REPORT

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

VOLUME I OF II

General Electric Company

Pittsfield, Massachusetts

February 1996

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FEBRUARY 1996

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SECTION 1 - INTRODUCTION

1.1 General

This report, prepared on behalf of the General Electric Company (GE) by Blasland, Bouck & Lee, Inc. (BBL), is an updated and revised version of the MCP Phase I and Interim Phase II Report for Former Housatonic River Oxbow Areas A, B, C, E, F, J, and K (Blasland & Bouck, April 1992). That earlier report has been updated and revised in accordance with an April 3, 1995 letter from GE to the MDEP that noted, among other tasks, that the April 1992 report be revised to reflect additional investigations, the revised MCP, and other pertinent developments that have occurred since April 1992. This report is submitted to the Massachusetts Department of Environmental Protection (MDEP) to meet requirements under the Massachusetts Contingency Plan (MCP) and a Consent Order executed by GE and the MDEP in May 1990.

While the previous report described various investigations and data needs related to Oxbow Areas A, B, C, E, F, J, and K, the oxbow areas covered in this report include only Oxbow Areas A, B, C, J, and K. Oxbows E and F will be included in later reports. Specifically,

- Oxbow Area E is being investigated as part of the MCP Phase II and RCRA Facility Investigation (RFI) of the Lyman Street Parking Lot/USEPA Area 5A Site and will be included in an upcoming Supplemental Phase II/RFI Report on that site (currently scheduled for submittal on April 1, 1996); and
- Oxbow Area F has been investigated as part of the MCP Phase II and RFI of the Newell Street Parking Lot/USEPA Area 5B Site (which includes Oxbow Area G as well) and will be included in an upcoming

Supplemental Phase II/RFI Report on that site (currently scheduled for submittal on March 1, 1996).

Other former oxbow and lowland areas (i.e., Oxbow Areas H and I) are being investigated as part of separate MCP or MCP/RCRA corrective action activities at the East Street Area 2/USEPA Area 4 and Newell Street Area 1 sites, respectively. Investigations on these sites will also be reported separately.

The investigative activities for these former oxbow and lowland areas under the MCP were originally proposed to the MDEP in GE's "Housatonic River MCP Phase II Scope of Work" (Blasland & Bouck, June 1990), which was conditionally approved by the MDEP in the fall of 1990. Similarly, it was originally intended that the information from those investigations would be reported along with the MCP Phase II information on the Housatonic River (which was reported to the MDEP in December 1991). However, the MCP activities for the former oxbows and lowland areas were delayed due to difficulties in obtaining the necessary approval from the Pittsfield Conservation Commission to install groundwater monitoring wells in the appropriate areas. Moreover, review of the data obtained from the MCP investigations of the former oxbow and lowland areas indicated that these areas present separate issues and concerns from those associated with the Housatonic River. For these reasons, a separate report was submitted on the former oxbow and lowland areas (Blasland & Bouck, April 1992).

This report provides an update of site investigations undertaken since April 1992 and constitutes a combined Phase I - Initial Site Investigation and a Phase II - Comprehensive Site Assessment Report for these areas. This report proposes the appropriate MCP outcome for each of the five Oxbow Areas at the present time.

1.2 Background Information

1.2.1 General

Prior to 1942, the stretch of the Housatonic River which flows through Pittsfield, Massachusetts, was characterized as a meandering stream. As such, the river contained a series of alternating bends, or oxbows, as well as lowland areas in this stretch.

In an effort to reduce the flooding potential of the Housatonic River, the City of Pittsfield, in a joint program with the U.S. Army Corps of Engineers during the early 1940s, altered the natural course of the river to form a relatively straight channel. In order to accomplish this, a number of oxbows or lowland areas, which had previously conveyed river flows or were intermittently flooded, were deliberately isolated from the newly-formed channel of the river. Information regarding the river rechannelization effort is available from mapping prepared by the City of Pittsfield in 1940 and is discussed further in Section 2.1.

A total of 11 of these oxbow or lowland areas were identified as needing investigation under the MCP. Each of these areas has been given a letter designation by GE. This report covers only five of the 11 oxbow areas, namely Areas A, B, C, J, and K. The other six areas (Oxbow Areas D, E, F, G, H, and I) are covered in separate reports associated with the Lyman Street/USEPA Area 5A (Oxbow E), Newell Street Parking Lot/USEPA Area 5B (Oxbows F and G), East Street Area 2/USEPA Area 4 (Oxbow H), and Newell Street Area I (Oxbow I) sites. Oxbow Areas A, B, C, J, and K are illustrated on Figures 1-1 through 1-3, and a brief description of each location is presented below.

1.2.2 Oxbow Area A

Oxbow Area A is approximately 5 acres in size and occupies a large field on the south side of the river north of Elm and Newell Streets (UTM N 4,700,500 M; E 644,600 M) as illustrated on Figure 1-2. A review of historical aerial photographs indicates that this area appears to have been a backwater area of the river. It also appears that portions of this area were filled prior to 1969, although filling continued into the 1980s (E. Barbalunga, pers. comm.).

1.2.3 Oxbow Area B

Oxbow Area B is located north of Area A across the present river channel (UTM N 4,700,700 M; E 644,600 M) as illustrated on Figure 1-2. This area measures approximately 3 acres in size and includes a former bend in the river which was isolated from the river by rechannelization. Also included within this area is a former low-lying swamp area located immediately to the east. Review of historical aerial photographs indicates that this area was filled prior to 1942.

1.2.4 Oxbow Area C

Oxbow Area C, measuring approximately 2 acres in size, is located directly east of Area A, southeast of the present river channel, and near the northwest end of Day Street (UTM N 4,700,630 M; E 644,670 M) as illustrated on Figure 1-2. Historical aerial photographs of this area indicate that portions of this former oxbow were not filled until the 1970s, although significant portions of this area were filled prior to 1956.

1.2.5 Oxbow Areas J and K

Oxbow Areas J and K are located approximately 2,500 feet upstream of the Newell Street bridge as shown in Figure 1-3. Area J measures approximately 4 acres in size and is located on the north side of the river

south of East Street, between Fasce and Commercial Streets (UTM N 4,702,440 M; E 646,300 M). Area K measures approximately one acre in size and is located on the south side of the river across from Area J and northeast of Ventura Avenue (UTM N 4,702,330 M; E 646,370 M). Review of aerial photographs of these areas could not provide sufficient evidence for dating the filling of these depressions.

1.3 Format of Document

This document is divided into several sections, including a description of the history and location of the former oxbow areas, a summary of previous investigations conducted at these areas and a characterization of the presence of PCBs and other hazardous constituents associated with these areas. Specifically, Section 2 describes the physical and environmental setting of the areas, including maps and photographs, topography and surface drainage, vegetation, hydrology, floodplain extent, geology, groundwater, critical wildlife species and habitats, land use, climatological and meteorological information, and utilities. Section 3 provides a disposal site history and Section 4 provides a discussion of investigations performed at the various areas. Section 5 describes the extent of detected hazardous constituents at each oxbow, and Section 6 presents a general summary of the fate and transport characteristics of the constituents detected. Section 7 discusses potential migration pathways, based on the information presented in Sections 2 through 6. Remaining data gaps and additional sampling needs are identified in Section 8. Finally, Section 9 summarizes the overall conclusions, potential future activities, and includes proposals for the appropriate outcome and status under the MCP for each of the former oxbow areas.

SECTION 2 - PHYSICAL AND ENVIRONMENTAL SETTING

2.1 Maps and Photographs

2.1.1 Site Mapping

As part of the Housatonic River MCP Phase II SOW, site mapping was prepared at a scale of 1:1,200 for all 11 of the former oxbows. From this mapping, additional mapping has been prepared to provide support for this document. In general, this mapping illustrates the location of the Housatonic River (both presently and historically), the approximate location of each of the former oxbows discussed in this document, and nearby city streets. The approximate locations of the former oxbow areas as well as the historical river channel were obtained from mapping prepared by the City of Pittsfield in 1940 in support of rechannelization efforts performed during that time. This mapping reflected the intended rechannelization activities. Actual construction efforts, however, may have varied from the plans. Variations, if any, are not expected to be significant for the oxbows discussed herein. This City of Pittsfield mapping is included in Appendix A.

United States Geological Survey (USGS) 7.5 x 15-minute quadrangle topographic mapping is also available for the former oxbow and lowland areas. Such mapping covers the entire Housatonic River Basin, presenting topographic contours and elevations; highways, roads, and other manmade structures; water features; and woodland areas. This USGS mapping has been used to prepare a site location map which is presented as Figure 1-1.

In addition, detailed mapping has been prepared by GE of the Housatonic River floodplain between the GE facility and the Woods Pond Dam. This mapping includes the former oxbow and lowland areas, and is

used by GE to support the various investigations being conducted on the Housatonic River. The mapping was prepared using photogrammetric methods and presents 2-foot elevation contours at a scale of 1:1,200. Various figures referenced throughout this report were prepared using this mapping.

2.1.2 Site Photographs

Table 2-1 presents a summary of available aerial photographs depicting the former Oxbow Areas A, B, C, J, and K. These aerial photographs have been reproduced to illustrate the progression of change related to the various oxbow areas. These photographs are presented as Figures 2-1 through 2-7 for the years 1942, 1957, 1969, 1979, and 1990, respectively.

2.2 Topography and Surface Drainage

As previously stated in Section 2.1, general topographic mapping of the former oxbow and lowland areas is available from the USGS (see Figure 1-1) as well as more detailed topographic mapping prepared by GE. Based on review of the available topographic mapping and site reconnaissance, the general topography associated with each of the former oxbow and lowland areas is summarized below.

Oxbow Area A can be characterized as a generally flat, open field with a few low areas. The steep bank of the Housatonic River marks the northwest border of this oxbow area. Surface drainage within Oxbow Area A appears to flow toward the Housatonic River or into a man-made drainage ditch. This ditch is located adjacent to the southeastern border of Oxbow Area A and runs through Oxbow Area C (Figure 1-2). Upon entering Oxbow Area C, the ditch turns towards the northwest, and continues until it discharges into the

Housatonic River. The ditch ranges from five to ten feet deep, and bisects Oxbow Area C between Day Street and the Housatonic River.

Oxbow Area B is mostly paved to the east of the chain-link fence that marks the property boundary of the Johnson Ford car dealership. The remainder of Oxbow Area B west of this fence is occupied by relatively flat undisturbed soil. Recent survey information indicates that the western portion of Oxbow Area B is approximately 5 feet lower in elevation than the paved area to the east. The observed slope of Oxbow Area B indicates drainage toward the Housatonic River.

As mentioned previously, Oxbow Area C is bisected by the man-made drainage ditch, which drains the central and southern portions of Oxbow Area C. The observed topography along the northern perimeter of Oxbow Area C indicates that surface drainage flows towards the Housatonic River in these areas.

Oxbow Areas J and K are also generally flat with a low slope toward the Housatonic River. Surface drainage within Oxbow Area J is directed toward East Street and eventually to the Housatonic River via an open channel located east of Longview Terrace (refer to unlabeled drainage sketch in Appendix B). This open channel is an extension of a 42-inch pipe that receives drainage from East Street and Merrill Road to the north. Oxbow Area K slopes moderately to the northeast, directing surface drainage toward the river.

2.3 Vegetation

In general, vegetation in the former oxbow and lowland areas varies from grasses and other perennial herbaceous plants to successional tree and shrub species characteristic of lowland areas. A wetlands inspection was performed by Associated Environmental Scientists, Inc., for GE in July 1991 as part of the

Conservation Commission permitting process. This inspection identified several vegetative species along the Housatonic River. This inspection was performed for Oxbow Areas A, B, and C as well as several former Oxbow areas that are no longer covered by this report. Vegetative species associated with Oxbows J and K are expected to be similar to those present in Oxbows A, B, and C. The Associated Environmental Scientists, Inc., report is included in Appendix C.

2.4 Hydrology

Pittsfield, Massachusetts is centrally located in the Housatonic River Basin between the eastern Berkshire Hills and the western Taconic Range. The Housatonic River originates in Pittsfield where the Southwest, West, and East Branches of the Housatonic River join. The river flows south through Berkshire County, through southeastern Massachusetts into Connecticut and discharges into the Long Island Sound. The Housatonic River drains approximately 504-square miles in western Massachusetts (Gay and Frimpter, 1984).

The Housatonic River system is fed primarily by runoff from rainfall and melting snow. The annual precipitation in the drainage basin averages approximately 46 inches per year. Approximately 22 inches per year escapes by evaporation and transpiration to the atmosphere, while the remaining 24 inches per year is lost as run-off, collects in reservoirs, lakes and ponds, or infiltrates the soil surface (Norvitch et al., 1968).

2.5 Flooding Potential

The flooding potential of the Housatonic River in the vicinity of the former oxbow and lowland areas has been documented by the Federal Emergency Management Agency (FEMA) (FEMA, February 1982 and January 1987). This

information includes flood elevations corresponding to flood flows with 10-, 50-, 100-, and 500-year recurrence intervals.

In addition, the Housatonic River floodplain between the Coltsville USGS Gaging Station and the Woods Pond Dam was evaluated by Blasland & Bouck using the HEC-2 hydraulic model developed by the United States Army Corps of Engineers (USACE). A description of those activities, as well as the results of more recent activities, are included in the Supplemental Phase II/RCRA Facility Investigation Report for the Housatonic River and Silver Lake (BBL, January 1996).

2.6 Geology and Hydrogeology

The geologic framework of the Pittsfield area, and of Berkshire County in general, consists of a carbonate bedrock overlain by unconsolidated surficial deposits of glacial origin. Cambrian and Ordovician age carbonate rocks (limestone, dolomite, and marble) of the Stockbridge Group comprise the bedrock within the main axis of the Housatonic River valley. These rock types are more easily eroded than the harder schists and phyllites of the abutting Taconic Range to the west, or the gneisses and schists of the Berkshire Highlands to the east. Borings completed by Geraghty & Miller in 1990 near several oxbow areas encountered bedrock at depths ranging from 52 to 63 feet below grade.

Unconsolidated surficial geologic deposits within the Housatonic River Basin (excluding swamps and recent alluvium) are of glacial origin, formed by glacial fluvial modification of the landscape, as well as glacial scouring and deposition. These deposits are of Pleistocene age (1.6 million to 10,000 years ago) and are classified as either stratified or nonstratified, depending on their mode of deposition. Stratified deposits exhibit grain-size sorting and stratification (sediments in beds or layers), implying fluid deposition such as from glacial

meltwater streams (glaciofluvial), or settling from suspension in a body of water adjacent to a glacier (glaciolacustrine). Nonstratified (till) deposits are not layered and exhibit poor sorting as they were deposited directly by a glacier without fluvial reworking. Known thicknesses of stratified and nonstratified deposits within the Housatonic River Basin range up to 240 feet and 90 feet, respectively (Norvitch et al., 1968). Till predominates in the upland areas, and stratified deposits occur primarily along the lower slopes. Holocene (10,000 years ago to the present) alluvial and swamp deposits are observed mainly in the valley bottoms.

A description of the aquifers in the Housatonic River Basin has been reported by the USGS, New England River Basin Commission (NERBC), and Connecticut Department of Environmental Protection (CDEP) (Norvitch et al., 1968; NERBC, 1980; Wilson et al., 1974). The carbonate bedrock would provide sufficient water for domestic and industrial use only if a well were installed within a solution or fault zone (Norvitch et al., 1968).

2.7 Groundwater

In general, groundwater varies greatly throughout the basin in terms of both quality and available quantity. In areas where crystalline rock such as gneiss and granite occur, groundwater tends to be only slightly mineralized as a result of the relative insolubility of these rock types. Aquifer yield in these areas can be abundant where bedrock contains significant fractures. However, groundwater quantities are limited where fracturing is not prevalent. In areas where schists predominate, groundwater may contain significant levels of iron and manganese, and aquifer yields may be limited even where fracturing is extensive. Regional water-quality data (presented by Norvitch et al., 1968) for selected wells installed

in the surficial and bedrock aquifers within the Housatonic River Basin are shown in Table 2-2.

As determined from a review of the MDEP's "Water Supply Protection Atlas" and through discussions with GE personnel, public or private water supply wells used for drinking water purposes are not located within a 0.5-mile radius of any of the oxbow or lowland areas. Four water supply wells at the Altresco Cogeneration facility, located northeast of the oxbow and lowland areas, draw water from several hundred feet within the bedrock to provide cooling water solely for industrial use. According to the Pittsfield Department of Public Utilities, the City of Pittsfield obtains its industrial and municipal water supply from the following surface water bodies east of Pittsfield: Sand Washington Reservoir, Cleveland Reservoir, Farnham Reservoir, New Sackett Reservoir, Lake Ashley, and the lower Ashley Intake. In the past, Onota Lake has been used as an emergency municipal and recreational water supply.

2.8 Critical Wildlife Species and Areas of Critical Environmental Concern

The National Wetlands Inventory performed by the United States Department of Interior Office of Biological Services has classified an area just east of Oxbow Area J as "palustrine, shrub, broad leaved deciduous". No other areas associated with the former oxbows have been classified by the National Wetlands Inventory (with the exception of the adjacent Housatonic River itself, which is classified as "riverine, lower perennial, open water"). Additionally, no areas are classified as Areas of Critical Environmental Concern as defined in 310 CMR 12.00.

Areas along the Housatonic River near the former oxbow and lowland areas may provide habitat to several wildlife species that are listed as Threatened, Endangered, or of Special Concern. The Natural Heritage and Endangered

Species Program, an agency of the Commonwealth of Massachusetts Division of Fish & Wildlife, has indicated that these species include, but may not be limited to, the Wood Turtle (*clemmys insculpta*), the American Bittern (*botaurus lentiginosus*), and the Least Bittern (*ixobrychus exilis*). The Massachusetts Division of Fish & Wildlife lists the first two species as being of Special Concern, and the third as Threatened.

2.9 Land Use

Information on land zoning of the five oxbow and lowland areas was taken from the Pittsfield Zoning Map (Pittsfield Planning Board, 1973) (Appendix D). Additionally, general land use associated with these areas has been determined based on visual observation during field reconnaissance of the sites and review of current aerial photographs. A brief discussion of land use and zoning associated with each of the oxbow areas covered by this report is presented below.

2.9.1 Oxbow Area A

Oxbow Area A is zoned as Commercial, Warehousing and Storage (C-W-S). However, the vast majority of this area is presently undeveloped and does not appear to be in use. As shown on Figures 1-2 and 2-6, the southern portion of Oxbow Area A is covered primarily by grass and low brush. The northern portion is primarily a swamp area, but also contains mature trees along the steep riverbank. Two commercial buildings are located in the southwestern corner of the area. The southern of these two buildings is entirely surrounded by pavement, while the northern is paved on two sides.

The area to the south and east of Oxbow Area A is predominately residential, with a number of small businesses located to the southwest of

Area A. A gas station, laundromat, and car wash are located on Elm Street south of Oxbow Area A and are zoned as General Business (B-G).

Oxbow Area A lies within property owned by Ermino Barbalunga of Pittsfield, Massachusetts. Only one institution, a church on the southern side of Elm Street, is within 500 feet of the disposal site boundary.

2.9.2 Oxbow Area B

Former Oxbow Area B is located on the north side of the Housatonic River, west of Lyman Street, immediately east of Cove Street, and can be divided into two general zones. The eastern site is located within a General Industrial (I-G) zone, while the western side extends into a C-W-S zone. Nearly all of Area B is presently used for parking in support of local businesses. The remaining portions are undeveloped.

As shown in Figures 1-2 and 2-6, a total of three buildings either exist within the boundaries of former Oxbow Area B or use portions of the area as part of business activities. Each of these buildings and associated land uses are described in more detail below.

Building #1 (actually consisting of three buildings) is located east of Lyman Street and is surrounded by pavement. This building is used by a number of businesses including a video store, a restaurant, and a commercial enterprise which employs mentally handicapped individuals. South of that area is a small strip of heavily vegetated land which comprises the riverbank of the Housatonic River. A chain link fence is present between Building #1 and the building immediately to the west, as illustrated in Figure 1-2. The paved area surrounding Building #1 is used by employees and the public to park vehicles and conduct business within the building. The paved area behind the building appears to be used for

parking and deliveries. There is no apparent use of the riverbank in this area.

Building #2, owned by a car dealership, is surrounded by pavement. South of the paved area is a small gravel-surfaced area used for parking cars associated with the business. Further south is the heavily vegetated riverbank north of the Housatonic River. This business has a chain link fence on both the east and west sides of the property. There is no apparent use of the riverbank in this area.

Building #3 is owned by another car dealership and appears to be used for automotive body work and painting activities. While this building is not within former Oxbow Area B, the area immediately south of this building, which lies partially within the former oxbow area, is used for parking cars that are associated with this business. This parking area has a predominantly gravel surface (with a small amount of grass) and is fenced on the east, west, and south sides (including the riverbank). A sign which states "Employees Only, Cars Not For Sale" is present on the gate. Again, the heavily vegetated riverbank of the Housatonic River is present to the south of the parking area.

In addition to the three buildings described above, a small area to the southwest of Building #3 along the riverbank was previously identified as a "use area" as part of the evaluation of the need for Short-Term Measures (STMs) in the Housatonic River floodplain. This identification was due to the presence of a small trail in this area. This use area was classified by the MDEP as within a "walker" exposure scenario.

Oxbow Area B and the buildings described above, lie within property owned by Phillip Massery and by Gary Johnson, both of Pittsfield,

Massachusetts. No institutions appear to be within 500 feet of the Oxbow Area B boundary.

2.9.3 Oxbow Area C

Oxbow Area C is located along the south side of the Housatonic River near the end of Day Street and is zoned as C-W-S. As illustrated in Figures 1-2 and 2-6, Oxbow Area C is comprised of a field on the western side with an expanse of trees and brush present along a portion of what appears to be the former oxbow channel. A small field is located immediately to the east of this tree-filled area and may encompass part of the former oxbow area. Ermino Barbalunga of Pittsfield, Massachusetts is the current owner of the property containing Oxbow Area C.

The potential uses of Oxbow Area C include people walking on a path at the end of Day Street or walking or recreating in the two fields. In addition, there is evidence of an occasional campfire near one side of the former oxbow, although there is no evidence of camping in this area. Also, it appears that the two fields are occasionally mowed as the grass and weeds in these areas were approximately one-foot high. There is no apparent use of the heavily vegetated area. Further, no institutions appear to be within 500 feet of the Oxbow Area C boundary.

2.9.4 Oxbow Area J

Oxbow Area J is located along the north side of the Housatonic River, just east of Fasce Street, within a Light Industrial (I-L) zone and partially into a residential (R-6) zone. This area is divided by a paved pedestrian footpath located immediately west of the former river channel in this area (Figure 1-3). The area west of the pedestrian footpath is a residential area. The area east of the footpath is used by a number of local businesses. Nearly half of this eastern area is used for parking in support

of the local businesses. Properties encompassing Oxbow Area J are owned by Bernard Potts of Lenox, MA; Smith Auto Electric Services, Inc. of Pittsfield, MA; and General Equities, Inc. of Kensington, CT.

As shown in Figures 1-3 and 2-7, a total of three buildings are present in Oxbow Area J. Building #1, located farthest east, is currently operated as a restaurant. The area between the restaurant and East Street is paved and used for parking. Additional parking is available in the paved area to the east of the building and in the gravel area behind the building. It is believed that the gravel parking area is also used for delivery of restaurant supplies. The area between the restaurant and the former oxbow channel to the west of the restaurant is lawn and contains a green, wooden fence running between the restaurant and the edge of the channel. The area between the parking area and the Housatonic River is heavily vegetated and does not exhibit any use.

Building #2, located west of Building #1, is a retail gas station. The area in the front and to the west side of this building is used by customers and is paved. No vehicle service functions are performed at this location. The area immediately south of Building #2 is grassy, and the area further south near the riverbank is heavily vegetated and does not exhibit any use.

Building #3 is an automotive electrical repair shop. This building is surrounded by a gravel parking lot. To the west of this building is a paved footpath running southeast from East Street to a bridge across the Housatonic River. The area immediately to the east of the footpath contains a small trail near the riverbank which loops back to the footpath and another trail which leads from the middle of the footpath to Building #3. The area to the west of the footpath is a residential area which has

been addressed as part of the East Street Area 1/USEPA Area 3 investigation (BBL, October 1994). No institutions appear to be within 500 feet of the Oxbow Area J boundary.

Based on the land uses described above, potential uses of Former Oxbow Area J include parking near the buildings, lawn maintenance activities adjacent to the restaurant, people walking along the footpath and adjacent trails, and miscellaneous occasional maintenance activities (i.e., brush clearing, etc.) adjacent to the footpath.

2.9.5 Oxbow Area K

Oxbow Area K is zoned as Residence District R-6 (minimum 6,000-square feet for a single-family home, and 7,500-square feet for a two-family home). This area is located within an undeveloped area which is not presently in use, and is northwest of several residential houses. As shown on Figures 1-3 and 2-7, Oxbow Area K consists almost entirely of a grass field, with some small brush and trees. Also, a small creek enters the Housatonic River on the eastern edge of Oxbow Area K. The property encompassing this area is owned by Delalba Realty, Inc. of Pittsfield, Massachusetts. No buildings stand on the property and there exists no known current usage of the Oxbow K area. Additionally, no institutions appear to be within 500 feet of the Oxbow Area K boundary.

2.10 Climatological and Meteorological Information

Information on the climate in the general vicinity of the oxbow and lowland areas was obtained from the "Upper Housatonic River Basin Study, Berkshire County, Massachusetts" by the United States Department of Agriculture (1980). The climate in the area is characterized as humid with a mean annual

temperature of about 46°F. Record temperatures recorded at the Pittsfield airport are a high of 95°F and a low of -25°F.

The average monthly precipitation varies from a low of 2.5 inches per month during the winter, to a high of 4.9 inches per month during the summer. The average annual precipitation for Pittsfield is 46 inches.

Historically, the frost-free period for the area is from late May to late September, which results in a growing season of between 120 and 140 days (U.S. Department of Agriculture 1980). However, these dates vary greatly from year to year, and freezing temperatures have been recorded well into June.

2.11 Utilities

Utilities located within or near the oxbow and lowland areas include water, sewer, electric supply, gas, and storm-drain easements. Design drawings for these service lines have been obtained from the City of Pittsfield Municipal Engineer and from Berkshire Gas. These drawings are presented in Appendix E and are referenced herein by the number of the drawing. Berkshire Gas provides natural gas service near some oxbow areas (Gas Distribution Plan 11), and the sewer and potable water lines are maintained by the City of Pittsfield Department of Public Utilities.

2.11.1 Oxbow Area A

Utilities within Oxbow Area A are solely located along its southern boundary. A 48-inch reinforced concrete sewer line that services the Mobil station and car wash on Elm Street runs east to west, coincident with the approximate southern delineation of the former fill area (Plan 271). The sewer line enters from the southern portion of Oxbow Area C near the end of Day Street and runs into the southeastern portion of Oxbow Area A. A 24-inch cast-iron storm drain runs from Elm Street to the south bank of the

Housatonic River, passing underneath the self-service car wash and into the southwestern corner of Oxbow Area A (Plan 38).

2.11.2 Oxbow Area B

Within the southeast perimeter of Oxbow Area B, overhead power lines run along the northern bank of the Housatonic River. A 48-inch water line known as the Silver Lake Outfall transects Oxbow Area B and emerges at the Housatonic River bank, as presented in Appendix E on drawings 3D and 168.

2.11.3 Oxbow Area C

As discussed above, a 48-inch reinforced concrete sewer line is located in the southern portion of Oxbow Area C near Day Street. A 24-inch diameter extension of this sewer line previously ran directly west from the end of Day Street through the former fill area, until it was abandoned in 1960 (Plan 272). Currently, a 48-inch circular storm-drain line extends the length of Day Street, entering the southeastern portion of Oxbow Area C (Plan 98).

2.11.4 Oxbow Areas J and K

As described in Section 2.9, Oxbow Areas J and K are located adjacent to light industrial and residential areas of Pittsfield, respectively. The sewer lines (Plans 339 and 645), water mains (Plans 4D and 4E), and drain lines (refer to unlabeled storm-drain sketch in Appendix B) that service the local businesses and homes within or near both oxbow areas are located underneath the roadways in these areas. Overhead power lines pass adjacent to Oxbow Area J along the footbridge that connects Longview Terrace north and south of the river.

2.12 Residential Population

The residential population was estimated within a half-mile radius of Oxbow Areas A, B, and C and Oxbow Areas J and K. To produce this population estimate, the total number of residential buildings observed within the half-mile boundary on site aerial photographs was multiplied by four (the estimated number of persons in an average household). A residential population of 5,400 persons was estimated to be within a half-mile radius of Oxbow Areas A, B, and C and 2,550 persons were estimated to be within a half-mile radius of Oxbow Areas J and K.

SECTION 3 - SOURCE DESCRIPTION

The most significant event in the "history" of the oxbow areas is considered to be the rechannelization of the Housatonic River in the early 1940s. The rechannelization project, performed for the portion of the river that flows through the City of Pittsfield, was undertaken as a flood prevention and mitigation project. The straightening of the river eliminated several river oxbows and lowland marshy areas along the river. As discussed in Section 1.3, several of these areas have been identified by GE for inclusion within the MCP process. Figures 1-2 and 1-3 identify the former oxbow or lowland areas along the Housatonic River that are covered by this document.

Several aerial photographs of the oxbow areas dating back to 1942 have been obtained. Table 2-1 presents a summary of these photographs depicting Oxbow Areas A, B, C, J, and K by date. Several of these photographs have been reproduced and included within this document as Figures 2-1 through 2-7. The aerial photographs indicate that the rechannelization project had been completed by 1942. The recent rechannelization is evident in the 1942 photograph by the lack of trees along the new river bank and evidence of bare, unvegetated surfaces in the former oxbow areas.

After the oxbow areas were isolated from the normal flows of the Housatonic River in the early 1940s, many of the oxbow areas were filled. The approximate time frame in which these oxbow areas were filled has been previously discussed, to the extent known, in Section 1.2. However, there are no available records which provide information regarding the specific type or origin of the fill material or regarding the parties involved in the filling activities or associated with the fill materials. It is likely that some, if not much, of these materials originated at areas not related to the GE facility. In fact, on

the rechannelization drawings developed by the City of Pittsfield in 1940 (included in Appendix A), the former oxbow areas are labeled as "disposal areas". These areas were publicly accessible and it is likely that a variety of industries and/or individuals contributed to the filling activities that occurred.

In addition to the fill materials that were placed within the oxbow areas, it is possible that there are other contributing sources of hazardous materials to the various media at the sites. While it is not expected that these potential sources are significant in comparison to the fill materials, they may impact the scope of subsequent activities. Potential sources may include the commercial/industrial operations that have occurred in the vicinity of select oxbow areas. These operations include automotive parts, service, and filling stations. Each of these activities potentially creates a situation where the release of oils or hazardous materials may occur to site media.

SECTION 4 - OXBOW INVESTIGATIONS

4.1 General

Various investigative activities have been conducted at Oxbow Areas A, B, C, J, and K between 1988 and November 1995 as part of several preliminary investigations, MCP Phase II activities, and evaluations of the need for STMs and the presence of potential "imminent hazards" as defined in the MCP. An overview of these activities is provided in Section 4.2 and summarized in Table 4-1. The results of these activities are presented in Sections 4.3, 4.4, 4.5, 4.6, and 4.7 for Oxbow Areas A, B, C, J, and K, respectively.

