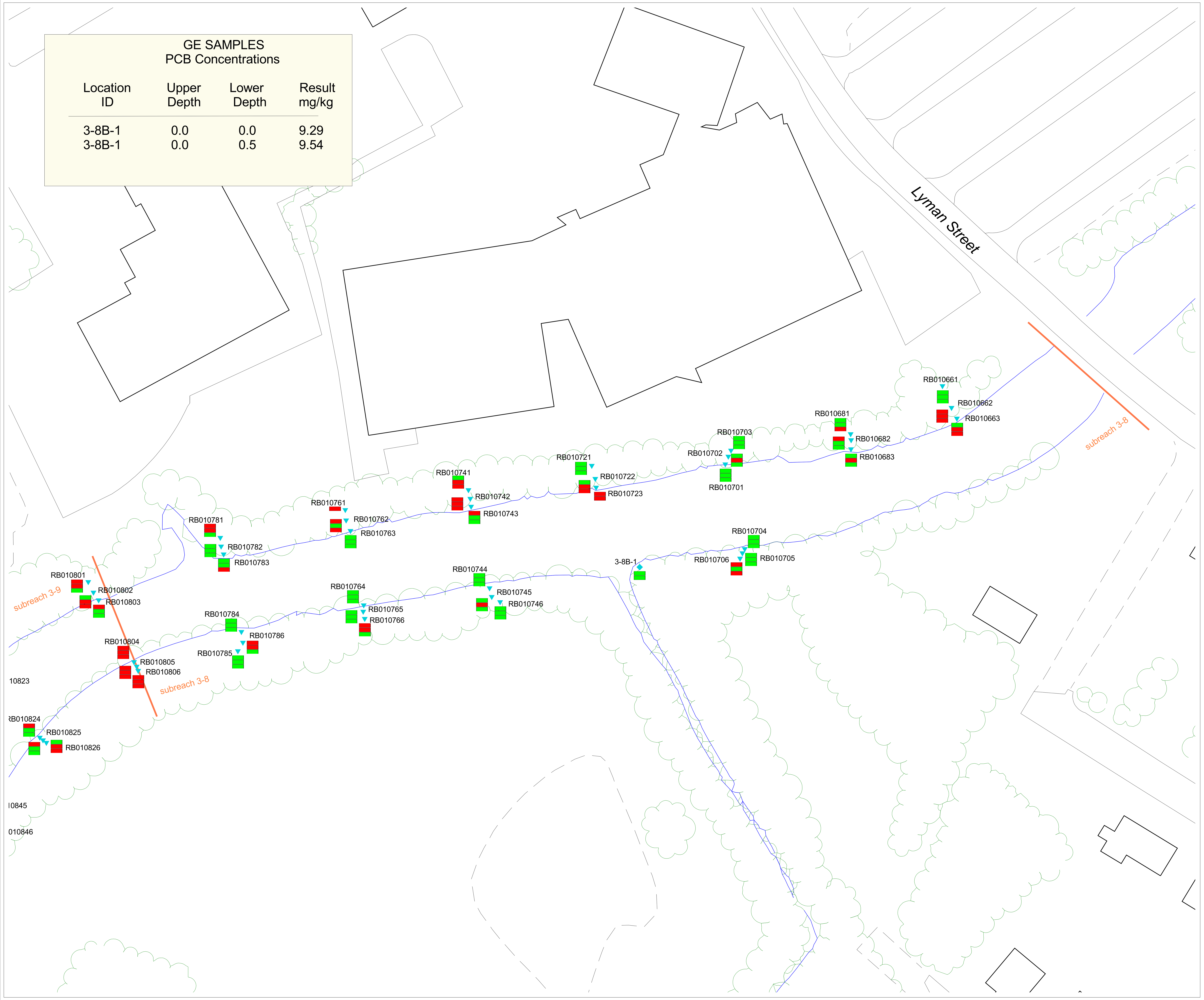
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 2K
SEDIMENT PCB DATA
SUBREACH 4-6

| o:\gepitt\aprs\eeca_sedsnov.apr | layout-reach 4-6 | o:\gepitt\epsfiles\landscape24x36\in\eeca_sed4-6.eps | 5:29 PM, 11/29/1999 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
3-8B-1	0.0	0.0	9.29
3-8B-1	0.0	0.5	9.54

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational / Residential

- EPA Sample Locations
- EPA-START Sample Locations
- GE Sample Locations
- Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

40 0 40 80 120 160 200

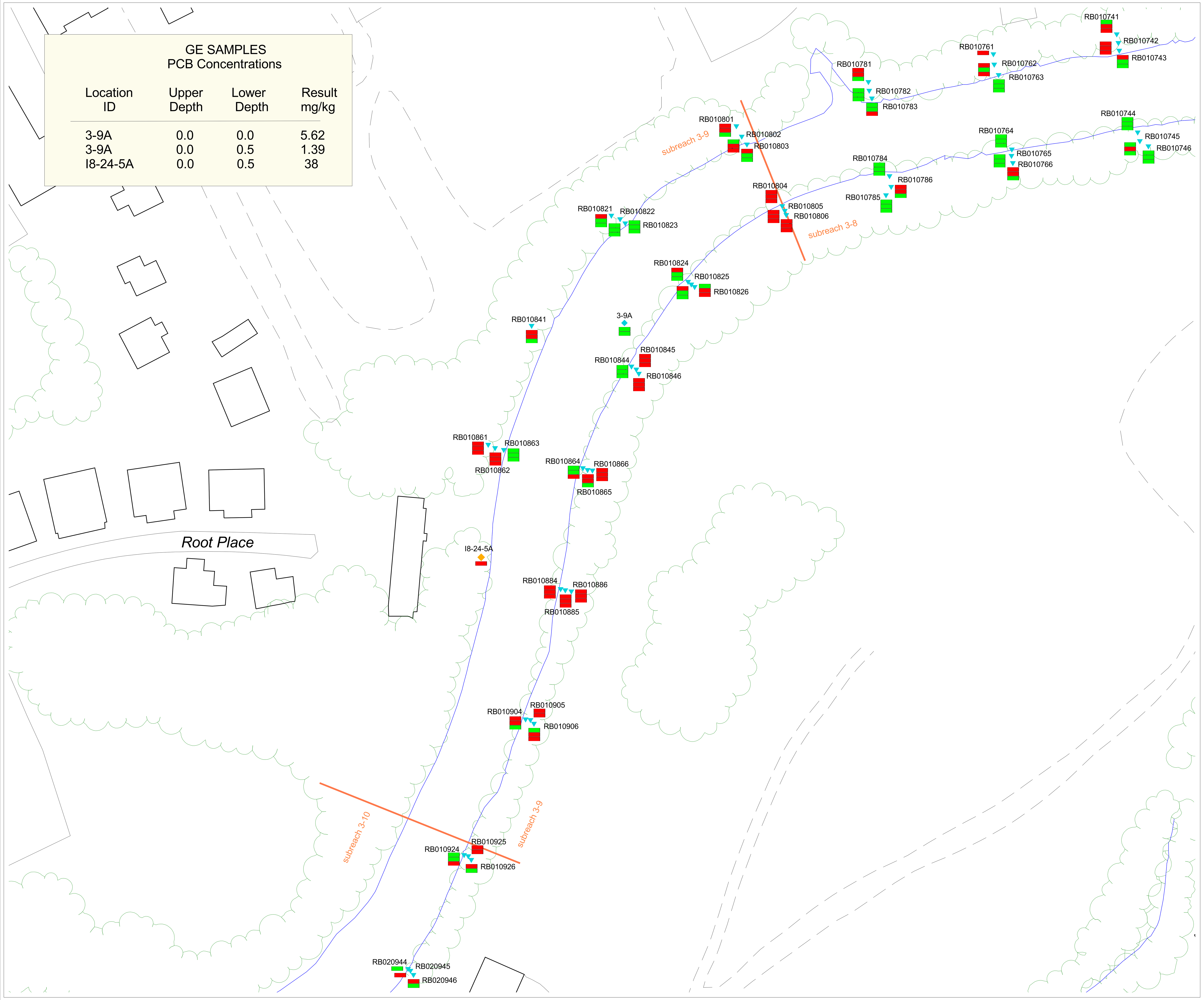
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3A
BANK PCB DATA
SUBREACH 3-8

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 3-8 | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank3-8.eps | 10:31 AM, 2/15/2000 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
3-9A	0.0	0.0	5.62
3-9A	0.0	0.5	1.39
I8-24-5A	0.0	0.5	38



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational | Residential
- EPA Sample Locations
- EPA-START Sample Locations
- GE Sample Locations
- Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

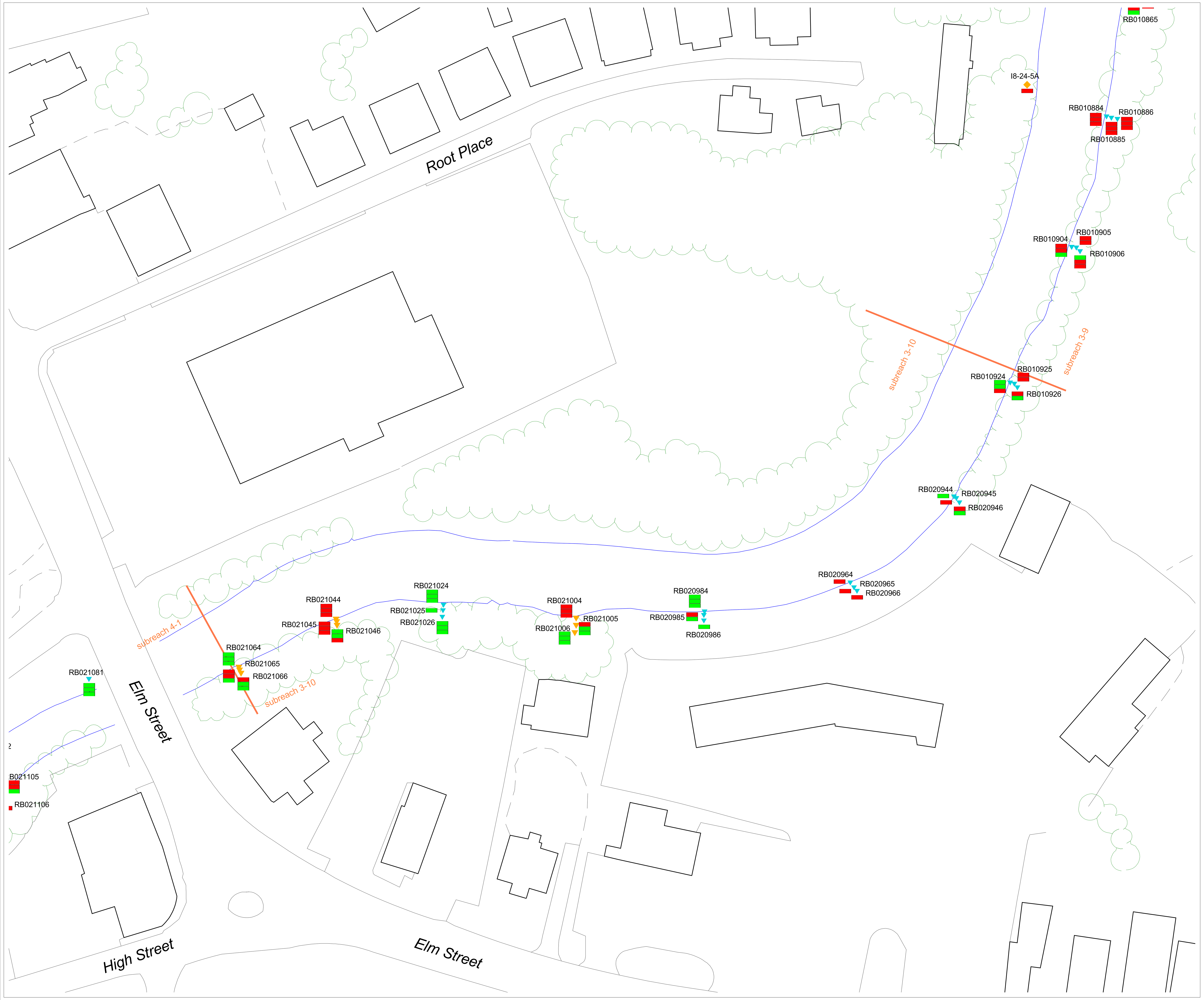
2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet
40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3B
BANK PCB DATA
SUBREACH 3-9



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational | Residential

EPA Sample Locations

EPA-START Sample Locations

GE Sample Locations

Subreach Dividers

Summary of PCB Concentrations in Bank Soils

Does not exceed cleanup criteria

Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

40 0 40 80 120 160 200

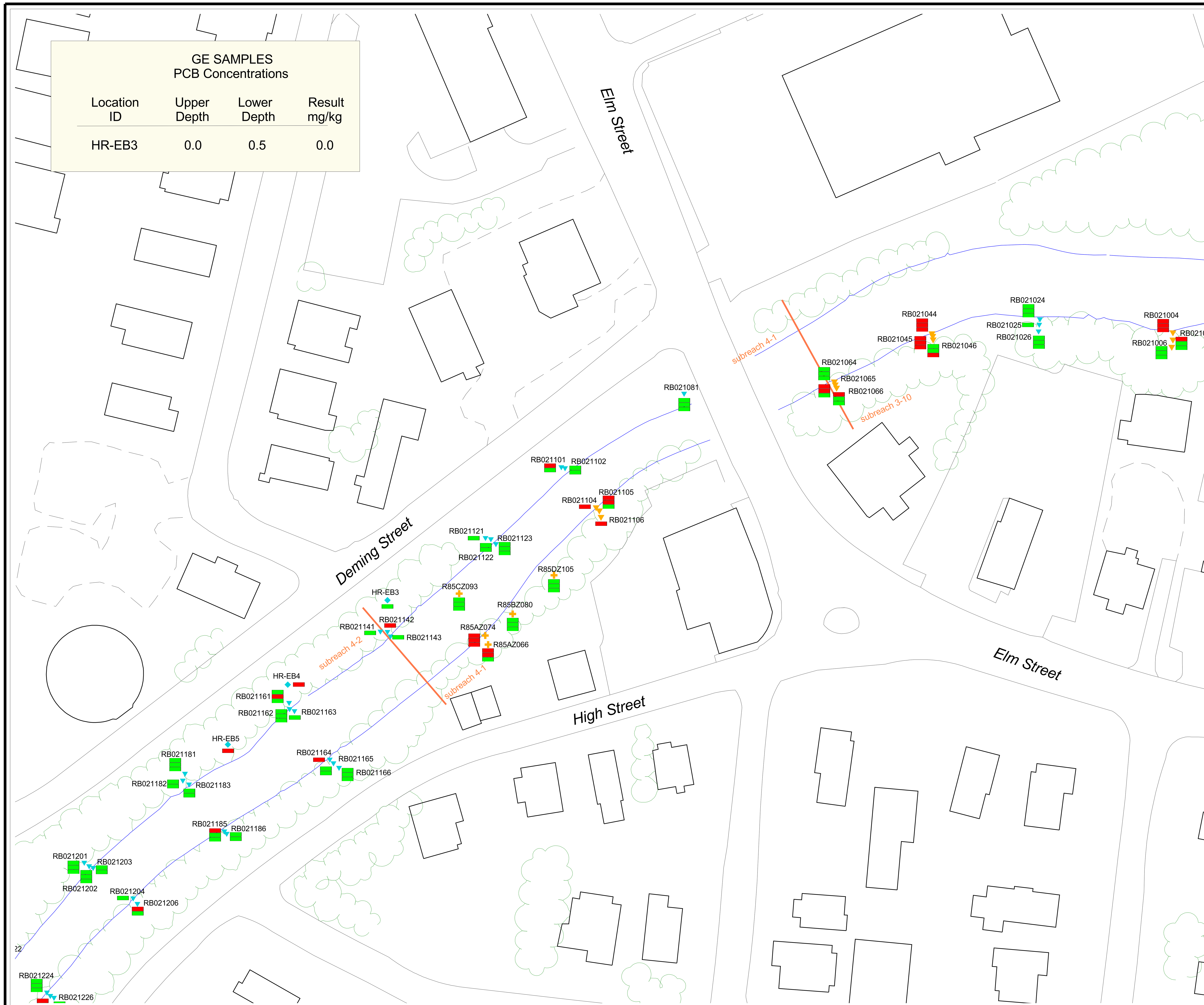
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3C
BANK PCB DATA
SUBREACH 3-10

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 3-10 | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank3-10.eps | 10:30 AM, 2/15/2000 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
HR-EB3	0.0	0.5	0.0



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational | Residential
- EPA Sample Locations
- EPA-START Sample Locations
- GE Sample Locations
- Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow — 0 - 0.5
1.0 - 1.5
Deep — 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

40 0 40 80 120 160 200

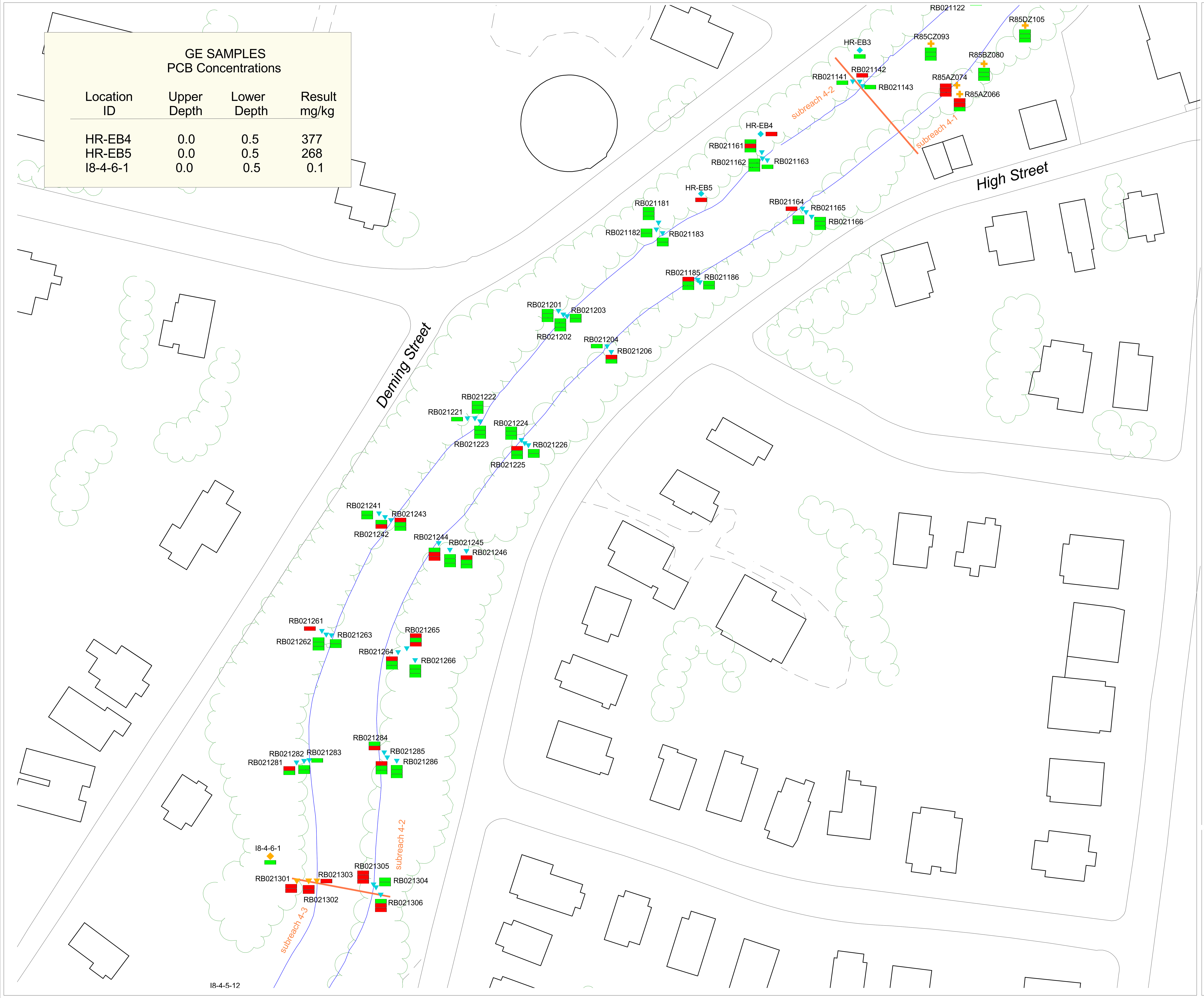
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3D
BANK PCB DATA
SUBREACH 4-1

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-1 | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-1.eps | 10:33 AM, 2/15/2000 |

GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
HR-EB4	0.0	0.5	377
HR-EB5	0.0	0.5	268
I8-4-6-1	0.0	0.5	0.1



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational / Residential

EPA Sample Locations
EPA-START Sample Locations
GE Sample Locations
Subreach Dividers

Summary of PCB Concentrations in Bank Soils

Does not exceed cleanup criteria
Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow — 0 - 0.5
1.0 - 1.5
Deep — 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

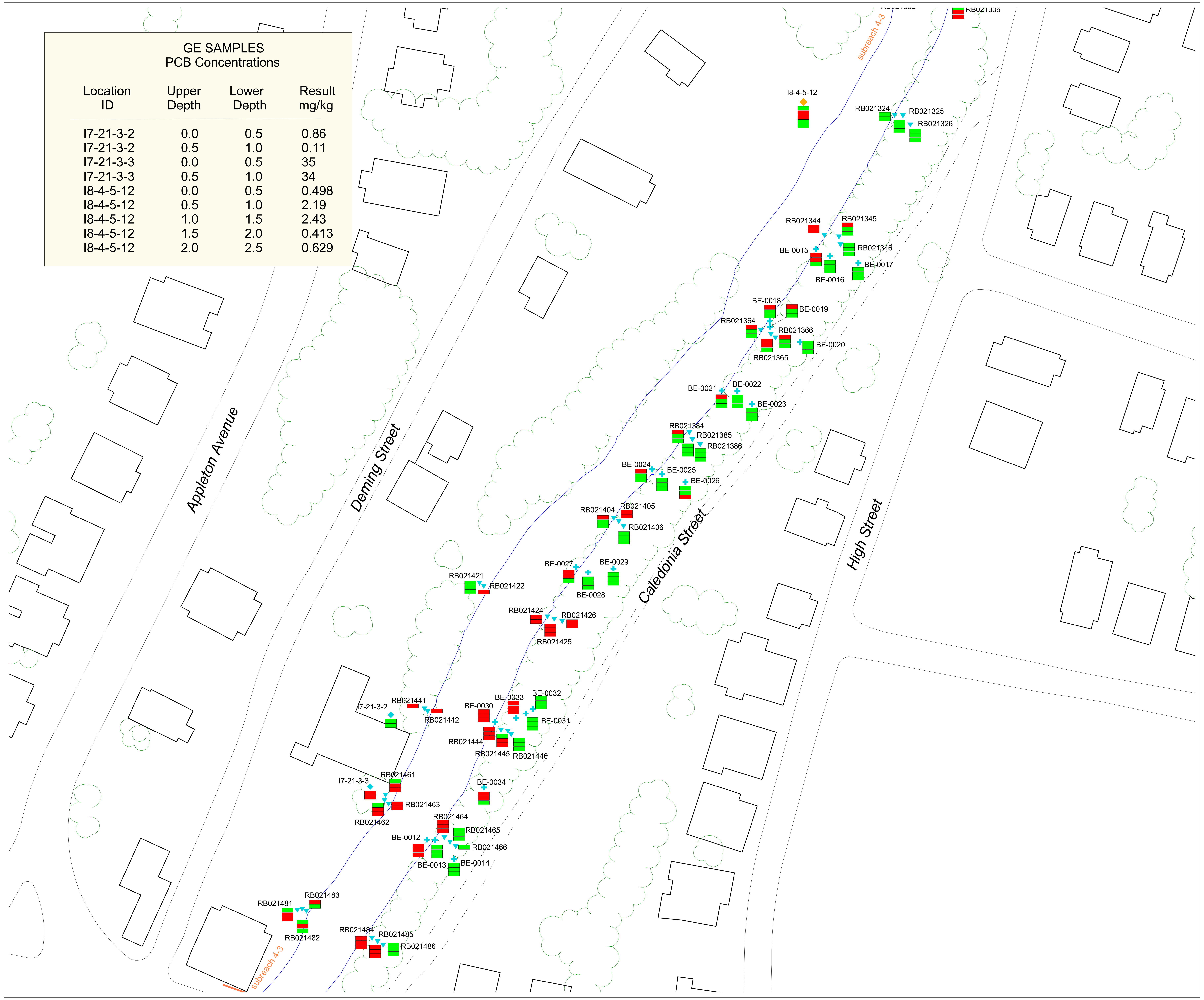
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3E
BANK PCB DATA
SUBREACH 4-2

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-2 | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-2.eps | 10:34 AM, 2/15/2000 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
I7-21-3-2	0.0	0.5	0.86
I7-21-3-2	0.5	1.0	0.11
I7-21-3-3	0.0	0.5	35
I7-21-3-3	0.5	1.0	34
I8-4-5-12	0.0	0.5	0.498
I8-4-5-12	0.5	1.0	2.19
I8-4-5-12	1.0	1.5	2.43
I8-4-5-12	1.5	2.0	0.413
I8-4-5-12	2.0	2.5	0.629

WESTON

MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational Residential

EPA Sample Locations

EPA-START Sample Locations

GE Sample Locations

Subreach Dividers

Summary of PCB Concentrations in Bank Soils

Does not exceed cleanup criteria

Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

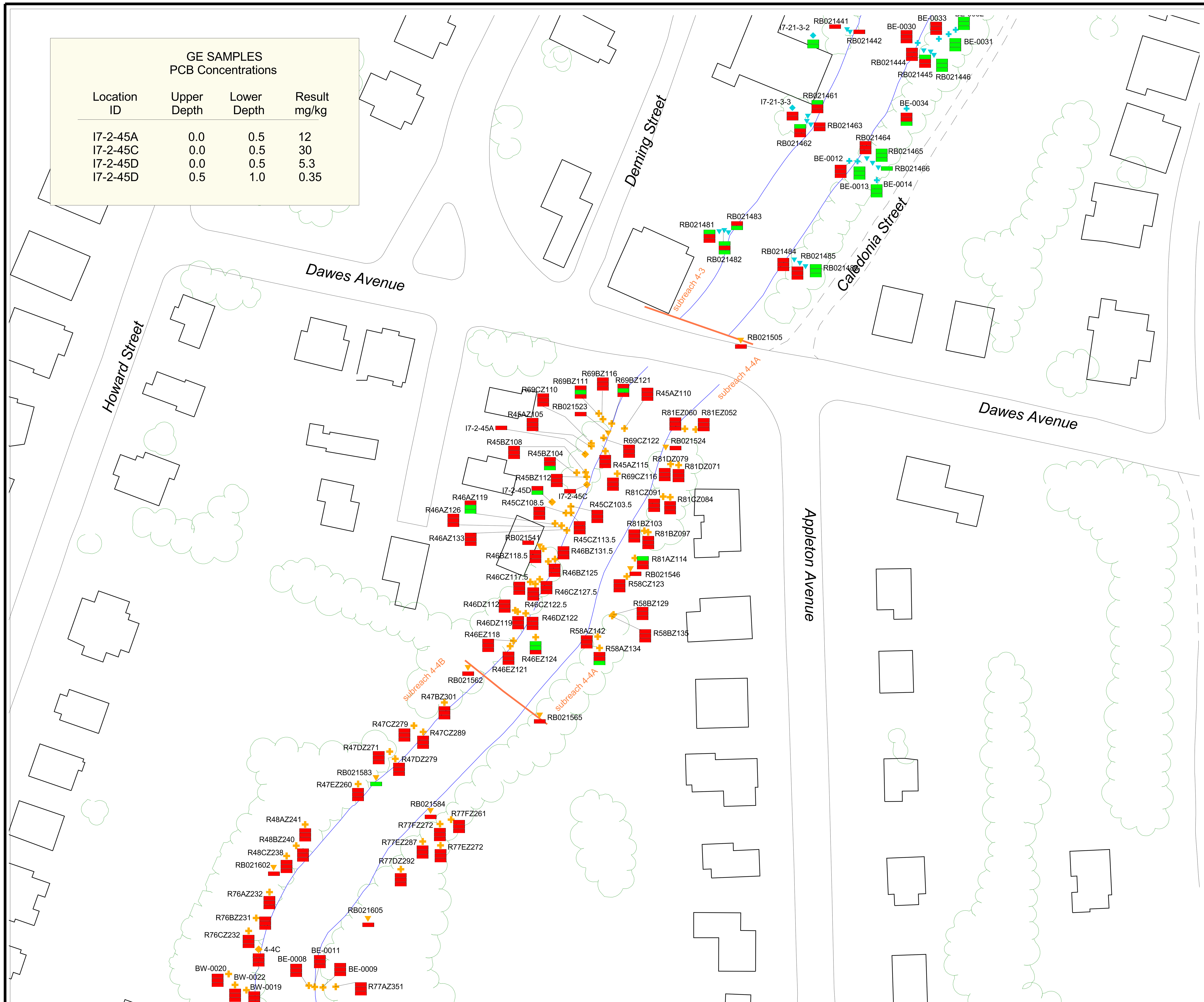
40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3F
BANK PCB DATA
SUBREACH 4-3

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-3 | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-3.eps | 10:35 AM, 2/15/2000 |

GE SAMPLES PCB Concentrations			
Location ID	Upper Depth	Lower Depth	Result mg/kg
I7-2-45A	0.0	0.5	12
I7-2-45C	0.0	0.5	30
I7-2-45D	0.0	0.5	5.3
I7-2-45D	0.5	1.0	0.35



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational	Residential	
▼	▼	EPA Sample Locations
✚	✚	EPA-START Sample Locations
◆	◆	GE Sample Locations
		Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