The results of these activities are also summarized on various figures included in this report. Specifically, Figures 4-1 and 4-2 show the sampling locations for the various oxbows, Figures 4-3 and 4-4 show the data from soil sampling for non-PCB constituents, Figures 4-5 and 4-6 show the data from soil sampling for PCBs, and Figures 4-7 and 4-8 show the data from groundwater sampling.

4.2 Overview of Oxbow Area Investigations

4.2.1 1988 Groundwater Investigation

Preliminary investigations of the former oxbows included the investigation of groundwater near Areas A, C, J, and K. These investigations included the installation of six well points near the edge of the Housatonic River near these former oxbows. Given the locations of the well points it is not clear if samples collected from these well points represent groundwater or pore water. In addition, due to the lack of a sand pack and other construction techniques that are usually used during monitoring well installation, the results obtained from well point sampling

can only be viewed as preliminary indicators of groundwater quality. For discussions of this investigation, the samples are referred to as groundwater samples. The locations of these well points are denoted as WP-1, WP-2, WP-3, WP-7, WP-8, and WP-9 and are illustrated in Figures 4-1 and 4-2. A sample of groundwater was collected from each of these well points and analyzed for priority pollutant compounds.

4.2.2 1989 Oxbow J Investigation

The investigation of Area J included a subsurface investigation referred to by GE as the "Yesterday's Restaurant/Footpath Oxbow Study," which was performed in October 1989. This investigation was performed in connection with proposed construction of a natural gas transmission line for the Altresco Cogeneration Facility. This investigation involved the collection of soil samples from a total of 11 soil borings. These soil boring locations are illustrated on Figure 4-2 and included: five borings (YB-1 through YB-5) located along the northern perimeter Area J; four borings (FP-1 through FP-4) located along a paved pedestrian footpath just to the west of Area J; and two borings (SA-1 and SA-2) located along the north side of the current river channel between Area J and the pedestrian footpath. Composite soil samples representative of 4-foot intervals of the soil encountered in each boring were collected. Each of the soil samples collected was analyzed for PCBs. In addition, each of the samples was screened in the field using a photoionization detector (PID) to evaluate the soil for relative volatile organic content. Based on this field screening, five soil samples were selected to be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in addition to PCBs.

4.2.3 MCP Phase II Investigation

The MCP Phase II SOW for the Housatonic River called for the performance of certain soil and groundwater investigations in the former oxbow and lowland areas. Between January 1991 and January 1992, Geraghty & Miller conducted the MDEP-approved field investigations within the five areas covered by this report. This investigation included installation of six groundwater monitoring wells and four soil borings, sampling and analysis of soil from those 10 borings, sampling and analysis of groundwater from the six new wells plus one existing well, and the collection of surficial soil samples at four locations.

The locations of the seven monitoring wells (new wells A-1, A-3, B-1, B-2, C-1, and C-2, and existing well J-1), four soil borings (designated A-2, C-3, K-1, and K-2), and four surficial samples (designated J-1S through J-4S) are shown on Figures 4-1 and 4-2. A summary of the MCP Phase II well construction activities is presented in Table 4-2. The six new wells were constructed to bridge the water table to detect the possible presence of any free-floating oil and to serve as groundwater sampling locations. The four soil borings were completed to the top of the water table or two feet below the bottom of fill material, whichever was deeper. The four surficial samples were collected from 0- to 4-inch depths.

During the installation of monitoring well A-3 within Oxbow Area A, difficulty was encountered during the drilling process. Despite five attempts to drill the monitoring well within a 50-foot radius of the proposed location, refusal occurred between one and 8 feet below the ground surface due to the presence of what appeared to be large blocks of concrete. GE sent a letter to the MDEP on December 18, 1991, proposing an alternative

location for well A-3. The MDEP responded that the proposed location was acceptable and the installation proceeded.

During this MCP Phase II Investigation, the four surficial samples and all soil boring samples collected from each 2-foot interval were submitted for PCB analysis. Additionally, surficial samples and the soil samples having the highest PID reading (Table 4-3) at each boring were submitted for analysis of all Appendix IX+3 constituents, including herbicides and pesticides. Further, all soil samples having a reading greater than 10 PID units were submitted for VOC analysis.

Groundwater samples collected during this investigation from wells A-1, A-3, B-1, B-2, C-1, and J-1 were submitted for analysis of all Appendix IX + 3 constituents. These groundwater samples (except at A-3) were also analyzed for pesticides and herbicides.

4.2.4 1993 STM Investigation

As requested by the MDEP in a letter of August 25, 1993, GE submitted, on October 4, 1993, a summary of activities relating to Oxbow Areas B, C, F, and J, which included existing soil sampling results to date, a description of current land uses, updated site maps illustrating sample results, and proposals for additional surficial sampling in the former Oxbow Area J.

This summary also provided sampling data for Oxbow Area B collected in August 1992 and January 1993 as part of the evaluation of need for STMs in the Housatonic River floodplain. Soil samples were collected at the five locations (I9-4-14A to I9-4-14E) (shown on Figure 4-1) and submitted for PCB analysis. Details related to the collection and analysis of the floodplain samples are presented in the reports entitled "Evaluation of Need for Short-Term Measures in the Housatonic River Floodplain"

(Blasland & Bouck, November 1992) and "Report on January 1993 Housatonic River Floodplain Property Sampling and Analysis" (Blasland & Bouck, February 1993).

4.2.5 Supplemental Oxbow J Investigation

In May 18, 1994 and August 16, 1994 letters to GE, the MDEP directed that GE undertake additional surficial sampling in the Oxbow J Area. In September 1994, GE collected six 0- to 4-inch surficial samples and one duplicate sample from the locations shown on Figure 4-2 (OX-J-SS1 to OX-J-SS6) and submitted them for analysis of PCBs, cyanide, total organic carbon (TOC) and PCDDs/PCDFs. Results were submitted to the MDEP in November 1994.

4.2.6 1995 Imminent Hazard Investigation

In an April 3, 1995 letter to the MDEP, GE proposed a plan to assess whether PCB concentrations previously detected in surficial soils at the GE Pittsfield sites might pose a potential "imminent hazard" as defined by the MCP, 310 CMR 40.032(2)(b). In accordance with that proposal, GE submitted, in August 1995, a report to the MDEP entitled "Evaluation of Potential Imminent Hazards" (BBL, August 1995). In that report, one sampling location within Oxbow Area A, two in Oxbow Area B, and one in Oxbow Area C were identified as having shown PCBs at concentrations greater than 10 ppm in the top two feet of soil borings and thus were found to warrant additional sampling to determine whether those particular locations posed a potential imminent hazard.

Surficial soil sampling at Oxbows A, B, and C was conducted in October 1995 in accordance with the plan contained in the August 1995 report. As shown on Figure 4-1, four surficial soil samples (at locations A-3, B-1, B-2, and C-2) were collected and analyzed for PCBs. A report

entitled "Potential Imminent Hazard Sampling and Analysis Report" (BBL, October 1995) presented these analytical results, evaluated the results, and concluded that only Oxbow Area C represented a potential imminent hazard as defined in the MCP, due to the surficial soil PCB concentration found at location C-2, the lack of access restriction, and the proximity to a residential property (less than 500 feet). An Immediate Response Action Plan (IRA) was prepared for Oxbow Area C which proposed additional soil sampling and PCB analysis. As part of this IRA, nine surficial samples were collected in November 1995 radially outward from location C-2 at 10-foot, 20-foot, and 30-foot distances. The locations of these samples are shown on Figure 4-1.

4.3 Oxbow Area A Investigation Results

Soil and groundwater analytical results collected at Oxbow Area A are presented below.

4.3.1 Soil Analytical Results - Oxbow Area A

Soil sampling was first conducted at Oxbow Area A during the MCP Phase II Investigation in 1991-1992. These samples were analyzed for Appendix IX+3 constituents. One additional surface sample was collected and analyzed for PCBs in 1995. The results of these sampling events are discussed below.

During the 1991-1992 MCP investigations, fill material was encountered at each of the three soil borings installed during the investigation, well A-1, boring A-2, and well A-3 at depths of 15, 14, and 17 feet below land surface, respectively. Fill material generally consisted of predominantly fine to coarse brown sand with gravel and brick fragments. In addition, fragments of asphalt and mortar were found at the well A-1. Fragments of

asphalt and cement were encountered at boring A-2, and fragments of coal, graphite, and wood were found at the well A-3.

VOCs

VOCs were detected in soil samples from all three borings in Oxbow Area A (Table 4-4 and Figure 4-3). In most soil samples from these borings, however, the only VOCs detected were methylene chloride and acetone, which were also detected in the associated method blanks at similar concentrations. Since methylene chloride and acetone are common laboratory contaminants, their presence in both the method blanks and the field samples at similar concentrations indicates that the sample results are due to laboratory contamination during preparation of the samples for analysis. (The same is true regarding the presence of these constituents in the samples from most of the other oxbow areas discussed below.) Apart from these two laboratory contaminants, the only VOCs detected above the quantitation limits in Oxbow Area A were ethylbenzene and xylenes, both of which were found only in the sample taken between 20 to 22 feet below the ground surface at location A-1 at concentrations of 0.019 ppm and 0.013 ppm, respectively. Ethylbenzene and xylenes are both commonly associated with the presence of gasoline.

SVOCs

A number of SVOCs were detected in the soil samples collected from boring A-2 and well A-3 (Table 4-5 and Figure 4-3). In the sample from well A-3 (12 to 14 feet), the SVOC detected in the highest concentration was phenanthrene at approximately 59 ppm. A number of SVOCs were detected at these locations at lower concentrations as indicated in Table 4-5 and Figure 4-3. A similar

group of compounds were detected in the sample from boring A-2 (6 to 8 feet), although at lower concentrations. SVOC concentrations in this sample ranged from 0.93 ppm (2-methylnaphthalene) to 7 ppm (benzo[k]fluoranthene). SVOCs were not detected in the sample collected from well A-1 (22 to 24 feet). It should be noted that a number of the SVOCs detected in this area, notably the polycyclic aromatic hydrocarbons, are associated with coal byproducts. Total phenols were detected at 3.6 ppm in the sample from boring A-2 and at 0.93 ppm in the sample from well A-3.

PCBs

A summary of total PCBs detected in soil samples from Oxbow A is presented in Table 4-6 and on Figure 4-5. The highest PCB concentrations were detected in soil samples from well A-3, ranging from "not detected" in the sample from 18 to 20 feet to 50 ppm in the sample from 8 to 10 feet. PCB concentrations detected in soil samples from boring A-2 ranged from not detected (4 to 6 feet and 6 to 8 feet) to 3.4 ppm (14 to 16 feet). PCBs were detected in soil samples from boring A-1 between 10 and 24 feet at concentrations of less than 1 ppm.

During the additional soil sampling at Oxbow Area A as part of the 1995 Imminent Hazard Investigation, one surficial soil sample (0-6 inches) was collected at location A-3 and submitted for PCB analysis. A total PCB concentration of 0.397 ppm was found in this sample, as shown in Table 4-6 and Figure 4-5.

Pesticides/Herbicides and PCDDs/PCDFs

Pesticides and herbicides were not detected in the two soil samples submitted for these analyses from well A-1 and boring A-2

(Table 4-7 and Figure 4-3). The analytical results for PCDDs and PCDFs, presented in Table 4-8 and on Figure 4-3, show that only one such isomer was detected above quantitation limits in only one sample from this oxbow area. Specifically, octachlorodibenzodioxin was detected at a concentration of 0.00025 ppm in the sample from the well A-3 (at a depth of 12 to 14 feet).

Metals and Other Constituents

The results of metals and sulfide analyses are presented in Table 4-9. A review of the data indicates no clear differences in concentrations of metals between samples collected from within fill material (i.e., the samples from boring A-2 and well A-3) and the sample collected from native material (i.e., the sample from well A-1 at 22 to 24 feet, which was taken from below the fill material). The metals detected and concentrations of individual elements appear to be representative of background soil conditions.

4.3.2 Groundwater Analytical Results - Oxbow Area A

Groundwater at Oxbow Area A was first sampled during the 1988 Groundwater Investigation. Well point WP-9 was installed near the bank of the Housatonic River as shown in Figure 4-1. A groundwater sample was collected from WP-9 and analyzed for VOCs, SVOCs, metals, cyanide and PCBs. Table 4-10 and Figure 4-7 present a summary of those constituents found and their respective concentrations. With the exception of PCBs, cyanide, and zinc, the constituents found were generally detected at levels near or below their quantitation limits. Zinc was detected at a concentration of 0.36 ppm and cyanide at 0.02 ppm. Total PCBs were detected at a concentration of 0.0244 ppm.

Groundwater samples were also collected from two wells in Oxbow Area A during the 1991-1992 MCP investigation. These samples were analyzed for Appendix IX+3 constituents, and the results are discussed below.

VOCs

The VOC analytical results for groundwater samples collected during the MCP Phase II Investigation from wells A-1 and A-3 are presented in Table 4-11 and Figure 4-7. The only VOC above quantitation limits was ethylbenzene at 0.011 ppm in well A-1 (except for methylene chloride at well A-3, which was also found in the associated method blanks and is attributed to laboratory contamination as discussed in Section 4.2.1).

SVOCs

The groundwater SVOC results are presented in Table 4-12 and Figure 4-7. SVOCs detected above the quantitation limit in well A-1 included naphthalene, 2-methylnaphthalene, acenaphthene, phenanthrene, and fluorene at concentrations ranging from 0.011 ppm to 0.034 ppm. A limited number of SVOCs were also detected above the quantitation limit in well A-3 at similar concentrations including acenaphthene, fluoranthene, pyrene, anthracene, and fluorene. Total phenols were detected in wells A-1 and A-3 at concentrations of 0.018 ppm and 0.082 ppm, respectively.

Pesticides/Herbicides, PCDDs/PCDFs and PCBs

Hexachlorodibenzofuran at 0.0000092 ppm in well A-3 was the only PCDD/PCDF detected in groundwater in Oxbow Area A (Table 4-13 and Figure 4-7). Neither pesticides, herbicides, nor PCBs were detected in groundwater samples from wells A-1 and A-3.

Metals

Results of metals analyses for groundwater sampling are presented in Table 4-14. The metals results for wells A-1 and A-3 show analyte concentrations that appear in most cases to reflect background groundwater quality conditions in the area. This is supported by the similarity in concentrations of individual metals with those detected in other oxbow area wells, by the similarity of metals concentrations detected in wells completed within fill material (e.g., wells A-1, A-3) versus wells completed in native materials (e.g., well B-2), and by comparison of oxbow metals results with results from other wells within the GE facility and surrounding area. Possible exceptions to this general conclusion in Oxbow Area A include the concentrations of certain metals detected in well A-3 (i.e., copper at 0.112 ppm, iron at 56.9 ppm, lead at 0.112 ppm, and sodium at 222 ppm) which may be attributable to materials in the fill.

4.4 Oxbow Area B Investigation Results

Soil and groundwater analytical results collected at Oxbow Area B are presented below.

4.4.1 Soil Analytical Results - Oxbow Area B

Oxbow Area B was first investigated during the MCP Phase II Investigation in 1991-1992 with the installation of wells B-1 and B-2. Drilling during this investigation found that fill material contained coarse brown sand with gravel and fragments of brick, coal, glass, and wood. Samples taken during this investigation were analyzed for Appendix IX+3 constituents. Additional soil sampling for PCBs was conducted during

several subsequent sampling events. All the soil sampling results are discussed below.

VOCs

As shown in Table 4-4 and Figure 4-3, VOCs were not detected above quantitation limits in the soil samples collected from the borings for wells B-1 and B-2, with the exception of methylene chloride and acetone, which were also present in associated method blank samples.

SVOCs

Analysis of SVOCs, presented in Table 4-5, detected several compounds at both well locations, with the highest concentrations detected in the duplicate sample from 4 to 6 feet in the well B-1 boring. Various other SVOCs were detected at wells B-1 and B-2 as indicated in Table 4-5 and Figure 4-3.

PCBs

PCB analytical results for Oxbow Area B soils are illustrated in Table 4-6 and Figure 4-5. During the MCP Phase II investigation, the highest PCB concentration was detected in the 0- to 2-foot sample from well B-2 (180 ppm), with lower concentrations of PCBs detected to a depth of 18 feet. At the location of well B-1, PCBs were detected in soil samples from 0 to 10 feet and from 16 to 20 feet. The highest concentration detected was 49 ppm in the 4- to 6-foot sample.

In addition to the sampling and analysis of soils at borings B-1 and B-2, five floodplain soil samples were collected in Oxbow Area B in August 1992 and January 1993 as part of the 1993 STM Investigation. Specifically, soil samples I9-4-14A to I9-4-14E were collected from five locations on property I9-4-14 within the western

portion of this former oxbow area and analyzed for PCBs. Samples from three locations were collected from a 0- to 6-inch depth, while samples from two locations were collected from 0- to 6-inch and 6- to 12-inch depths. The results of these analyses, also presented in Table 4-6 and Figure 4-5, indicate PCB concentrations in the five 0- to 6-inch depth samples ranged from 3.5 to 47 ppm, with four of the five samples below 7 ppm. PCB concentrations in the two 6- to 12-inch depth samples were 6.7 and 5.4 ppm.

Lastly, as part of the 1995 Imminent Hazard Investigation, one surficial (0- to 6-inch) soil sample was collected at each of locations B-1 and B-2 and analyzed for PCBs. Analytical results indicated a surficial PCB concentration of 4.18 ppm at location B-1 and 11.8 ppm at location B-2 (Table 4-6 and Figure 4-5).

Pesticides/Herbicides and PCDDs/PCDFs

The analytical results for pesticides and herbicides in the two samples from well B-1 and well B-2 submitted for such analyses are presented in Table 4-7 and on Figure 4-3. The only such constituent detected was the organochlorine pesticide gamma-BHC (lindane) in the soil sample from well B-1 (4 to 6 feet) at a concentration of 0.10 ppm.

The analysis of PCDDs and PCDFs detected several compounds in soil samples from both well B-1 and well B-2 (Table 4-8 and Figure 4-3). Several PCDFs were detected in the samples from 4 to 6 feet in well B-1, with hexachlorodibenzofuran having the highest concentration at 0.0069 ppm. PCDDs and PCDFs were also detected in well B-2 at concentrations ranging from 0.00010 ppm (2,3,7,8-tetrachlorodibenzofuran) to 0.00066 ppm (octachlorodibenzodioxin).

Metals and Other Constituents

The concentrations of metals detected in soil samples are presented in Table 4-9. Such concentrations occur naturally in soils in the area and appear to reflect background soil conditions. All metals analyzed, with the exception of copper and lead, detected at 333 ppm and 285 ppm, respectively, in the soil sample from 4 to 6 feet in the boring for well B-1, are below background levels.

4.4.2 Groundwater Analytical Results - Oxbow Area B

The only groundwater sampling at Oxbow Area B was conducted during the MCP Phase II Investigation in 1991-1992. Groundwater samples from monitoring wells B-1 and B-2 were analyzed for Appendix IX+3 constituents. The analysis of VOCs in groundwater samples from Oxbow Area B indicated that the only constituent detected above the quantitation limit was benzene at 0.0010 ppm in well B-2 (Table 4-11 and Figure 4-7). Table 4-12 indicates that SVOCs were not detected above quantitation limits in well B-1 or well B-2.

Pesticides, herbicides, PCBs, PCDDs and PCDFs were not detected in samples from these wells. Metals results, included in Table 4-14 appear to reflect background groundwater quality conditions.

4.5 Oxbow Area C Investigation Results

Soil and groundwater analytical results collected at Oxbow Area C are presented below.

4.5.1 Soil Analytical Results - Oxbow Area C

The MCP Phase II Investigation in 1991-1992 was the first soil investigation of Oxbow Area C. Soil samples from wells C-1 and C-2 and boring C-3 were analyzed for Appendix IX+3 constituents. Additional surficial soil samples were collected from Oxbow Area C in 1995 and analyzed for PCBs. The results of these sampling events are discussed below.

During the 1991-92 investigations, fill material, consisting predominantly of fine to coarse sand with gravel, was encountered at the borings for wells C-1 and C-2 from 0 to 15 feet and at boring C-3 from 0 to 7 feet. In addition, white angular rock fragments, graphite, and wood fragments were found. The fill material also contained brick and wood fragments at location C-2 and brick and coal fragments at boring C-3.

VOCs

With the exception of methylene chloride and acetone, VOCs were not detected above quantitation limits in soil samples from the borings for wells C-1 and C-2 and boring C-3 (Table 4-4 and Figure 4-3). In each case that methylene chloride was detected, it was also detected in the associated method blank. Acetone was also detected in method blanks associated with two samples, but was detected in another field sample (well C-2 at 12 to 14 feet) at a level of 0.044 ppm and not detected in the related method blank.

SVOCs

SVOCs were detected in soil samples from each of the three locations (wells C-1, C-2 and boring C-3), with the highest concentrations found in the 2- to 4-foot sample from boring C-3 (Table 4-5 and Figure 4-3). SVOC concentrations at boring C-3

ranged from 49 ppm [benzo(b+k) fluoranthene] to non-detect. Total phenols were detected at 0.22 ppm in the 10- to 12-foot sample from the well C-1 boring.

PCBs

During the 1991-1992 investigations, varying concentrations of PCBs were detected in each of the soil samples from Oxbow Area C (see Table 4-6 and Figure 4-5). PCB concentrations were highest in the 0- to 2-foot sample from well C-2 (750 ppm) and were detected to a depth of 20 feet in the boring, although at concentrations of less than 150 ppm. PCBs were detected in the boring for well C-1, varying from 0.38 ppm in the 0- to 2-foot sample to 57 ppm in the 12- to 14-foot sample. At boring C-3, PCBs were detected in four samples ranging from 0.13 ppm to 24 ppm, although three of the four samples were less than 1 ppm. PCBs were detected only to a depth of 8 feet in that boring, although soils were analyzed for PCBs a depth of 14 feet.

As part of the 1995 Imminent Hazard Investigation, one surficial (0-6 inch) soil sample was collected at location C-2 and analyzed for PCBs. As shown in Table 4-6 and on Figure 4-5, analytical results indicated a total PCB concentration of 745 ppm. This finding prompted additional surficial sampling in the vicinity of location C-2. Eight surficial (0-6 inch) soil samples were collected in November 1995 and analyzed for PCBs. The analytical results of this sampling are presented in Table 4-6 and Figure 4-5. This November 1995 round of sampling indicated surficial soil PCB concentrations ranging from a high of 418 ppm to a low of 5.6 ppm.

Pesticides/Herbicides and PCDDs/PCDFs

The analysis of pesticides (Table 4-7 and Figure 4-3) detected 4,4'-DDD at 0.097 ppm in the 10- to 12-foot sample at well C-1 and 4,4'-DDT (0.14 ppm), delta-BHC (0.023 ppm), and gamma-BHC (lindane) (0.0067 ppm) in the 12- to 14-foot sample from well C-2. Pesticides were not detected in the sample from boring C-3. Herbicides were not detected in any of the samples.

At well C-2, octachlorodibenzodioxin was detected (0.00018 ppm) in the soil sample from 12 to 14 feet (Table 4-8 and Figure 4-3). Octachlorodibenzodioxin was also detected (0.0030 ppm) in the soil sample from 10 to 12 feet at well C-1, along with pentachlorodibenzofuran (0.00038 ppm) and hexachlorodibenzofuran (0.00041 ppm).

Metals and Other Constituents

For the same reasons discussed earlier, the results of the metals analysis (Table 4-9) appear generally to reflect background soil conditions. Included in this table are the results of the sulfide analysis, which show the presence of sulfide in samples from wells C-1 and C-2, most notably in the sample from well C-1 where sulfide was detected at 92.4 ppm.

4.5.2 Groundwater Analytical Results - Oxbow Area C

VOCs, SVOCs and Metals

As part of the 1988 Groundwater Investigation, two monitoring well points (WP-7 and WP-8) were installed in Oxbow Area C near the bank of the Housatonic River. Groundwater samples were analyzed for VOCs, SVOCs, PCBs, and metals. Results from this sampling are presented in Table 4-10 and Figure 4-7. Chlorobenzene was detected at 0.011 ppm at WP-8. The metals copper, silver, zinc, as well as

cyanide, were detected below 1 ppm at WP-7 and WP-8. Sampling indicated a total PCB concentration of 0.0278 ppm at WP-7 and 0.0056 ppm at WP-8.

A second round of groundwater sampling at Oxbow Area C was conducted during the MCP Phase II Investigation in 1991-1992. VOCs and SVOCs were not detected above the quantitation limits in groundwater samples from wells C-1 and C-2. Total phenols were detected at 0.019 ppm in well C-1 (Tables 4-11 and 4-12 and Figure 4-7).

Pesticides/Herbicides PCDDs/PCDFs, and PCBs

Pesticides, herbicides, and PCBs were not detected in samples submitted for these analyses in 1991-1992. PCDD and PCDF analyses detected the presence of three constituents, as shown in Table 4-13, but not at levels which the laboratory could definitely identify or quantify. Metals results, included in Table 4-14, again appear to reflect background groundwater quality conditions.

4.6 Oxbow Area J Investigation Results

Soil and groundwater analytical results from Oxbow Area J are presented below.

4.6.1 Soil Analytical Results - Oxbow Area J

Investigation of soil at the Oxbow Area J was initiated during the 1989 Oxbow J Investigation with the collection of soil samples at locations YB-1 to YB-5, FP-1 to FP-4, and SA-1 and SA-2. These samples were all analyzed for PCBs, and, based on PID readings, some samples were selected for VOC and SVOC analysis.

In the MCP Phase II Investigation in 1991-1992, the soil sampling in Oxbow Area J entailed surficial soil collection and analysis. These samples (J-1S through J-4S) were analyzed for PCBs and Appendix IX+3 constituents.

At the request of the MDEP, additional surficial sampling was conducted at Oxbow J during the 1994 Supplemental Oxbow J Investigation. Six surficial samples (0-4 inch) were collected at locations OX-J-SS1 through OX-J-SS6, and submitted for PCB, cyanide, TOC, PCDD, and PCDF analyses.

The results of these sampling events are discussed below.

VOCs

The 1989 VOC analytical results for Area J are presented in Table 4-4 and Figure 4-4. These results indicate that no VOCs were detected above the quantitation limit that were not found in corresponding methods blanks.

During the 1991-1992 MCP investigations, methylene chloride and acetone were the only VOCs detected above the quantitation limit in the four surficial soil samples collected within Oxbow Area J (Table 4-4 and Figure 4-4). Methylene chloride was also detected in related method blanks in each case. Acetone, however, was not detected in the related method blanks and was detected at concentrations ranging from 0.023 ppm to 0.059 ppm.

SVOC

The 1989 SVOC analytical results for Area J are presented in Table 4-5 and Figure 4-4. These results show that slightly elevated concentrations of a number of SVOCs were detected in one of the

samples analyzed (from FP-3), while the remaining samples were not found to contain any SVOCs above the quantitation limits.

During the 1991-1992 MCP investigations, several SVOCs were detected above quantitation levels in each of the soil samples in the approximate range of 0.4 to 3.2 ppm (Table 4-5 and Figure 4-4). Total phenols were detected in sample J-4S at 0.29 ppm.

PCBs

The results of the 1989 PCB analyses are summarized in Table 4-6 and Figure 4-6. These results indicated the presence of PCBs in soils of this area at concentrations ranging from less than 1 ppm to 2.8 ppm, with one location (FP-2) exhibiting PCBs at 13 ppm. Only four of the 30 samples analyzed were found to contain PCB concentrations in excess of 1 ppm. During the MCP Phase II Investigation in 1991, total PCBs were detected in surficial soils at concentrations of 1.9 ppm in J-4S, 1.7 ppm in J-1S, and 0.53 ppm in J-2S. The 1994 investigations reported total PCB concentrations in surficial soils ranging from 0.28 to 1.6 ppm (Table 4-6 and Figure 4-6).

Pesticides/Herbicides and PCDDs/PCDFs

Analyses of pesticides and herbicides during the 1991-1992 MCP investigations detected only 4,4'-DDT at 0.0069 ppm in sample J-3S (Table 4-7 and Figure 4-4). The results of the analysis of PCDDs and PCDFs are summarized in Table 4-8 and Figure 4-4. PCDDs and PCDFs were detected in each of the surficial soil samples except J-3S. The highest PCDF concentration detected was pentachlorodibenzofuran at 0.0572 ppm in J-4S. The highest PCDD compound detected was hexachlorodibenzodioxin, which was found at 0.0085 ppm in J-4S.

PCDD and PCDF concentrations in J-1S and J-2S were all less than 0.001 ppm.

During the 1994 investigations, several PCDDs and PCDFs were detected at each of the six sampling locations with the highest concentration at OX-J-SS4 (octachlorodibenzodioxin at 0.0065 ppm) (Table 4-8 and Figure 4-4).

Metals and Other Constituents

Metals results from the 1991-1992 MCP sampling are provided in Table 4-9 and again generally indicate background soil conditions. Cyanide was detected in samples J-1S and J-2S at concentrations of 1.3 and 120 ppm, respectively. Sulfide was also detected in sample J-2S at 65 ppm.

Cyanide was not detected during the 1994 sampling. TOC during the 1994 sampling ranged from 1.3% to 13% (Table 4-9).

4.6.2 Groundwater Analytical Results - Oxbow Area J

As part of the 1988 Groundwater Investigation, one well point (WP-3) was installed in Oxbow Area J and sampled for VOCs, SVOCs, metals, cyanide, and PCBs. One VOC (trans-1,2-dichloroethene) was detected above quantitation limits at 0.018 ppm (Table 4-10 and Figure 4-8). Copper and zinc were detected at 0.01 ppm and 5.2 ppm respectively. PCBs were not detected in groundwater during this sampling.

During the MCP Phase II Investigation, one well (J-1) was installed in the location shown on Figure 4-2. Groundwater was sampled at this location for Appendix IX+3 constituents. As shown in Tables 4-11 to 4-13, analysis of the sample from well J-1 detected no VOCs (again apart from methylene chloride, which was also found in the method blank) and no other organic constituents (SVOCs, PCBs, pesticides, herbicides, or PCDDs/

PCDFs) above the quantitation limits. Metals results, presented in Table 4-14, again are reflective of background groundwater quality conditions.

4.7 Oxbow Area K Investigation Results

Soil and groundwater analytical results for Oxbow Area K are presented below.

4.7.1 Soil Analytical Results - Oxbow Area K

As part of the MCP Phase II Investigation, two soil borings K-1 and K-2 were installed in the locations shown in Figure 4-2. Fill material was encountered at both soil borings, K-1 and K-2, to depths of 6 feet and 7 feet below land surface, respectively. The fill material at boring K-1 consisted of brown to black, fine to coarse grained sand with silt, gravel, and organic material. The fill material at soil boring K-2 contained brown to black, fine to medium sand with silt and wood fragments. Cellophane was found from 6 to 8 feet below land surface in boring K-2.

No further soil sampling was conducted in Oxbow Area K after the MCP Phase II Investigation.

VOCs/SVOCs/PCBs

As shown in Tables 4-4, 4-5, and Figure 4-4, VOCs and SVOCs were not found above the quantitation limit in the soil samples from borings K-1 and K-2 (with the exception of methylene chloride and acetone, which were also found in related method blanks). As shown in Table 4-6 and Figure 4-6, PCBs were detected only in the 0- to 2-foot samples from each boring at concentrations of 0.15 ppm in boring K-1 and 0.07 ppm in boring K-2.

Pesticides/Herbicides and PCDDs/PCDFs

The analysis of herbicides detected 2,4-D at 0.22 ppm, 2,4,5-TP (silvex) at 0.051 ppm, and 2,4,5-T at 0.052 ppm in the 14- to 16-foot sample from boring K-1 (Table 4-7 and Figure 4-4). Herbicides were not detected in the sample from boring K-2, and pesticides were not detected in either sample from boring K-1 or boring K-2. PCDDs and PCDFs were not detected in either of the samples from Oxbow Area K.

Metals and Other Constituents

The analytical results for metals are included in Table 4-9. Again, these results show concentrations indicative of background soil conditions.

4.7.2 Groundwater Analytical Results - Oxbow Area K

As part of the 1988 Groundwater Investigation, two well points (WP-1 and WP-2) were installed along the Housatonic River in Oxbow Area K at the locations shown in Figure 4-2. Groundwater samples were analyzed for VOCs, SVOCs, metals, and PCBs. Analytical results, as shown in Table 4-10, indicated the presence of lead at 0.04 ppm and zinc at 2.5 ppm at WP-1, and copper at 0.01 ppm and zinc at 1.3 ppm at WP-2. Analyses also indicated a PCB concentration of 0.00361 ppm at WP-1 (Table 4-10 and Figure 4-8). No further groundwater sampling has been conducted at Oxbow Area K.

Since it is unclear whether these well point data represent groundwater conditions, results from these locations are considered to be preliminary indicators of site conditions. Additional monitoring wells will be installed in Oxbow Area J, with sampling and analysis for PCBs and metals.

SECTION 5 - EXTENT OF DETECTED HAZARDOUS CONSTITUENTS

5.1 General

This section of the report summarizes the extent of detected hazardous constituents in soil and groundwater at Oxbow Areas A, B, C, J, and K based upon the site investigations conducted from 1988 to November 1995. Each oxbow area is described separately in the following subsections.

5.2 Oxbow Area A

5.2.1 Soil

No significant VOCs were found in the soils in Oxbow Area A during the MCP Phase II Investigation (Table 4-4 and Figure 4-3). The only VOCs found above quantitation limits (and not in the method blanks) were ethylbenzene (0.019 ppm) and xylenes (0.013 ppm) in the deep (20-22 foot) soil sample collected from the well A-1 boring. As shown in Table 4-5 and on Figure 4-3, a number of SVOCs were detected in the soil samples collected from boring A-2 and well A-3, with a maximum concentration of 59 ppm (phenanthrene). The MCP Phase II Investigation indicated PCBs in the subsurface soils at all borings, with the highest concentration of 50 ppm in the 8-10 foot sample from the well A-3 boring (Table 4-6 and Figure 4-5). PCBs were also detected in the shallow (0-2 foot) soil samples at 25 ppm at location A-3 and below 1 ppm at location A-2. In the 1995 Imminent Hazard Investigation, total PCBs were detected at a concentration of 0.397 ppm in a 0 to 6-inch surficial sample at location A-3 (Table 4-6 and Figure 4-5).

Generally, the SVOCs and PCBs were found within the fill material, with PCBs also detected intermittently at low concentrations in the natural sand

deposits at depths ranging from 14 to 22 feet. The only other constituents detected were one finding of octachlorodibenzodioxin at a concentration of 0.00025 ppm in the 12- to 14-foot soil sample from well A-3 and metals at apparently background soil concentrations.

Thus, the extent of hazardous materials in the soil at Oxbow Area A is defined generally by the presence of SVOCs and PCBs in the fill material. Although existing data indicate that PCBs are present in surficial soils only in low concentrations, additional surficial sampling for PCBs is warranted in certain areas in the oxbow. In addition, due to the finding of PCBs at 50 ppm in the subsurface at well A-3, additional sampling of subsurface soils for PCBs between that location and the Housatonic River is warranted (if feasible) to adequately delineate the extent of PCBs in this area.

5.2.2 Groundwater

Groundwater samples collected during the 1988 Groundwater Investigation and the MCP Phase II Investigation at Oxbow Area A likewise showed no significant VOC concern, with the only VOC found above quantitation limits being ethylbenzene at 0.011 ppm in well A-1 (Table 4-11 and Figure 4-7). As in the soils, a number of SVOCs were detected in the groundwater, at concentrations ranging up to 0.036 ppm (acenaphthene in well A-2); and a single PCDF was detected (hexachlorodibenzofuran at 0.0000092 ppm in well A-3) (Table 4-12 and Figure 4-7). While PCBs were detected at WP-9 (at 0.0244 ppm) in the 1988 Groundwater Investigation (Table 4-10 and Figure 4-7), no PCBs were detected in the subsequent groundwater sampling of wells A-1 and A-3 (Table 4-6 and Figure 4-7). However, because those wells may not have collected groundwater representative of downgradient conditions, installation and PCB sampling of

an additional well between well A-3 and the river (if feasible) appears warranted to determine whether PCBs are present in the groundwater in this area.

5.3 Oxbow Area B

5.3.1 Soil

No VOCs above the quantitation limit (and not found in the method blanks) were found in the soil in Oxbow Area B during the MCP Phase II Investigation (Table 4-4 and Figure 4-3). A number of SVOCs were detected in the soil in this area, with a maximum concentration of 16 ppm (Table 4-5 and Figure 4-3). PCBs were detected in borings B-1 and B-2, with a maximum concentration of 180 ppm found in the shallow (0 to 2 foot) sample from the well B-2 boring. PCBs were found both in the fill material (0 to 7 feet in depth at the well B-1 boring) and in the natural sand deposits (samples below 7 feet in well B-1 and in samples from both fill and natural sand in the well B-2 boring), generally at low levels and decreasing with depth (see Table 4-6 and Figure 4-5).

Analysis of surficial (0- to 6-inch) soil samples from locations I9-4-14A to I9-4-14E indicated surficial total PCB concentrations ranging from 3.5 ppm to a maximum of 47 ppm at location I9-4-14C. PCBs were also detected at 0.5- to 1.0-foot depth at locations I9-4-14D and I9-4-14E.

The most recent sampling of borings B-1 and B-2 during the 1995 Imminent Hazard Investigation indicated surficial (0- to 6-inch) PCB concentrations of 4.2 ppm at boring B-1 and 11.8 ppm at boring B-2.

During the MCP Phase II Investigation, one organochlorine pesticide, gamma-BHC (lindane) was detected in the fill material at the well B-1 boring at 0.1 ppm (Table 4-7 and Figure 4-3). PCDDs/PCDFs were

detected in both soil borings (Table 4-8 and Figure 4-3). Metals concentrations in the soil samples appear to generally reflect background conditions, with the possible exception of copper and lead, which were found in the fill material in the well B-1 boring at 333 and 285 ppm, respectively.

The data collected to date in Oxbow Area B indicates the presence of PCBs (up to 180 ppm) at generally shallow depths and SVOCs at concentrations generally less than 1 ppm with concentrations ranging up to 4.2 ppm. The presence of PCBs is correlated with the presence of fill material in boring B-1, but no fill material was observed in boring B-2 (although PCBs were observed up to 180 ppm in the 0- to 2-foot increment). The 1995 sampling results did not indicate the presence of an imminent hazard at Oxbow Area B. The constituents in the western portion of the oxbow appear well-delineated, and the eastern portion of the oxbow is largely paved or occupied by buildings. However, additional soil boring installation and analysis for PCBs and SVOCs appears warranted in the middle portion of the oxbow to better delineate the presence of these constituents.

5.3.2 Groundwater

Based upon the analytical results of the MCP Phase II Investigation, there does not appear to be any significant concern regarding the groundwater in Oxbow Area B. The only constituents found above quantitation limits in the groundwater were benzene at 0.010 ppm in well B-2 and metals at concentrations that reflect background groundwater conditions (Tables 4-11, 4-14, and Figure 4-7).

5.4 Oxbow Area C

5.4.1 Soil

The soil analyses at Oxbow Area C performed as part of the MCP Phase II Investigation show no appreciable VOCs, but do show a number of SVOCs in the fill material (maximum of 49 ppm) (Tables 4-4, 4-5 and Figure 4-3). PCBs were detected in all borings in this area and were found both in the fill material and in the natural sand deposits. The fill material thickness ranged from 0 to 15 feet at the borings for wells C-1 and C-2 and from 0 to 7 feet at boring C-3; and the highest PCB concentrations were found in or just below the fill material (57 and 49 ppm around the fill/native material interface in the well C-1 boring; 750 ppm in the shallow soil and 150 ppm at the bottom of the fill material in the well C-2 boring; and 24 ppm at the bottom of the fill material in boring C-3) (Table 4-6 and Figure 4-5). In addition, a few pesticides and several PCDDs/PCDFs were detected in samples taken from the fill material at the borings for wells C-1 and C-2 (but not boring C-3) (Tables 4-7, 4-8, and Figure 4-3).

Sampling of Oxbow Area C during the 1995 Imminent Hazard Investigation also indicated an elevated surficial soil (0- to 6-inch) PCB concentration of 745 ppm at boring C-2 (Table 4-6 and Figure 4-5). Follow-up sampling of eight locations within the vicinity of C-2 during November 1995 indicated surficial soil PCB concentrations ranging from 5.58 to 418 ppm, with two locations below 10 ppm, five locations from 10 to 60 ppm, and one location over 400 ppm (Table 4-6 and Figure 4-5).

Thus, the extent of hazardous materials in Oxbow Area C soils appears, in general, to be associated with the fill material (although some lower concentrations of PCBs were found in the natural sand deposits). In

the shallow (0 to 2 feet) soil samples, PCBs were not found above 1 ppm at locations C-1 and C-3, but were found up to 750 ppm at location C-2. Moreover, the boring at location C-2 showed the highest PCB concentrations in the subsurface soil. Accordingly, further surficial and subsurface sampling in the vicinity of location C-2 is warranted to delineate the extent of PCBs in this area. Additional SVOC analysis is also necessary in the western portion of the oxbow (in the vicinity of borings C-1 and C-3) to delineate the presence of SVOCs in soils.

5.4.2 Groundwater

Data from the 1988 Groundwater Investigation in this area showed detectable concentrations of chlorobenzene at well point WP-8 0.011 ppm, PCBs at well points WP-7 and WP-8 (at 0.0278 ppm and 0.0056 ppm, respectively), and a few metals at both well points at low concentrations (notably zinc at 0.36 to 0.42 ppm) (Table 4-10 and Figure 4-7). However, the MCP Phase II Investigation of groundwater in Oxbow C showed no constituents in excess of quantitation limits at wells C-1 and C-2, except for phenols at 0.019 ppm in well C-1 and some metals at background concentrations (Tables 4-11 to 4-14 and Figure 4-7). Accordingly, no additional groundwater sampling in this oxbow is warranted.

5.5 Oxbow Area J

5.5.1 Soil

As shown on Table 4-4, the results of the 1989 Oxbow J Investigation indicated that no VOCs were detected above quantitation limits in the subsurface soils that were also not detected in associated method blanks. SVOCs were found in the soil borings in that investigation, with a maximum concentration of 17 ppm of phenanthrene in the 4- to 8-foot sample from

boring FP-3 (see Table 4-5 and Figure 4-4). All samples where VOCs and SVOCs were detected consisted of fill material. Low levels of PCBs were detected in the subsurface soil in this area (see Table 4-6 and Figure 4-6). Only 4 of the 30 samples analyzed were found to contain PCB concentrations in excess of 1 ppm; three of those four samples showed concentrations in the range of 1 to 3 ppm; and the remaining sample (from 0 to 4 feet at FP-2) showed a concentration of 13 ppm. The soils containing PCBs consisted predominantly of fill material.

In the MCP Phase II Investigation, four surficial soil samples were collected from 0 to 4 inches in Oxbow Area J. The only VOC detected that was not also detected in the associated method blanks was acetone at concentrations of 0.023 to 0.059 ppm (Table 4-4 and Figure 4-4). Several SVOCs were detected at concentrations up to 3.2 ppm (Table 4-5 and Figure 4-4). PCBs were detected in three of the four samples at concentrations of 0.53 to 1.9 ppm (Table 4-6 and Figure 4-6). Analysis of pesticides and herbicides detected 4,4-DDT at 0.0069 ppm in J-3S (Table 4-7 and Figure 4-4). PCDDs and PCDFs were detected in three of the four samples at concentrations up to 0.0085 ppm (at J-4S) for PCDDs and up to 0.0572 ppm (at J-4S) for PCDFs (Table 4-8 and Figure 4-4). The concentrations of PCDFs detected are not consistent with the PCDFs levels which would be anticipated based on the PCB levels present (acknowledging that PCBs contain certain low levels of PCDFs as an incidental result of their manufacture). Similarly, PCDD levels would not be attributed to the presence of PCBs found in this area. Finally, metals were found at generally background concentrations (Table 4-9).

The Supplemental MCP Oxbow J Investigation of six locations near the Oxbow J footpath (OX-J-SS1 to OX-J-SS6) reported several PCDDs and

PCDFs above quantitation limits in surficial (0- to 4-inch) soils at each location (Table 4-8 and Figure 4-4). PCBs were detected at concentrations ranging from 0.28 to 1.6 ppm in the surficial soils (Table 4-6 and Figure 4-6). This investigation further reported no detection of cyanide in surficial soils.

Although previous sampling in Oxbow Area J has indicated the presence of a number of constituents as noted above, the number and placement of previous wells, borings, and surficial soil sampling locations has adequately characterized the site. Thus, additional sampling is not warranted at Oxbow Area J.

5.5.2 Groundwater

In the 1988 Groundwater Investigation at Oxbow Area J, the only constituents detected at well point WP-3 above quantitation limits were trans-1,2-dichloroethylene (0.018 ppm) and low levels of zinc (5.2 ppm) and copper (0.01 ppm)(Table 4-10 and Figure 4-8). The MCP Phase II Investigation of groundwater detected no Appendix IX+3 constituents in well J-1 (apart from those found in the blanks and metals at concentrations reflective of background groundwater quality conditions) (Tables 4-11 to 4-14). Accordingly, no further groundwater sampling in this oxbow is warranted.

5.6 Oxbow Area K

5.6.1 Soil

The soil data from the MCP Phase II Investigation for Oxbow Area K revealed no significant soil concerns. No VOCs or SVOCs were found above quantitation limits (other than those also found in the blanks); PCB concentrations detected were well below 1 ppm; analysis for pesticides and

herbicides detected only a few herbicides at low levels in one sample (the 14-16 foot sample at boring K-1); no PCDDs or PCDFs were detected; and only a few metals were found at background concentrations (Tables 4-4 to 4-9; Figures 4-4 and 4-6).

5.6.2 Groundwater

The groundwater data for Oxbow Area K come from the sampling of well points WP-1 and WP-2 during the 1988 Groundwater Investigation. The only constituent detected at those well points were PCBs at 0.00361 ppm at WP-1 and copper, lead, and zinc below 3 ppm (Table 4-10 and Figure 4-8). The detection of these parameters in groundwater and the limited scope of available data, warrant the installation of additional monitoring wells in Oxbow Area J with sampling and analysis for PCBs and metals.

SECTION 6 - FATE AND TRANSPORT CHARACTERISTICS

6.1 General

Various chemical constituents have been detected in the soils, sediments, groundwater, and surface water at Oxbow Areas A, B, C, and J. The information presented in this section provides a general characterization of the environmental fate and transport properties associated with the constituents observed in one or more of these media. This section discusses only those compounds that were found at levels above the quantitation limit or CLP-required detection limit, and excludes those that were found in associated blank samples (thus indicating laboratory contamination).

The fate and transport of compounds in the environment depend on a variety of chemical, physical, and biological processes. This section provides a brief summary of the potential fate and transport mechanisms associated with the release and dispersion of the compounds detected at the oxbow areas. This summary does not indicate that each of the mechanisms discussed is actually occurring in these areas. The extent of hazardous materials actually found in these areas has been discussed in previous sections, and potential migration pathways are discussed in Section 7.

6.2 Characterization of Detected Hazardous Materials

Due to the number of constituents detected, many of which were at low concentrations, properties of representative groups of chemicals will be discussed rather than of specific compounds. These groups of chemicals and the constituents within each group exhibit specific properties that determine their behavior in the environment. Discussions regarding the concentrations and

locations of the compounds detected in groundwater and soils are presented in Sections 4 and 5.

VOCs detected at the Oxbow Areas A, B, C, and J include ketones, aromatics, and halogenated compounds. Semivolatiles detected include phenols, and polynuclear aromatic hydrocarbons (PAHs). In addition, PCBs, PCDDs/PCDFs pesticides, herbicides, and metals were detected and are discussed in the following sections.

Table 6-1 presents the water solubility, log octanol/water partitioning coefficient (log K_{ow}), vapor pressure, and Henry's Law Constant for organic compounds detected in the soils, sediment, surface water, and groundwater at the oxbow areas. These properties provide considerable insight into the fate and transport of a compound in the environment. Depending on their vapor pressure, highly water-soluble chemicals are less likely to volatilize and are generally more likely to biodegrade (Howard, 1989). Water solubility can also affect adsorption and desorption on soils. Compounds which are more soluble are more likely to desorb from soils. Water solubility can also affect possible transformation by hydrolysis, photolysis, oxidation, and reduction (Verschueren, 1983). The log octanol/water partition coefficient correlates well with a compound's tendency to bioconcentrate and adsorb to soil or sediment (Howard, 1989). Generally, the higher the compound's log octanol/water partitioning coefficient, the higher the compound's affinity for adsorption and the lower its mobility in groundwater. Henry's Law Constant provides an indication of the tendency of a compound to volatilize, and thus provides a means for ranking the relative volatilities of chemicals (Verschueren, 1983). Henry's Law Constants can be obtained from the literature or can be calculated by dividing a compound's vapor pressure by its water solubility. The Henry's Law Constant can be used to calculate the rate of evaporation from water. The information presented in

Table 6-1 will be referenced as appropriate during discussion of the various groups of compounds.

6.2.1 Volatiles

VOCs detected above quantitation limits in the media at the oxbow areas include ketones, aromatics, and halogenated compounds. As indicated in Table 6-1, the water solubilities and vapor pressures of these compounds range from moderate to high and their log K_{ow} values are relatively low.

6.2.1.1 Ketones

Ketones are one class of volatile organics present above quantitation limits at the oxbow areas. Acetone is the one ketone compound detected in site soils and groundwater. As a chemical class, ketones are characterized by moderate water solubility and high volatility.

In surface soils, ketones are subject to competing processes of dissolution and volatilization. As such, these substances are prone to dissolve into infiltrating precipitation and move into underlying soils or volatilize to the atmosphere. Transport in the soil-gas phase from deeper soils will be substantially limited, however, by partitioning of the gas phase into the soil water, biodegradation, and the general heterogeneous nature of soils (USEPA, 1989).

In subsurface environments, acetone tends to be highly mobile. In moist environments or during heavy precipitation events, these compounds are prone to leaching mechanisms. Downward migration may occur as these substances dissolve into the soil water which is transported through the soil column. Biodegradation of acetone can limit transport within and to groundwater since these compounds

biodegrade under both aerobic and anaerobic conditions (Howard, 1989).

6.2.1.2 Aromatics

Aromatic compounds detected at the oxbow areas include benzene, ethylbenzene, and xylenes. In the upper soil, the competing processes of volatilization to the atmosphere and downward migration with infiltrating precipitation are the dominant fate processes. Generally, aromatics are highly mobile (as liquid or gas) in soil (ATSDR, 1989a; 1990; Swann et al., 1983). However, upward migration from subsurface soils in the soil-gas phase and subsequent volatilization to the atmosphere will be substantially limited by partitioning of the gas phase into the soil water, adsorption (to a small extent), biodegradation, and the general heterogeneous nature of soils (USEPA, 1989).

In deeper soil, the most likely transport mechanism is dissolution into soil water and downward migration through the soil. Competing processes of biodegradation and limited adsorption to soil organic matter may decrease the quantities of the chemicals released to groundwater. Aromatics are generally capable of biodegrading under both aerobic and anaerobic conditions. Ethylbenzene, however, has been found to be resistant to biodegradation under anaerobic conditions (Howard, 1989). Soil adsorption is expected to be moderate for ethylbenzene and xylenes, and low for benzene (Howard, 1989; 1990).

6.2.1.3 Halogenated Compounds

Chlorobenzene was the only halogenated VOC detected above quantitation limits at the oxbow areas. Halogenated VOCs are

characterized by their volatility and relatively high water solubility. In the surficial soil, volatilization into the atmosphere may be a significant transport mechanism. Halogenated VOCs are mobile in soil. Due to their high solubility in water, these compounds may leach downward through the soil column with percolating soil water. Biodegradation of the halogenated VOCs under aerobic conditions is generally regarded as being very slow to nonexistent. Biotransformation of halogenated organic compounds via reductive dehalogenation has been demonstrated under anaerobic conditions (Wilson et al., 1986). Slow biodegradation may occur under anaerobic conditions where acclimated microorganisms exist (Howard, 1990).

The transport of halogenated compounds in the aquatic environment is generally dominated by volatilization, and their ultimate fate typically involves atmospheric processes (USEPA, 1979a). Losses via biodegradation, chemical degradation, adsorption to sediments, and bioconcentration in aquatic organisms are expected to be minor.

6.2.2 Semivolatiles

Semivolatiles detected at the oxbow areas include phenols and PAHs.

6.2.2.1 Phenols

Phenols detected at the oxbow areas are limited to pentachlorophenol in Oxbow Area B soils and phenol in soils and groundwater of Oxbow Areas A and C.

In the terrestrial environment, phenols exhibit low to moderate adsorption to soils and most biodegrade rapidly. Despite their high solubility and limited adsorption to soils, biodegradation is usually sufficiently rapid to prevent migration into groundwater. Exceptions include those situations where the concentration of phenols is sufficient

to inhibit or reduce microbial growth (Howard, 1989). Phenols are not expected to significantly hydrolyze under natural environmental conditions (Howard, 1989).

In the aquatic environment, photo-oxidation, metal-catalyzed oxidation, and biodegradation all contribute to the aquatic degradation of phenol (USEPA, 1979b). Volatilization may occur, and any phenols that pass into the atmosphere would be rapidly destroyed by oxidation. Neither adsorption to sediments nor bioaccumulation appear to be significant processes in the fate of phenols (USEPA, 1979b).

6.2.2.2 PAHs

At each of the oxbow areas, a variety of PAHs were detected in soils. Additionally, a limited number of PAHs were detected in the groundwater of Oxbow Area A.

PAHs are semi-volatile compounds that have low water solubilities and have a strong tendency to adsorb to soil particles and organic matter (Table 6-1). The PAHs with higher molecular weights tend to be less water soluble and have higher octanol/water partitioning coefficients, and thus have a higher affinity for adsorption to soil. Within the soil environment, biodegradation of PAHs is also related to molecular weight. PAHs with lower molecular weights tend to undergo microbial degradation more rapidly than the PAHs with higher molecular weights. The lower molecular weight PAHs may also be subject to volatilization, but to a much lesser extent than VOCs.

6.2.3 PCBs

PCBs have been detected at various concentrations in the soils at each of the oxbow areas.

The fate and transport of PCBs in the environment are greatly influenced by their low water solubility and high affinity for soil organic matter. This generally limits aqueous-phase concentrations to low parts-per-billion levels unless significant amounts of solvents, oils, or colloids are present (Baker et al., 1986; Dragun, 1989). In general, the adsorption of PCBs to soils and sediments increases with increasing soil organic content, decreasing soil particle size, and increasing congener chlorination (Lyman et al., 1982; Pignatello, 1989). PCBs could potentially volatilize from soil, but strong adsorption to soils tends to limit the extent of volatilization (ATSDR, 1989b).

PCBs are fairly persistent in the environment, and degradation via chemical oxidation, hydrolysis, and photolysis in soil or aquatic systems is generally insignificant. PCBs may, however, be subject to loss via biotransformation and biodegradation. Experimental evidence indicates that PCBs are susceptible to biodegradation under both aerobic and anaerobic conditions. In general, the degradability of PCB congeners under aerobic conditions increases as the degree of chlorination decreases. Variations in this trend exist and are attributed to preferential degradation of meta- and para-substituted PCBs.

Laboratory research has shown that the lesser-chlorinated PCB congeners are subject to aerobic biodegradation by microorganisms indigenous to soils and sediments. Aerobic biodegradation results in a complete breakdown of PCBs, causing a net decrease in total PCB concentration. Various breakdown products have been identified, and include chlorinated catechol, chlorobenzoic acid, and carbon dioxide (Bedard et al., 1987a; 1987b; Hankin and Sawhney, 1984; Fries and Marrow, 1984).

As with aerobic biodegradation, preferential degradation of meta- and para-substituted congeners has been observed under anaerobic conditions (Quensen et al., 1988). Laboratory research has shown that PCBs undergo reductive dechlorination under anaerobic conditions by indigenous microorganisms. Study results indicate that the more highly chlorinated PCBs are transformed to less chlorinated congeners by anaerobes (Quensen et al., 1988) and that the lower chlorinated PCBs may be further degraded to carbon dioxide, water, and chloride by aerobes (Chen et al., 1988).

Plant uptake and translocation of PCBs by crops is generally not significant (Bacci and Gaggi, 1985; O'Connor et al., 1991; Fries and Marrow, 1981; Iwata and Gunther, 1976; Weber and Mrozek, 1979; Webber et al., 1983).

6.2.4 Polychlorinated Dibenzo-p-dioxin/Dibenzofuran Compounds (PCDDs/PCDFs)

At the oxbow areas, a number of low-level PCDD and PCDF congeners were detected in soils. Additionally, a low concentration of a single PCDF congener was detected in the groundwater of Oxbow Area A.

The majority of information available on the environmental fate and transport of PCDDs and PCDFs is specific to 2,3,7,8-TCDD, while some information is also available for 2,3,7,8-TCDF. Although there are significant differences in toxicity between these congeners and other PCDD/PCDF congeners, the environmental fate and transport data on 2,3,7,8-TCDD and 2,3,7,8-TCDF may be regarded as generally representative of the entire class of PCDDs and PCDFs due to similarities in physical/chemical properties.

Based on their very low water solubilities and consequently high organic carbon adsorption coefficients (K_{oc} values), PCDDs and PCDFs are

expected to strongly adsorb to most soils, thereby limiting migration of the compounds (HSDB, 1990b).

6.2.5 Pesticides/Herbicides

Pesticides detected at low concentrations in soils at the former river oxbow areas include gamma-BHC (lindane), delta-BHC, 4,4'-DDT and 4,4'-DDD. Additionally, the herbicides 2,4-D, 2,4,5-TP (silvex), and 2,4,5-T were detected at low concentrations in the soils of Oxbow Area K.

The fate and transport properties differ among these compounds due to differences in their chemical and physical properties. Gamma-BHC, delta-BHC and 4,4'-DDT are organochlorine insecticides, and DDD is a chlorinated degradation product of DDT. 2,4-D, 2,4,5-TP and 2,4,5-T are chlorinated phenoxy herbicides.

DDT and DDD are notably persistent compounds, and because DDT degrades to DDD, DDD concentrations may increase as DDT levels decrease. In soil, DDT and DDD are expected to adsorb strongly to soils and be essentially immobile (HSDB, 1990a; 1990b), whereas the other compounds are somewhat mobile and may enter groundwater under certain conditions. Migration of all compounds is expected to be limited, however, by biotransformation and biodegradation, depending on whether a suitable microbial population is present. Volatilization from soils is not expected to be significant, except for gamma- and delta BHC (Hartley and Kidd, 1987). The dominant fate processes would depend upon the chemical and environmental conditions.

6.2.6 Metals

A number of naturally occurring metals were detected in the soils and groundwater at the oxbow areas. Metals are cycled within the environment, forming various species with different physical and chemical properties.

Metal species may be transformed from one inorganic or organometallic species to another, but the inorganic element itself does not degrade.

Certain organic species are highly water soluble, while others are extremely insoluble. The movement of a particular metal into and within groundwater is determined by the amount and form of the metal, the groundwater's chemical and physical properties, and the composition of the soil or waste solution with which the metal is associated (USEPA, 1988). The soil properties affecting metal retention/release and transport include bulk density, surface area, particle-size distribution, pH, redox conditions, ion exchange capacity, amount of organic matter, type and amount of metal oxides, and type and amount of clay minerals (USEPA, 1988). Adsorption to soil organic matter, at levels commonly found in surface soils and sediments, is one of the primary immobilizing processes for metals (USEPA, 1988). The form in which an inorganic element exists is highly dependent upon the chemical characteristics of the site such as pH, oxygen level, and ionic characteristics.

SECTION 7 - POTENTIAL MIGRATION PATHWAYS

7.1 General

This section discusses the potential migration pathways for the chemical constituents that have been detected at the oxbow areas, based on the investigations described in Section 4 and summarized in Section 5. As discussed in Section 5, the limited analytical data available at Oxbow Area K does not indicate any significant contamination of the soil or groundwater (although further groundwater sampling will be undertaken). Hence, the discussion of potential migration pathways will focus on Oxbow Areas A, B, C, and J. This discussion also relies on the physical characteristics and environmental setting of these areas, presented in Section 2, and on the fate and transport characteristics of the chemicals detected, presented in Section 6, since all of these factors will influence the potential for migration of these substances.

In order for exposure to occur, a transport pathway by which a chemical will migrate from its source to a point of potential exposure must be established. Hence, identification of migration pathways allows for an overall understanding of the exposure potential associated with the site and serves to direct the scope of subsequent exposure evaluations.

The following subsections present information describing potential migration pathways specific to each of Oxbow Areas A, B, C, and J. This Phase I/Interim Phase II Report does not include discussions of exposure-specific information (i.e., the identification of potential human and environmental receptor populations, the preliminary delineation of exposure points, discussions of potential routes of exposure, and calculations of exposure point concentrations). This exposure-related information is not presented here since supplemental data collection will

be performed at certain locations in these oxbows as described in Section 8. In addition, oxbow-specific evaluations of exposure are appropriate at these oxbow areas; and such evaluations would be more usefully made in connection with preparation of the Risk Assessment when characterizations of chemical distribution are more complete and the exposure information is more focused. For these reasons, discussions of exposure information for this site will be specifically addressed in the Scope of Work for the Risk Assessment.

7.2 Oxbow Area A

Oxbow Area A covers an area of approximately five acres. The site is generally flat with a few low lying areas (that occasionally collect water) in the southern portion of the site. The central and northern sections of the site slope gently toward the Housatonic River. A man-made drainage ditch encircles the southeastern border and continues off site to a discharge point at the river.

The oxbow area is well vegetated throughout its area. The majority of the site supports grasses and low-growing shrubs. Limited areas of woodland exist on the eastern, northern, and western perimeter of the site. Residential development exists to the southeast in the vicinity of Crosier Avenue. Commercial development exists to the immediate south.

Soil investigations at Oxbow Area A have identified the presence of PCBs, PAHs and trace concentrations of a single PCDD congener at concentrations above quantitation limits. Groundwater investigations have detected low concentrations of ethylbenzene, various PAHs, phenols, and a single PCDF congener. A review of the results of the metals detected in soils in this area indicates that the types and concentrations of individual metals appear to be representative of background soil conditions. The same is generally true of the

metals detected in groundwater in this area, with a few exceptions (see Section 4.3.2).