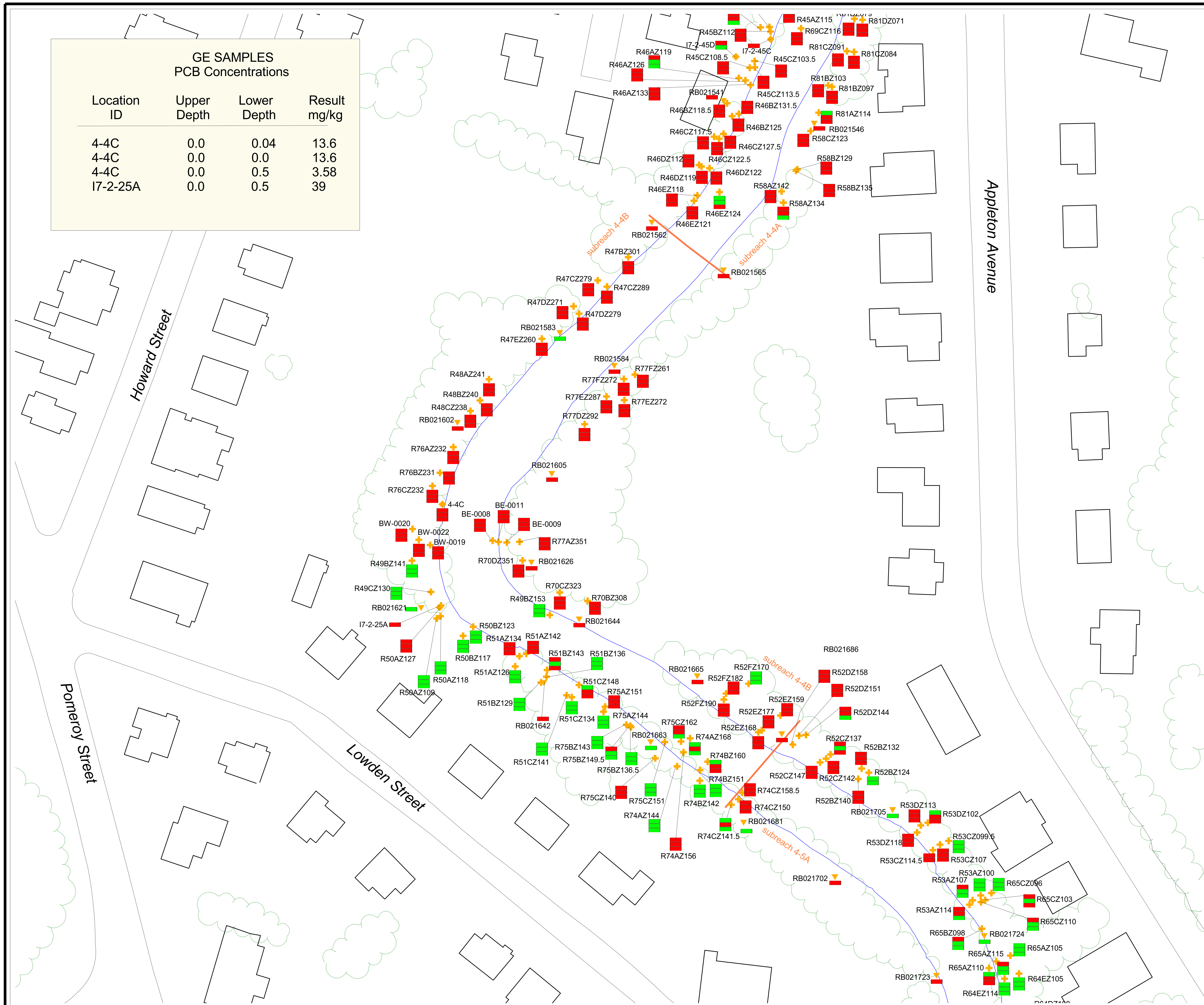
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3G
BANK PCB DATA
SUBREACH 4-4A

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-4A | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-4a.eps | 10:36 AM, 2/15/2000 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
4-4C	0.0	0.04	13.6
4-4C	0.0	0.0	13.6
4-4C	0.0	0.5	3.58
I7-2-25A	0.0	0.5	39

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational / Residential

- EPA Sample Locations
- EPA-START Sample Locations
- GE Sample Locations
- Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

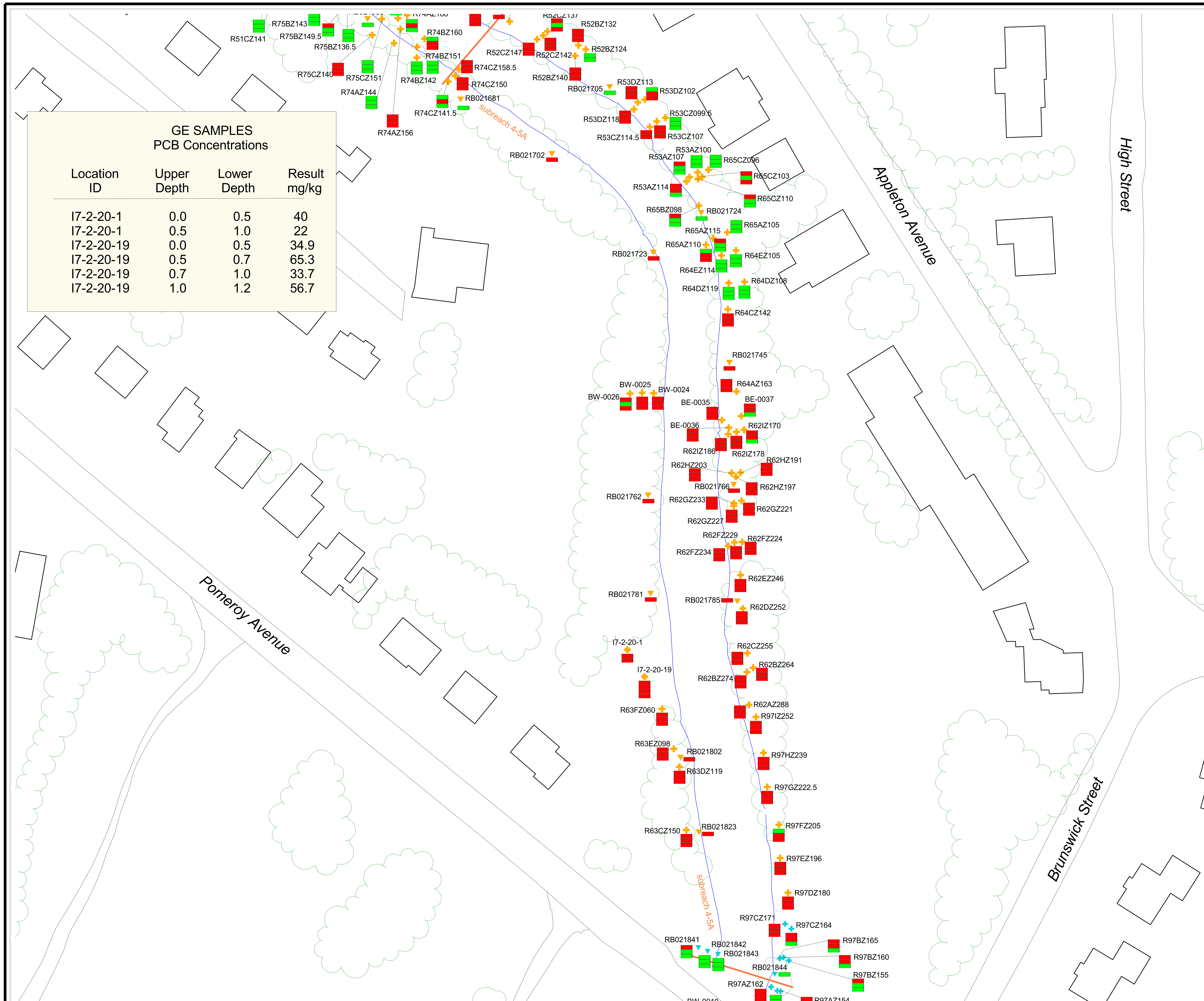
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3H
BANK PCB DATA
SUBREACH 4-4B

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-4B | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-4b.eps | 10:36 AM, 2/15/2000 |



GE SAMPLES
PCB Concentrations

Location ID	Upper Depth	Lower Depth	Result mg/kg
I7-2-20-1	0.0	0.5	40
I7-2-20-1	0.5	1.0	22
I7-2-20-19	0.0	0.5	34.9
I7-2-20-19	0.5	0.7	65.3
I7-2-20-19	0.7	1.0	33.7
I7-2-20-19	1.0	1.2	56.7

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational
Residential

EPA Sample Locations
EPA-START Sample Locations
GE Sample Locations
Subreach Dividers

Summary of PCB
Concentrations in Bank Soils

Does not exceed cleanup criteria
Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

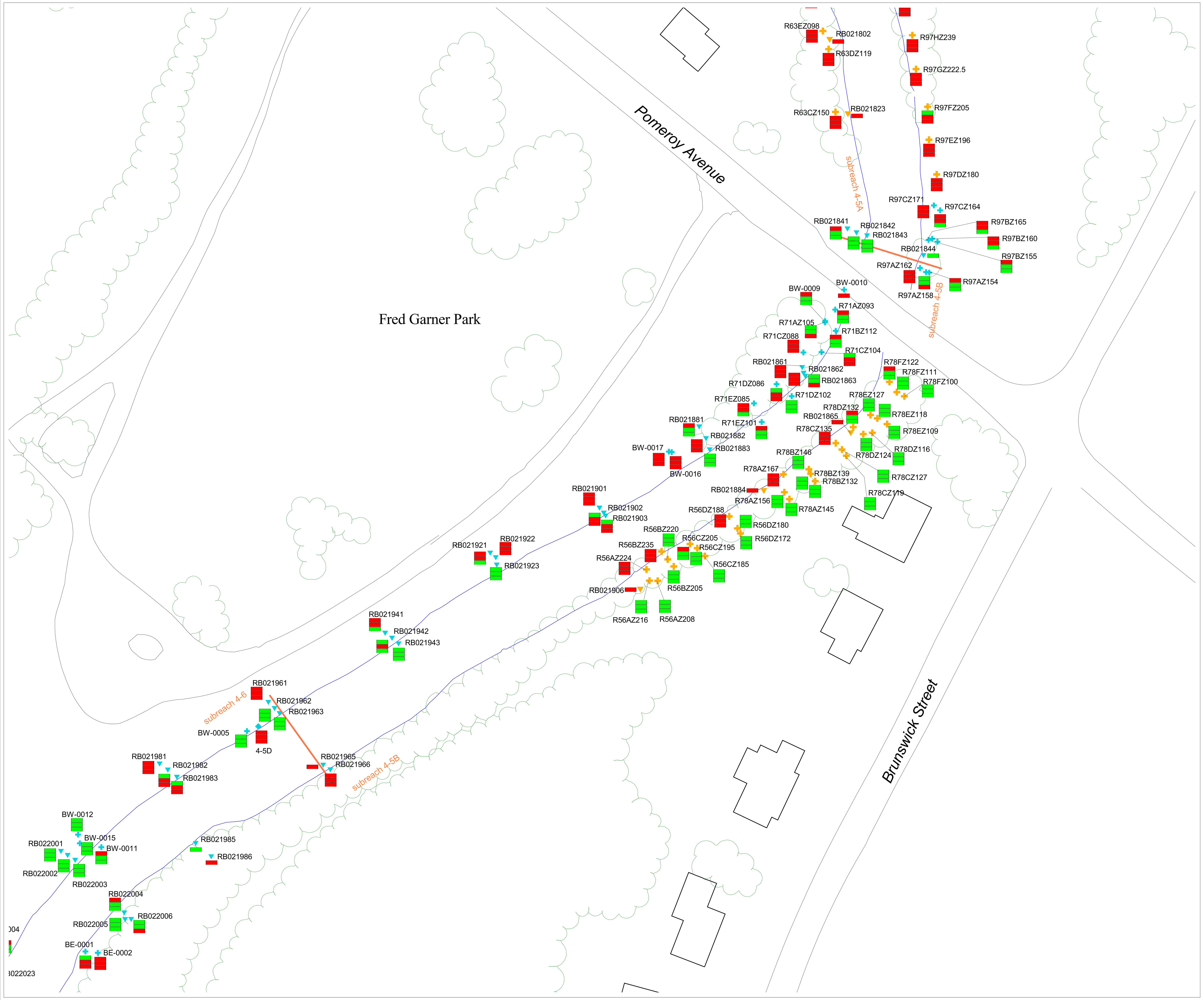
Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3I
BANK PCB DATA
SUBREACH 4-5A

| o:\gepitt\aprs\eeca_banksfeb.apr | Banks, Reach 4-5A | o:\gepitt\epsfiles\landscape24x36\in\eeca_bank4-5a.eps | 10:37 AM, 2/15/2000 |



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational | Residential

EPA Sample Locations

EPA-START Sample Locations

GE Sample Locations

Subreach Dividers

Summary of PCB Concentrations in Bank Soils

Does not exceed cleanup criteria

Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow 0 - 0.5
1.0 - 1.5
Deep 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3J
BANK PCB DATA
SUBREACH 4-5B

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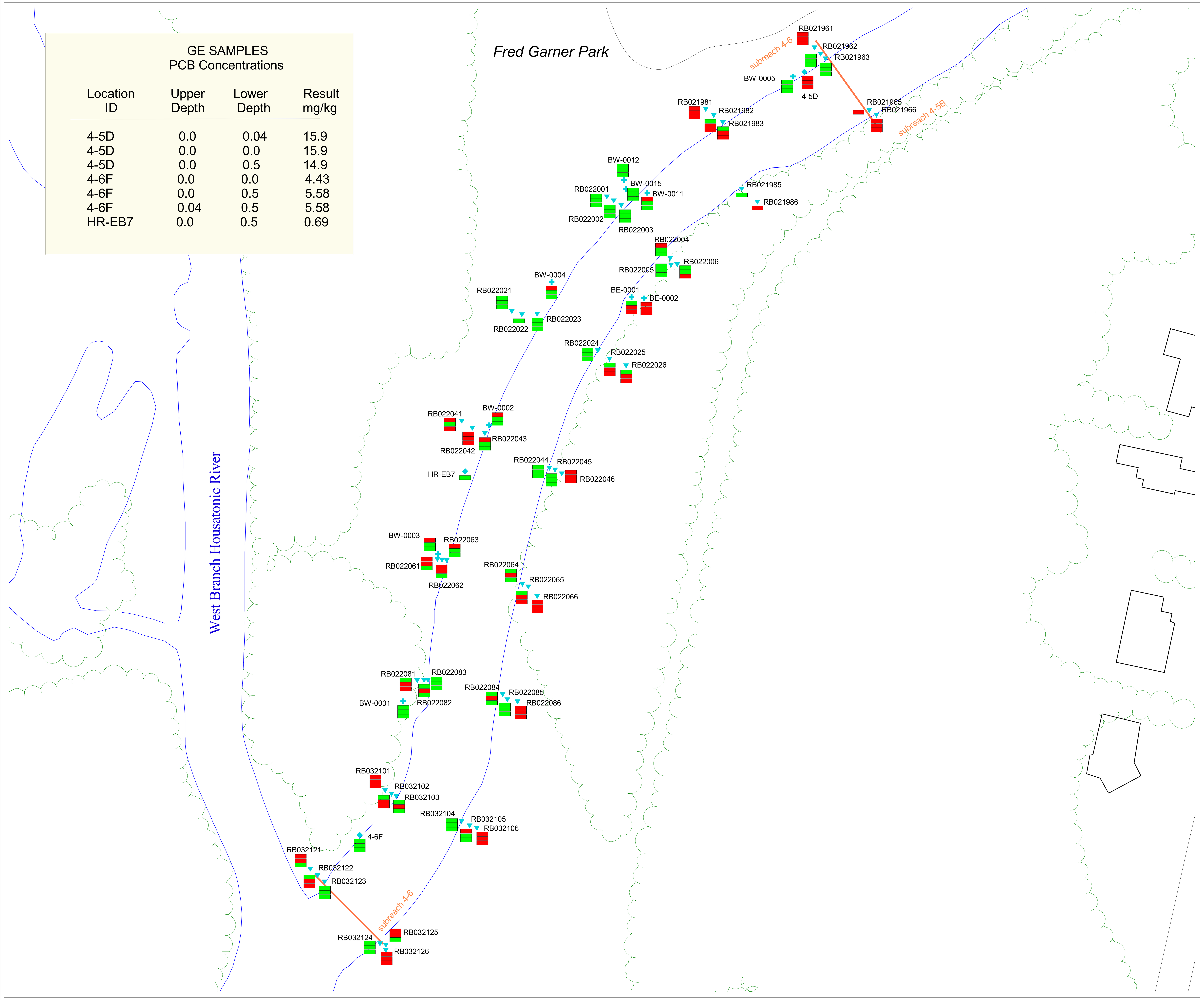
GE SAMPLES PCB Concentrations			
Location ID	Upper Depth	Lower Depth	Result mg/kg
4-5D	0.0	0.04	15.9
4-5D	0.0	0.0	15.9
4-5D	0.0	0.5	14.9
4-6F	0.0	0.0	4.43
4-6F	0.0	0.5	5.58
4-6F	0.04	0.5	5.58
HR-EB7	0.0	0.5	0.69



WESTON
MANAGERS DESIGNERS/CONSULTANTS

LEGEND:

Recreational | Residential

- EPA Sample Locations
- EPA-START Sample Locations
- GE Sample Locations
- Subreach Dividers

Summary of PCB Concentrations in Bank Soils

- Does not exceed cleanup criteria
- Exceeds cleanup criteria

Bank Soil Depth Rank Key

Shallow — 0 - 0.5
1.0 - 1.5
Deep — 2.0 - 2.5

NOTE: The depth intervals provided on the depth key above apply to the EPA samples which were collected from regular intervals in most cases. There are a few EPA samples however that do not fall into the specific depth intervals given above. The reader should refer to the data tables in Appendix H for confirmation of the sample interval for specific samples. The GE data were not collected from regular depth intervals and thus are summarized in the table on this figure for ease of viewing.