Based upon the available information, potential migration pathways for the chemicals detected in the media of concern at Oxbow Area A include the following: 1) migration from surficial soils; 2) migration from subsurface soils; and 3) migration via groundwater.

7.2.1 Migration from Surficial Soils

To the extent chemical constituents are present in Oxbow Area A surficial soils, they may migrate through the following mechanisms: 1) stormwater runoff; 2) volatilization and/or dusting; and/or 3) erosion/transport by flood waters. Current site conditions, however, are such that these migration pathways are not likely to be of significant concern.

Stormwater runoff will be minimized by the low slope and the abundant vegetation present on the majority of the site. Transport of materials to off-site areas via stormwater flow will be further minimized by the surrounding band of woodlot vegetation. Overland migration of surficial soils into the river will also be minimized by the thick growth of river bank vegetation present along the entire river bank area.

As noted previously, the southern portion of the site is flat with numerous depressions. This portion of the site is unlikely to generate significant quantities of surface runoff. This fact is reflected by occurrences of stormwater ponding in depressed areas. As such, the drainage ditch in the southeastern portion of the site is unlikely to receive large quantities of surface water runoff or to transport appreciable quantities of surficial soils originating from the site. Additionally, should extreme conditions result in the generation of runoff from this area, the

drainage ditch would prevent translocation of surficial soils to off-site areas south of Oxbow Area A.

Volatilization mechanisms are unlikely to contribute to the transport of the constituents detected in Oxbow Area A soils. PCBs were detected in surficial soils at very low concentrations (below 1 ppm) and thus are not at concentrations where volatilization to any appreciable extent is likely. In addition, the physical and chemical characteristics of PCBs encourage adsorption to soils and discourage volatilization. Dusting via natural processes (i.e., wind uplift) will be inhibited by site conditions which include small areas of exposed soils and vegetative cover. Dusting via mechanical suspension may occur if heavy use of off-road vehicles occurs at the site. This migration pathway will be limited to those instances conducive to dust generation (i.e., dry conditions). The poorly drained nature of Oxbow A soils will further reduce the potential that on-site conditions will remain conducive to dust generation for any significant period of time.

The third potential migration pathway is the transport of surficial soils with Housatonic River flood waters. Although the frequency of flooding has been reduced by past channelization efforts, Oxbow Area A remains within the 50-year floodplain. The potential significance of flood-based transport will be directly related to the intensity of the flooding event, although the extensive vegetative cover present throughout the site is likely to retard erosional processes.

7.2.2 Migration from Subsurface Soils

Potential migration pathways for the movement of chemical constituents from subsurface soils include the following: 1) leaching/dissolution into groundwater; and 2) volatilization/dust generation during excavations.

Leaching mechanisms are not expected to be significant transport pathways in Oxbow Area A. The chemicals present in subsurface soils in elevated concentrations (PCBs, PAHs) have very low water solubilities and are likely to remain adsorbed to subsurface soils. This is supported by analytical data from the 1991-1992 MCP Investigation of the site, which did not detect PCBs in underlying groundwater at any of the oxbows sampled. The groundwater investigation at the site has established that fill materials are in direct contact with the water table. The dissolution of chemicals directly into groundwater is a more likely migration pathway and is probably responsible for the limited occurrence of PAHs in groundwater at the site.

Volatilization of organics and/or the generation of dusts from subsurface soils could potentially occur during disturbances (e.g. excavations) of subsurface soils. The possibility for future development of the site does exist, and the presence of underground utilities has been noted. Although excavations associated with construction or repair activities (e.g. utilities) may occur, they are likely to be infrequent in nature and of short duration.

7.2.3 Migration via Groundwater

The fate of chemical constituents present in groundwater at Oxbow Area A could possibly include the following: 1) permanent "containment" within the groundwater system as a result of adsorption onto subsurface soils; 2) subsurface transport via groundwater discharge to a receiving surface water; and 3) volatilization into subsurface soils at the saturated/unsaturated interface or to the atmosphere during excavation activity which extends to the saturated zone. These three possible constituent fates are discussed below:

First, groundwater sampling has detected low concentrations of one VOC, several PAHs, phenols, and one PCDF at Oxbow Area A. As groundwater moves in the subsurface, these dissolved constituents may become adsorbed to soil particles.

Second, movement of groundwater beneath the Oxbow Areas is toward the Housatonic River. Though not detected at significant levels, the constituents found in groundwater at Oxbow Area A will ultimately be transported via groundwater flow to a discharge point along the Housatonic River.

Third, the significance of volatilization mechanisms at the site will be limited by the low concentrations of volatile constituents present in site groundwater. Volatilization to subsurface soils is unlikely to result in the transport of appreciable mass to unsaturated soils. Volatilization to the atmosphere will be limited to excavation events associated with construction or repair activities in this area. These activities will be infrequent and typically of short duration. In addition, the considerable depth to groundwater (12 to 14 feet) in Oxbow Area A significantly reduces the likelihood that excavations will extend to the water table. As such, it is unlikely that volatilization mechanisms will contribute significantly to chemical migration from the site.

7.3 Oxbow Area B

Oxbow Area B covers an area of approximately 3 acres. The site is flat with a slight slope toward the Housatonic River. The eastern portion of the oxbow is paved, and the western section is mainly an unvegetated area. Vegetative growth at the site is limited to the river bank area in the southern portion of the site.

The general area is currently being used for commercial purposes. Adjacent land uses include further commercial development and limited residential use to the southwest along Root Place. Utilities present at the site include a powerline right-of-way along the north bank of the Housatonic River.

Soil investigations at Oxbow Area B have identified the presence of PCBs, PAHs, the pesticide lindane, PCDDs, PCDFs, phenols, and some metals in borings at the site. As discussed in Section 5.3.2, the groundwater investigation at Oxbow Area B showed no significant groundwater concerns in this area.

Based upon the available information, potential migration pathways for the chemicals detected in environmental media of Oxbow Area B include the following: 1) migration from surficial soils; and 2) migration from subsurface soils.

7.3.1 Migration from Surficial Soils

Extensive areas of this site are paved, and as such, are protected against soil-borne migration pathways. To the extent chemical constituents are present in uncovered surficial soils at this site, they could migrate through the following mechanisms: 1) stormwater runoff; 2) volatilization and/or dusting; and 3) erosion/transport by flood waters.

Stormwater runoff will discharge from Oxbow Area B directly to the Housatonic River to the south and west. Exposed soils in the western portion of the site will be subject to transport via overland runoff. However, actual quantities discharged to the river will be decreased to a significant extent by the thick growth of vegetation on adjacent river banks. There is no evidence indicating the potential for transport to off-site soils via stormwater runoff, as the dominant slope at the site directs all drainage to the river.

Volatilization mechanisms are unlikely to contribute to the transport of constituents from Oxbow Area B surficial soils. PCBs and PAHs, which were detected in both subsurface and surficial soils at the site, are not prone to significant volatilization.

Due to the exposed condition of the soils in the western portion of this area, dusting mechanisms may be active at this site. Wind uplift may occur during dry conditions, but will be limited by the small area of exposed soils. Mechanical suspension of surficial soils is possible as the site supports frequent vehicular storage activities.

Transport of surficial soils with flood waters is also possible. Oxbow Area B is located within the 50-year floodplain and could be subject to periodic inundation. The potential for flood-based transport is increased due to the exposed condition of soils in the western portion of the site.

7.3.2 Migration from Subsurface Soils

Potential migration pathways for the movement of chemical constituents from subsurface soils include the following: 1) leaching into groundwater; and 2) volatilization/dust generation during excavations.

Results of the subsurface investigations at Oxbow Area B suggest that fill material is not in contact with the underlying groundwater. In addition, groundwater analysis at the site indicates that leaching mechanisms are not occurring in subsurface soils. Chemical constituents detected in subsurface soils have not been found in underlying groundwater. This is expected, as the primary chemicals observed in subsurface soils (PCBs, PAHs, PCDDs and PCDFs) have very low water solubilities and are likely to remain adsorbed to subsurface soils.

The volatilization of organics and/or generation of dusts could potentially occur during disturbances (e.g. excavations) of subsurface soils.

However, excavations are unlikely in Oxbow Area B. The site is already developed and underground utilities (with the exception of the Silver Lake Outfall) are not located within the oxbow area. As such, it is unlikely that excavation-based migration pathways will contribute significantly to the release of hazardous materials from Oxbow Area B.

7.4 Oxbow Area C

Oxbow Area C covers an area of approximately 2 acres. The site is flat and supports well-developed growths of grassland vegetation in its interior and forest species around the perimeter. A man-made drainage ditch bisects the site directing surface drainage to the Housatonic River. Sewer lines exist in the southern and southeastern portion of the oxbow area. Residential development is present to the south and west of the Oxbow at Day and Ashley Streets.

Soil investigations at Oxbow Area C have identified the presence of PCBs, SVOCs (phenols, PAHs), a few pesticides, and several PCDD/PCDF compounds in the borings at the site. While an earlier groundwater investigation found PCBs and chlorobenzene in well points in this area, the MCP Phase II groundwater investigation detected no chemical constituents in excess of detection limits in on-site wells, except for phenols at 0.019 ppm in one well and metals at background concentrations.

Based upon the data, it appears that the potential migration pathways of interest for the chemicals detected at Oxbow Area C are: 1) migration from surficial soils; and 2) migration from subsurface soils.

7.4.1 Migration from Surficial Soils

Chemical constituents present in surficial soils at the site might migrate through the following mechanisms: 1) stormwater runoff; 2) volatilization and/or dusting; and 3) erosion/transport by flood waters.

Stormwater runoff will discharge to the Housatonic River, either directly or indirectly via the on-site drainage ditch bisecting the site. However, the well vegetated condition of the site (including the river bank areas) will significantly reduce the potential for direct overland migration of surface soils with stormwater runoff.

Migration of chemical constituents from Oxbow Area C surficial soils via volatilization and/or dusting mechanisms is unlikely. Although PCBs have been detected in subsurface and surficial soils at the site, the physical and chemical characteristics of PCBs do not encourage volatilization mechanisms, as noted earlier. Similarly, dusting mechanisms will be inhibited by site conditions, including the presence of vegetative soil cover and the limited potential for mechanical disturbances (i.e., lack of vehicular traffic and limited potential for on-site excavations).

Overland transport of surficial soils with Housatonic River flood waters exists as a potential migration pathway for all oxbow areas. As mentioned previously, the significance of this pathway will be dependent upon the condition of the site (i.e., undeveloped vs. developed) and the condition of site soils (i.e., covered vs. uncovered). The vegetative cover at Oxbow Area C is likely to retard erosional processes related to river flooding.

7.4.2 Migration from Subsurface Soils

Potential migration pathways for the movement of chemical constituents from subsurface soils include the following: 1) leaching into groundwater; and 2) volatilization/dust generation during excavations.

Subsurface fill has not been found to be in contact with underlying groundwater at Oxbow Area C. In addition, the MCP Phase II Investigation data show an absence of elevated chemical concentrations in groundwater, except phenols at 0.019 ppm, indicating that groundwater at the site is

currently generally unaffected by overlying soils/fill material. Leaching mechanisms do not appear to be occurring at the site.

Excavation-based volatilization/dusting migration pathways are unlikely to be significant as only one VOC (acetone at 0.044 ppm) has been detected in Oxbow Area C soils. In addition, the site's undeveloped nature and limited use serve to further reduce the potential for dusting.

7.5 Oxbow Area J

Oxbow Area J covers an area of approximately four acres. The site is relatively flat and slopes toward the river. An open drainage channel exists on site and accepts flow from a storm drain which discharges runoff from East Street and Merrill Road to the north.

The oxbow area supports light industrial development and includes considerable open areas of exposed soils/paved lots in parking areas and also vegetated woodlot areas adjacent to the river. Commercial/light industrial development exists to the east and commercial/ residential development exists to the west. Utilities present at the site include buried sewer lines, storm drains, and water mains.

Soil investigations at Oxbow Area J have identified the presence of low levels of PCBs, one VOC, and several SVOCs in the subsurface soil, and PCBs, one VOC, PAHs, PCDDs/PCDFs, phenols, and a single pesticide (4.4'-DDT) in surficial soils. Metals were detected in soils at concentrations representative of background concentrations. The MCP groundwater investigations did not detect any constituents above method detection limits (apart from some metals at background concentrations).

Potential migration pathways for the chemicals detected in Oxbow Area J soils include the following: 1) migration from surficial soils; and 2) migration from subsurface soils.

7.5.1 Migration from Surficial Soils

Chemical constituents may migrate from site surficial soils through the following mechanisms: 1) stormwater runoff; 2) volatilization and/or dusting; and 3) erosion/transport by flood waters.

Stormwater runoff will discharge to the Housatonic River, either directly or indirectly via the on-site drainage channel. However, the well vegetated condition of the site's river bank areas will reduce the potential for direct overland migration of surface soils with stormwater runoff.

Volatilization mechanisms will not be significant at the site. No VOCs (other than trace levels of acetone) have been detected in surficial soils. The remaining constituents in those soils (PCBs, PAHs, PCDDs/PCDFs, phenols, and pesticides) are present in low concentrations and are not prone to volatilization. However, dusting mechanisms may occur at the site due to the exposed condition of the site soils although, again, the constituents detected are present at low concentrations.

As noted previously, the transport of surficial soils with Housatonic River flood waters exists as a potential migration pathway for all oxbow areas.

7.5.2 Migration from Subsurface Soils

As with other oxbow areas, potential migration pathways for the movement of chemical constituents from subsurface soils include the following: 1) leaching/dissolution into groundwater; and 2) volatilization/dust generation during excavations.

Groundwater analysis at the site indicates that neither dissolution or leaching mechanisms are occurring at the site. The PCBs, VOCs, PAHs, phenols, PCDDs/PCDFs, and pesticides detected in soils at the site have not been detected in groundwater.

Excavation-based volatilization of organics is unlikely to occur at the site, however, for reasons discussed above (i.e., low chemical concentrations, low volatility). Dusting may also occur during these events, but it is likely that they will be infrequent and of short duration.

SECTION 8 - REMAINING DATA GAPS

8.1 General

This section identifies the remaining data gaps associated with the oxbow areas discussed in this report, based on a review of the investigations presented in Section 4, and the extent of detected hazardous constituents presented in Section 5. Sections 8.2 through 8.6 present an area-by-area review of the remaining data gaps. After the MDEP's approval of the present report, a Supplemental Phase II Scope of Work will be prepared and submitted to the MDEP, describing in detail the proposed activities to fill these data gaps at the oxbow areas.

In general, the supplemental field investigations deemed necessary consist, where applicable, of additional surface and/or subsurface soil sampling. Only at Oxbow Areas A and K have any groundwater data gaps been identified for the oxbow areas covered by this report. Water column monitoring of the Housatonic River for PCBs and other constituents at locations upstream and downstream of Oxbow Areas A, B, C, J, and K has been performed by GE. The results of the water column analyses are described in the Supplemental Phase II/RFI Report for the Housatonic River and Silver Lake (BBL, January 1996) and indicate no measurable impact from these former oxbow areas on the water quality of the river.

8.2 Oxbow Area A

PCBs were found at depth in the subsurface soils of Oxbow Area A at concentrations up to 50 ppm and in shallow (0 to 2 feet) soils at concentrations up to 25 ppm. Both of these maximum concentrations were detected in the

boring for well A-3. Subsequent surficial soil sampling at well A-3 indicated a PCB concentration of 0.397 ppm in the top 6 inches.

Although existing data indicate surficial PCB concentrations are below 1 ppm, additional surficial soil sampling is needed to determine the presence and extent of PCBs in other areas of the oxbow. It would also be useful to install another soil boring in the area between well A-3 and the Housatonic River in order to sample and analyze the subsurface soil in that area for PCBs. (As discussed below, this boring would be converted to a monitoring well.) As discussed in Section 4.1.2, five attempts were previously made to install a well boring in this area and refusal occurred between 1 and 8 feet below land surface. Hence, additional efforts will be necessary to determine the feasibility of drilling a new boring in this area.

In addition, the positioning of the existing groundwater monitoring wells (A-1 and A-3) in Oxbow Area A may not provide an adequate assessment of the presence of PCBs in groundwater. Hence, it would be desirable to install another monitoring well downgradient of the existing wells (i.e., between well A-3 and the river). If it is feasible to drill a boring in this area, that boring would be converted to a monitoring well for sampling and analysis for PCBs.

8.3 Oxbow Area B

The existing data associated with Oxbow Area B show the presence of SVOCs and PCBs in the soils, with a maximum PCB concentration of 180 ppm found in shallow (0-2 feet) soils at boring B-2. Subsequent sampling of the top 6 inches of soil at this location found a PCB concentration of 11.8 ppm. The analyses of five samples collected in the western portion of the oxbow indicated one surficial soil sample above 10 ppm PCBs (I9-4-14C at 47 ppm). (Because this property was classified as falling within a walker scenario, with a

corresponding PCB trigger level of 50 ppm PCBs, no additional STM-related activities were required at this property.) The extent of PCBs in soil in the western portion of Oxbow Area B is adequately delineated, and the eastern portion of this oxbow is largely paved or occupied by buildings. However, further soil sampling will be undertaken in the middle portion of the oxbow (to the west and east of boring B-2) in order to adequately delineate the extent of PCBs and SVOCs in this area.

Groundwater sampling during the 1992 MCP Investigation at wells B-1 and B-2 detected only one constituent (benzene at 0.010 ppm) above quantitation, limits or background levels. Hence, no further groundwater sampling is warranted at Area B.

8.4 Oxbow Area C

As in Oxbow Area B, additional soil sampling is necessary to adequately delineate the extent of PCBs and SVOCs in Oxbow Area C. The existing data indicate that several SVOCs and PCBs were found in the subsurface soil in this area, with the highest PCB concentration in the well C-2 boring (up to 150 ppm). Moreover, the shallow (0-2 foot) soil sample from this boring showed a PCB concentration of 750 ppm. The PCB concentration observed in the 0- to 2-foot soil sample at boring C-2 was confirmed by sampling during the October 1995 Imminent Hazard Investigation. Additional surficial soil sampling in the vicinity of well C-2 was conducted in November 1995. Six of the eight samples analyzed indicated the presence of PCBs over 10 ppm, with one sample greater than 400 ppm. Further surficial and subsurface soil sampling near boring C-2 is warranted to delineate the depth and extent of PCBs in this area. Additional SVOC analysis for soils is also warranted at the western portion of Oxbow Area C.

Although the 1988 Groundwater Investigation in this oxbow showed detectable concentrations of chlorobenzene at wellpoint WP-8, PCBs at well points WP-7 and WP-8, and a few metals at both well points at low concentrations, the 1991-1992 MCP investigation showed no constituents in excess of the quantitation limits at wells C-1 and C-2, except for phenols at 0.019 ppm in well C-1 and some background concentrations of metals. Accordingly, no additional groundwater sampling in this oxbow is warranted.

8.5 Oxbow Area J

As discussed in Section 5.5, the existing data associated with Oxbow Area J provide a sufficient characterization of surface and subsurface conditions in this area. Hence, no further field investigations in this area appear needed.

8.6 Oxbow Area K

As discussed in Section 5.6, additional soil sampling is not required in Oxbow Area K. However, the presence of PCBs and metals detected in groundwater warrant the installation of additional monitoring wells and sampling and analyses for metals and PCBs.

SECTION 9 - CONCLUSIONS AND FUTURE ACTIVITIES

9.1 Conclusions

Based on the foregoing discussion, the following outcomes would appear to be appropriate at the present stage of the MCP process:

- At Oxbow Areas A, B, C, and K, additional Phase II Comprehensive Response Actions are necessary. Such actions should include additional field investigations, as described in Sections 8.2, 8.3, 8.4, and 8.6.
- At Oxbow Area J, for the reasons noted in Sections 5.5 and 8.5, no further field investigations appear to be needed. Rather, the additional activities would consist of the remaining Phase II response actions -- i.e., a risk assessment.

It should be noted that, for the oxbow areas which would remain in Phase II of the MCP, GE reserves the right to take the position that it is not legally responsible under Chapter 21E for carrying out activities to address constituents that are not attributable to materials or releases from the GE facility or to other GE operations.

9.2 Scope of Remaining Activities

Section 8 of this document has identified additional field activities to satisfy several data gaps concerning the presence and extent of hazardous materials at Oxbow Areas A, B, C, and K. Following the MDEP's review and approval of this Phase I/Interim Phase II Report, a Supplemental Phase II Scope of Work will be prepared to incorporate the activities discussed in Section 8 for those areas, as well as to address additional study objectives (if any) identified by the MDEP

in its review of this report. Following the MDEP's approval of that Supplemental Phase II Scope of Work, the supplemental field activities will be performed. Further field activities would be contingent on obtaining access agreements with the property owners. The results of these activities will be presented in a Supplemental Phase II Report.

After completion of all Phase II field investigations, a separate Scope of Work for a Risk Assessment for all these former oxbow areas (including Oxbow Area J) will be submitted for MDEP review and approval. This Scope of Work will utilize the available information to propose the activities necessary to evaluate the risks to human health and environment at these sites. The results of these risk assessment/characterizations will be presented in a Final Phase II Report, which will represent completion of the Comprehensive Site Assessment for these sites.

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Tables

TABLE 2-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A,B,C,J, AND K

SUMMARY OF HISTORICAL AERIAL PHOTOGRAPHS

Date	Photographer	Approx. Scale of Photos	Former Oxbows Shown
July 13, 1942	Nat. Arch.[1]	1:16,300	Areas A,B,C,J, and K
October 3, 1957	Col-East[2]	1:25,000	Areas A,B,C,J, and K
April 14, 1969	Col-East	1:4,800	Areas A,B,C,J, and K
March 29, 1979	Col-East	1:6,000	Areas A,B,C,J, and K
April 23, 1990	Lockwood[3]	1:6,000	Areas A,B,C,J, and K

Notes:

1 Nat. Arch. - USGS National Archives, Washington, D.C.
2 Col-East - Col-East, Inc., North Adams, Massachusetts
3 Lockwood - Lockwood Mapping, Inc., Rochester, New York

TABLE 2-2

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF CHEMICAL QUALITY DATA OF WATER FROM SELECTED WELLS IN SURFICIAL AND BEDROCK AQUIFERS*

Constituent or Characteristic	Stratified Deposits (Sand and Gravel)		Till		Limestone and Dolomite (Carbonates)		Quartzite		Gneiss		Schist	
	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples
Silica	3.4 - 12	12	3.6 - 7.2	4	3.5 - 9.2	15	7.9 - 11	3	8.8 - 15	4	3.3 - 11	6
Iron	0.01 - 1.1	16	0.04 - 0.07	4	0.00 - 0.10	16	0.00 - 0.03	3	0.03 - 0.99	5	0.01 - 1.2	10
Manganese	0.00 - 0.22	12	0.00 - 0.10	4	0.00 - 0.06	15	0	3	0.00 - 0.07	5	0.01 - 0.46	8
Calcium	6.4 - 68	18	19 - 78	7	28 - 85	23	9.6 - 42	3	13 - 26	5	16 - 40	7
Magnesium	0.9 - 36	18	5.5 - 26	7	8.8 - 36	23	2.2 - 17	3	2.8 - 13	5	1.0 - 16	6
Sodium	1.1 - 8.5	12	1.1 - 9.5	5	1.3 - 5.3	12	1.1 - 3.7	3	1.7 - 3.6	4	0.7 - 16	6
Potassium	0.1 - 3.8	12	0.4 - 2.2	4	0.2 - 0.30	15	0.9 - 4.4	3	1.0 - 2.2	4	0.2 - 1.4	6
Bicarbonate	12 - 312	22	34 - 302	8	112 - 340	29	38 - 164	6	59 - 158	8	41 - 169	10
Sulfate	11 - 29	12	12 - 27	5	9.0 - 28	17	4.4 - 19	3	4.8 - 17	4	0.0 - 22	6
Chloride	1.0 - 21	12	2.0 - 28	6	0.8 - 22	12	1.0 - 13	4	1.1 - 8.0	4	1.0 - 22	6
Fluoride	0.0 - 0.2	12	0.0 - 0.1	4	0.0 - 0.1	15	0.1 - 0.2	3	0.0 - 0.1	4	0.0 - 0.2	6
Nitrate	0.0 - 6.8	12	0.2 - 20	6	0.1 - 19	17	0.9 - 14	4	0.0 - 3.7	4	0.0 - 1.8	6
Dissolved Solids (Residue on evaporation at 180°C)	29 - 278	12	99 - 245	4	141 - 308	11	50 - 222	3	74 - 132	4	59 - 176	6
Hardness as $CaCO_3$												
Calcium, Magnesium	20 - 270	22	74 - 302	8	106 - 356	29	32 - 175	6	44 - 143	8	44 - 143	10
Noncarbonate	0 - 48	22	8 - 58	8	4 - 141	29	1 - 41	6	0 - 14	8	0 - 18	10
Specific Conductance (Micromhos at 25°C)	48 - 512	22	168 - 567	8	208 - 874	29	72 - 358	6	107 - 282	8	96 - 289	10
pH	6.6 - 8.2	22	6.9 - 8.4	8	7.1 - 8.3	29	7.1 - 7.8	6	7.5 - 9.0	8	6.7 - 8.1	10
Color	1 - 4	12	1 - 4	4	1 - 3	15	1	3	1 - 2	4	0 - 6	6
Turbidity	0.3 - 0.5	2	--	--	0.1	1	--	--	--	--	0.7	1
Temperature (°F)	36 - 56	22	38 - 54	8	45 - 59	29	46 - 54	6	43 - 57	8	41 - 56	9

Notes:
*Source - Norvitch, Ralph F., D.F. Farrell, F.H. Pausek, and R.C. Peterson, 1968. Hydrology and Water Resources of the Housatonic River Basin, Massachusetts. U.S. Geological Survey Hydrologic Investigations Atlas HA-281.

TABLE 4-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

HISTORY OF OXBOW INVESTIGATIONS

Investigation	Sampling Period	Conducted By	Oxbows Investigated	Sampling Activities
1988 Groundwater Investigation	1988	Geraghty & Miller	A,C,J, and K	Groundwater analyses for VOCs, SVOCs, metals and PCBs.
1989 Oxbow J Investigation	October 1989	Geraghty & Miller	J	Soil analyses for VOCs, SVOCs, and PCBs.
MCP Phase II Investigation	January 1991 - January 1992	Geraghty & Miller	A,B,C,J, and K	Soil and groundwater analyses for Appendix IX+3 constituents and PCBs.
1993 STM Investigation	August 1992, January 1993	Blasland & Bouck Engineers	B	Soil analyses for PCBs.
Supplemental Oxbow J Investigation	September 1994	Blasland & Bouck Engineers	J	Soil analyses for dioxins and furans, metals, PCBs, cyanide, and TOC.
1995 Imminent Hazard Investigation	October 1995, November 1995	Blasland, Bouck & Lee, Inc.	A, B, and C	Soil analyses for PCBs.

TABLE 4-2

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSAOTNIC RIVER OXBOW AREAS A, B, C, J, AND K

MCP PHASE II INVESTIGATION WELL CONSTRUCTION SUMMARY AND SURVEY INFORMATION FOR MONITORING WELLS IN HOUSATONIC RIVER OXBOW AREAS A,B,C, AND J

Well Designation	Elevation[a] of Measuring Point[b]	Depth of Well (ft)	Screen Length (ft)	Depth of Screen (ft)	Elevation[a] of Screened Interval	Elevation[a] of Grade (Land Surface)
A-1	986.21	24.0	15.0	9.0-24.0	975.24-960.24	984.24
A-3	988.32	22.0	15.0	7.0-22.0	978.30-963.30	985.30
B-1	981.61	20.0	15.0	5.0-20.0	976.88-961.88	981.88
B-2	978.06	18.0	15.0	3.0-18.0	975.53-960.53	978.53
C-1	990.90	24.0	15.0	9.0-24.0	979.10-964.10	988.10
C-2	980.86	18.0	15.0	3.0-18.0	976.46-961.46	979.46
J-1[c]	988.66	32.0	NA	NA	NA	988.00

Notes:

[a] Elevation given in feet above mean sea level.
[b] Measuring point is the top of the PVC casing.
[c] Well construction information is not available (NA) for Well J-1.

TABLE 4-3

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

MCP PHASE II INVESTIGATION - SUMMARY OF PHOTOIONIZATION DETECTOR (PID) RESULTS FOR SOIL SAMPLES COLLECTED FROM HOUSATONIC RIVER OXBOW AREAS A, B, C, AND K

Well (W)/Boring (B) Location	Depth (Feet) and Corresponding PID Results (ppm)*											
	(0-2)	(2-4)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(20-22)	(22-24)
A-1(W)	0.3	0.1	13.4	3.7	4.3	1.8	14.3	12.0	3.4	1.8	12.2	15.6
A-2(B)	0.8	0.2	5.8	68.9	0.5	0.7	1.7	2.1	NA	NA	NA	NA
A-3(W)	0.0	0.7	1.1	1.1	0.7	2.1	3.8	3.0	2.0	0.8	2.0	NA
B-1(W)	0.0	0.0	16.8	0.0	0.0	0.0	0.4	0.0	0.4	0.0	NA	NA
B-2(W)	3.7	3.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	NA	NA	NA
C-1(W)	0.0	0.0	0.3	0.4	0.1	1.5	1.2	1.3	1.3	1.2	1.2	1.0
C-2(W)	0.3	NS	0.1	0.7	2.1	4.2	16.2	0.7	NS	0.4	NA	NA
C-3(B)	0.5	1.7	1.4	0.2	0.0	0.0	0.0	NA	NA	NA	NA	NA
K-1(B)	0.0	0.0	0.0	2.4	5.2	0.8	9.2	10.5	8.3	8.5	NA	NA
K-2(B)	0.0	0.0	7.4	22.6	42.0	NA	NA	NA	NA	NA	NA	NA

Notes:
1. * These results are semi-quantitative only.
2. NA = Not analyzed; boring did not extend to this depth.
3. NS= No sample; sample was not collected due to insufficient volume of soil.

TABLE 4-4

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR HOUSATONIC RIVER OXBOW AREAS A,B,C,J, AND K

SUMMARY OF VOCs DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A,B,C,J, AND K

	Oxbow A							Oxbow B		Oxbow C		
Location:	Well A-1	Well A-1	Well A-1	Well A-1	Well A-1	Boring A-2	Well A-3	Well B-1	Well B-2	Well C-1	Well C-2	Boring C-3
Depth:	4-6'	12-14'	14-16'	20-22'	22-24'	6-8'	12-14'	4-6'	0-2'	10-12'	12-14'	2-4'
Sample Date:	11/91	11/91	11/91	11/91	11/91	11/91	1/92	11/91	11/91	11/91	11/91	11/91
Parameter												
Methylene Chloride	0.031B	0.030B (0.037B)	0.027B	0.064B	0.044B	0.034B	0.026B	0.032B (0.051B)	0.10B	0.028B	0.058B (0.045B)	0.034B
Acetone	0.023B	0.012B (0.017B)	0.012B	0.063B	0.016B	0.017B	0.026B	0.023B (0.024B)	0.046B	0.036B	0.048B (0.044)	0.014B
Ethylbenzene	ND	ND	ND	0.019	ND	ND	ND	ND	0.005J	ND	ND	ND
Xylene (Total)	ND	ND	ND	0.013	ND	ND	0.005J	ND	0.012J	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	0.004J (0.002J)	0.007J	ND	ND	0.002J
2-Butanone	ND	ND	ND	0.007J	ND	ND	ND	ND	ND	ND	ND	ND

	Oxbow J									Oxbow K	
Location:	J-1S	J-2S	J-3S	J-4S	YB-2	YB-4	FP-1	FP-2	FP-3	Boring K-1	Boring K-2
Depth:	0-4'	0-4'	0-4'	0-4'	4-8'	0-4'	8-12'	4-8'	4-8'	14-16'	8-10'
Sample Date:	12/91	12/91	12/91	12/91	10/89	10/89	10/89	10/89	10/89	2/91	2/91
Parameter											
Methylene Chloride	0.056B	0.074B	0.056B	0.087B	0.003BJ	0.002BJ	0.006B	0.006B	0.005BJ	0.033B	0.038B
Acetone	0.023	0.039	0.028	0.059	NA	NA	NA	NA	NA	0.022B	0.032B
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (Total)	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	ND
Toluene	ND	ND	ND	ND	0.001J	ND	0.004J	0.003J	0.003J	ND	ND
2-Butanone	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	0.004J	0.005J	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethene	ND	0.003J	0.002J	0.003J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	0.001J	ND	ND	ND	ND

Notes:

1. Concentrations reported parts per million in dry weight (ppm). Only detected analytes are shown.
2. B - Indicates the compound was found in the associated blank, as well as in the sample.
3. J - Indicates an estimated concentration below the sample quantitation limit.
4. ND = Not detected.
5. ( ) = Duplicate sample analytical result.
6. A, B, C, J, and K series samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.
7. YB and FP series samples analyzed by IT Analytical Services, Knoxville, TN.

TABLE 4-5

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF SVOCs AND PHENOLS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

Parameter	Oxbow A		Oxbow B		Oxbow C		
Location	Boring A-2	Well A-3	Well B-1	Well B-2	Well C-1	Well C-2	Boring C-3
Depth	6-8'	12-14'	4-6'	0-2'	10-12'	12-14'	2-4'
Sampling Date	11/91	1/92	11/91	11/91	11/91	11/91	11/91
Phenanthrene	5.7	59E	0.50 (13D)	2.2	13	0.21J (1.2)	27D
Di-n-butylphthalate	ND	ND	ND (ND)	0.085J	ND	ND (0.13J)	ND
Fluoranthene	6.7	49	0.76 (16D)	3.6	20	0.34J (1.5)	41D
Pyrene	5.3	42	0.77 (13D)	2.5	19	0.23J (1.1)	43D
Benzo(a)anthracene	3.0	17	0.51 (7.3D)	1.7	11	0.18J (0.74)	24D
Chrysene	2.7	18	0.49 (6.9D)	1.5	13	0.15J (0.71)	22D
bis(2-Ethylhexyl)phthalate	0.35J	0.88J	ND (0.27DJ)	0.33J	0.26J	0.049J (0.20J)	ND
Benzo(b)fluoranthene	4.0	26X	1.1X (13D)	4.2	20X	0.14J (0.45J)	49D
Benzo(k)fluoranthene	7.0	26X	1.1X (13D)	4.2	20X	0.14J (0.28J)	49D
Benzo(a)pyrene	2.5	15	0.66 (5.7D)	2.1	10	0.15J (0.62)	22D
Ideno(1,2,3-cd)pyrene	1.1	6.6	0.33J (3.1D)	0.97	3.6	ND (0.32J)	13D
Benzo(g,h,i)perylene	1.1	7.6	0.35J (3.4D)	1.2	3.3	ND (0.27J)	12D
Anthracene	1.9	14	0.19J (10D)	0.71	1.6J	0.23J (0.29J)	10D
Acenaphthylene	1.0	6.1	0.16J (0.50DJ)	0.75	2.2	ND (ND)	2.9DJ
1-Methylnaphthalene	1.9	22	0.05J (0.95DJ)	0.21J	0.33J	ND (ND)	2.5DJ
Naphthalene	2.2	23	ND (1.7D)	0.22J	0.23J	ND (ND)	1.9DJ
Dibenzofuran	1.1	7.3	ND (1.9D)	0.14J	0.27J	ND (0.064J)	2.7DJ
Acenaphthene	0.63J	6.1	0.05J (2.1D)	0.27J	0.24J	ND (0.095J)	3.1DJ
Dibenzo(a,h)anthracene	0.34J	2.1J	0.12J (0.88DJ)	0.23J	1.1J	ND (0.10J)	3.6D
Fluorene	2.2	17	0.079J (3.4D)	0.37J	1.2J	ND (0.14J)	5.4D
4-Aminobiphenyl	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
2-Methylnaphthalene	0.93	17	ND (0.73DJ)	0.11J	ND	ND (ND)	1.6DJ
1,2,4-Trichlorobenzene	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
3-Methylphenol	ND	ND	ND (ND)	0.05J	ND	ND (ND)	ND
4-Methylphenol	ND	ND	ND (ND)	0.05J	ND	ND (ND)	ND
2,4-Dimethylphenol	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
2,3,4,6-Tetrachlorophenol	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
Pentachlorophenol	0.51J	ND	0.72J (2.3DJ)	0.62J	ND	ND (ND)	ND
bis(2-chloroethyl)ether	ND	ND	ND (ND)	0.069J	ND	ND (ND)	ND
Benzoic acid	0.10J	ND	ND (ND)	0.085J	ND	ND (ND)	ND
Butylbenzlphthalate	ND	ND	ND (ND)	0.3J	ND	ND (ND)	ND
Acetophenone	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
Methylene-bis(2-Chloroaniline)	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
N-nitrosodiphenylamine	ND	ND	ND (ND)	ND	ND	ND (ND)	ND
Total Phenols	3.6	0.93	ND (ND)	0.31	0.22	ND	ND

(See Notes on Page 2)

TABLE 4-5
(Cont'd)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF SVOCs AND PHENOLS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

		Oxbow J									Oxbow K
	Location	J-1S	J-2S	J-3S	J-4S	YB-2	YB-4	FP-1	FP-2	FP-3	Boring K-2
	Depth	0-4'	0-4'	0-4'	0-4'	4-8'	0-4'	8-12'	4-8'	4-8'	8-10'
Parameter	Sampling Date	12/91	12/91	12/91	12/91	10/89	10/89	10/89	10/89	10/89	10/89
Phenanthrene		0.59	0.77	0.63	1.7	0.29J	0.43J	0.48J	0.48J	17	0.053J
Di-n-butylphthalate		ND	ND	ND	0.15J	ND	ND	ND	ND	ND	0.053J
Fluoranthene		1.4	1.0	1.2	2.8	0.47J	0.89J	0.35J	0.55J	15	0.080J
Pyrene		0.95	0.81	1.0	2.4	0.70J	0.94J	0.27J	0.42J	13	0.097J
Benzo(a)anthracene		0.61	0.57	0.63	1.5	0.30J	0.65J	ND	0.26J	8.1	0.045J
Chrysene		0.75	0.70	0.64	2.2	0.31J	0.64J	ND	0.23J	5.8	0.059J
bis(2-Ethylhexyl)phthalate		0.056J	ND	0.053J	0.42J	ND	ND	ND	ND	ND	0.067J
Benzo(b)fluoranthene		1.5	0.58X	0.65X	3.2X	0.38J	1.0J	ND	ND	5.0	0.086JX
Benzo(k)fluoranthene		1.5	0.58X	0.65X	3.2X	0.46J	0.91J	ND	ND	4.2	0.086JX
Benzo(a)pyrene		0.70	0.45	0.60	1.5	0.37J	0.93J	ND	0.20J	5.6	0.042J
Ideno(1,2,3-cd)pyrene		0.36J	0.32J	0.29J	ND	ND	0.66J	ND	ND	3.0	ND
Benzo(g,h,i)perylene		0.43	0.28J	0.35J	ND	ND	0.77J	ND	ND	3.5	ND
Anthracene		0.13J	0.14J	0.10J	0.18J	ND	0.26J	ND	ND	3.6	ND
Acenaphthylene		0.092J	0.056J	ND	0.25J	0.27J	0.42J	ND	ND	0.43J	ND
1-Methylnaphthalene		ND	0.041J	ND	ND	NA	NA	NA	NA	NA	ND
Naphthalene		ND	0.043J	ND	0.15J	ND	ND	ND	ND	1.2J	ND
Dibenzofuran		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
Acenaphthene		0.048J	0.052J	0.063J	ND	ND	ND	ND	ND	1.3J	ND
Dibenzo(a,h)anthracene		0.13J	0.097J	0.088J	ND	ND	0.24J	ND	ND	0.73J	ND
Fluorene		0.054J	0.058J	0.049J	0.14J	ND	ND	ND	ND	1.6J	ND
4-Aminobiphenyl		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
2-Methylnaphthalene		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
1,2,4-Trichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylphenol		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
4-Methylphenol		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
2,4-Dimethylphenol		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
2,3,4,6-Tetrachlorophenol		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
Pentachlorophenol		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
bis(2-chloroethyl)ether		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic acid		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
Butylbenzlphthalate		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
Acetophenone		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
Methylene-bis(2-Chloroaniline)		ND	ND	ND	ND	NA	NA	NA	NA	NA	ND
N-nitrosodiphenylamine		ND	ND	ND	ND	ND	0.63BJ	ND	ND	0.25J	ND
Total Phenols		ND	ND	ND	0.29	ND	ND	ND	ND	ND	ND

Notes:
1. Concentrations reported in parts per million - dry weight (ppm). Only detected analytes are shown.
2. E - Indicates the compound exceeds the calibration range of the gas chromatograph/mass spectrophotometer (GC/MS) instrument.
3. D - Indicates analysis at a secondary dilution factor.
4. J - Indicates an estimated concentration below the sample quantitation limit.
5. X - Indicates coeluting indistinguishable isomers.
6. ( ) - Indicates duplicate sample analytical result.
7. NA - Indicates parameter not analyzed.
8. ND - Indicates parameter not detected.
9. A, B, C, J, and K series samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.
10. YB and FP series samples analyzed by IT Analytical Services, Knoxville, TN.

TABLE 4-6

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF TOTAL PCBS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

	Oxbow A				Oxbow B								
Location	A-1	A-2	A-3	A-3	B-1	B-1	B-2	B-2	I9-4-14A	I9-4-14B	I9-4-14C	I9-4-14D	I9-4-14E
Sample Date	11/91	12/91	1/92	10/95	12/91	10/95	11/91	10/95	8/92	8/92	8/92	1/93	1/93
Interval													
0-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-6'	NS	NS	NS	0.397	NS	4.18	NS	11.8	6.2	4.3	47	4.3	3.5
0.5-1.0'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5.4	6.7
0-2'	ND	0.38	25	NS	15	NS	180 (14*)	NS	NS	NS	NS	NS	NS
0-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2-4'	ND	3.1	3.0	NS	23	NS	2.7	NS	NS	NS	NS	NS	NS
4-6'	ND	ND	17	NS	11 (8.1*) (49*)	NS	ND	NS	NS	NS	NS	NS	NS
4-8'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
6-8'	ND	ND	0.29	NS	6.2	NS	0.73	NS	NS	NS	NS	NS	NS
8-10'	ND	0.19	50	NS	ND(0.10)	NS	0.09	NS	NS	NS	NS	NS	NS
8-12'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10-12'	0.06	0.35	0.87	NS	ND	NS	17(1.8)	NS	NS	NS	NS	NS	NS
12-14'	0.18	0.35	1.4	NS	ND	NS	1.4	NS	NS	NS	NS	NS	NS
12-16'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
14-16'	0.89	3.4	1.9	NS	ND	NS	ND	NS	NS	NS	NS	NS	NS
16-18'	ND	NS	1.9(3.0)	NS	2.6	NS	0.59	NS	NS	NS	NS	NS	NS
16-20'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
18-20'	0.06	NS	ND	NS	0.21	NS	NS	NS	NS	NS	NS	NS	NS
20-22'	ND	NS	0.62	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-24'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
22-24'	0.057*	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
24-28'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
28-30'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

(See Notes on Page 5)

TABLE 4-6
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF TOTAL PCBS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

	Oxbow C												
Location	C-1	C-2	C-2	C2-10N	C2-10S	C2-10E	C2-10W	C2-20N	C2-20S	C2-20E	C2-20W	C2-30E	C-3
Sample Date	11/91	12/91	10/95	11/95	11/95	11/95	11/95	11/95	11/95	11/95	11/95	11/95	12/91
Interval													
0-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-6'	NS	NS	745	418	36.8	55.3	22.3	5.58	7.55	59.3	NA	12.8	NS
0.5-1.0'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-2'	0.79(0.38)	750	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.93
	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2-4'	1.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.45
4-6'	19	95	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.13
4-8'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
6-8'	3.3	42	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	24
8-10'	8.7	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
8-12'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10-12'	11(0.86*)	11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
12-14'	57	22(0.26*) (1.6*)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
12-16'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
14-16'	NS	150	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
16-18'	49	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
16-20'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
18-20'	13	5.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-22'	13	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-24'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
22-24'	6.6(6.7)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
24-28'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
28-30'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 4-6
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF TOTAL PCBS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

	Oxbow J										
Location	YB-1	YB-2	YB-3	YB-4	YB-5	FP-1	FP-2	FP-3	FP-4	SA-1	SA-2
Sample Date	10/89	10/89	10/89	10/89	10/89	10/89	10/89	10/89	10/89	10/89	10/89
Interval											
0-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0.5-1.0'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-2'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-4'	0.95	2.3	0.57	0.55	1.8	ND	13	2.8	0.19	0.25	0.20
2-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-8'	0.43	0.80	ND	ND	0.08	ND	ND	0.38	ND	ND	0.13
6-8'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
8-10'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
8-12'	NS	NS	NS	NS	NS	ND	NS	NS	NS	0.05	ND
10-12'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
12-14'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
12-16'	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
14-16'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
16-18'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
16-20'	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
18-20'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-22'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-24'	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
22-24'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
24-28'	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
28-30'	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS

TABLE 4-6
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF TOTAL PCBS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

	Oxbow J										Oxbow K	
Location	J-1S	J-2S	J-3S	J-4S	OX-J-SS1	OX-J-SS2	OX-J-SS3	OX-J-SS4	OX-J-SS5	OX-J-SS6	K-1	K-2
Sample Date	12/91	12/91	12-91	12/91	9/94	9/94	9/94	9/94	9/94	9/94	2/91	2/91
Interval												
0-4'	1.7 (0.97*)	0.53(0.44*)	ND	1.9(0.71*)	0.63	1.6	1.5	1.3	0.29(0.35)	0.28	NS	NS
0-6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0.5-1.0'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
0-2'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.15	0.07
0.4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2-4'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
4-6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
4-8'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
6-8'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
8-10'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
8-12'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10-12'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
12-14'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
12-16'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
14-16'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
16-18'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
16-20'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
18-20'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
20-22'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
20-24'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
22-24'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
24-28'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
28-30'	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 4-6
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF TOTAL PCBS DETECTED IN SOIL SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

Notes:

1. Concentrations reported in parts per million - dry weight (ppm).
2. ND - Not detected.
3. NS - Not sampled.
4. Samples analyzed by IT Analytical Services, Knoxville, TN, unless otherwise indicated.
5. 1994 OX series samples analyzed by Quanterra Environmental Services, Knoxville, TN.
6. 1995 A, B, and C series samples analyzed by Maxymillian Technologies, Inc., Pittsfield, MA.
7. * - Data reported by CompuChem Laboratories, Research Triangle Park, NC.
8. ( ) - Indicates duplicate sample.

TABLE 4-7

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF PESTICIDES AND HERBICIDES IN SOIL SAMPLES HOUSATONIC RIVER OXBOW AREAS B, C, J, AND K

Location	Oxbow B	Oxbow C		Oxbow J	Oxbow K
	Well B-1	Well C-1	Well C-2	J-3S	Boring K-1
Depth	4-6'	10-12'	12-14'	0-4"	14-16'
Sample	11/91	11/91	11/91	12/91	2/91
Parameter					
Pesticides					
gamma-BHC (lindane)	0.10	ND	0.0067	ND	ND
delta-BHC	ND	ND	0.023	ND	ND
4,4'-DDD	ND	0.097	ND	ND	ND
4,4'-DDT	ND	ND	0.14	0.0069	ND
Herbicides					
2,4-D	ND	ND	ND	ND	0.22
2,4,5 - TP (Silvex)	ND	ND	ND	ND	0.051
2,4,5 - T	ND	ND	ND	ND	0.052

Notes:

1. Concentrations are reported in parts per million - dry weight (ppm). Only detected analytes are shown.
2. Samples analyzed by CompuChem Laboratories, Inc. Research Triangle Park, NC.

TABLE 4-8

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF PCDDS AND PCDFS IN SOIL SAMPLES - HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

PARAMETER		OXBOW A	OXBOW B		OXBOW C		OXBOW J		
	Location	A-3	B-1	B-2	C-1	C-2	J-1S	J-2S	J-4S
	Depth	12-14'	4-6'	0-2'	10-12'	12-14'	0-4'	0-4'	0-4'
	Sample Date	1/92	12/91	11/91	11/91	11/91	12/91	12/91	12/91
2,3,7,8-Tetrachlorodibenzodioxin		ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorodibenzodioxin (total)		ND	ND	ND	ND	ND	ND	ND	M
1,2,3,7,8-Pentachlorodibenzodioxin		NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorodibenzodioxin (total)		ND	ND	ND	ND	ND	ND	ND	0.0016
1,2,3,4,7,8-Hexachlorodibenzodioxin		NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzodioxin		NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzodioxin		NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzodioxin (total)		ND	ND	M	ND	ND	ND	ND	0.0085
1,2,3,4,6,7,8-Heptachlorodibenzodioxin		NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzodioxin (total)		M	ND	0.00017	M	ND	0.00017	0.000061	0.0067
Octachlorodibenzodioxin		0.00025	ND	0.00066	0.00030	0.00018	0.00094	0.00021	0.0020
2,3,7,8-Tetrachlorodibenzofuran		ND	M	0.00010	M	ND	0.000047	M	0.00023
1,2,7,8-Tetrachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
Tetrachlorodibenzofuran (total)		ND	ND	0.00051	M	ND	0.00022	M	0.017
1,2,3,7,8-Pentachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorodibenzofuran (total)		ND	M (0.00098)	0.00059	0.00038	ND	M	0.00015	0.057
1,2,3,4,7,8-Hexachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzofuran (total)		M	0.0034 (0.0069)	0.00048	0.00041	M	0.00039	0.00017	0.022
1,2,3,4,6,7,8-Heptachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzofuran (total)		M	0.0020 (0.0041)	0.00026	M	ND	0.00025	M	0.0026
Octachlorodibenzofuran		M	0.0022 (0.0053)	0.00024	M	ND	0.00018	0.000045	0.00031

TABLE 4-8
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF PCDDS AND PCDFS IN SOIL SAMPLES - HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

PARAMETER	Location	OXBOW J (Continued)						
	Depth	OX-J-SS1	OX-J-SS2	OX-J-SS3	OX-J-SS4	OX-J-SS5	OX-J-SS5 DUP.	OX-J-SS6
	Sample Date	0-4'	0-4'	0-4'	0-4'	0-4'	0-4'	0-4'
		9/94	9/94	9/94	9/94	9/94	9/94	9/94
2,3,7,8-Tetrachlorodibenzodioxin		ND	ND	ND	0.00000055	ND	ND	ND
Tetrachlorodibenzodioxin (total)		0.00000082	0.0000035	0.0000046	0.0000099	0.00000069	0.0000011	0.0000038
1,2,3,7,8-Pentachlorodibenzodioxin		ND Q	ND Q	ND Q	0.0000030 X	ND	ND	ND
Pentachlorodibenzodioxin (total)		ND Q	0.000014	0.0000084	0.000011	ND	ND	ND
1,2,3,4,7,8-Hexachlorodibenzodioxin		0.0000011J	0.0000019 J	0.0000020 J	0.0000043	0.00000068 J	0.00000057 J	0.00000078 J
1,2,3,6,7,8-Hexachlorodibenzodioxin		0.0000029	0.0000052	0.0000074	0.000023	0.0000019 J	0.0000018 J	0.0000022 J
1,2,3,7,8,9-Hexachlorodibenzodioxin		0.0000019 J	0.0000031	0.0000038	0.0000068	0.0000011 J	0.00000090 J	0.0000014 J
Hexachlorodibenzodioxin (total)		0.000024	0.000047	0.000057	0.000130	0.000015	0.000013	0.000020
1,2,3,4,6,7,8-Heptachlorodibenzodioxin		0.000050	0.000091	0.000110	0.000680	0.000034	0.000031	0.000037
Heptachlorodibenzodioxin (total)		0.000100	0.000170	0.000250	0.002100	0.000074	0.000067	0.000100
Octachlorodibenzodioxin		0.000390	0.000860	0.000840	0.006500	0.000260	0.000240	0.000270
2,3,7,8-Tetrachlorodibenzofuran		0.0000068	0.000016	0.000037	0.000035	0.0000057	0.0000055	0.000013
1,2,7,8-Tetrachlorodibenzofuran		0.0000026	0.0000078	0.000015	0.000019	0.0000032	0.0000030	0.0000083
Tetrachlorodibenzofuran (total)		0.000059 X	0.000160 X	0.000320 X	0.000320 X	0.000065 X	0.000045 X	0.000110 X
1,2,3,7,8-Pentachlorodibenzofuran		0.0000023 J	0.0000059	0.0000099	0.000018	0.0000020 J	0.0000018 J	0.0000035
2,3,4,7,8-Pentachlorodibenzofuran		0.0000098	0.000016	0.0000076	0.000039	0.0000067	0.0000065	0.0000069
Pentachlorodibenzofuran (total)		0.000130 X	0.000260 X	0.000460 X	0.000450 X	0.000097 X	0.000086 X	0.000094 X
1,2,3,4,7,8-Hexachlorodibenzofuran		0.0000046	0.000015	0.000018	0.000036	0.0000043	0.0000032	0.0000048
1,2,3,6,7,8-Hexachlorodibenzofuran		0.0000066	0.000026 X	0.000030 X	0.000032 X	0.0000060 X	0.0000051 X	0.0000065 X
2,3,4,6,7,8-Hexachlorodibenzofuran		0.0000094	0.000016	0.000035	0.000031	0.0000072 X	0.0000058 X	0.0000077 X
1,2,3,7,8,9-Hexachlorodibenzofuran		0.0000011 J	0.0000029	0.0000036	0.0000062	0.00000099 J	0.00000081 J	0.0000011 J
Hexachlorodibenzofuran (total)		0.000130 X	0.000350 X	0.000520 X	0.000500 X	0.000092 X	0.000080 X	0.000092 X
1,2,3,4,6,7,8-Heptachlorodibenzofuran		0.000026X	0.000160 X	0.000110 X	0.000150 X	0.000024 X	0.000019 X	0.000022 X
1,2,3,4,7,8,9-Heptachlorodibenzofuran		0.0000021 J	0.000006	0.0000064	0.000013	0.0000021 J	0.0000014 J	0.0000019 J
Heptachlorodibenzofuran (total)		0.000061 X	0.000300 X	0.000230 X	0.000420 X	0.000052 X	0.000043 X	0.000046 X
Octachlorodibenzofuran		0.000033	0.000100	0.000089	0.000290	0.000026	0.000022	0.000022

TABLE 4-8
(cont'd)
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF PCDDS AND PCDFS IN SOIL SAMPLES - HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

Notes:

1. Results are presented in dry weight parts per million (ppm).
2. Q = Indicates that coeluting non-dioxin isomers were noted to be present by the analytical laboratory.
3. J = Indicates an estimated concentration below the sample quantitation limit.
4. X = Indicates that a contribution from diphenyl ethers is suspected by the analytical laboratory.
5. ND = Analyte was analyzed for, but not detected.
6. ( ) = Indicates duplicate sample result.
7. NA = Indicates parameter not analyzed.
8. M = Indicates parameter presence was noted, but not at a level which the laboratory could provide a definite identification or quantity.
9. A, B, C, and J series samples analyzed by ChemWest Analytical Laboratories, Inc.
10. OX series samples analyzed by Alta Analytical Laboratory, Inc., El Dorado Hills, CA.

TABLE 4-9

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF METALS, SULFIDE, CYANIDE, AND TOC DETECTED IN SOIL SAMPLES -

HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

	Oxbow A			Oxbow B				Oxbow C			Oxbow J	
Location	Well A-1	Boring A-2	Well A-3	Well B-1	Well B-2	19-4-14A	19-4-14C	Well C-1	Well C-2	Boring C-3 J	J-1S	J-2S
Depth	22-24'	6-8'	12-14'	4-6'	0-2'	0-6'	0-6'	10-12'	12-14'	2-4'	0-4'	0-4'
Parameter / Sample Date	11/91	11/91	1/92	12/91	11/91	8/92	8/92	11/91	11/91	12/91	12/91	12/91
Aluminum	5,590E	6,120	4,980*	6,950 (7,790)	5,220	NA	NA	6,550	6,330 (9,850)	8,840	9,730*	5,670*
Antimony	4.3JN	4.2JN	ND	4.4JN	ND	NA	NA	ND	ND (ND)	ND	8.9JN	10.5JN
Arsenic	5.8QN	6.5QN	5.7Q*	6.6AN (4.8AN)	5.1AN	NA	NA	4.3	3.6 (4.8)	4.9N	9.4Q	21.9A
Barium	24.1E	27.6	18.4J*	91.1 (68.1)	37.7	NA	NA	36.5	17.4J (29.6J)	40.7	57.3	41.5J
Beryllium	ND	0.29J	0.15J	0.33J (0.41J)	0.21J	NA	NA	0.19J	0.15J (0.22J)	0.28J	0.39J	ND
Cadmium	ND	ND	ND	0.63 (ND)	0.80	NA	NA	ND	ND (ND)	ND	ND	ND
Calcium	51,600E	57,400	15,100*	16,100 (3,310)	8,340	NA	NA	17,200*	8,050* (12,400*)	23,100	6,750E	9,570E
Chromium	7.5*	6.7	7.0*	15.1 (13.4)	13.1	NA	NA	9.1	8.3 (12)	8.6	17.2	41
Cobalt	5.2J	7.0	6.1	7.9 (8.8)	5.1J	NA	NA	6.6	6.6 (10.2)	7.4	9.5J	9.4J
Copper	13	19.6	19.8	333 (62.6)	36.5	NA	NA	287N*	15.3N* (18N*)	123	30.8N	95.6N
Iron	15,100E*	17,400E	12,500	19,800E (15,200E)	11,400E	NA	NA	16,100E	15,400E (20,700E)	21,200E	19,600*	68,700*
Lead	21.1Q*	16.3	28.8	285N (97.5N)	94.2N	NA	NA	104N	28.9A (33.3A)	26.8	97.8*	121*
Magnesium	15,100	32,900	8,650*	4,000 (4,280)	5,950	NA	NA	9,560*	4,820* (5,740*)	14,000	5,980	7,150
Manganese	226E	446	376*	379 (273)	190	NA	NA	351	223 (298)	430	517N*	854N*
Mercury	ND	0.18N*	ND	0.37N* (0.23N*)	0.61N*	NA	NA	ND	ND (ND)	ND	0.20	0.60
Nickel	9.3	14.2	11.3	23.1 (15.6)	11.1	NA	NA	12.6	13.1 (17.7)	16.4	17.7	43.8
Potassium	207J	648	331J	599 (637)	571	NA	NA	435J	404J (534J)	772	1,070J	393J
Selenium	0.46JWN	0.36JWN	ND	ND (0.41JN)	0.38JN	NA	NA	ND	ND (ND)	ND	ND	ND
Silver	ND	ND	ND	1.1J* (3.8*)	0.77J*	NA	NA	ND	ND (ND)	ND	ND	ND
Sodium	135J	119J	97.6J	159J (168J)	90.5J	NA	NA	111J	102J (187J)	101J	145J	120J
Vanadium	6.6	10	6.9*	13.9 (15.8)	10.5	NA	NA	11.5	7.7 (11.1)	14	20.3	14.1
Zinc	43.5EN*	52.4E	38.8*	342E (118E)	135E	NA	NA	107E	51.4E (79.8E)	67.3E	126	164
Sulfide	ND	ND	ND	ND (ND)	ND	NA	NA	92.4	25.4 (34.1)	ND	ND	65
Cyanide	ND	ND	ND	ND (ND)	ND	NA	NA	ND	ND (ND)	ND	1.3	120
TOC	NA	NA	NA	NA	NA	14,000	13,000	NA	NA	NA	NA	NA

(See Notes on Page 3)

TABLE 4-9
(CONT'D)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A,B,C,J AND K

SUMMARY OF METALS, SULFIDE, CYANIDE, AND TOC DETECTED IN SOIL SAMPLES -
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

Location	Oxbow J								Oxbow K	
Depth	0-4"	0-4"	0-4"	0-4"	0-4"	0-4"	0-4"	0-4"	14-16'	8-10'
Parameter Sample Date	12/91	12/91	9/94	9/94	9/94	9/94	9/94	9/94	2/91	2/91
Aluminum	5,500	10,100*	NA	NA	NA	NA	NA	NA	4,200	2,900
Antimony	ND	11.1JN	NA	NA	NA	NA	NA	NA	ND	ND
Arsenic	5.5A	9.5	NA	NA	NA	NA	NA	NA	2.0	ND
Barium	28.0J	66.8	NA	NA	NA	NA	NA	NA	ND	ND
Beryllium	ND	0.30J	NA	NA	NA	NA	NA	NA	ND	ND
Cadmium	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND
Calcium	8,240E	18,100E	NA	NA	NA	NA	NA	NA	17,000	ND
Chromium	7.7	17.8	NA	NA	NA	NA	NA	NA	3.2	4.2
Cobalt	5.6J	14.8J	NA	NA	NA	NA	NA	NA	ND	ND
Copper	12.0N	58.8N	NA	NA	NA	NA	NA	NA	11	ND
Iron	14,400*	44,200*	NA	NA	NA	NA	NA	NA	12,000	7,400
Lead	13.5*	195*	NA	NA	NA	NA	NA	NA	ND	ND
Magnesium	4,590	11,500	NA	NA	NA	NA	NA	NA	9,800	1,300
Manganese	214N*	987N*	NA	NA	NA	NA	NA	NA	300	56
Mercury	ND	0.21	NA	NA	NA	NA	NA	NA	ND	ND
Nickel	9.9	27.9	NA	NA	NA	NA	NA	NA	9.3	ND
Potassium	969J	1,120J	NA	NA	NA	NA	NA	NA	ND	ND
Selenium	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND
Silver	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND
Sodium	166J	174J	NA	NA	NA	NA	NA	NA	ND	ND
Vanadium	11.6	27.3	NA	NA	NA	NA	NA	NA	5.9	ND
Zinc	33	266	NA	NA	NA	NA	NA	NA	38	19
Sulfide	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOC	NA	NA	30,900	12,900	22,200	32,300	11,600 (133,300)	21,500	NA	NA

(See Notes on Page 3)

TABLE 4-9
(CONT'D)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOW AREAS A,B,C,J AND K

SUMMARY OF METALS, SULFIDE, CYANIDE, AND TOC DETECTED IN SOIL SAMPLES - HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

Notes:

1. Concentrations reported in parts per million-dry weight (ppm). Only detected analytes are shown.
2. A - Indicates spike recoveries are outside the range of 85% to 115%. Reported results is produced from a singe-point method-of-standard-addition calculation.
3. J - Indicates the reported value is less than the contract required detection limit (CRDL), but greater than the instrument detection limit (IDL).
4. E - Indicates the reported value is estimated because of the presence of interference.
5. N - Indicates the sample matrix spike analysis was outside control limits.
6. Q - Indicates a severe physical or chemical interference in the sample. Result should be regarded as an estimate only.
7. W - Indicates a slight matrix-related interference for the analyte.
8. * - Indictes a non-homogeneous sample matrix in regard to the flagged analyte.
9. ND - Not detected.
10. NA - Parameter not analyzed.
11. A, B, C, J, and K series and OX-series cyanide samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.
12. OX - series TOC samples analyzed by Quanterra Environmental Services, Knoxville, TN.