NOTES:

1. Cleanup concentration criteria for PCBs in recreational land use samples is 10 ppm in the top 1 foot and 10 ppm in the next 2 feet.

2. Cleanup concentration criteria for PCBs in residential land use samples is 2 ppm in the top 3 feet.

N

Scale in Feet

40 0 40 80 120 160 200

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3 - 3K
BANK PCB DATA
SUBREACH 4-6

LEGEND:

- Appendix IX Sample Locations
- Sub-Reach Dividers
- Roads
- Floodplain
- Surface Hydrology
- Building Footprints

N

Scale in Feet

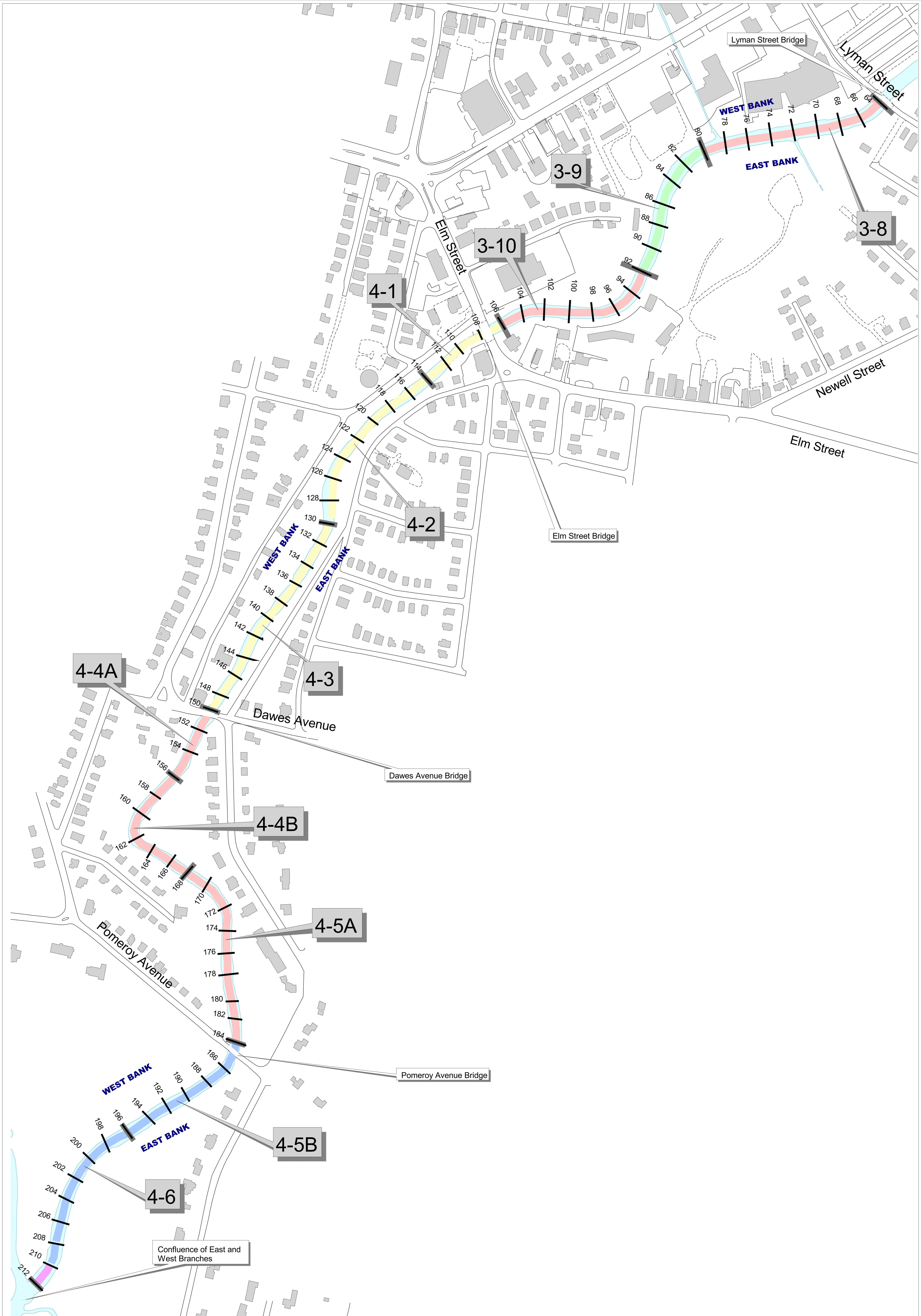
200 0 200 400 600

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 2.3-4
SEDIMENT AND BANK
APPENDIX IX LOCATION MAP

SECTION 3

FIGURES



LEGEND:

Excavation Depths:

- 2 Ft.
- 2 Ft. (Bedrock)
- 2.5 Ft.
- 3 Ft.
- 3.5 Ft.

- Transects
- Sub-reach Dividers
- Roads
- Surface Hydrology
- Building Footprints

N

Scale in Feet

200 0 200 400 600

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 3.4-1
EXTENT OF SEDIMENT REMOVAL
FOR CLEANUP

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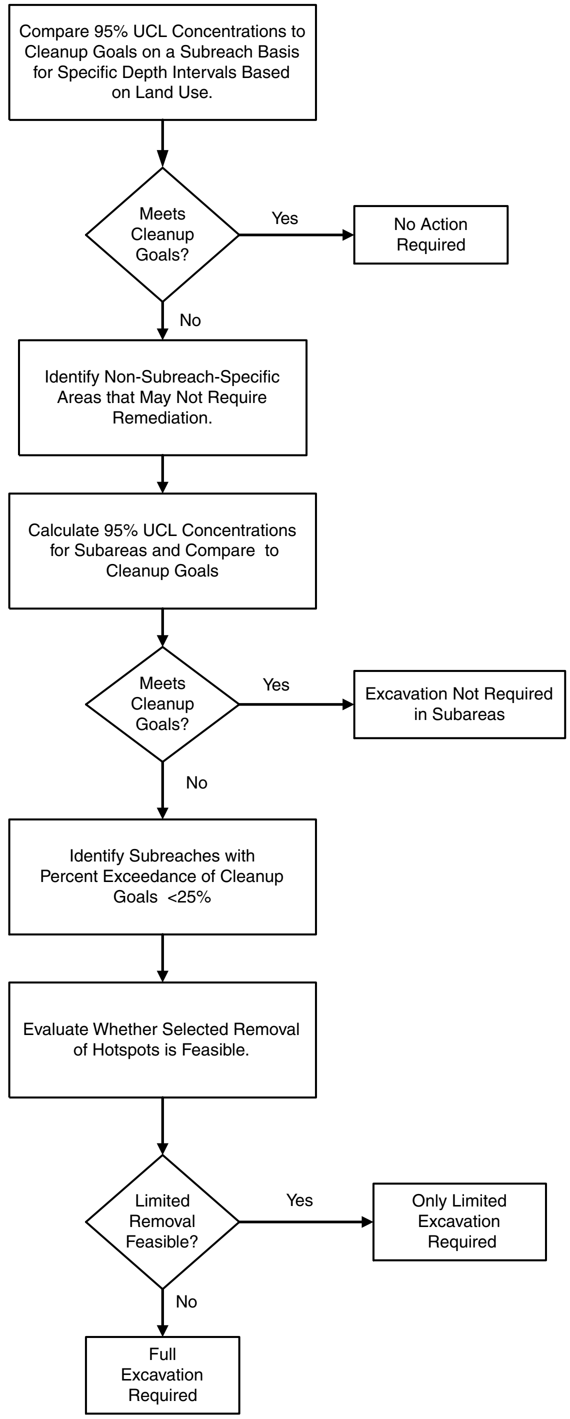
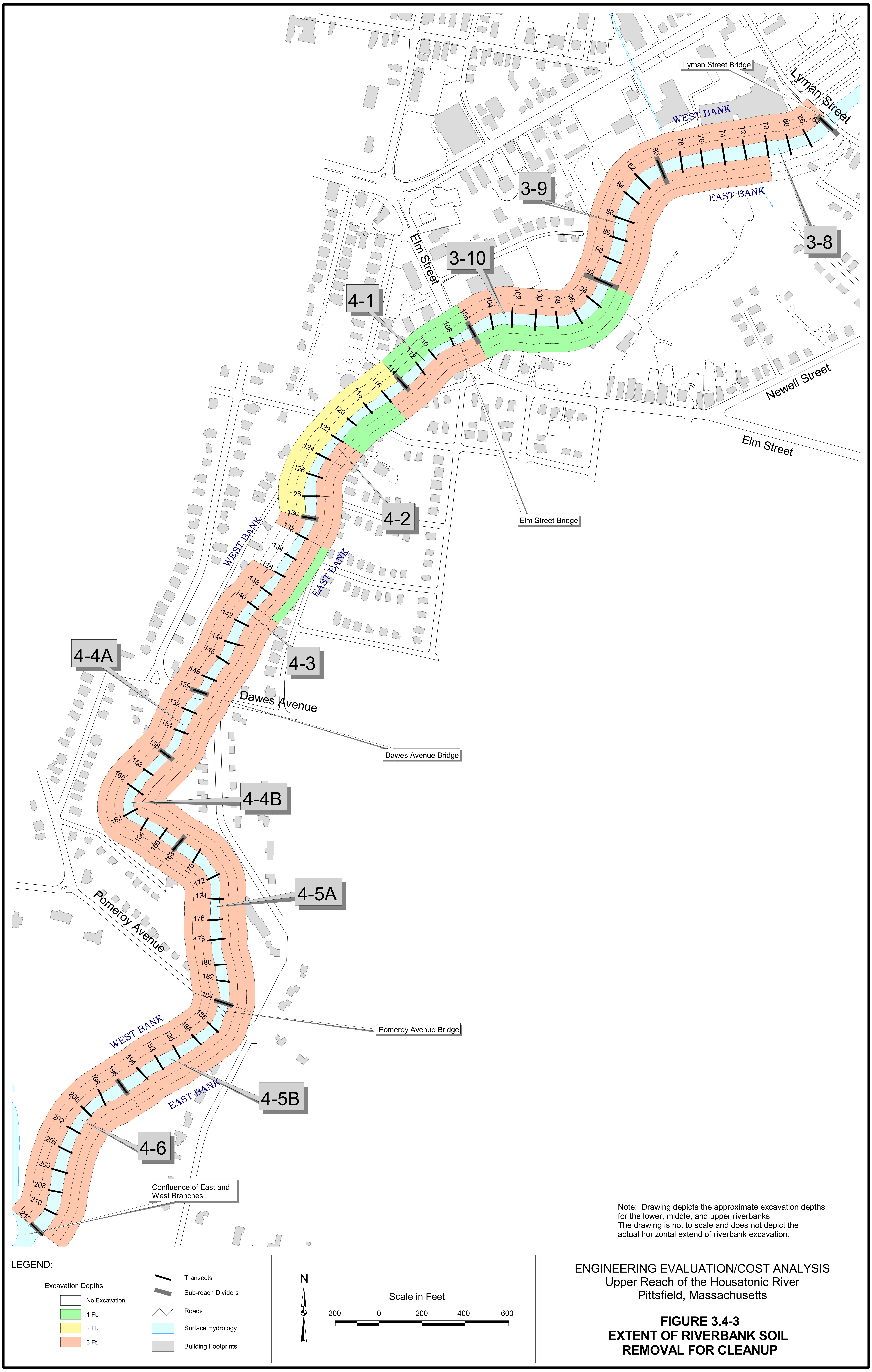


ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 3.4-2
EVALUATION OF RIVERBANK SOIL REMEDIATION AREAS DECISION MATRIX