TABLE 4-10

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR FORMER HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF 1988 GROUNDWATER INVESTIGATION WELL-POINT DATA[1]

Well Point ID#:	WP-1	WP-2	WP-3	WP-7	WP-8	WP-9
Volatile Organic Compounds (ppm)						
Chlorobenzene	ND	ND	ND	ND	0.011	0.005J
Trans-1,2-Dichloroethene	ND	ND	0.018	ND	ND	0.005J
Methylene Chloride	ND	ND	ND	ND	ND	0.005J
Vinyl Chloride	ND	ND	0.010J	ND	ND	0.010J
Base/Neutral Organic Compounds (ppm)						
Acenaphthene	ND	ND	ND	ND	0.010J	ND
Bis(2-ethylhexyl)phthalate	0.010J	ND	ND	ND	ND	ND
Diphenylaniline	ND	ND	ND	0.010J	ND	0.010J
4-Chloro-3-Methylphenol	ND	ND	ND	0.010J	ND	0.010J
Inorganics (filtered) (ppm)						
Copper	ND	0.01	0.01	0.01	ND	ND
Lead	0.04	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	0.005	ND
Zinc	2.5	1.3	5.2	0.36	0.42	0.36
Cyanide	ND	ND	ND	ND	0.03	0.02
PCBs (unfiltered) (ppm)						
Aroclor 1242	ND	ND	ND	0.0088	0.0013	0.0064
Aroclor 1260	0.0036	ND	ND	0.019	0.0043	0.018
Total PCBs	0.00361	ND	ND	0.0278	0.0056	0.0244

Notes:

1. Analyses were performed for priority pollutant compounds. Only those parameters which were detected are summarized.
2. ND - Not detected.
3. J - Indicates an estimated concentration below the sample quantitation limit.
4. Samples analyzed by International Technology Corporation, Knoxville, TN.

TABLE 4-11

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT
FOR HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF VOCs DETECTED IN GROUNDWATER SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

Parameter	Location	Oxbow A		Oxbow B		Oxbow C		Oxbow J
		Well A-1	Well A-3	Well B-1	Well B-2	Well C-1	Well C-2	Well J-1
	Sample Date	12/91	1/92	12/91	11/91	11/91	11/91	12/91
Methylene Chloride		0.004BJ	0.011B	0.005BJ	0.002BJ	0.004BJ	0.003BJ	0.010B
Toluene		ND	0.003J	ND	ND	ND	ND	ND
Ethylbenzene		0.011	ND	ND	ND	ND	ND	ND
Xylene (Total)		0.003J	0.003J	ND	0.001J	ND	ND	ND
Benzene		0.004J	0.003J	ND	0.010	ND	ND	ND
Carbon Disulfide		ND	ND	ND	0.001J	0.004J	ND	ND

Notes:

1. Concentrations are reported in parts per million (ppm). Only detected analytes are shown.
2. B - indicates the compound was found in the associated blank, as well as in the sample.
3. J - indicates an estimated concentration below the sample quantitation limit.
4. ND - Indicates parameter not detected.
5. Samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.

TABLE 4-12

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER
HOUSATONIC RIVER OXBOW AREAS A, B, C, J AND K

SUMMARY OF SVOCs AND PHENOLS DETECTED IN GROUNDWATER SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

	Oxbow A		Oxbow B	Oxbow C		Oxbow J
Location	Well A-1	Well A-3	Well B-2	Well C-1	Well C-2	Well J-1
Parameter Sample Date	12/91	1/92	12/91	11/91	11/91	12/91
Phenanthrene	0.012	0.007J	ND	ND	0.004J	ND
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND
Fluoranthene	0.002J	0.016	ND	ND	0.004J	ND
Pyrene	0.004J	0.012	ND	ND	0.004J	ND
Benzo(a)anthracene	ND	0.005J	ND	ND	0.002J	ND
Chrysene	ND	0.006J	ND	ND	0.002J	ND
bis(2-Ethylhexyl)phthalate	ND	0.003BJ	0.002J	ND	ND	0.001BJ
Benzo(b)fluoranthene	ND	0.007JX	ND	ND	0.003JX	ND
Benzo(k)fluoranthene	ND	0.007JX	ND	ND	0.003JX	ND
Benzo(a)pyrene	ND	0.004J	ND	ND	0.002J	ND
Phenol	ND	ND	ND	ND	ND	ND
Aniline	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	0.001J	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	0.002J	ND	ND	0.001J	ND
Anthracene	0.004J	0.011	ND	ND	0.001J	ND
Acenaphthylene	0.001J	0.001J	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND
Naphthalene	0.034	0.003J	ND	ND	ND	ND
Dibenzofuran	0.001J	ND	ND	ND	ND	ND
Acenaphthene	0.015	0.036	ND	ND	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Fluorene	0.011	0.015	ND	ND	0.002J	ND
2-Methylnaphthalene	0.013	ND	ND	ND	ND	ND
2-Methylphenol	ND	0.008J	ND	ND	ND	ND
2,4-Dimethylphenol	ND	0.004J	ND	ND	ND	ND
Benzoic Acid	ND	0.003J	ND	ND	ND	ND
Total Phenols	0.018	0.082	ND	0.019	ND	ND

Notes:

1. Concentrations reported in parts per million (ppm). Only detected analytes are shown.
2. B - Indicates the compound was found in the associated blank as well as in the sample.
3. E - Indicates the compound exceeds the calibration range of the gas chromatograph/mass spectrophotometer (GC/MS) instrument.
4. J - Indicates an estimated concentration below the sample quantitation limit.
5. X - Indicates coeluting indistinguishable isomers.
6. ND - Indicates parameter not detected.
7. Samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.

TABLE 4-13

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER
HOUSATONIC RIVER OXBOW AREAS A, B, C, J, AND K

SUMMARY OF PCDDs AND PCDFs IN GROUNDWATER SAMPLES
HOUSATONIC RIVER OXBOW AREAS A AND C

Parameter	Oxbow A Well A-3	Oxbow C Well C-2
2,3,7,8 Tetrachlorodibenzodioxin	ND	ND
Tetrachlorodibenzodioxin	ND	ND
Pentachlorodibenzodioxin	ND	ND
Hexachlorodibenzodioxin	ND	ND
Heptachlorodibenzodioxin	ND	ND
Octachlorodibenzodioxin	M	M
2,3,7,8-Tetrachlorodibenzofuran	ND	ND
Tetrachlorodibenzofuran	ND	ND
Pentachlorodibenzofuran	ND	ND
Hexachlorodibenzofuran	0.0000092	ND
Heptachlorodibenzofuran	ND	M
Octachlorodibenzofuran	ND	M

Notes:

1. Concentrations reported in parts per million (ppm). Only detected analytes are presented.
2. M - Indicates parameter presence was noted, but not at a level which the laboratory could provide a definite identification or quantity.
3. ND - Indicates parameter not detected.
4. Samples analyzed by ChemWest Analytical Laboratories, Inc.

TABLE 4-14

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER
HOUSATONIC RIVER OXBOW AREAS A, B, C, J AND K

SUMMARY OF METALS AND SULFIDE DETECTED IN GROUNDWATER SAMPLES
HOUSATONIC RIVER OXBOW AREAS A, B, C, AND J

Location	Oxbow A		Oxbow B		Oxbow C		Oxbow J
	Well A-1	Well A-3	Well B-1	Well B-2	Well C-1	Well C-2	Well J-1
Sample Date	12/91	1/92	12/91	11/91	12/91	12/91	12/91
Parameter							
Aluminum	0.105J	24.9	0.103J	0.143J	2.52	0.231	17.3N*
Antimony	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	0.0351*	ND	ND	ND	ND	0.0074JW
Barium	0.125J	0.154J	0.075J	0.129J	0.079J	0.0949	0.12J
Beryllium	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND
Calcium	79.4	108	86.1	68.7	135	71.8	61.4
Chromium	ND	0.0322	ND	ND	0.0048J	ND	0.0211
Cobalt	ND	0.0303J	ND	ND	ND	ND	0.0142J
Copper	ND	0.112	ND	ND	0.0101J	ND	0.035
Iron	7.29	56.9	3.7	3.01	14.5	2.21	29.1
Lead	ND	0.112	0.0032	ND	0.0119	ND	0.0126N*
Magnesium	26.8	50.6	30.3	24.8	28	13.6	32.7
Manganese	0.73	3.07	0.419	1.67	2.39	0.602	3.32
Mercury	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	0.0469	ND	ND	ND	ND	0.0279J
Potassium	6.71	11.8	2.98J	1.83J	6.99	7.01	5.59
Selenium	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND
Sodium	52.3	222	26.7	35.4	42.7	41.5	16.7E
Thallium	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	0.0343J	ND	ND	ND	ND	0.0197J
Zinc	0.0358	0.181	0.0283	0.0379	0.0245	0.0351	0.119
Sulfide	ND	3.3	ND	ND	5.2	2.2	ND
Cyanide	ND	ND	ND	ND	ND	ND	ND

Notes:

1. Concentrations reported in parts per million (ppm).
2. J - Indicates the reported value is less than the contract required detection limit (CRDL), but greater than the instrument detection limit (IDL).
3. E - Indicates the reported value is estimated because of the presence of interference.
4. N - Indicates the sample matrix analysis was outside control limits.
5. Q - Indicates a severe physical or chemical interference in the sample. Result should be regarded as an estimate only.
6. W - Indicates a slight matrix-related interference for the analyte.
7. * - Indicates sample matrix duplicate analysis was not within control limits.
8. ND - Indicates parameters not detected.
9. Samples analyzed by CompuChem Laboratories, Inc., Research Triangle Park, NC.

TABLE 6-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A, B, C, J, AND K

PHYSICAL AND CHEMICAL PROPERTIES OF SELECT CONSTITUENTS

Constituent[1]	Water Solubility[2] (mg/l)	LOG Kow	Vapor Pressure[2] (mm Hg)	Henry's Law Constant[2] (atm-m^3/mole)
VOLATILES				
KETONES				
Acetone	Miscible	-0.24	231	3.67E-5
AROMATICS				
Benzene	1791	2.13	95.2	5.42E-3
Ethylbenzene	161	3.15	9.53	8.44E-3
Xylene (1,2-)	175	3.12	6.6	5.19E-3
Xylene (1,3-)	146	3.20	8.3	7.19E-3
Xylene (1,4-)	156	3.15	8.7	7.60E-3
HALOGENATED COMPOUNDS				
Chlorobenzene	471.7	2.84	11.9	3.45E-3
SEMIVOLATILES				
POLYCHLORINATED BENZENES				
1,3-Dichlorobenzene	111 (20°C)	3.60	2.3	1.8E-3
1,4-Dichlorobenzene	87	3.52	1.76	1.5E-3
1,2,4-Trichlorobenzene	48.8 (20°C)	4.02	0.29	1.42E-3
PHENOLS				
Phenol	87,000	1.46	0.524	3.97E-7
Pentachlorophenol	14(20°C)	5.01	1.1E-4(20°C)	
PAHS				
Acenaphthene	3.88	3.92	0.004-0.03	1.55E-4
Acenaphthylene	3.93	3.94	9.0E-4	1.13E-5
Anthracene	0.03-0.075	4.45	2.67E-6	6.5E-5
Benzo(a)anthracene	0.009	5.66	3.08E-8	9.75E-7
Benzo(b)fluorantene	0.0015	6.12	5.0E-7	1.11E-4
Benzo(k)fluoranthene	8.0E-4	6.12	9.6E-10	4.0E-7
Benzo(a)pyrene	0.001-0.004	5.97	5.5E-9	1.82E-6
Chrysene	0.002	5.66	3.08E-8	9.46E-5
Dibenz(a,h)anthracene	2.5E-6	6.50	1.0E-10	1.15E-4
Fluoranthene	0.26	4.95	1.0E-8	1.26E-8
Fluorene	1.98	4.18	7.0E-4.8.0E-3	8.39E-5
Indeno(1,2,3-cd)pyrene	2.2E-5	6.58	1.0E-10	1.6E-6
1-Methylnaphthalene	29	3.87	0.07	2.6E-4
2-Methylnaphthalene	25	3.86	0.05	3.74E-4
Naphthalene	31.7	3.30	0.082	4.24E-4

TABLE 6-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER
OXBOWS A, B, C, J, AND K

PHYSICAL AND CHEMICAL PROPERTIES OF SELECT CONSTITUENTS

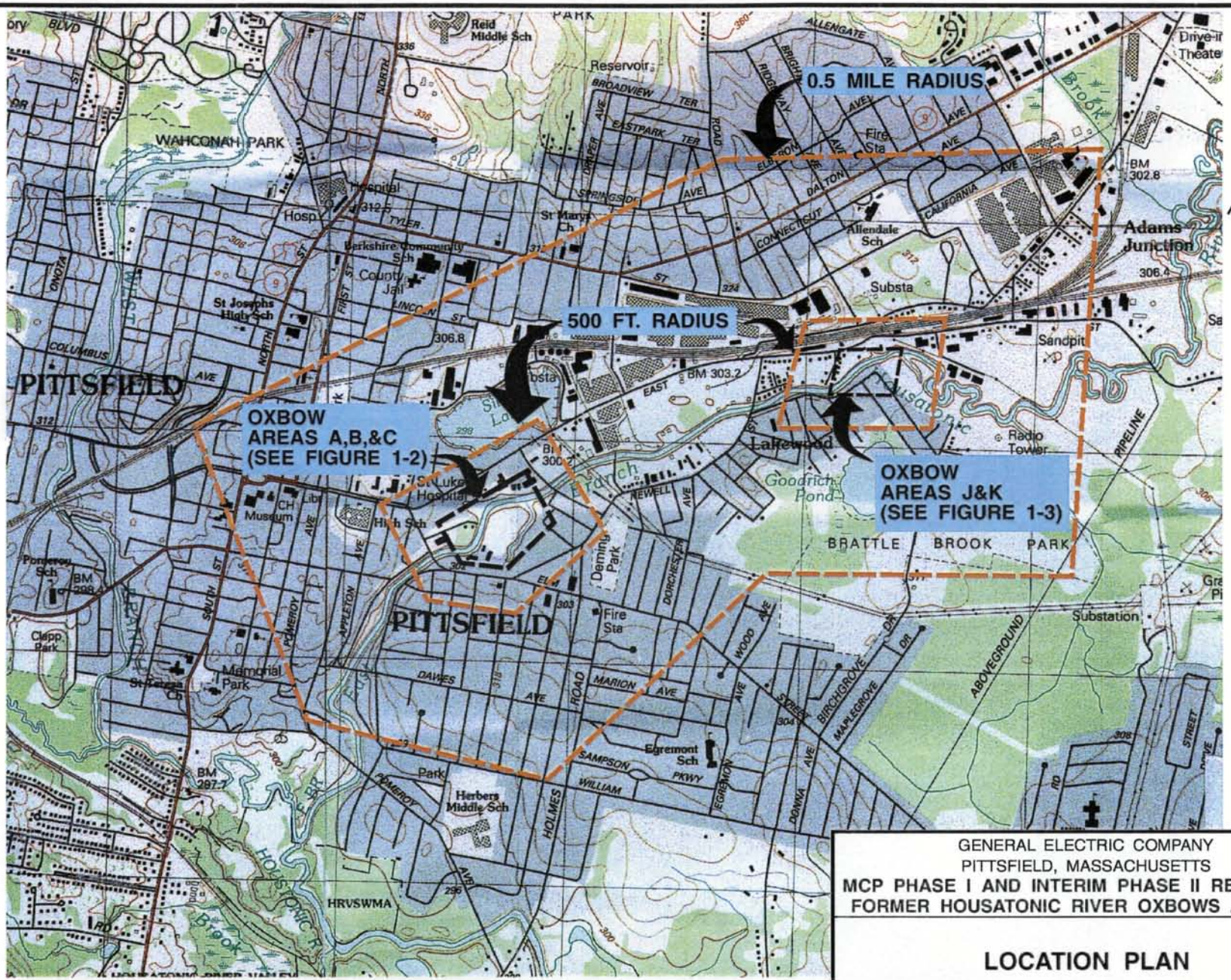
Constituent[1]	Water Solubility[2] (mg/l)	LOG Kow	Vapor Pressure[2] (mm Hg)	Henry's Law Constant[2] (atm-m^3/mole)
Phenanthrene	1.00	4.46	2.0E-4	3.95E-5
Pyrene	1.4E-7	4.88	2.5E-6	1.1E-5
AMINES				
Benzidine	520	1.34	NA	
O-Phenylenediameine	4.15(35°C)	0.15	NA	
PHTHALATE ESTERS				
Butylbenzylphthalate	2.9±1.2ppm	477	8.6E-6(20°C)	
PCBS				
Aroclor 1242	0.24	5.6	4.06E-4	5.2E-4
Aroclor 1254	0.012	6.5	7.71E-5	2.0E-3
Aroclor 1260	0.0027	6.8	4.05E-5	4.6E-3
DIOXINS/FURANS (PCDDs/PCDFs)				
2,3,7,8-TCDD	3.17E-4	6.15-7.28	1.4E-9	2.1E-6
(Not all dioxin/furan composite listed)				
PESTICIDES/HERBICIDES				
gamma-BHC (Lindane)	7.3/2 ppm	3.61	5.57 E-5 mm Hg at 25°C	
delta-BHC	NA	NA	NA	
4,4'-DDD	0.160 ppm at 24°C	NA	NA	
4,4-DDT	0.0034	6.19	5.5E-6(20°C)	5.13E-4
2,4-D	682 ppm at 25°C	2.81	1.05 E-2 mm Hg at 25°C	
2,4,5-T	278 ppm at 20°C	3.13	<7.5E-7 at 20°C	
2,4,5-TP (silvex)	140 ppm at 25°C	NA	NA	

Notes:
[1]Organic compounds detected in soils, sediments, surface water, or groundwater above the quantitation limit during MCP Phase II Investigation sampling.
[2]At 25°C unless noted.
NA = Not Available

References:

(Howard, 1989; 1990; 1991; CHEMFATE, 1989; Hansch and Leo, 1985; Hartley and Kidd, 1983; USEPA, 1980; Verschueren, 1983)

Figures



REFERENCE: PITTSFIELD EAST & WEST, MASSACHUSETTS USGS QUADS. 1988

2000' 0 2000'

Approximate Scale: 1" = 2000'

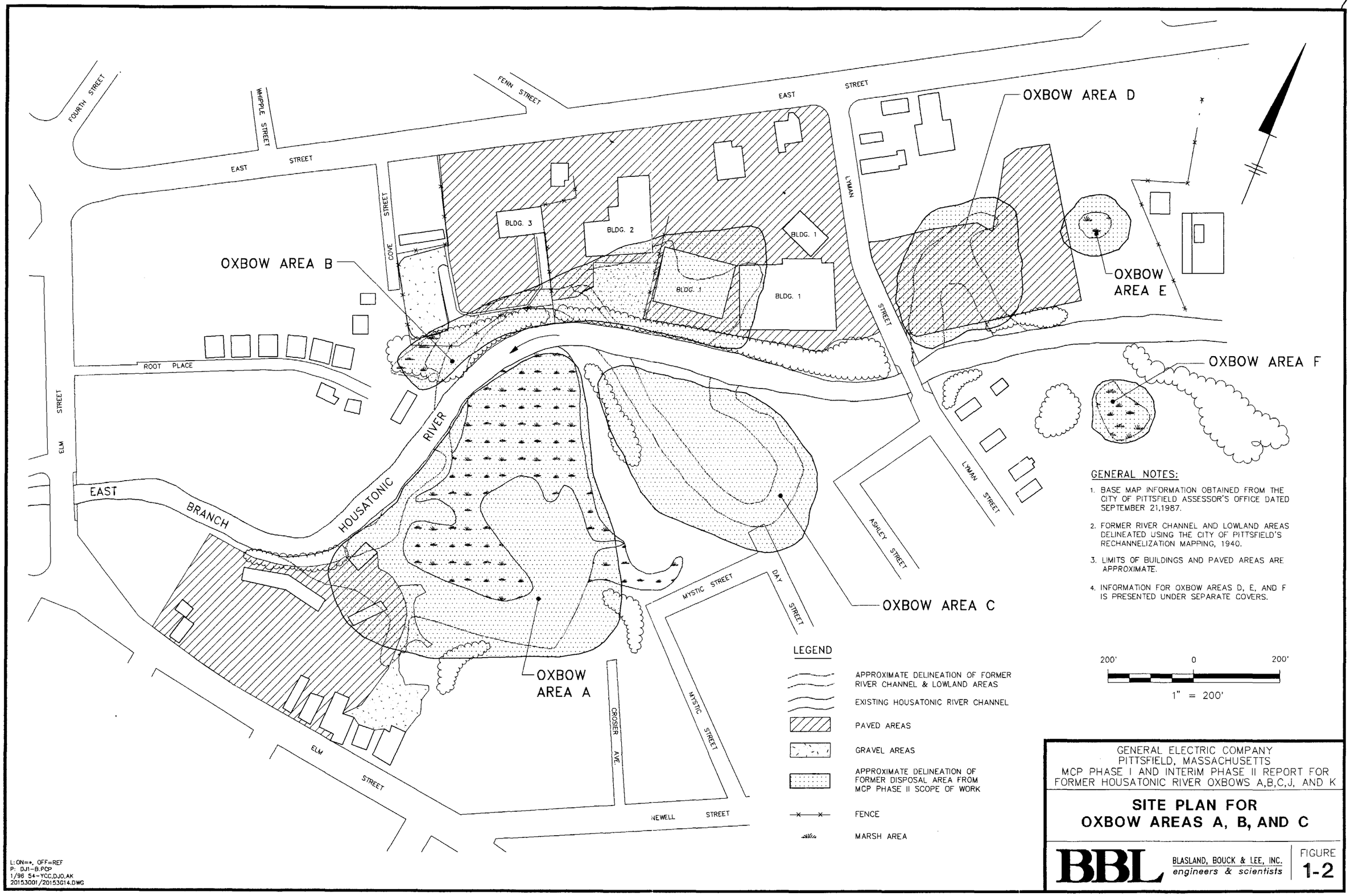
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

LOCATION PLAN

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1-1

1/96 D54-jvm
20153001/20153n01.CDR



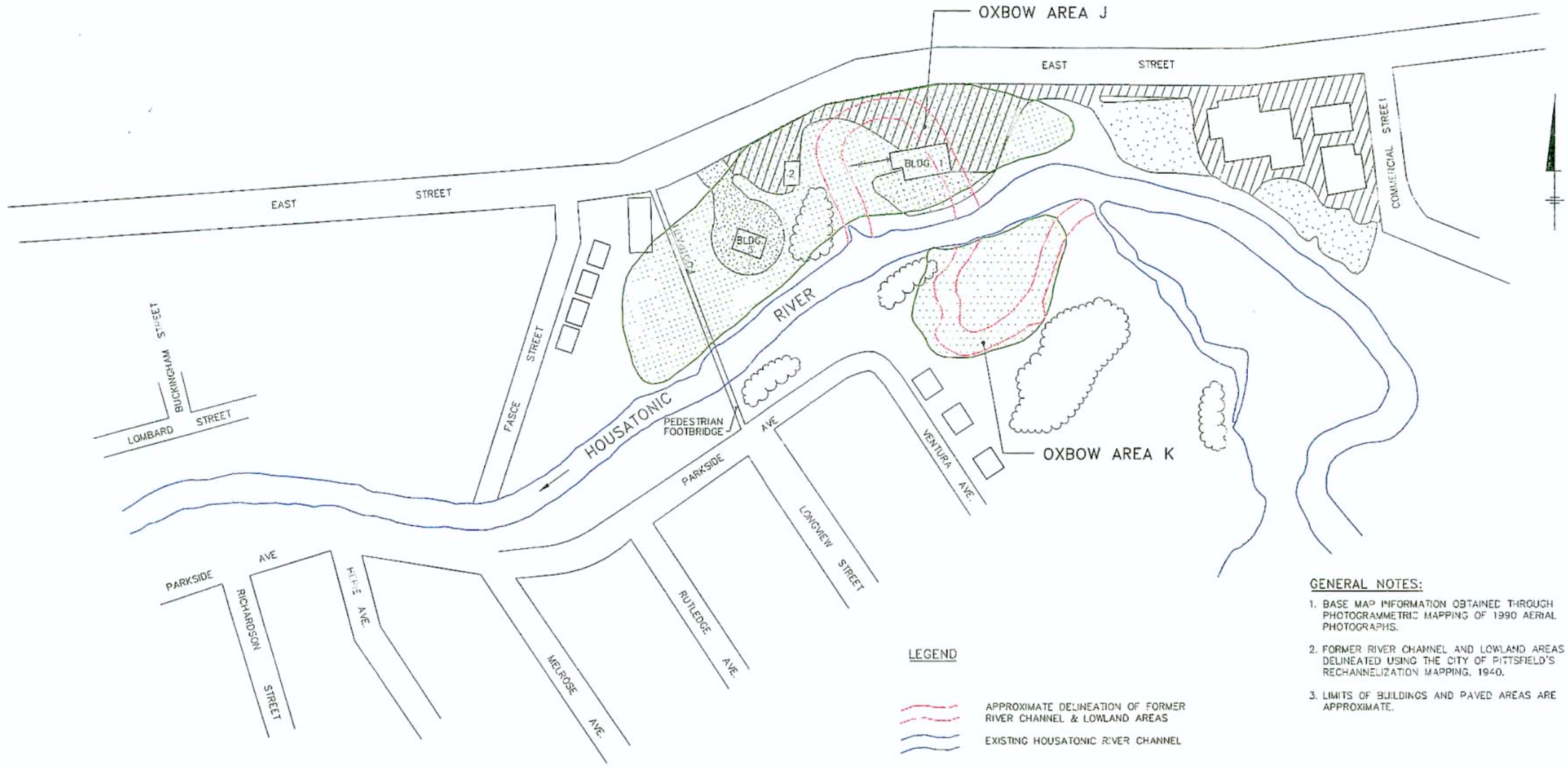
L:ON=*, OFF=REF
P: DJ1-B.PCP
1/96 54-YCC,DJO,AK
20153001/20153G14.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SITE PLAN FOR OXBOW AREAS A, B, AND C

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 1-2



LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- FENCE
- PAVED PARKING
- GRAVEL PARKING
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED THROUGH PHOTOGRAMMETRIC MAPPING OF 1990 AERIAL PHOTOGRAPHS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SITE PLAN FOR OXBOW AREAS J AND K

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 1-3

L:ON=*, OFF=REF
P: DJ1-B.PCP
1/95 54-YCC, DJO AK
20153001/20153013.DWG

APPROX. SCALE: 1" = 500'
500' 0 500'

NOTE:
OXBOW LOCATIONS ARE APPROXIMATE, DETERMINED FROM CITY OF PITTSFIELD HISTORIC RECHANNELIZATION MAP(1940)

LEGEND:
APPROXIMATE LOCATION OF FORMER OXBOW AND LOWLAND AREAS

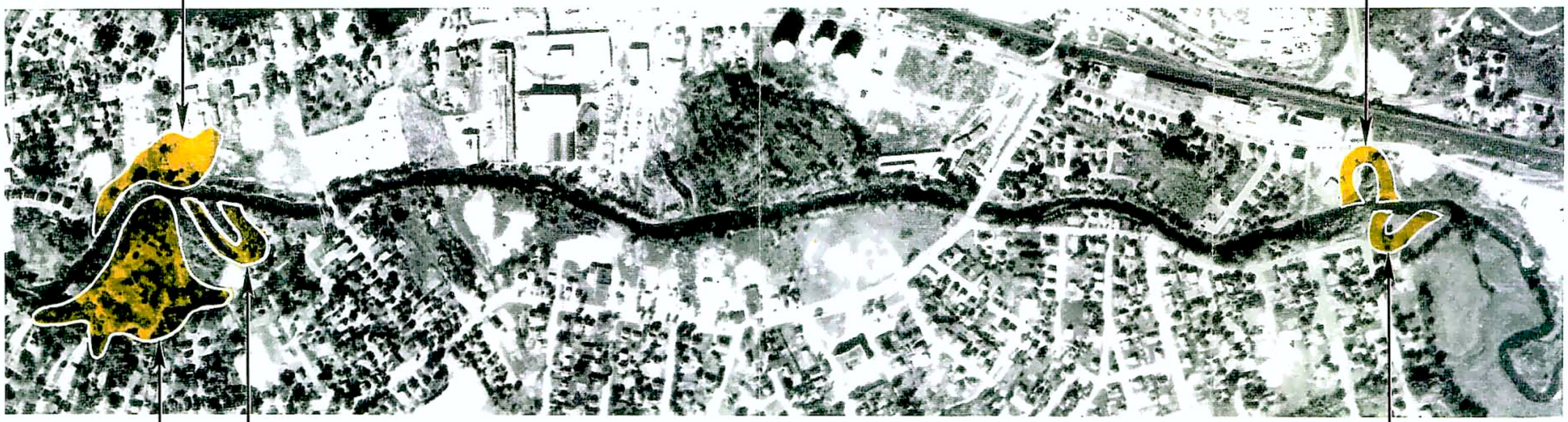
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE 1 AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

1942 AERIAL PHOTOGRAPH

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-1

1/96 D54-jvm
20153001/20153n02.CDR



APPROX. SCALE: 1" = 500'

0' 0 500'

NOTE:

OXBOW LOCATIONS ARE APPROXIMATE, DETERMINED FROM CITY OF PITTSFIELD HISTORIC RECHANNELIZATION MAP(1940)

LEGEND:

APPROXIMATE LOCATION OF FORMER OXBOW AND LOWLAND AREAS

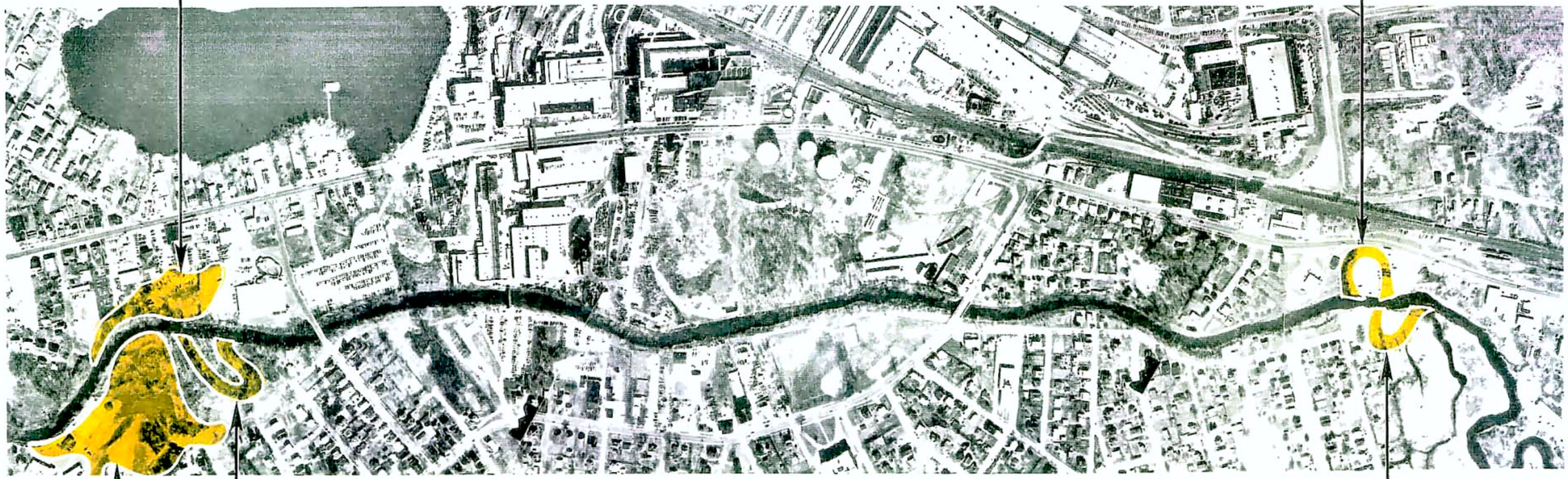
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE 1 AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1957 AERIAL PHOTOGRAPHY

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-2

lvm
20153n03.CDR



APPROX. SCALE: 1" = 500'

500' 0 500'

NOTE:

OXBOW LOCATIONS ARE APPROXIMATE, DETERMINED FROM CITY OF PITTSFIELD HISTORIC RECHANNELIZATION MAP(1940).