99P-3022

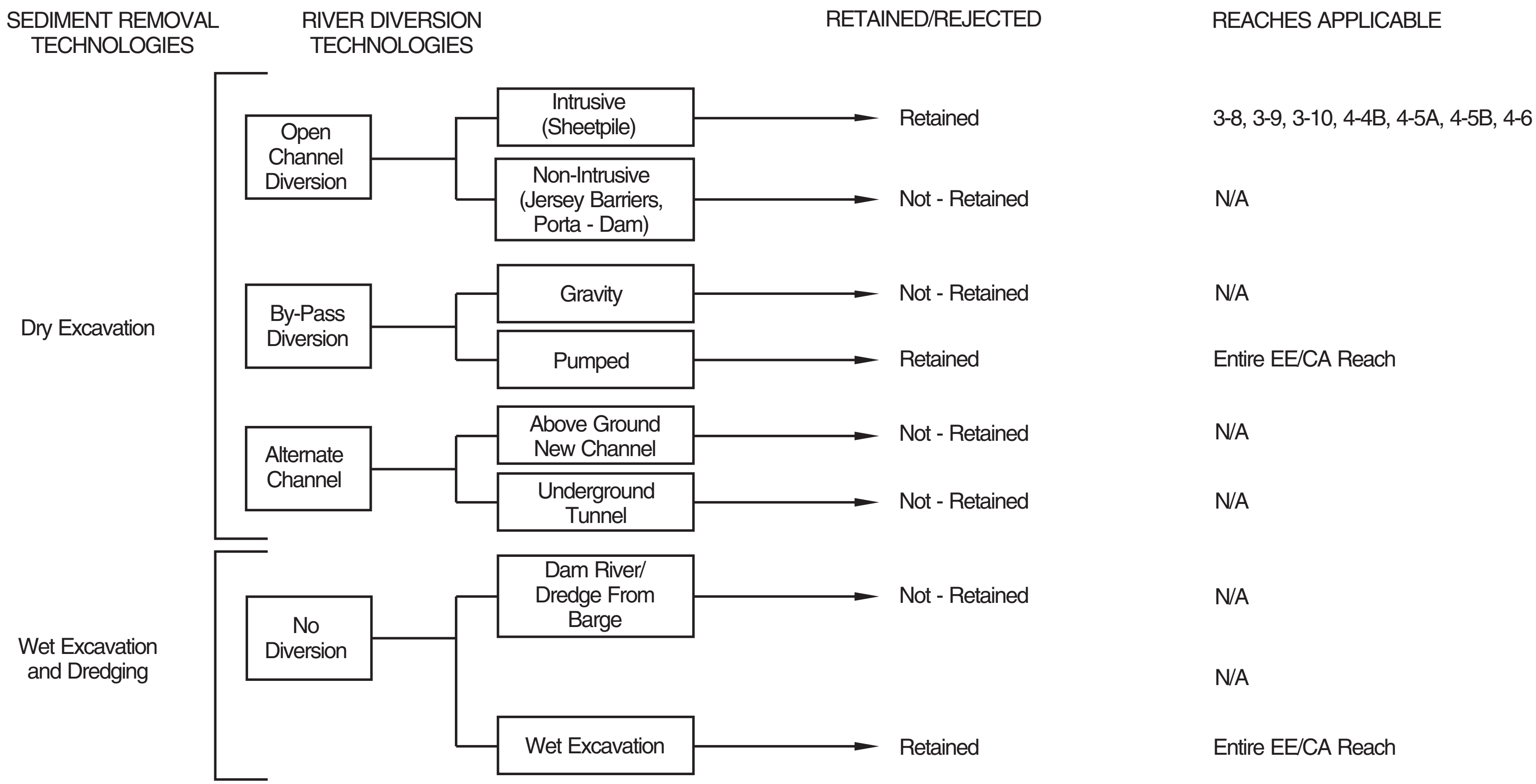


ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 3.4-3
EXTENT OF RIVERBANK SOIL REMOVAL FOR CLEANUP

SECTION 4

FIGURES

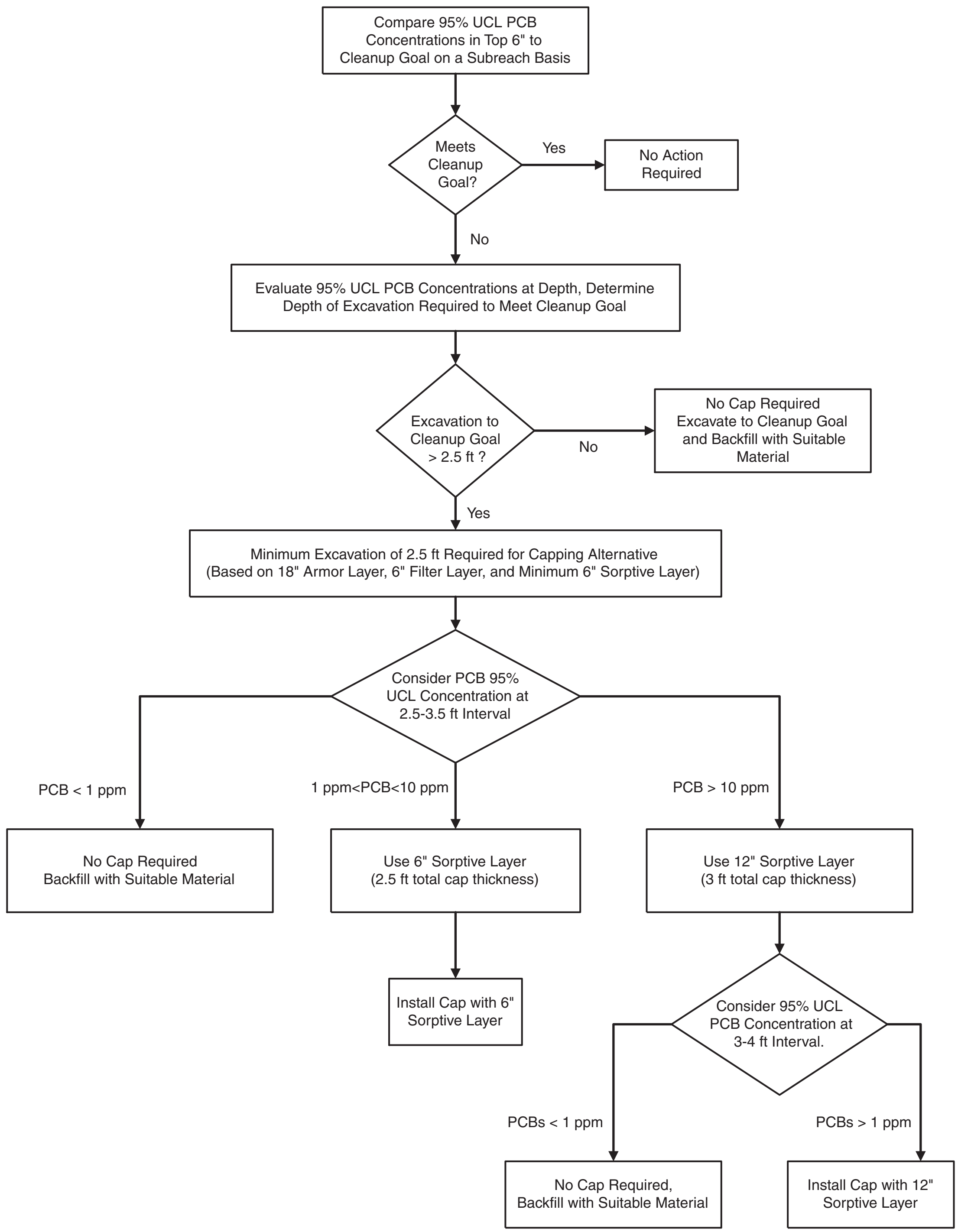


WESTON MANAGERS DESIGNERS/CONSULTANTS

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.2-1
SUMMARY CHART OF RIVER DIVERSION AND SEDIMENT REMOVAL SCREENING

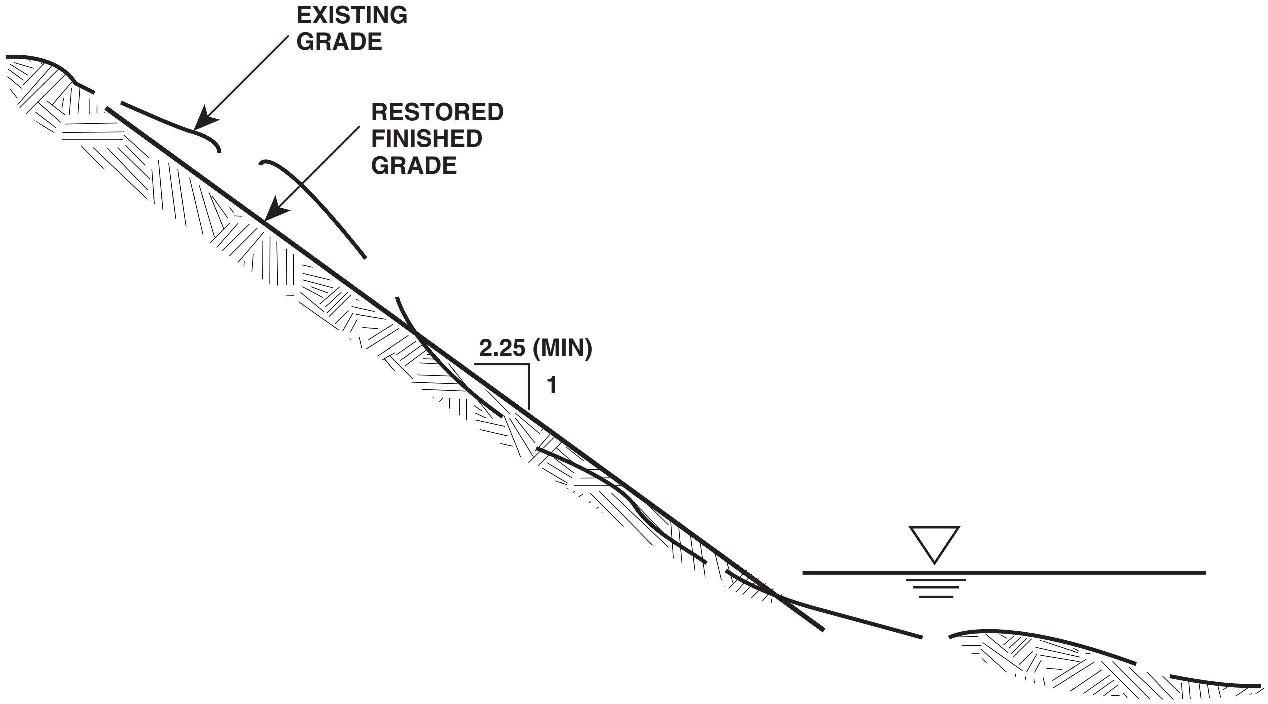
00P-0332



ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.3-1
EVALUATION OF SEDIMENT REMEDIAL ALTERNATIVES CAPPING VERSUS EXCAVATION TO CLEANUP GOALS

99P-3021

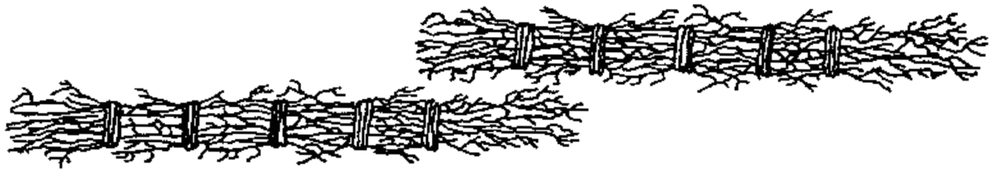


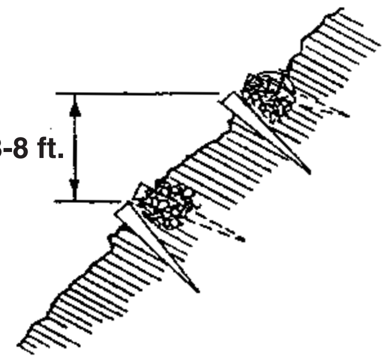
Source:
Roy F. Weston, Inc., 1999.

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-1
TYPICAL SLOPE REGRADING

99P-2020-1





DESIGN TABLE					
SLOPE	1:1	2:1	3:1	4:1	6:1
CONTOUR INTERVAL	3	4	5	6	8

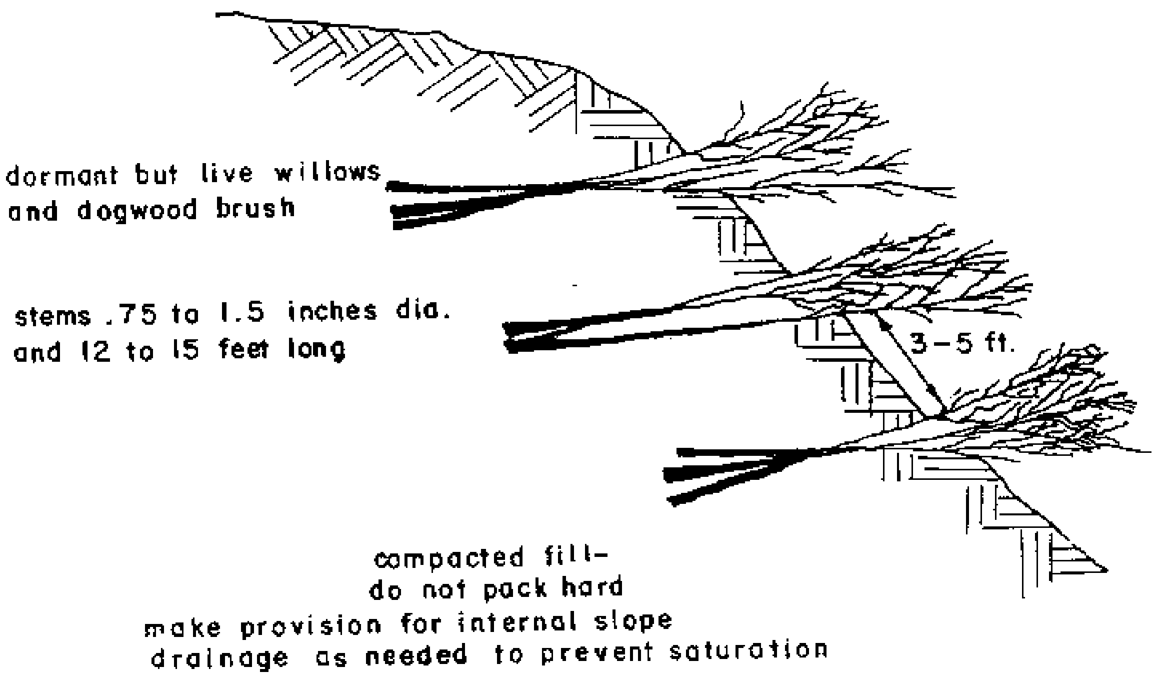
CONSTRUCTION SPECIFICATIONS

1. WATTLES SHALL BE 4" MINIMUM DIAMETER AND BUNDLED WITH TAPERED ENDS TO AN OVERALL LENGTH 18 INCHES LONGER THAN THE STEMS.
2. STRUCTURAL MEASURES SUCH AS REVETMENT, DRAINAGE, SURFACE DITCHES WILL BE INSTALLED PRIOR TO WATTLING. SLOPE SHALL BE GRADED AND SMOOTHED WITH OBSTRUCTIONS REMOVED.
3. ANCHOR STAKES WILL BE PLACED ON THE SLOPE AT THE DESIRED CONTOUR INTERVAL.
4. WORKING FROM THE BOTTOM OF THE SLOPE TO THE TOP, EXCAVATE WATTLE TRENCH JUST ABOVE THE STAKES. TRENCH SHALL BE HALF THE DIAMETER OF THE WATTLES. PLACE WATTLES IN TRENCH ANCHORING WITH ADDITIONAL STAKES AT 18 INCH INTERVALS. LOWER WATTLES WITH SOIL LEAVING ABOUT 10% EXPOSURE.
5. SOIL SHALL BE WORKED INTO THE WATTLES AND COMPACTED BY FOOT TRAFFIC.
6. ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WATTLING OPERATIONS.

Source:
Guidelines for Urban Erosion and
Sediment Control: New York, 1991 (99-0156).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-2
WATTLING DETAILS

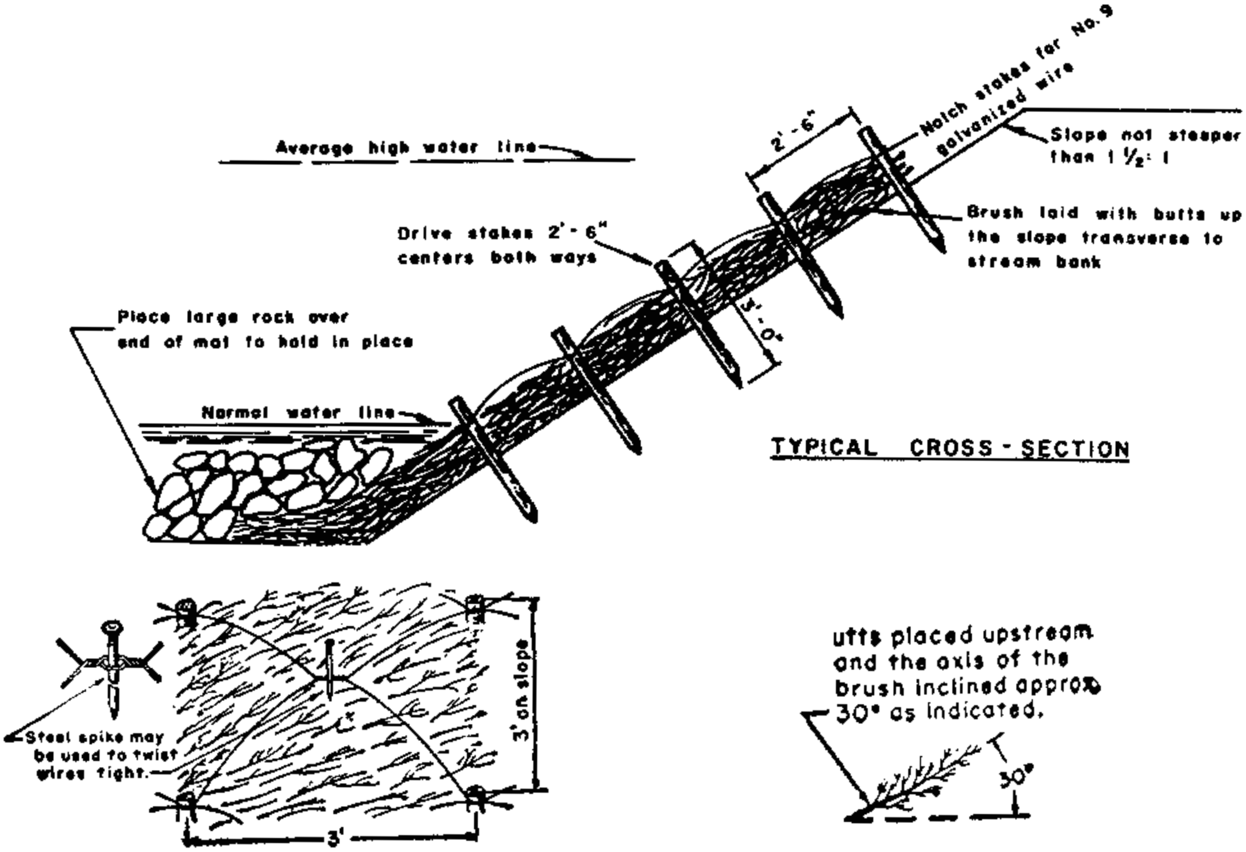


Source:
Guidelines for Urban Erosion and
Sediment Control: New York, 1991 (99-0156).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-3
BRUSH LAYERING METHOD

99P-2020-4



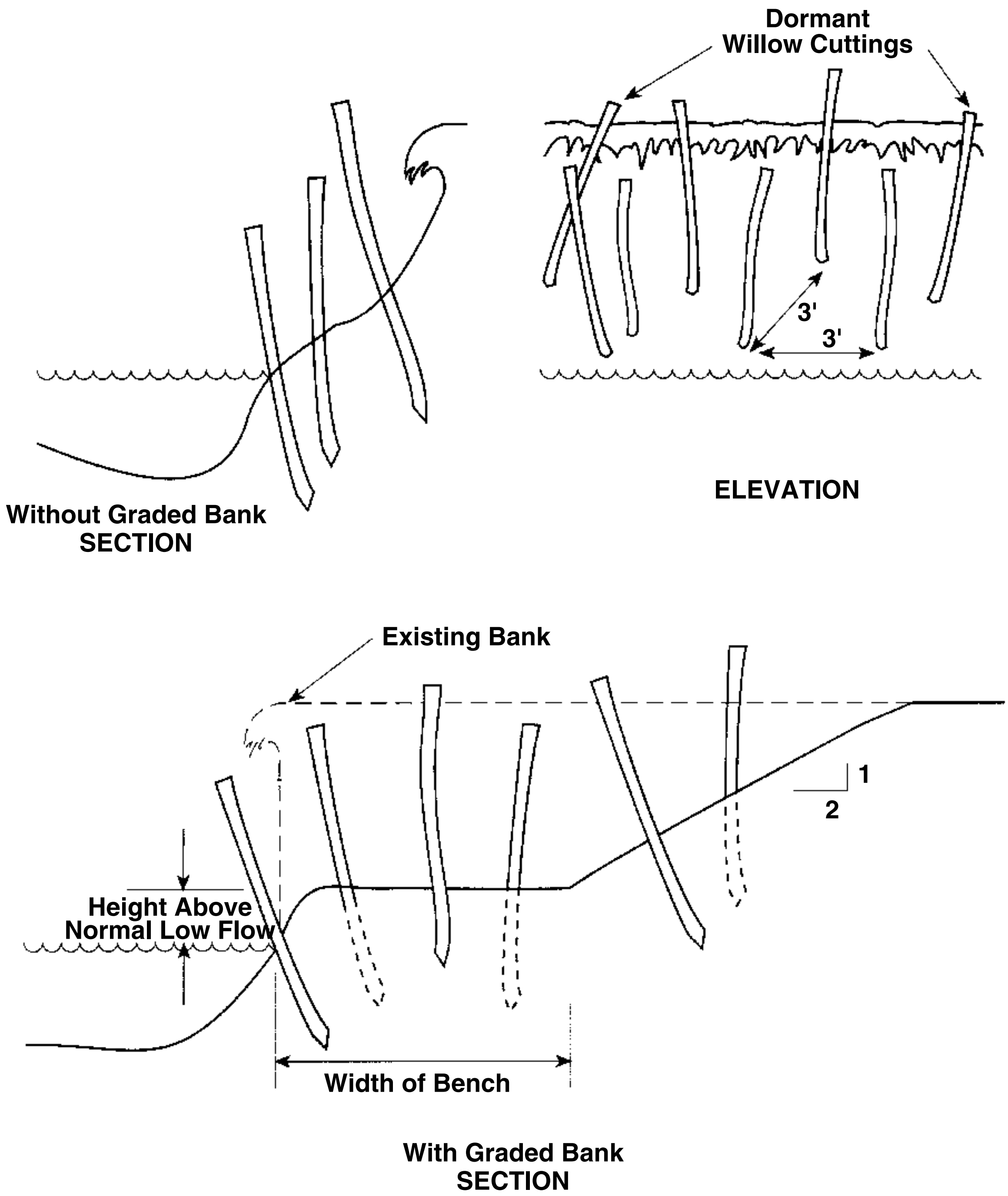
CONSTRUCTION SPECIFICATIONS

1. PREPARE SLOPE SURFACE BY GRADING TO A UNIFORM, SMOOTH SURFACE.
2. LAY HARDWOOD BRUSH IN AN UPSTREAM DIRECTION BEGINNING AT THE DOWN-STREAM END. THE TOE SHOULD BE ESTABLISHED FIRST.
3. THE BUTT END OF THE BRUSH WILL BE PLACED UPSTREAM AND THE PLANT MATERIALS INCLINED APPROXIMATELY 30 DEGREES.
4. THE UPSTREAM EDGE OF THE MAT WILL BE KEYED INTO THE SLOPE 2 FEET. STAKES WILL BE DRIVEN THROUGHOUT THE MATTING ON 3 FOOT CENTERS EACH WAY BEGINNING ALONG THE TOE OF THE MAT.
5. NO. 9 GALVANIZED WIRE WILL BE ATTACHED TO THE STAKES OVER THE MAT AND TIGHTENED TO SECURE THE MAT.
6. SLOPE AREAS ABOVE THE MAT WILL BE SLOPED AND SEEDED.

Source:
Guidelines for Urban Erosion and Sediment Control: New York, 1991 (99-0156).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

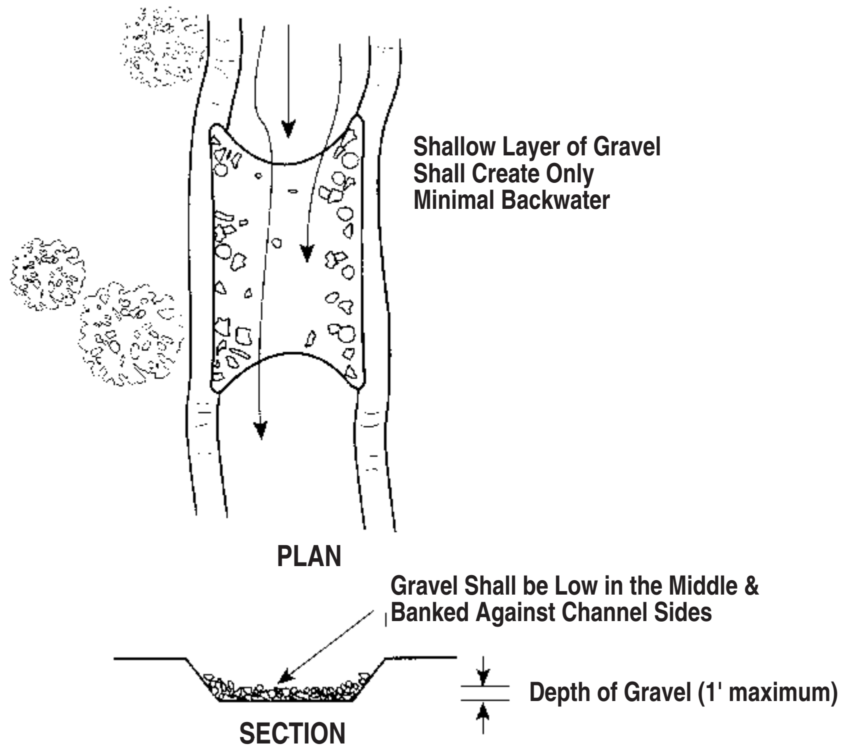
FIGURE 4.6-4
BRUSH MATTING DETAILS



Source:
Ohio's Standards for Stormwater Management, 1996 (99-0157).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-5
STREAMBANK STABILIZATION WITH DORMANT POSTS AND STAKES

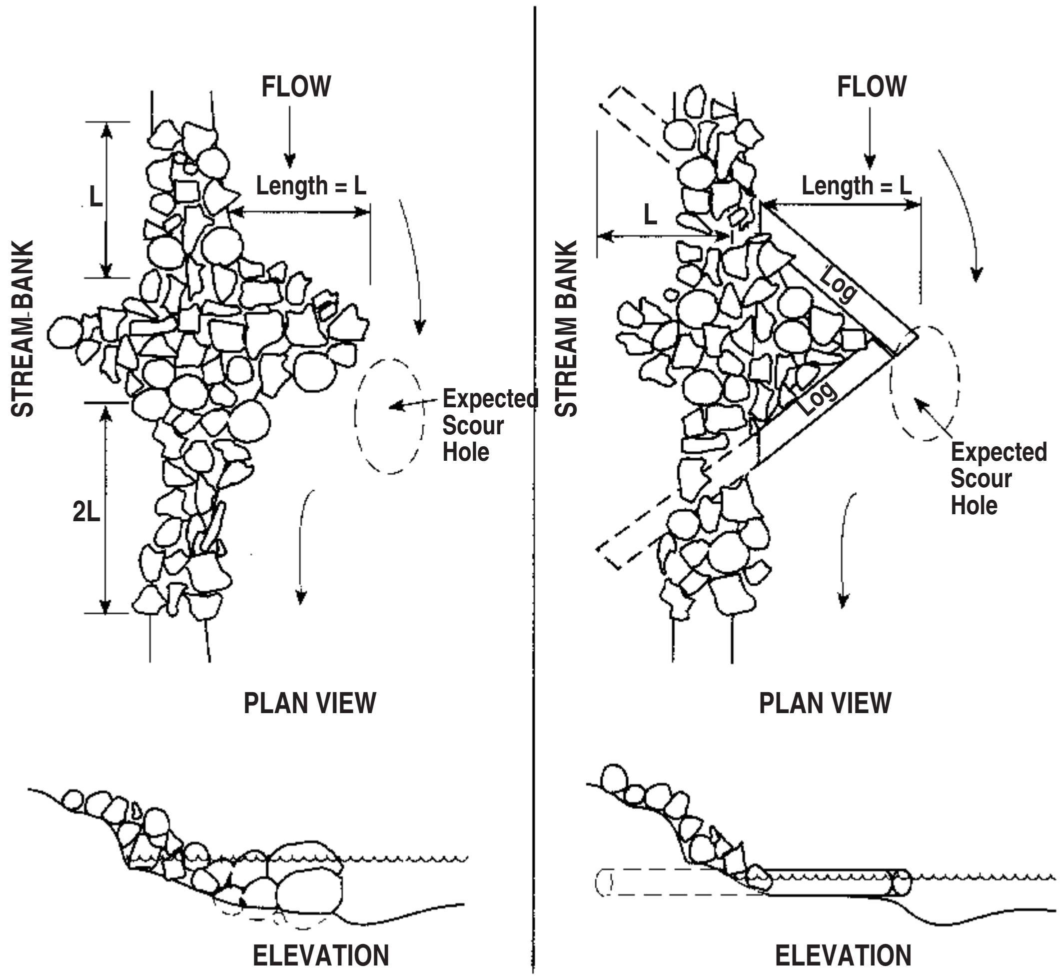


1. The length of gravel riffles shall be equivalent to 1.5 times the channel width.
2. The gravel shall NOT be placed so that it acts as a dam or creates a backwater pool. It shall be generally less than 1-ft. thick and no higher than the existing water surface elevation.
3. The gravel shall be placed so that it is slightly lower in the middle of the channel and higher by the streambanks.
4. Gravel size shall be similar to the substrate and gravel bars in the existing stream channel and so that the gravel will be stable at low and medium flows but erodible at high flows.

Source:
Ohio's Standards for Stormwater Management, 1996 (99-0157).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-6
GRAVEL RIFFLE

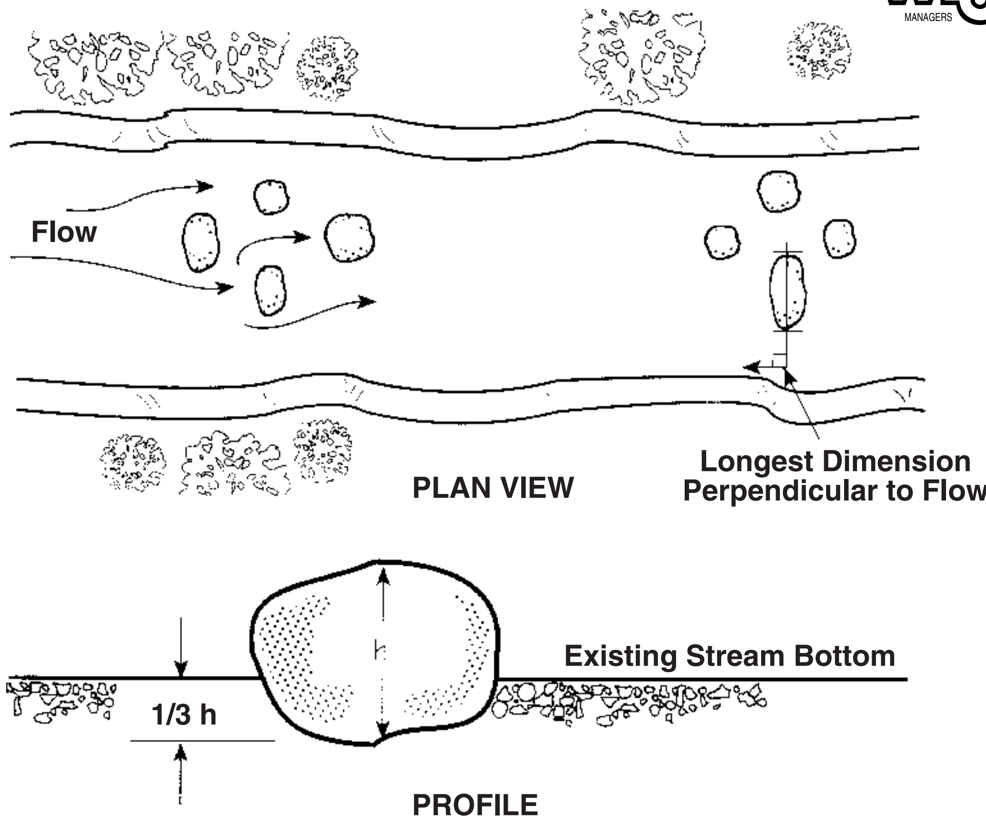


1. The height of deflectors shall allow them to project above the water surface during low flows and be submerged during high flows.
2. Rock used in the deflectors shall be large enough to be stable for high flows. The largest rocks should be arranged near the point of the deflector.
3. The voids in the rock and riprap shall be filled with soil and planted.

Source:
Ohio's Standards for Stormwater Management, 1996 (99-0157).

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-7
CURRENT DEFLECTORS



1. Eddy rocks shall be larger than 2 ft. except in small channels where they shall be no more than one-fifth the width of the channel.
2. Groups of three to seven rocks shall be placed in a staggered patterned so current deflected around one rock then flows into another.
3. Eddy rocks shall be placed in the center half of a channel in straight runs where they will be in swift current during high flow. However, they shall not be placed in riffles.
4. Rocks shall be placed with their longest dimension perpendicular to the flow, not angled to one bank or the other.
5. Rocks shall be placed so they will project above the surface during low flows and be submerged during high flows. Also, they shall be placed in an excavation so that they are at least one-third buried in the channel bed.