LEGEND:

APPROXIMATE LOCATION OF FORMER OXBOW AND LOWLAND AREAS

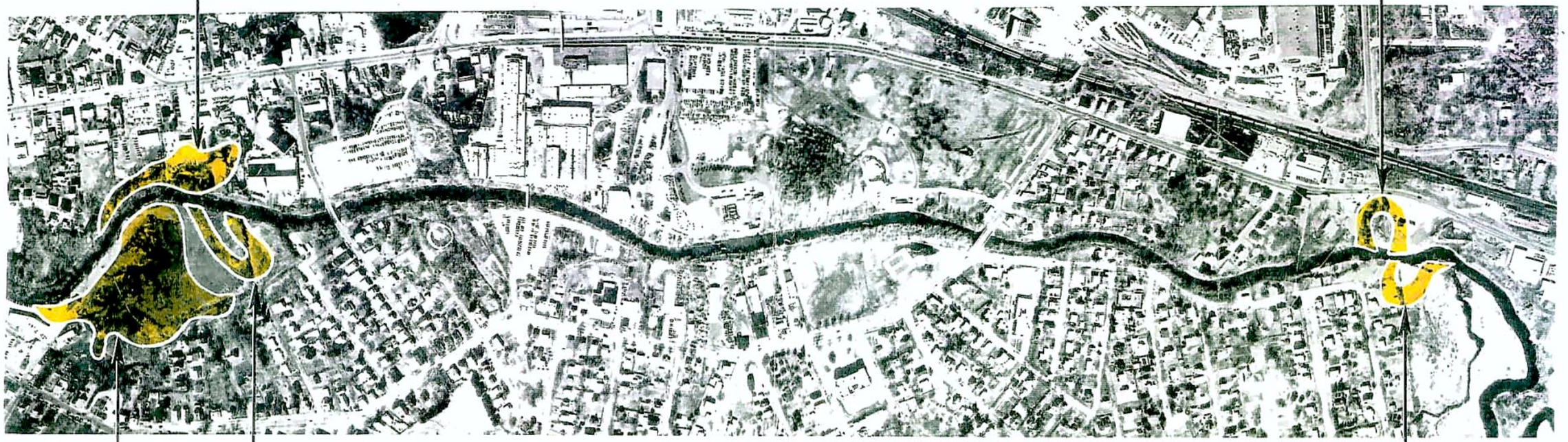
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE 1 AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1969 AERIAL PHOTOGRAPH

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-3

1/96 D54-jvm
20153001/20153n04.CDR



APPROX. SCALE: 1" = 500'
500' 0 500'

NOTE:

OXBOW LOCATIONS ARE APPROXIMATE, DETERMINED FROM CITY OF PITTSFIELD HISTORIC RECHANNELIZATION MAP(1940)

LEGEND:

APPROXIMATE LOCATION OF FORMER OXBOW AND LOWLAND AREAS

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1979 AERIAL PHOTOGRAPH

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-4

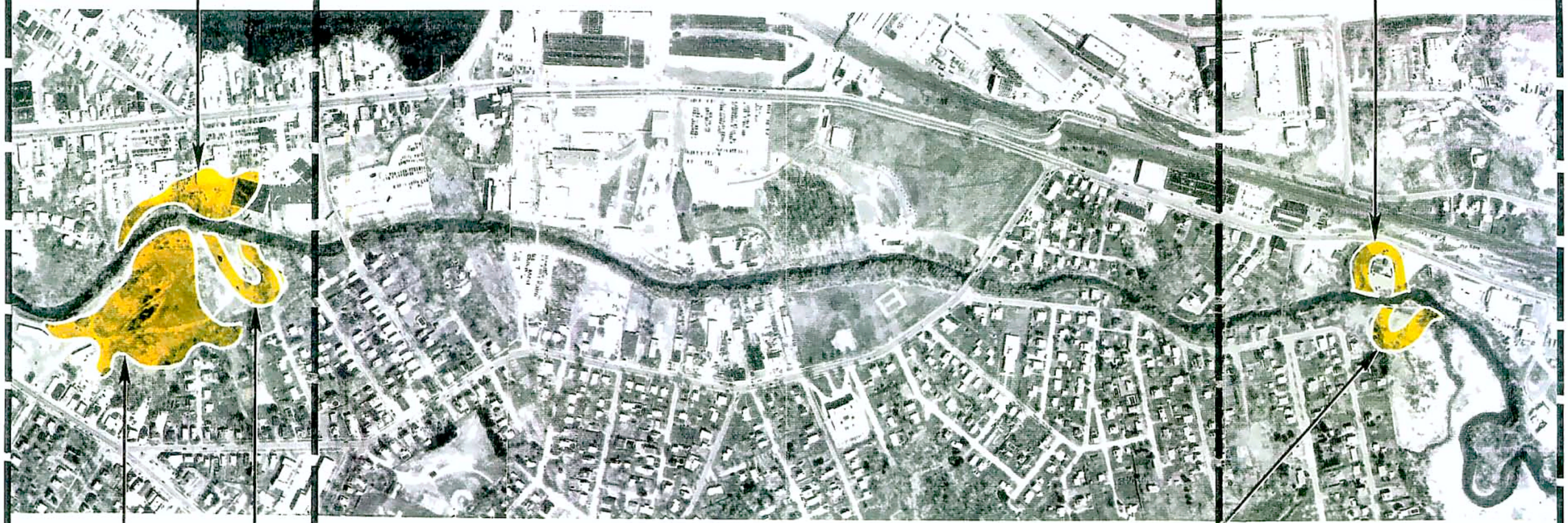
1/96 D54-jvm
20153001/20153n05.CDR

SEE FIGURE 2-6 FOR ENLARGEMENT OF AREAS A,B, AND C

SEE FIGURE 2-7 FOR ENLARGEMENT OF AREAS J AND K

OXBOW B

OXBOW J



OXBOW A

OXBOW C

OXBOW K

APPROX. SCALE: 1" = 500'

500' 0 500'

NOTE:

OXBOW LOCATIONS ARE APPROXIMATE, DETERMINED FROM CITY OF PITTSFIELD HISTORIC RECHANNELIZATION MAP(1940)

LEGEND:

APPROXIMATE LOCATION OF FORMER OXBOW AND LOWLAND AREAS

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1990 AERIAL PHOTOGRAPH

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-5

1/96 D54-jvm
20153001/20153n05.CDR

200' 0 200'

Approximate Scale: 1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1990 AERIAL PHOTOGRAPH ENLARGEMENT OXBOW AREAS A,B,AND C

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2-6

1/96 DS4-jvm
20153001/20153n07.CDR

200' 0 200'

Approximate Scale: 1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J,&K

1990 AERIAL PHOTOGRAPH ENLARGEMENT OXBOW AREAS J AND K

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE **2-7**

1/96 D54-jvm
20153001/20153n08.CDR

OXBOW AREA D

OXBOW AREA E

OXBOW AREA F

OXBOW AREA B

OXBOW AREA C

OXBOW AREA A

FOURTH STREET

WHIPPLE STREET

FENN STREET

EAST STREET

COVE STREET

ROOT PLACE

ELM STREET

LYMAN STREET

ASHLEY STREET

MYSTIC STREET

DAY STREET

CROSIER AVE.

NEWELL STREET

EAST BRANCH HOUSATONIC RIVER

BLDG. 1

BLDG. 2

BLDG. 3

B-1

B-2

I9-4-14A

I9-4-14B

I9-4-14C

I9-4-14D

I9-4-14E

WP-8

WP-9

WP-7

C-1

C-2

C-3

C2-20N

C2-20W

C2-10N

C2-10W

C2-10E

C2-20E

C2-30E

C2-10S

C2-20S

A-1

A-2

A-3

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THE CITY OF PITTSFIELD ASSESSOR'S OFFICE DATED SEPTEMBER 21,1987.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. INFORMATION FOR OXBOW AREAS D, E, AND F IS PRESENTED UNDER SEPARATE COVERS.

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- PAVED AREAS
- GRAVEL AREAS
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- FENCE
- MARSH AREA
- 1988 WELL POINT LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION AND 1995 SURFICIAL SAMPLE LOCATION
- FLOODPLAIN STM SAMPLING LOCATION (AUGUST 1992 OR JANUARY 1993)
- 1995 SURFICIAL SAMPLE LOCATION

200' 0 200'

1" = 200'

L:ON=*, OFF=REF
P: DJI-B.PCP
1/95 54-DJO
20153001/20153G16.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SAMPLING LOCATIONS FOR OXBOW AREAS A, B, AND C

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-1

OXBOW AREA J

EAST STREET

EAST STREET

COMMERCIAL STREET

BLDG. 1

BLDG. 2

FP-4
OX-J-SS1
J-2S
FP-3
FP-2
OX-J-SS2
J-3S
OX-J-SS4
OX-J-SS3
FP-1
OX-J-SS5
J-4S
OX-J-SS6
J-1
SA-1
SA-2
FP-5
FP-6
FP-7
FP-8

WP-1
WP-2
WP-3
K-1
K-2

OXBOW AREA K

RIVER

HOUSATONIC

PEDESTRIAN FOOTBRIDGE

FOOTPATH

FASCE STREET

LOMBARD STREET

BUCKINGHAM STREET

VENTURA AVE.

PARKSIDE AVE

LONGVIEW STREET

RUTLEDGE AVE.

MELROSE AVE.

HERE AVE.

RICHARDSON STREET

PARKSIDE AVE

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- FENCE
- PAVED PARKING
- GRAVEL PARKING
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- 1986 WELL POINT LOCATION
- 1989 SOIL BORING LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP SURFICIAL SOIL SAMPLING LOCATION
- 1992 MCP WELL LOCATION
- 1994 MCP SUPPLEMENTAL SURFICIAL SOIL SAMPLING LOCATION

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED THROUGH PHOTOGRAMMETRIC MAPPING OF 1990 AERIAL PHOTOGRAPHS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SAMPLING LOCATIONS FOR OXBOW AREAS J AND K

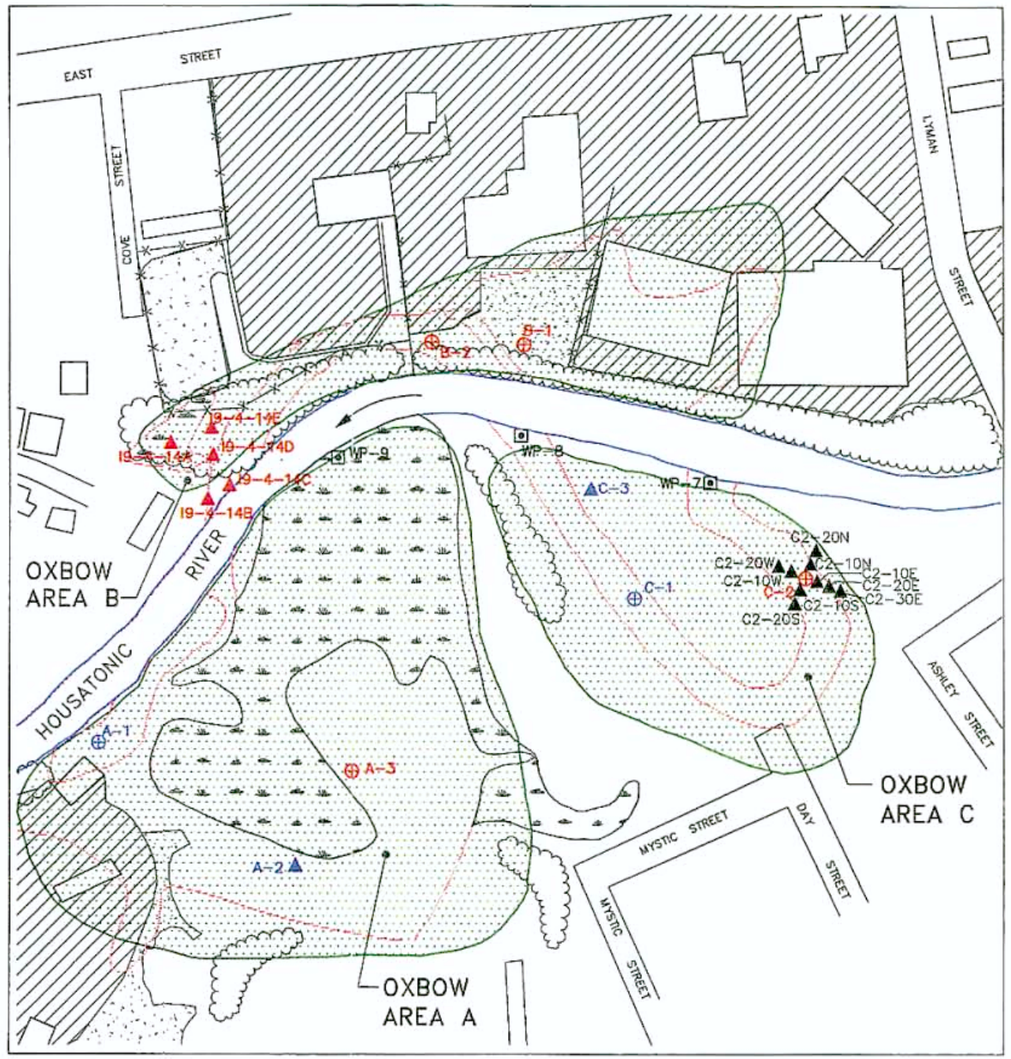
BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-2

L:ON=*, OFF=REF
P: DJ1-B.PCP
1/96 54-DJO
20153001/20153G15.DWG

SUMMARY OF SOILS DATA - OXBOW AREAS A, B, AND C

VOLATILE ORGANIC COMPOUNDS (ppm)	A-1 (20-22')	A-2 (6-8')	A-3 (12-14')	B-1 (4-6')	B-2 (0-2')	C-1 (10-12')	C-2 (12-14')	C-3 (2-4')
Acetone	-	-	-	-	-	-	0.044	-
Ethylbenzene	0.019	-	-	-	-	-	-	-
Xylenes (Total)	0.013	-	-	-	-	-	-	-
SEMIVOLATILE ORGANIC COMPOUNDS (ppm)								
Phenanthrene	-	5.7	59	0.50(13)	2.2	13	(1.2)	27
Fluoranthene	-	6.7	49	0.76(16)	3.6	20	(1.5)	41
Pyrene	-	5.3	42	0.77(13)	2.5	19	(1.1)	43
Benzo(a)anthracene	-	3.0	17	0.51(7.3)	1.7	11	(0.74)	24
Chrysene	-	2.7	18	0.49(6.9)	1.5	13	(0.71)	22
Benzo(b)fluoranthene	-	4.0	26	1.1(13)	4.2	20	-	49
Benzo(k)fluoranthene	-	7.0	26	1.1(13)	4.2	20	-	49
Benzo(a)pyrene	-	2.5	15	0.66(5.7)	2.1	10	(0.62)	22
Indeno(1,2,3-cd)pyrene	-	1.1	6.6	3.1	0.97	3.6	-	13
Benzo(g,h,i)perylene	-	1.1	7.6	3.4	1.2	3.3	-	12
Anthracene	-	1.9	14	10	0.71	-	-	10
Acenaphthylene	-	1.0	6.1	-	0.75	2.2	-	-
1-Methylnaphthalene	-	1.9	22	-	-	-	-	-
Naphthalene	-	2.2	23	1.7	-	-	-	-
Dibenzofuran	-	1.1	7.3	1.9	-	-	-	-
Acenaphthene	-	-	6.1	2.1	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	3.6
Fluorene	-	2.2	17	3.4	-	-	-	5.4
2-Methylnaphthalene	-	0.93	-	-	-	-	-	-
Total Phenols	-	3.6	0.93	-	0.31	0.22	-	-
PESTICIDES (ppm)								
gamma-BHC(Lindane)	-	-	-	0.10	-	-	0.0067	-
delta-BHC	-	-	-	-	-	-	0 023	-
4,4'-DDD	-	-	-	-	-	0.097	-	-
4,4'-DDT	-	-	-	-	-	-	0.14	-
DIOXIN AND FURAN COMPOUNDS (ppm)								
Hexachlorodibenzodioxin (Total)	-	-	-	-	M	-	-	-
Heptachlorodibenzodioxin (Total)	-	-	M	-	0.00017	M	-	-
Octachlorodibenzodioxin (Total)	-	-	0.00025	-	0.00066	0.00030	0 00018	-
2,3,7,8-Tetrachlorodibenzofuran (Total)	-	-	-	M	0.00010	M	-	-
Tetrachlorodibenzofuran (Total)	-	-	-	-	0.00051	M	-	-
Pentachlorodibenzofuran (Total)	-	-	-	M(0.00098)	0.00059	0.00038	-	-
Hexachlorodibenzofuran (Total)	-	-	M	0.003(0.0069)	0.00048	0.00041	M	-
Heptachlorodibenzofuran(Total)	-	-	M	0.002(0.0041)	0.00026	M	-	-
Octachlorodibenzofuran (Total)	-	-	M	0.002(0.0053)	0.00024	M	-	-
SULFIDE (ppm)	-	-	-	-	-	92.4	25.4(34.1)	-



LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- PAVED AREAS
- GRAVEL AREAS
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
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- 1992 MCP GROUNDWATER MONITORING WELL LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION AND 1995 SURFICIAL SAMPLE LOCATION
- FLOODPLAIN STM SAMPLING LOCATION (AUGUST 1992 OR JANUARY 1993)
- 1995 SURFICIAL SAMPLE LOCATION

200' 0 200'

SCALE: 1" = 200'

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THE CITY OF PITTSFIELD ASSESSOR'S OFFICE DATED SEPTEMBER 21, 1987.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. RESULTS ARE PRESENTED ONLY FOR CONSTITUENTS DETECTED ABOVE THE QUANTITATION LIMIT AND NOT DETECTED IN CORRESPONDING BLANK SAMPLES.
5. DETECTED METALS ARE NOT INCLUDED AS THEY ARE GENERALLY AT CONCENTRATIONS REPRESENTATIVE OF BACKGROUND.
6. ( ) INDICATES DUPLICATE SAMPLE.
7. – INDICATES PARAMETER WAS NOT DETECTED OR DETECTED AT A CONCENTRATION BELOW THE QUANTITATION LIMIT.
8. M INDICATES PARAMETER PRESENCE WAS NOTED BUT NOT AT A LEVEL WHICH THE LABORATORY COULD PROVIDE A DEFINITE IDENTIFICATION OR QUANTITY.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SUMMARY OF SOIL ANALYTICAL DATA FOR OXBOW AREAS A, B, AND C

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4-3

L:ON=*, OFF=REF
P: DJI-B.PCP
1/95 54-DJO PMC
20153001/20153G20.DWG

SUMMARY OF SOILS DATA - OXBOW AREAS J AND K

	FP-3 (4-8')	J-1S (0-0.3')	J-2S (0-0.3')	J-3S (0-0.3')	J-4S (0-0.3')	K-1 (14-16')
VOLATILE ORGANIC COMPOUNDS (ppm)						
Acetone	-	0.023	0.039	0.028	0.059	-
SEMIVOLATILE ORGANIC COMPOUNDS (ppm)						
Phenanthrene	17	0.59	0.77	0.63	1.7	-
Fluoranthene	15	1.4	1.0	1.2	2.8	-
Pyrene	13	0.95	0.81	1.0	2.4	-
Benzo[a]anthracene	8.1	0.61	0.57	0.63	1.5	-
Chrysene	5.8	0.75	0.70	0.64	2.2	-
Benzo[b]fluoranthene	5.0	1.5	0.58	0.65	3.2	-
Benzo[k]fluoranthene	4.2	1.5	0.58	0.65	.32	-
Benzo[a]pyrene	5.6	0.70	0.45	0.60	1.5	-
Indeno[1,2,3-cd]pyrene	3.0	-	-	-	-	-
Benzo[g,h,i]perylene	3.5	0.43	-	-	-	-
Anthracene	3.6	-	-	-	-	-
Total Phenols	-	-	-	-	0.29	-
PESTICIDES (ppm)						
4,4'-DDT	NA	-	-	0.0069	-	-
HERBICIDES (ppm)						
2,4-D	NA	-	-	-	-	0.22
2,4,5-TP (Silvex)	NA	-	-	-	-	0.051
2,4,5-T	NA	-	-	-	-	0.052

		OX-J-SS1 (0-0.3')	OX-J-SS2 (0-0.3')	OX-J-SS3 (0-0.3')	OX-J-SS4 (0-0.3')	OX-J-SS5 (0-0.3')	OX-J-SS6 DUP. (0-0.3')	OX-J-SS6 (0-0.3')
DIOXIN AND FURAN COMPOUNDS (ppm)								
2,3,7,8-TCDD	NA	-	-	-	0.00000055	-	-	-
TCDD (total)	NA	0.00000082	0.0000035	0.0000046	0.0000099	0.00000069	0.0000011	0.0000038
1,2,3,7,8-PeCDD	NA	-	-	-	0.0000030	-	-	-
PeCDD (total)	NA	-	0.000014	0.0000084	0.0000011	-	-	-
1,2,3,4,7,8-HxCDD	NA	0.0000011	-	-	0.0000043	-	-	-
1,2,3,6,7,8-HxCDD	NA	0.0000029	0.0000052	0.0000074	0.000023	-	-	-
1,2,3,7,8,9-HxCDD	NA	-	0.0000031	0.0000038	0.0000068	-	-	-
HxCDD (total)	NA	0.000024	0.000047	0.000057	0.000130	0.000015	0.000013	0.000020
1,2,3,4,5,7,8-HpCDD	NA	0.000050	0.000091	0.000110	0.000680	0.000034	0.000031	0.000037
HpCDD (total)	NA	0.000100	0.000170	0.000250	0.002100	0.000074	0.000067	0.000100
OCDD	NA	0.000390	0.000860	0.000840	0.006500	0.000260	0.000240	0.000270
2,3,7,8-TCDF	NA	0.0000068	0.000016	0.000037	0.000035	0.0000057	0.0000055	0.000013
1,2,7,8-TCDF	NA	0.0000026	0.0000078	0.000015	0.000019	0.0000032	0.0000030	0.0000083
TCDF (total)	NA	0.000059	0.000160	0.000320	0.000320	0.000065	0.000045	0.000110
1,2,3,7,8-PeCDF	NA	-	0.0000059	0.0000099	0.000018	-	-	0.0000035
2,3,4,7,8-PeCDF	NA	0.0000098	0.000015	0.0000076	0.000039	0.0000067	0.0000065	0.0000069
PeCDF (total)	NA	0.000130	0.000260	0.000460	0.000450	0.000097	0.000086	0.000094
1,2,3,4,7,8-HxCDF	NA	0.0000046	0.000015	0.000018	0.000036	0.0000043	0.0000032	0.0000048
1,2,3,6,7,8-HxCDF	NA	0.0000066	0.000026	0.000030	0.000032	0.0000060	0.0000051	0.0000065
2,3,4,6,7,8-HxCDF	NA	0.0000094	0.000016	0.000035	0.000031	0.0000072	0.0000058	0.0000077
1,2,3,7,8,9-HxCDF	NA	-	0.0000029	0.0000036	0.0000062	-	-	-
HxCDF (total)	NA	0.000130	0.000350	0.000520	0.000500	0.000092	0.000080	0.000092
1,2,3,4,6,7,8-HpCDF	NA	0.000026	0.000160	0.000110	0.000150	0.000024	0.000019	0.000022
1,2,3,4,7,8,9-HpCDF	NA	-	0.000006	0.0000064	0.000013	-	-	-
HpCDF (total)	NA	0.000061	0.000300	0.000230	0.000420	0.000052	0.000043	0.000046
OCDF	NA	0.000033	0.000100	0.000089	0.000290	0.000026	0.000022	0.000022
TOTAL CYANIDE (ppm)	NA	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON (ppm)	NA	30900	12900	22200	32300	11600	133300	21500
SULFIDE (ppm)	NA	-	-	-	-	-	-	-

VOLATILE ORGANIC COMPOUNDS (ppm)								
Acetone	-	0.023	0.039	0.028	0.059	-		
SEMIVOLATILE ORGANIC COMPOUNDS (ppm)								
Phenanthrene	17	0.59	0.77	0.63	1.7	-		
Fluoranthene	15	1.4	1.0	1.2	2.8	-		
Pyrene	13	0.95	0.81	1.0	2.4	-		
Benzo[a]anthracene	8.1	0.61	0.57	0.63	1.5	-		
Chrysene	5.8	0.75	0.70	0.64	2.2	-		
Benzo[b]fluoranthene	5.0	1.5	0.58	0.65	3.2	-		
Benzo[k]fluoranthene	4.2	1.5	0.58	0.65	.32	-		
Benzo[a]pyrene	5.6	0.70	0.45	0.60	1.5	-		
Indeno[1,2,3-cd]pyrene	3.0	-	-	-	-	-		
Benzo[g,h,i]perylene	3.5	0.43	-	-	-	-		
Anthracene	3.6	-	-	-	-	-		
Total Phenols	-	-	-	-	0.29	-		
PESTICIDES (ppm)								
4,4'-DDT	NA	-	-	0.0069	-	-		
HERBICIDES (ppm)								
2,4-D	NA	-	-	-	-	0.22		
2,4,5-TP (Silvex)	NA	-	-	-	-	0.051		
2,4,5-T	NA	-	-	-	-	0.052		
DIOXIN AND FURAN COMPOUNDS (ppm)		OX-J-SS1 (0-0.3')	OX-J-SS2 (0-0.3')	OX-J-SS3 (0-0.3')	OX-J-SS4 (0-0.3')	OX-J-SS5 (0-0.3')	OX-J-SS6 DUP. (0-0.3')	OX-J-SS6 (0-0.3')
2,3,7,8-TCDD	NA	-	-	-	0.00000055	-	-	-
TCDD (total)	NA	0.00000082	0.0000035	0.0000046	0.0000099	0.00000069	0.0000011	0.0000038
1,2,3,7,8-PeCDD	NA	-	-	-	0.0000030	-	-	-
PeCDD (total)	NA	-	0.000014	0.0000084	0.0000011	-	-	-
1,2,3,4,7,8-HxCDD	NA	0.0000011	-	-	0.0000043	-	-	-
1,2,3,6,7,8-HxCDD	NA	0.0000029	0.0000052	0.0000074	0.000023	-	-	-
1,2,3,7,8,9-HxCDD	NA	-	0.0000031	0.0000038	0.0000068	-	-	-
HxCDD (total)	NA	0.000024	0.000047	0.000057	0.000130	0.000015	0.000013	0.000020
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HpCDD (total)	NA	0.000100	0.000170	0.000250	0.002100	0.000074	0.000067	0.000100
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1,2,7,8-TCDF	NA	0.0000026	0.0000078	0.000015	0.000019	0.0000032	0.0000030	0.0000083
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1,2,3,7,8-PeCDF	NA	-	0.0000059	0.0000099	0.000018	-	-	0.0000035
2,3,4,7,8-PeCDF	NA	0.0000098	0.000015	0.0000076	0.000039	0.0000067	0.0000065	0.0000069
PeCDF (total)	NA	0.000130	0.000260	0.000460	0.000450	0.000097	0.000086	0.000094
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1,2,3,6,7,8-HxCDF	NA	0.0000066	0.000026	0.000030	0.000032	0.0000060	0.0000051	0.0000065
2,3,4,6,7,8-HxCDF	NA	0.0000094	0.000016	0.000035	0.000031	0.0000072	0.0000058	0.0000077
1,2,3,7,8,9-HxCDF	NA	-	0.0000029	0.0000036	0.0000062	-	-	-
HxCDF (total)	NA	0.000130	0.000350	0.000520	0.000500	0.000092	0.000080	0.000092
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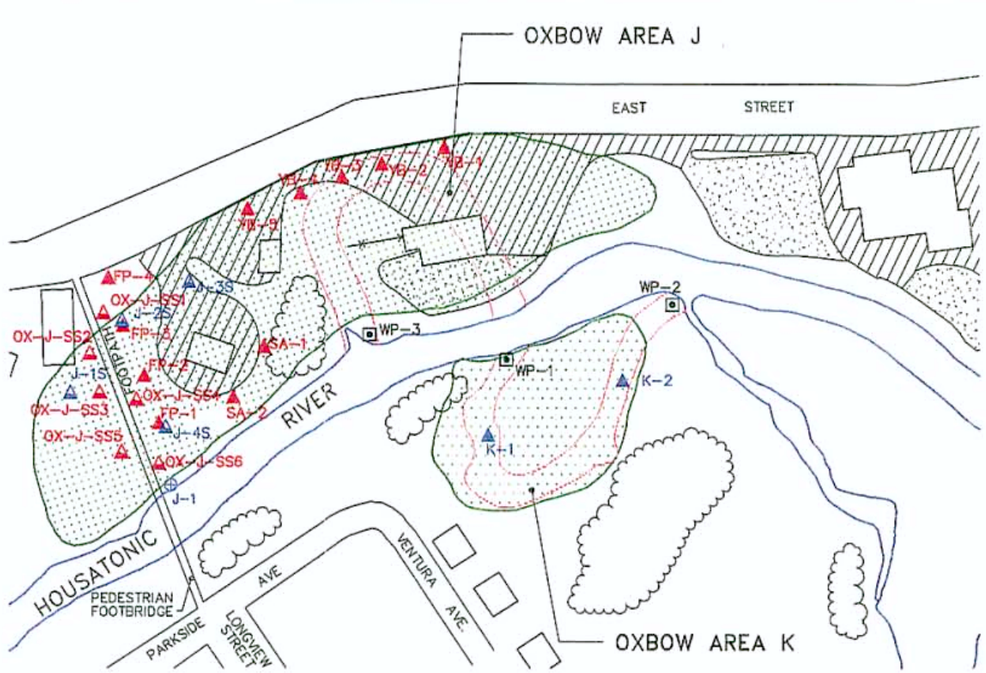
1,2,3,4,7,8,9-HpCDF	NA	-	0.000006	0.0000064	0.000013	-	-	-
HpCDF (total)	NA	0.000061	0.000300	0.000230	0.000420	0.000052	0.000043	0.000046
OCDF	NA	0.000033	0.000100	0.000089	0.000290	0.000026	0.000022	0.000022
TOTAL CYANIDE (ppm)	NA	-	120	-	-	-	-	-
TOTAL ORGANIC CARBON (ppm)	NA	NA	NA	NA	NA	NA	30900	12900
SULFIDE (ppm)	NA	-	65	-	-	-	-	-



LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- FENCE
- PAVED PARKING
- GRAVEL PARKING
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- 1988 WELL POINT LOCATION
- 1989 SOIL BORING LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP SURFICIAL SOIL SAMPLING LOCATION
- 1992 MCP WELL LOCATION
- 1994 MCP SUPPLEMENTAL SURFICIAL SOIL SAMPLING LOCATION

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED THROUGH PHOTOGRAMMETRIC MAPPING OF 1990 AERIAL PHOTOGRAPHS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. RESULTS ARE PRESENTED ONLY FOR CONSTITUENTS DETECTED ABOVE THE QUANTITATION LIMIT AND NOT DETECTED IN CORRESPONDING BLANK SAMPLES.
5. DETECTED METALS ARE NOT INCLUDED AS THEY ARE GENERALLY AT CONCENTRATIONS REPRESENTATIVE OF BACKGROUND.
6. ( ) INDICATES DUPLICATE SAMPLE.
7. – INDICATES PARAMETER NOT DETECTED OR DETECTED AT A CONCENTRATION BELOW QUANTITATION LIMITS.
8. M INDICATES PARAMETER PRESENCE WAS NOTED BUT NOT AT A LEVEL WHICH THE LABORATORY COULD PROVIDE A DEFINITE IDENTIFICATION OR QUANTITY.
9. NA INDICATES PARAMETER NOT ANALYZED.