Source:
Ohio's Standards for Stormwater Management, 1996 (99-0157).

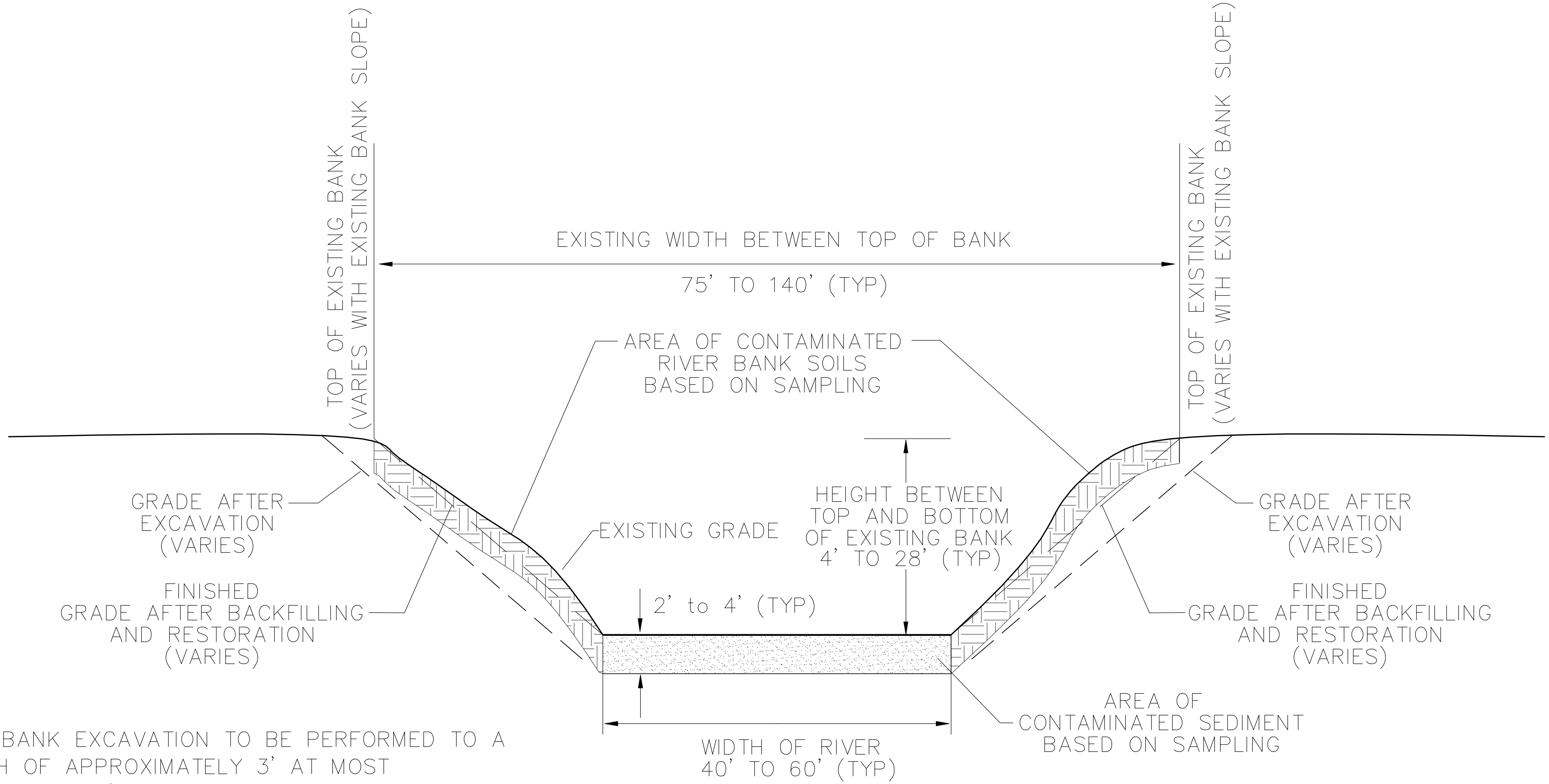
ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 4.6-8
BOULDER PLACEMENT

99P-2020-9

SECTION 5

FIGURES



NOTES:

1. RIVERBANK EXCAVATION TO BE PERFORMED TO A DEPTH OF APPROXIMATELY 3' AT MOST SUBREACHES. (REFER TO TABLE 3.4-2 FOR EXCEPTIONS BASED ON CONTAMINANT CONCENTRATIONS).

2. FINISHED GRADE TO HAVE A SLOPE OF 2.25H:IV OR SHALLOWER, UNLESS HARD STRUCTURES ARE INSTALLEDTO MAINTAIN EXISTING TOP OF BANK.

LEGEND

RIVER BED SEDIMENT EXCAVATION

RIVER BANK SOIL EXCAVATION

GRADE FOLLOWING EXCAVATION

FINISHED GRADE FOLLOWING RESTORATION

EXISTING GROUND/ RIVERBED SURFACE

NOT TO SCALE

ENGINEERING EVALUATION/COST ANALYSIS
UPPER REACH OF THE HOUSATONIC RIVER
PITTSFIELD, MASSACHUSETTS

FIGURE 5.2-1
RIVER EXCAVATION
CONCEPTUAL CROSS SECTION

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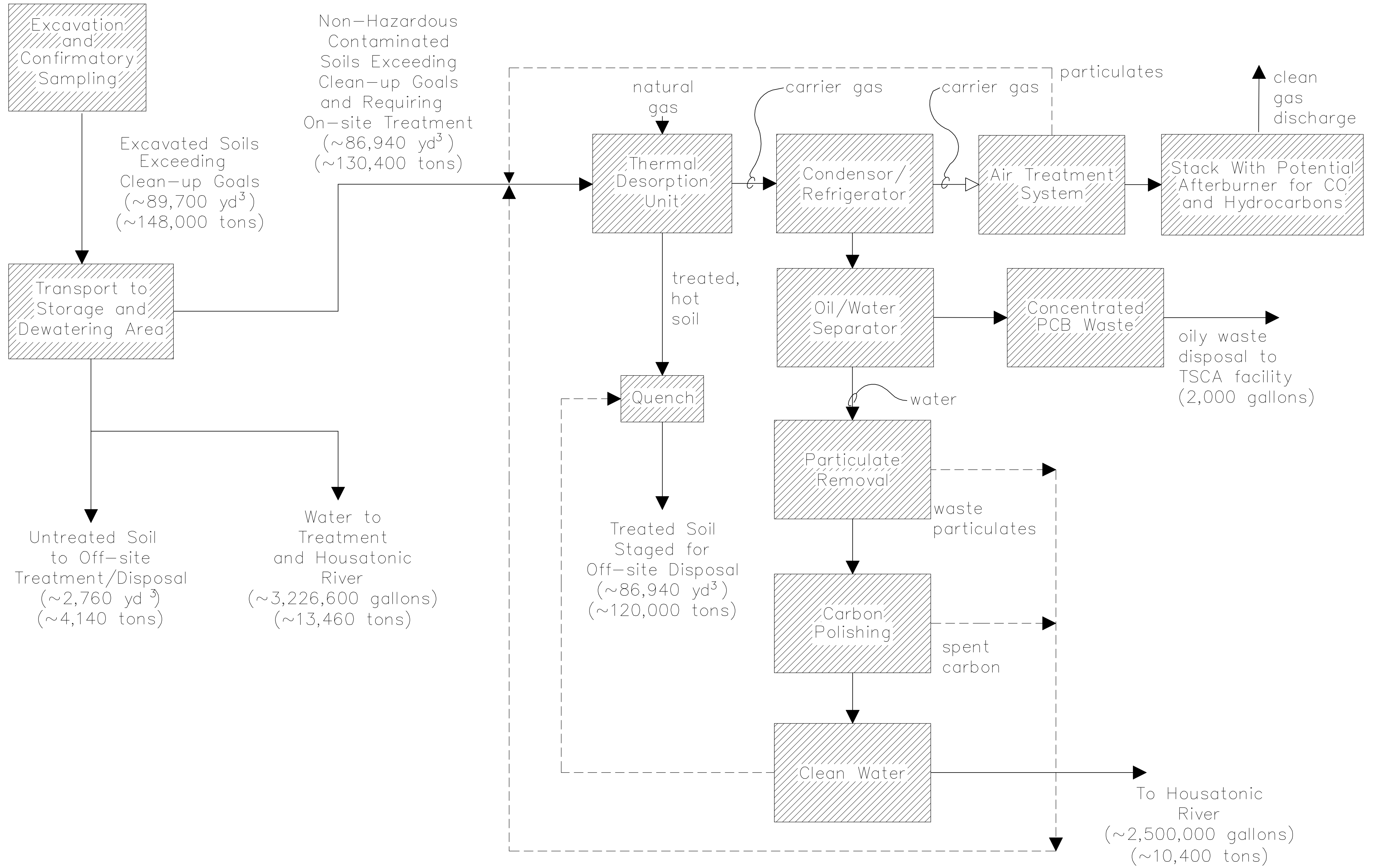


LEGEND

PROCESS FLOW ——→

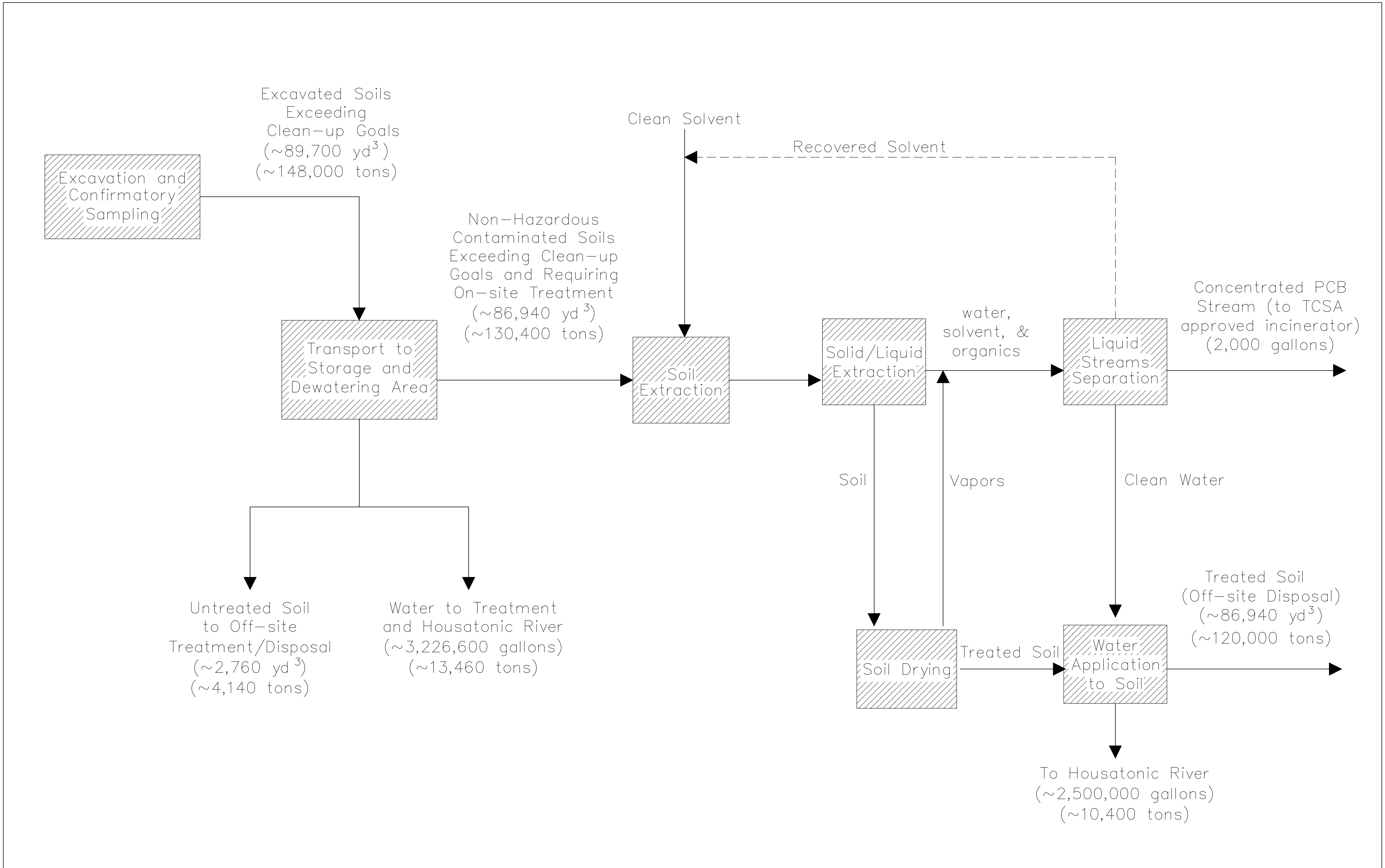
RECYCLE FLOW - - - - →

NOT TO SCALE

ENGINEERING EVALUATION/COST ANALYSIS
UPPER REACH OF THE HOUSATONIC RIVER
PITTSFIELD, MASSACHUSETTS

FIGURE 5.2-2
REMEDIAL PROCESS FLOW SHEET
DISPOSAL OPTION C – THERMAL DESORPTION

G:\PROJECTS\10971032\FINLEECA\SECT5\FIGURES\EE-CA.DWG



LEGEND

PROCESS FLOW →

RECYCLE FLOW - - - - →

NOT TO SCALE

ENGINEERING EVALUATION/COST ANALYSIS
UPPER REACH OF THE HOUSATONIC RIVER
PITTSFIELD, MASSACHUSETTS

FIGURE 5.2-3
REMEDIAL PROCESS FLOW SHEET
DISPOSAL OPTION D – SOLVENT EXTRACTION

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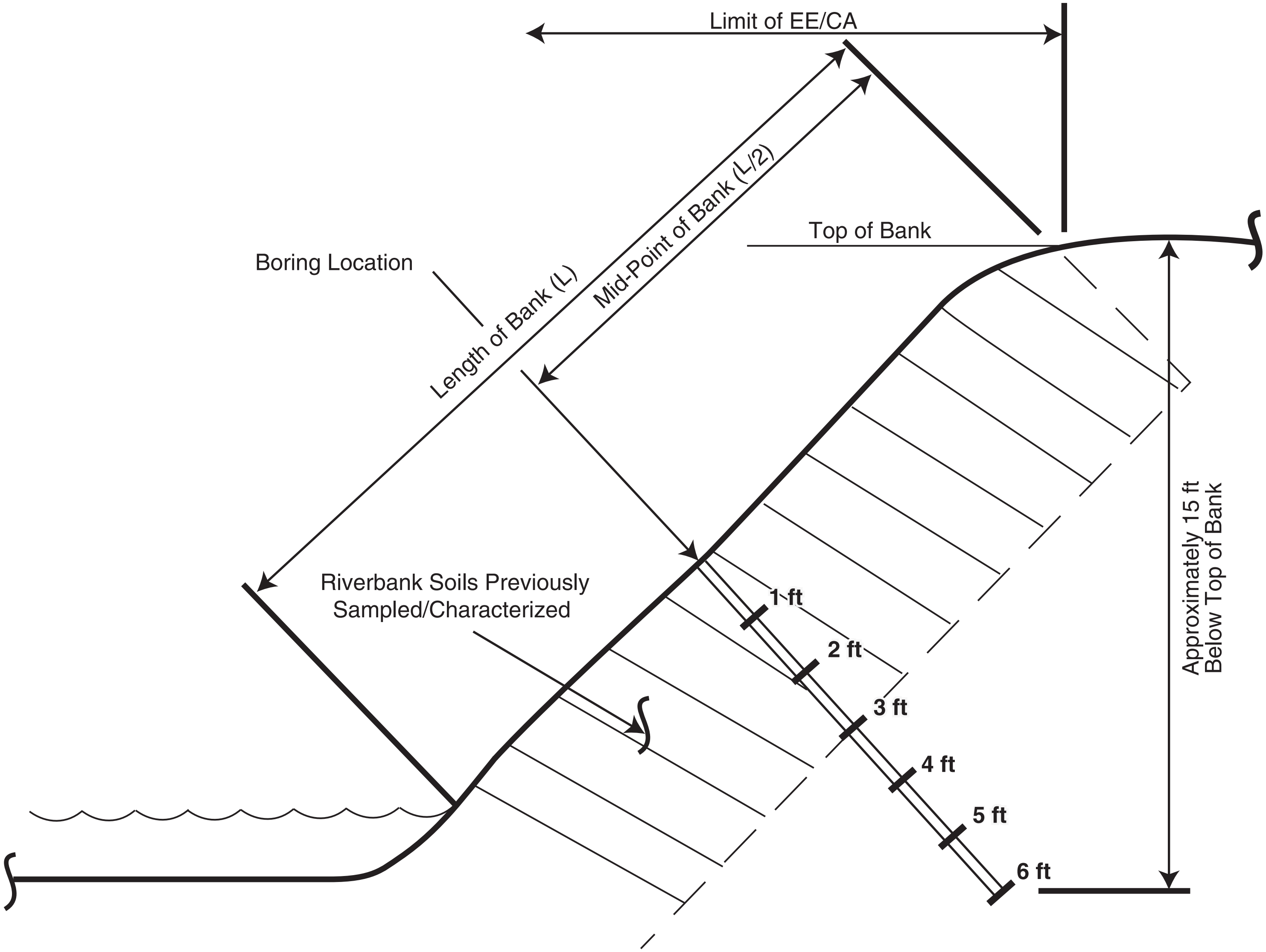
SECTION 6

FIGURES



LEGEND

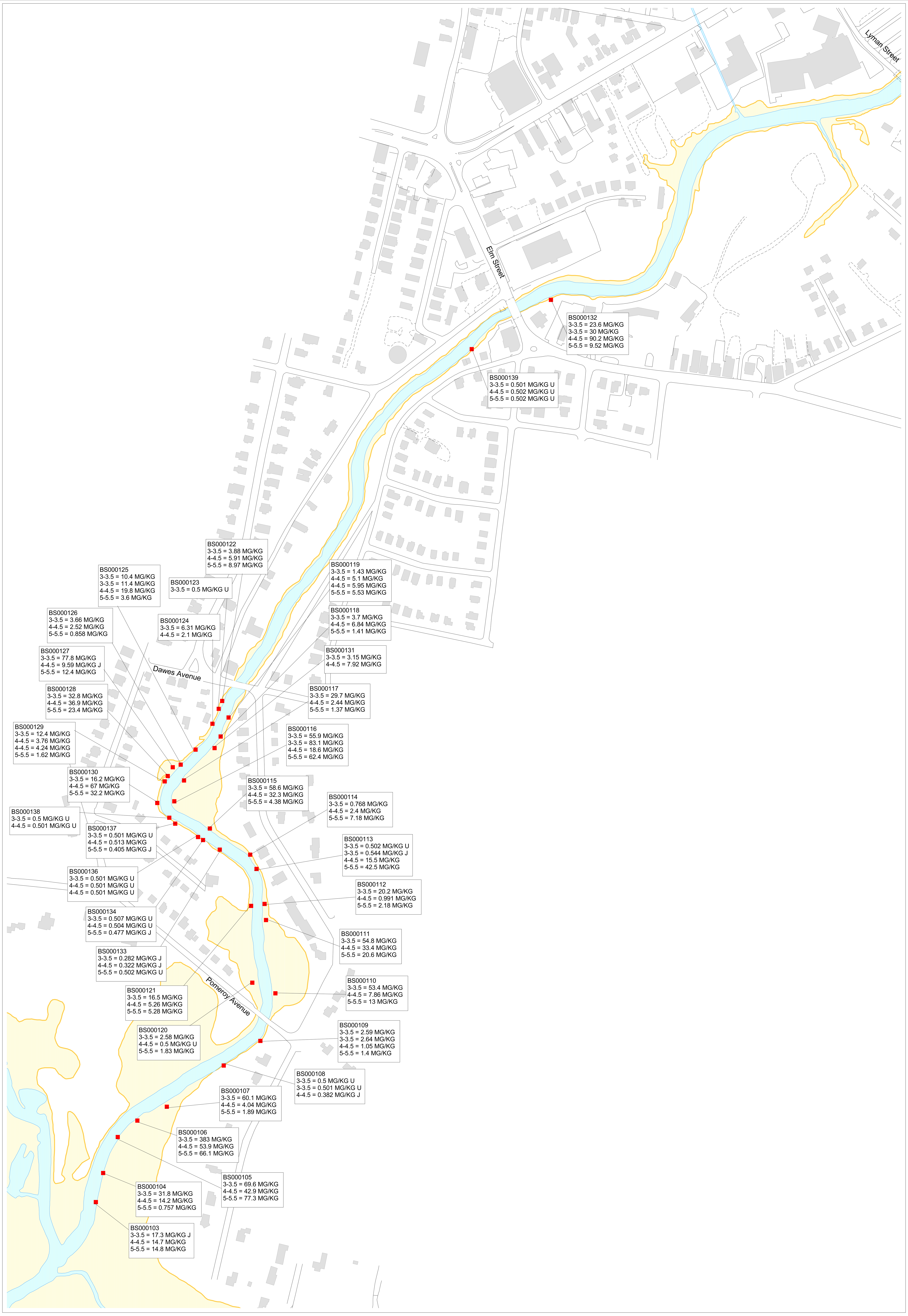
Riverbank Soils Previously Characterized

Boring Location and Depth Intervals
1 ft 2 ft

ENGINEERING EVALUATION/COST ANALYSIS
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 6.1-1
SCHEMATIC CROSS SECTION OF BORING LOCATION

00P-1286



LEGEND:

- Residential Riverbank Boring Location
- Roads
- Buildings
- Hydrology
- 10-year Floodplain

N

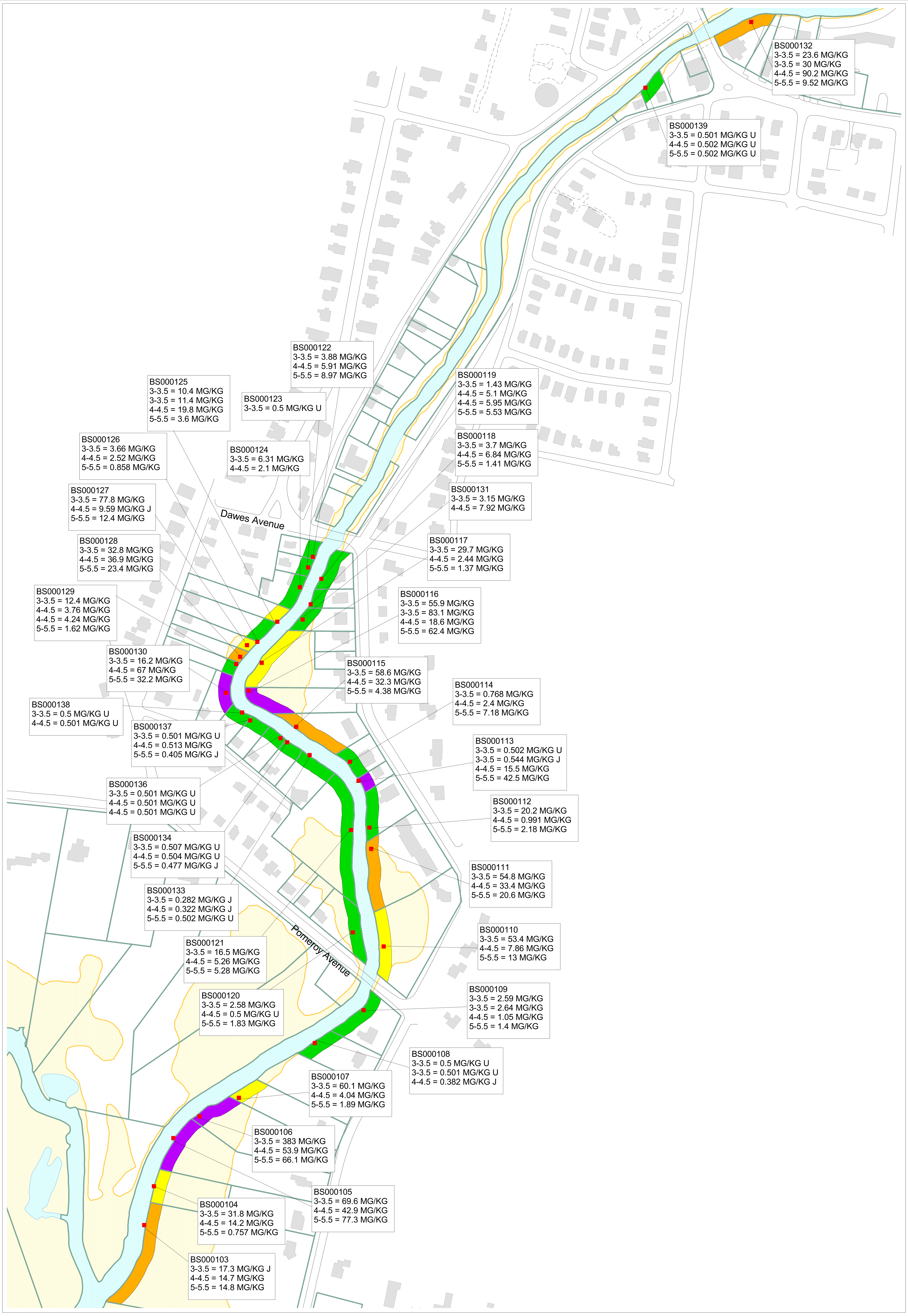
Scale in Feet

200 0 200 400 600

Engineering Evaluation/Cost Analysis
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 6.1-2
EE/CA RIVERBANK SAMPLING
TOTAL PCB RESULTS

| o:/gepitt/aprs/r4est_excav.apr | layout - figure 6.1-2 | o:\gepitt\epsfiles\portrait24x36\in\r4rivbank_borings_fig612.eps | 8:35 AM, 7/12/2000 |



LEGEND:

Excavation Depths

- No Additional Excavation
- Additional Excavation to 4 ft Depth
- Additional Excavation to 5 ft Depth
- Additional Excavation to 6 ft Depth
- Residential Riverbank Boring Location
- Roads
- Buildings
- Parcel Boundary
- Hydrology
- 10-year Floodplain

N

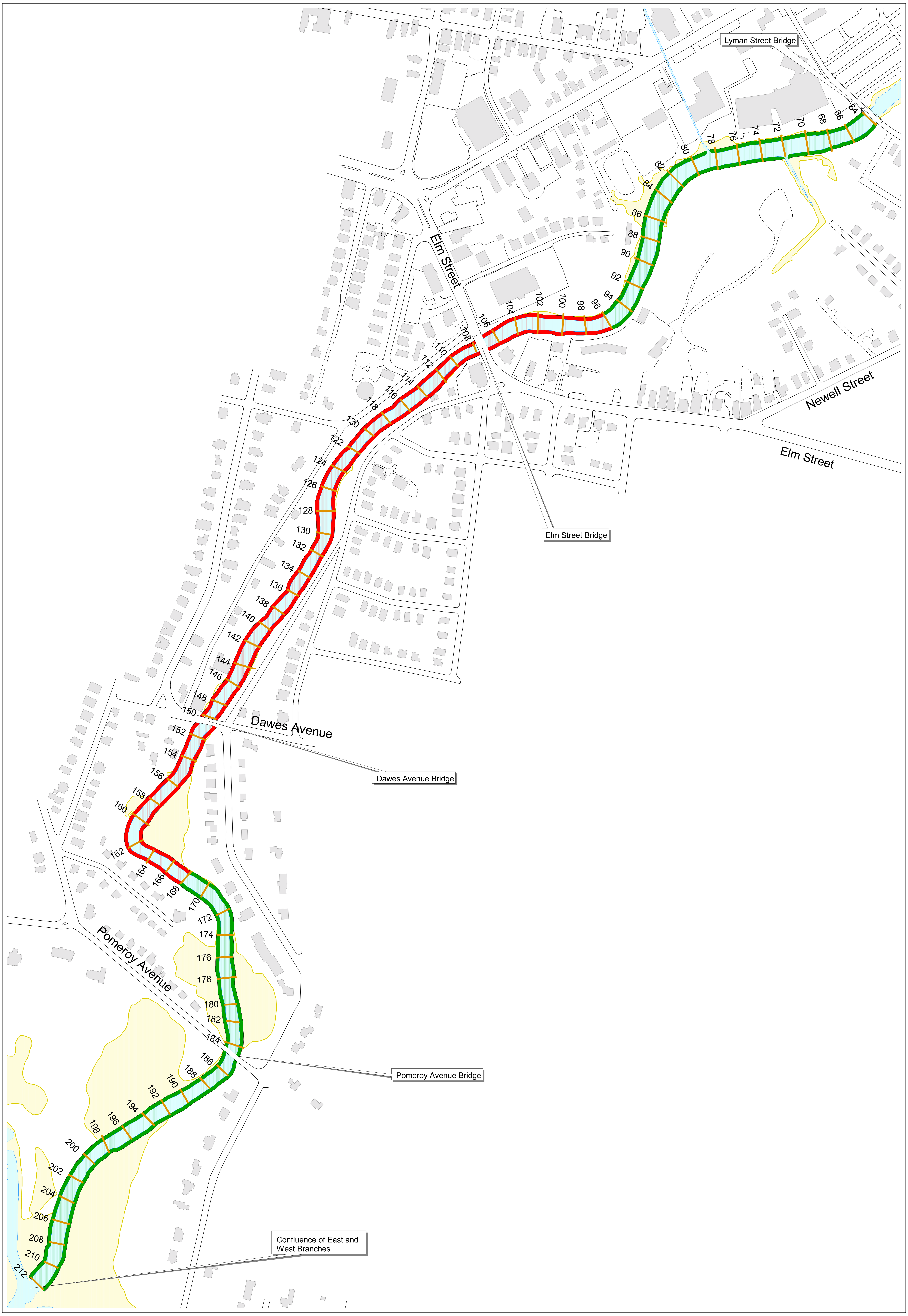
Scale in Feet

150 0 150 300

Engineering Evaluation/Cost Analysis
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 6.1-3
SUPPLEMENTAL RIVERBANK SAMPLING PROGRAM
EXCAVATION TO REVISED CLEANUP CRITERIA

| o:/gepitt/aprs/r4est_excav.apr | layout - fig 6.1-3 | o:\gepitt\epsfiles\portrait24x36\in\rivbnk_excav_fig613.eps | 8:33 AM, 7/12/2000 |



LEGEND:

- Removal with Pumped Bypass Diversion
- Removal with Sheetpile Diversion
- Transects
- Roads
- Buildings
- Hydrology
- 10-year Floodplain

N

Scale in Feet

200 0 200 400 600

Engineering Evaluation/Cost Analysis
Upper Reach of the Housatonic River
Pittsfield, Massachusetts

FIGURE 6.3-1
RECOMMENDED REMOVAL ALTERNATIVE

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00-0391 Silfer, A.T., General Electric. 8 September 1999. Letter to R. Cavagnero, EPA. Re: Supplemental Addendum to June 1999 Detailed Work Plan, On-Plant Consolidation Areas.

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