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SUMMARY OF SOIL ANALYTICAL DATA FOR OXBOW AREAS J AND K

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4-4

L:ON=*, OFF=REF
P: DJI-B.PCP
1/98 S4-DJO, PMC, PGL
20153001/20153G21.DWG

B-2 1991	
Depth(ft)	Conc.(ppm)
0-2	180(14)
2-4	2.6
4-6	ND
6-8	0.73
8-10	0.09
10-12	17(1.8)
12-14	1.4
14-16	ND
16-18	0.59
B-2 1995	
Depth(ft)	Conc.(ppm)
0-0.5	11.8

B-1 1991	
Depth(ft)	Conc.(ppm)
0-2	15
2-4	23
4-6	11(8.1)(49)
6-8	5.2
8-10	ND(0.10)
10-12	ND
12-14	ND
14-16	ND
16-18	2.6
18-20	0.21
B-1 1995	
Depth(ft)	Conc.(ppm)
0-0.5	4.2

I9-4-14E	
Depth(ft)	Conc.(ppm)
0-0.5	3.5
0.5-1.0	6.7

I9-4-14A	
Depth(ft)	Conc.(ppm)
0-0.5	6.2

I9-4-14D	
Depth(ft)	Conc.(ppm)
0-0.5	4.3
0.5-1.0	5.4

I9-4-14C	
Depth(ft)	Conc.(ppm)
0-0.5	47

I9-4-14B	
Depth(ft)	Conc.(ppm)
0-0.5	4.3

C-3	
Depth(ft)	Conc.(ppm)
0-2	0.93
2-4	0.45
4-6	0.13
6-8	24
8-10	ND
12-14	ND

C-2 1995 SUP	
D(0.5ft)	Conc.(ppm)
C2-10N	418
C2-10S	36.8
C2-10E	55.3
C2-10W	22.3
C2-20N	5.58
C2-20S	7.55
C2-20E	59.3
C2-30E	12.8

C-2 1991	
Depth(ft)	Conc.(ppm)
0-2	750
4-6	95
6-8	42
8-10	81
10-12	11
12-14	22(0.26)(1.6)
14-16	150
18-20	5.3
C-2 1995	
Depth(ft)	Conc.(ppm)
0-0.5	745

A-1	
Depth(ft)	Conc.(ppm)
0-2	ND
2-4	ND
4-6	ND
6-8	ND
8-10	ND
10-12	0.06
12-14	0.18
14-16	0.89
16-18	ND
18-20	0.06
20-22	ND
22-24	0.057

A-2	
Depth(ft)	Conc.(ppm)
0-2	0.38
2-4	3.1
4-6	ND
6-8	ND
8-10	0.19
10-12	0.35
12-14	0.35
14-16	3.4

A-3 1992	
Depth(ft)	Conc.(ppm)
0-2	25
2-4	3.0
4-6	17
6-8	0.29
8-10	50
10-12	0.87
12-14	1.4
14-16	1.9
16-18	1.9(3.0)
18-20	ND
20-22	0.62
A-3 1995	
Depth(ft)	Conc.(ppm)
0-0.5	0.397

C-1	
Depth(ft)	Conc.(ppm)
0-2	0.79(0.38)
2-4	1.1
4-6	19
6-8	3.3
8-10	8.7
10-12	11(0.86)
12-14	57
16-18	49
18-20	13
20-22	13
22-24	6.6 (6.7)

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THE CITY OF PITTSFIELD ASSESSOR'S OFFICE DATED SEPTEMBER 21,1987.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. INFORMATION FOR OXBOW AREAS D, E, AND F IS PRESENTED UNDER SEPARATE COVERS.
5. ( ) – INDICATES DUPLICATE SAMPLE.

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- PAVED AREAS
- GRAVEL AREAS
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- FENCE
- MARSH AREA
- 1988 WELL POINT LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION AND 1995 SURFICIAL SAMPLE LOCATION
- FLOODPLAIN STM SAMPLING LOCATION (AUGUST 1992 OR JANUARY 1993)
- 1995 SURFICIAL SAMPLE LOCATION

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SOIL PCB DATA FOR OXBOW AREAS A, B, AND C

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-5

L:ON=►, OFF=REF
P: DJI-B.PCP
1/96 54-DJO AK
20153001/20153018.DWG

J3-S	
Depth(ft)	Conc(ppm)
0-0.3	ND

YB-5	
Depth(ft)	Conc(ppm)
0-4	1.8
4-8	0.08

YB-4	
Depth(ft)	Conc(ppm)
0-4	0.55
4-8	ND

YB-3	
Depth(ft)	Conc(ppm)
0-4	0.57
4-8	ND

YB-2	
Depth(ft)	Conc(ppm)
0-4	2.3
4-8	0.8

YB-1	
Depth(ft)	Conc(ppm)
0-4	0.95
4-8	0.43

SA-1	
Depth(ft)	Conc(ppm)
0-4	0.25
4-8	ND
8-12	0.05

FP-4	
Depth(ft)	Conc(ppm)
0-4	0.19
4-8	ND

OX-J-SS1	
Depth(ft)	Conc(ppm)
0-0.3	0.63

J2-S	
Depth(ft)	Conc(ppm)
0-0.3	0.53(0.44)

FP-3	
Depth(ft)	Conc(ppm)
0-4	2.8
4-8	0.38

OX-J-SS2	
Depth(ft)	Conc(ppm)
0-0.3	1.6

J1-S	
Depth(ft)	Conc(ppm)
0-0.3	1.7(0.97)

OX-J-SS3	
Depth(ft)	Conc(ppm)
0-0.3	1.5

FP-2	
Depth(ft)	Conc(ppm)
0-4	13
4-8	ND

OX-J-SS4	
Depth(ft)	Conc(ppm)
0-0.3	1.3

OX-J-SS5	
Depth(ft)	Conc(ppm)
0-0.3	0.29(0.35)

FP-1	
Depth(ft)	Conc(ppm)
0-4	ND
4-8	ND
8-12	ND
12-16	ND
16-20	ND
20-24	ND
24-28	ND
28-30	ND

J4-S	
Depth(ft)	Conc(ppm)
0-0.3	1.9(0.71)

OX-J-SS6	
Depth(ft)	Conc(ppm)
0-0.3	0.28

SA-2	
Depth(ft)	Conc(ppm)
0-4	0.2
4-8	0.13
8-12	ND

K-2	
Depth(ft)	Conc(ppm)
0-2	0.07
2-4	ND
4-6	ND
6-8	ND
8-10	ND

K-1	
Depth(ft)	Conc(ppm)
0-2	0.15
2-4	ND
4-6	ND
6-8	ND
8-10	ND
10-12	ND
12-14	ND
14-16	ND
16-18	ND
18-20	ND

OXBOW AREA J

OXBOW AREA K

EAST STREET

COMMERCIAL STREET

HOUSATONIC RIVER

PEDESTRIAN FOOTBRIDGE

VENTURA AVE.

PARKSIDE AVE.

LONGVIEW STREET

RUTLEDGE AVE.

HERE AVE.

MELROSE AVE.

RICHARDS

LOMBARD STREET

BLDG. 1

BLDG. 2

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
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- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- 1989 SOIL BORING LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP SURFICIAL SOIL SAMPLING LOCATION
- 1992 MCP WELL LOCATION
- 1994 MCP SUPPLEMENTAL SURFICIAL SOIL SAMPLING LOCATION

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED THROUGH PHOTOGRAMMETRIC MAPPING OF 1990 AERIAL PHOTOGRAPHS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. ( ) - INDICATES DUPLICATE SAMPLE

200' 0 200'

1" = 200'

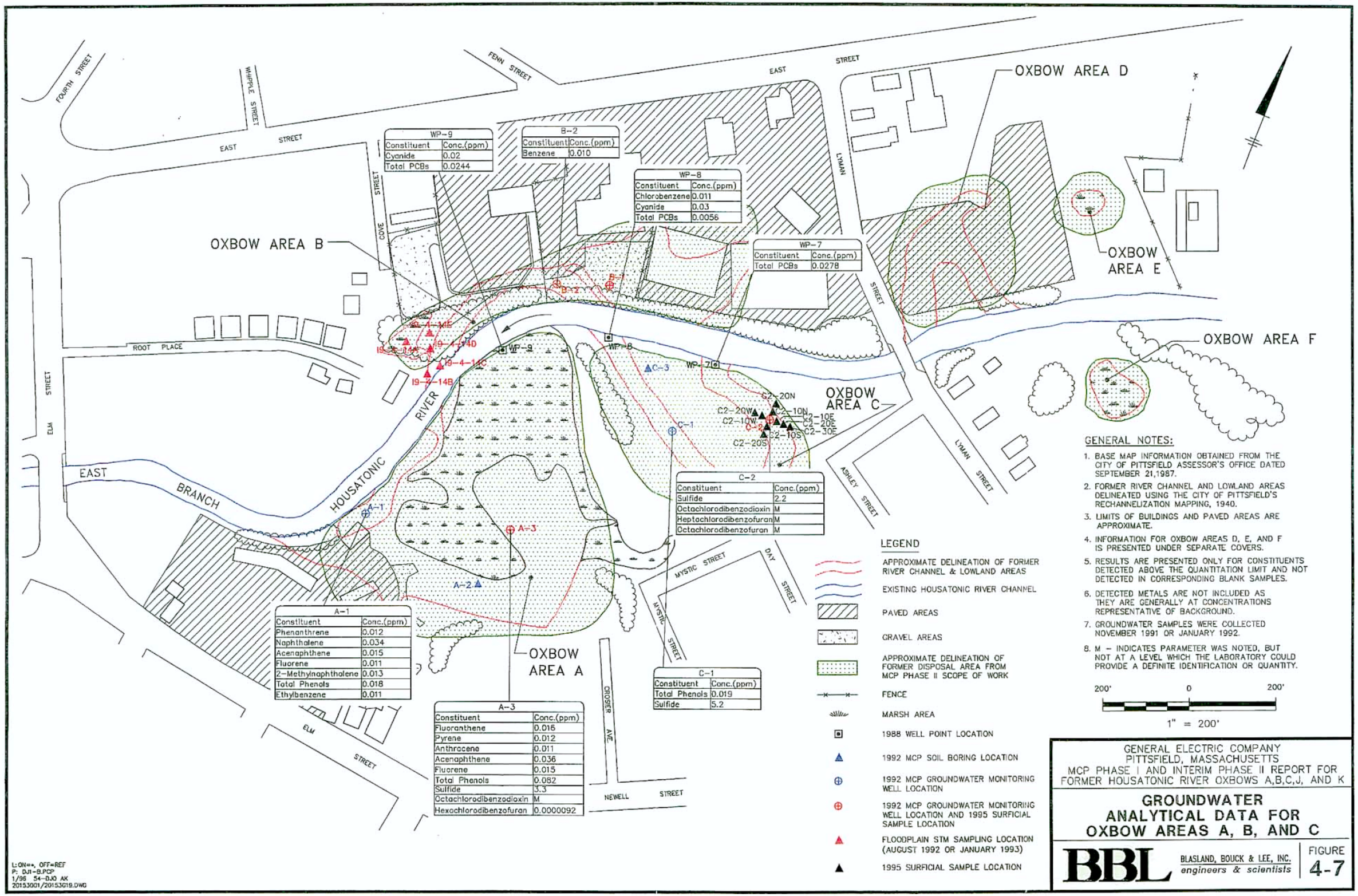
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

SOIL PCB DATA FOR OXBOW AREAS J AND K

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-6

L:ON=*, OFF=REF
P: DJI-B.PCP
1/96 S4-DJD
20153001/20153G17.DWG



WP-9	
Constituent	Conc.(ppm)
Cyanide	0.02
Total PCBs	0.0244

B-2	
Constituent	Conc.(ppm)
Benzene	0.010

WP-8	
Constituent	Conc.(ppm)
Chlorobenzene	0.011
Cyanide	0.03
Total PCBs	0.0056

WP-7	
Constituent	Conc.(ppm)
Total PCBs	0.0278

C-2	
Constituent	Conc.(ppm)
Sulfide	2.2
Octachlorodibenzodioxin	M
Heptachlorodibenzofuran	M
Octachlorodibenzofuran	M

C-1	
Constituent	Conc.(ppm)
Total Phenols	0.019
Sulfide	5.2

A-1	
Constituent	Conc.(ppm)
Phenanthrene	0.012
Naphthalene	0.034
Acenaphthene	0.015
Fluorene	0.011
2-Methylnaphthalene	0.013
Total Phenols	0.018
Ethylbenzene	0.011

A-3	
Constituent	Conc.(ppm)
Fluoranthene	0.016
Pyrene	0.012
Anthracene	0.011
Acenaphthene	0.036
Fluorene	0.015
Total Phenols	0.082
Sulfide	3.3
Octachlorodibenzodioxin	M
Hexachlorodibenzofuran	0.0000092

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- PAVED AREAS
- GRAVEL AREAS
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- FENCE
- MARSH AREA
- 1988 WELL POINT LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION
- 1992 MCP GROUNDWATER MONITORING WELL LOCATION AND 1995 SURFICIAL SAMPLE LOCATION
- FLOODPLAIN STM SAMPLING LOCATION (AUGUST 1992 OR JANUARY 1993)
- 1995 SURFICIAL SAMPLE LOCATION

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THE CITY OF PITTSFIELD ASSESSOR'S OFFICE DATED SEPTEMBER 21,1987.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. INFORMATION FOR OXBOW AREAS D, E, AND F IS PRESENTED UNDER SEPARATE COVERS.
5. RESULTS ARE PRESENTED ONLY FOR CONSTITUENTS DETECTED ABOVE THE QUANTITATION LIMIT AND NOT DETECTED IN CORRESPONDING BLANK SAMPLES.
6. DETECTED METALS ARE NOT INCLUDED AS THEY ARE GENERALLY AT CONCENTRATIONS REPRESENTATIVE OF BACKGROUND.
7. GROUNDWATER SAMPLES WERE COLLECTED NOVEMBER 1991 OR JANUARY 1992.
8. M – INDICATES PARAMETER WAS NOTED, BUT NOT AT A LEVEL WHICH THE LABORATORY COULD PROVIDE A DEFINITE IDENTIFICATION OR QUANTITY.

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR
FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

GROUNDWATER ANALYTICAL DATA FOR OXBOW AREAS A, B, AND C

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-7

L:ON=*, OFF=REF
P: DJ1-B.PCP
1/98 54-DJO AK
20153001/20153G19.DWG

OXBOW AREA J

EAST STREET

COMMERCIAL STREET

EAST STREET

BUCKINGHAM STREET

LOMBARD STREET

FASCE STREET

FOOTPATH

HOUSATONIC RIVER

PEDESTRIAN FOOTBRIDGE

PARKSIDE AVE

LONGVIEW STREET

VENTURA AVE.

RUTLEDGE AVE

RICHARDSON STREET

HERIE AVE

MELROSE AVE

OXBOW AREA K

BLDG. 1

BLDG. 2

WP-1	
Constituent	Conc. (ppm)
Total PCBs	0.00361

WP-3	
Constituent	Conc. (ppm)
Trans-1,2-Dichloroethene	0.018

LEGEND

- APPROXIMATE DELINEATION OF FORMER RIVER CHANNEL & LOWLAND AREAS
- EXISTING HOUSATONIC RIVER CHANNEL
- FENCE
- PAVED PARKING
- GRAVEL PARKING
- APPROXIMATE DELINEATION OF FORMER DISPOSAL AREA FROM MCP PHASE II SCOPE OF WORK
- 1988 WELL POINT LOCATION
- 1989 SOIL BORING LOCATION
- 1992 MCP SOIL BORING LOCATION
- 1992 MCP SURFICIAL SOIL SAMPLING LOCATION
- 1992 MCP WELL LOCATION
- 1994 MCP SUPPLEMENTAL SURFICIAL SOIL SAMPLING LOCATION

GENERAL NOTES:

1. BASE MAP INFORMATION OBTAINED THROUGH PHOTOGRAMMETRIC MAPPING OF 1990 AERIAL PHOTOGRAPHS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. LIMITS OF BUILDINGS AND PAVED AREAS ARE APPROXIMATE.
4. RESULTS ARE PRESENTED ONLY FOR CONSTITUENTS DETECTED ABOVE THE QUANTITATION LIMIT AND NOT DETECTED IN CORRESPONDING BLANK SAMPLES.
5. DETECTED METALS ARE NOT INCLUDED AS THEY ARE GENERALLY AT CONCENTRATIONS REPRESENTATIVE OF BACKGROUND.

200' 0 200'

1" = 200'

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP PHASE I AND INTERIM PHASE II REPORT FOR FORMER HOUSATONIC RIVER OXBOWS A,B,C,J, AND K

GROUNDWATER ANALYTICAL DATA FOR OXBOW AREAS J AND K

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-8

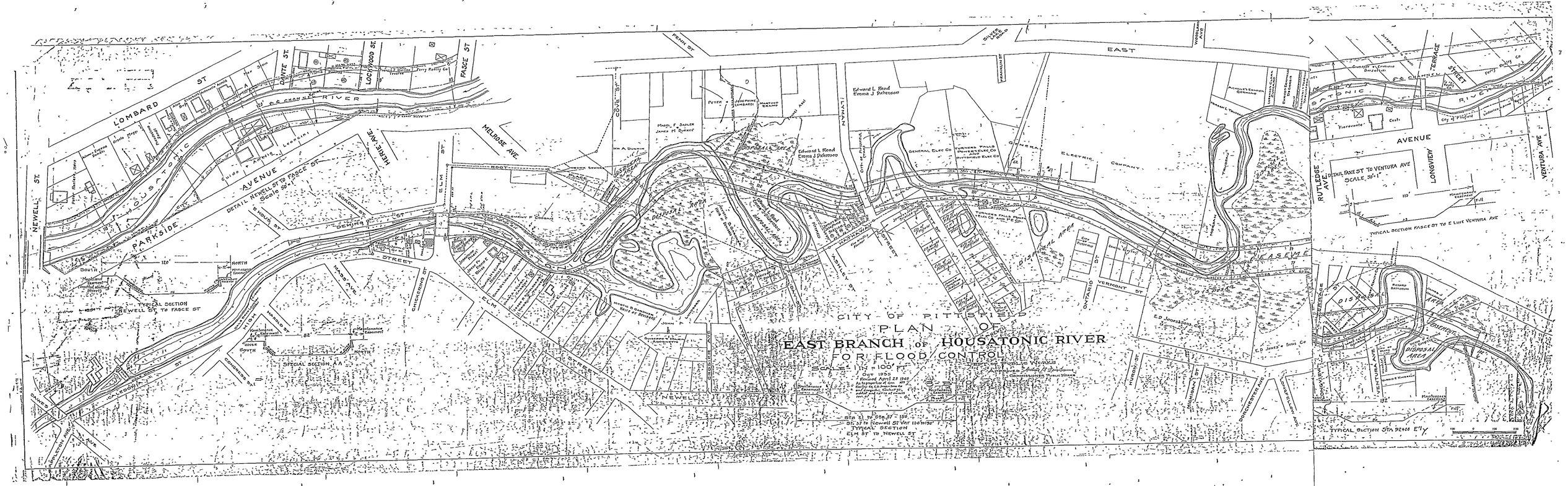
L:ON=*, OFF=REF
P: DJ1-B.PCP
1/96 54-DJO AK
20153001/20153G22.DWG

SDMS 5785

Appendices

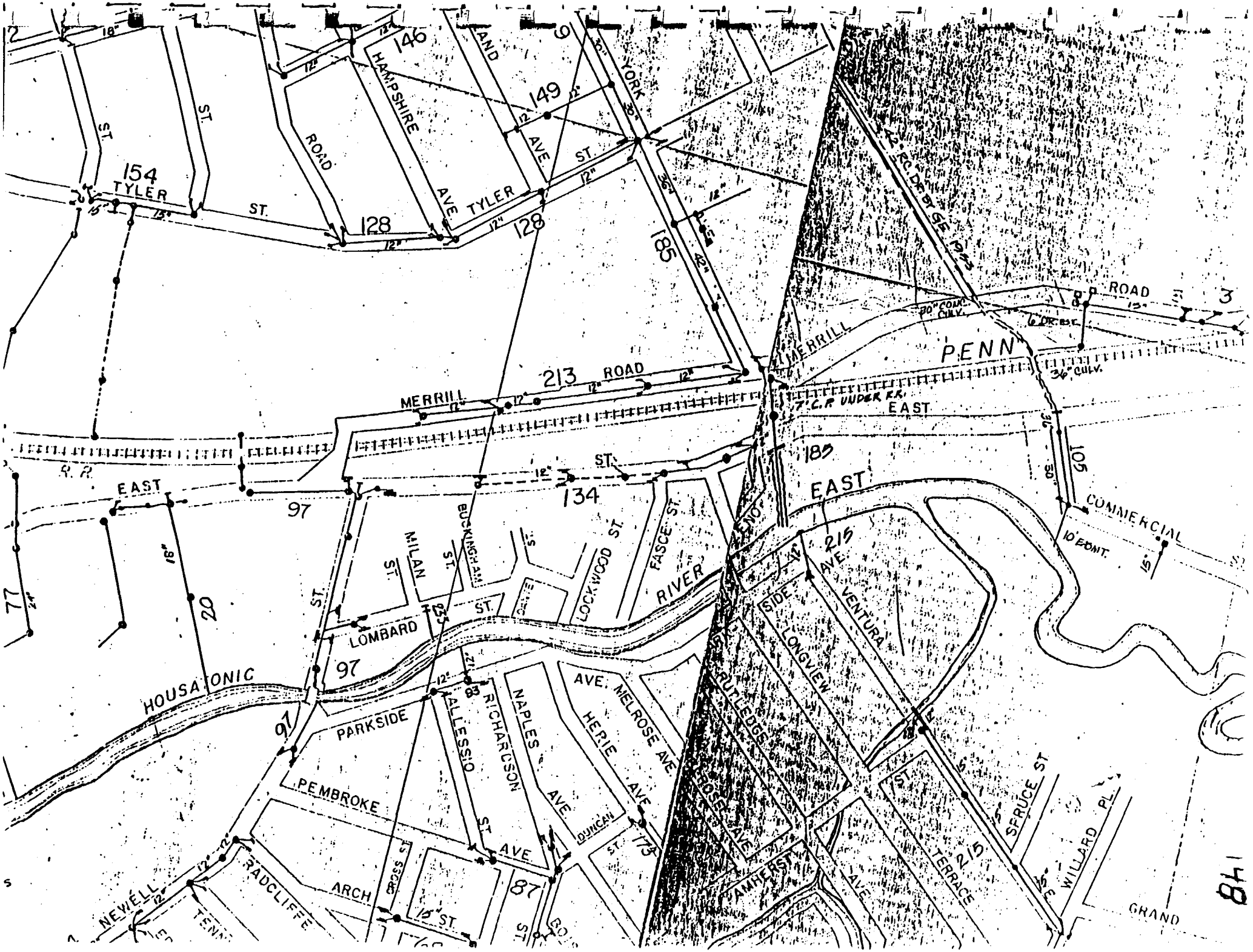
APPENDIX A

CITY OF PITTSFIELD RECHANNELIZATION MAPPING, 1940


CITY OF PITTSFIELD
PLAN OF
EAST BRANCH of HOUSATONIC RIVER
FOR FLOOD CONTROL
SCALE 1 IN = 100' FT.
OCT 1939
Commissioners Public Works
Sta 1 to Sta 37 - 150
Sta 37 to Newell St Var 150 to 130'
TYPICAL SECTION
ELM ST TO NEWELL ST
DETAIL NEWELL ST TO FASCE ST
Scale 30'=1'
TYPICAL SECTION NEWELL ST TO FASCE ST
SPECIAL SECTION AA
DETAIL FASCE ST TO VENTURA AVE
SCALE 30'=1'
TYPICAL SECTION FASCE ST TO E LINE VENTURA AVE
TYPICAL SECTION 5TH DEREE E'LY
EAST
NEWELL ST.
LOMBARD ST
PARKSIDE AVENUE
HOUSATONIC RIVER
MELROSE AVE
ELM ST
FASCE ST
VENTURA AVE
RUTLEDGE AVE
LONGVIEW TERRACE
DISPOSAL AREA
PENN ST
VERMONT ST
ONTARIO ST
CHECKERING ST
CONDERSE ST
HAMILTON AVE
CALEDONIA ST
NEWELL STREET

APPENDIX B

OXBOW AREA J - UNLABELED DRAINAGE SKETCH


TYLER ST.
ROAD
HAMPSHIRE
AVE
YORK
ST.
AVE.
TYLER
ST.
MERRILL
ROAD
213
MERRILL
ST.
EAST
R. R.
EAST
97
134
MILAN ST.
BUCKINGHAM
LOCKWOOD ST.
FASCE ST.
RIVER
LOMBARD
ST.
HOUSATONIC
97
91
PARKSIDE
PEMBROKE
ALLESSIO
RICHARDSON
NAPLES
AVE.
HERIE
AVE.
MELROSE AVE
DUNCAN
ST.
AVE
ARCH
NEWELL
RADCLIFFE
TENN
87
15" ST.
PENN
EAST
185
105
COMMERCIAL
10' EDMT.
215
AVE
VENTURA
SIDE
LONGVIEW
RUTLEDGE
ROSE AVE
AMHERST
AVE
215
TERRACE
SPRUCE ST
WILLARD PL
GRAND
84

APPENDIX C

ASSOCIATED ENVIRONMENTAL SCIENTISTS, INC. REPORT ON VEGETATION IN OXBOW AREAS A, B, C, E, AND F

150

ASSOCIATED ENVIRONMENTAL SCIENTISTS, INC.

311 Elm Street • P.O. Box 979 • West Springfield, MA 01090-0979
Telephone (413) 737-3586 • FAX (413) 734-9250

July 11, 1991

Mr. Mark C. Phillips
GE Environmental and Facilities Division
100 Woodlawn Avenue
Pittsfield, MA 01201

RE: Analysis of Wetlands in the Vicinity of
Proposed Monitoring Well Locations
MCP Phase II, Housatonic River
Pittsfield, Mass.

The data contained in this report were collected at the various proposed monitoring well locations shown on the plan by Blasland & Bouck Engineers, P.C., entitled, "Proposed Study Activities", file number 101.97.01, dated June, 1990. Specifically, the monitoring well locations to be discussed in this report include two each in Oxbows A, B, and C, one each in Oxbows E and F.

Three additional monitoring wells are to be located in the GE Newell Street parking lot shown on another plan by Blasland & Bouck, P.C. entitled Newell St. Site Proposed Field Activities file No. 101.96.54 dated June, 1990. Of the eleven monitoring wells to be discussed, four are located outside of the 100-foot buffer zone and five are to be placed in existing paved areas.

Each of the proposed monitoring well locations mentioned above have been located in oxbows in areas which are easily accessible by a drilling rig and will cause no damage to wetland vegetation and pose the least potential threat to the Housatonic River due to sedimentation during the drilling process. The data collected on each proposed monitoring well location includes the vegetative composition in the immediate area of the monitoring well, the vegetative composition of the nearest wetland, the distance of the proposed monitoring well from the nearest wetland boundary, and the approximate slope of the monitoring well location. Each monitoring well location shall be discussed individually below by area designation.

OXBOW A

There are two monitoring wells proposed for Oxbow A. The westernmost location has been designated ROA01 and the easternmost location has been designated ROA02. Both locations occur within a field area south of the Housatonic River dominated by old field successional vegetation over a "fill" soil profile.

To the south of the field there are numerous businesses fronting on Elm Street.

1. ROA01

Vegetation identified in monitoring well location:

Common Name	Species Name	*Hydric Category	*Abundance
Red Clover	Trifolium pratense	FACU-	M
Daisy Fleabane	Erigeron annuus	FACU	U-M
Bugle	Ajuga reptans	UPL	U
Common St. Johnswort	Hypericum perforatum	UPL	U
Queen Anne's Lace	Daucus carota	UPL	U
Bladder Campion	Silene cucubalas	UPL	M-A
Black-eyed Susan	Rudbeckia hirta	FACU-	U
Fragrant Bedstraw	Galium triflorum	FACU	U-M
Timothy	Phleum pratense	FACU	U
Trembling Aspen	Populus tremula	FACU	U
Pussy Willow	Salix discolor	FACW	U-M
Kentucky Bluegrass	Poa pratensis	FACU	U-M
Cypress Spurge	Euphorbia cyparissias	UPL	U

*See attachment at the end of the report for description of hydric categories and abundance symbols.

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
American Elm	Ulmus americana	FACW-	U
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	A
Black Willow	Salix nigra	FACW+	U-M
Riverbank Grape	Vitis riparia	FACW	M
Field Horsetail	Equisetum arvense	FAC	M
Fragrant Bedstraw	Galium triflorum	FACU	M
Jewelweed	Impatiens capensis	FACW	U
Oriental Bittersweet	Celastrus orbiculatus	UPL	M

Proposed monitoring well location ROA01 is located 43 feet from the wetland boundary bordering the Housatonic River and 52 feet from the edge of water as marked with a five foot wooden stake topped with fluorescent orange paint. The topography is flat in the area of the monitoring well with a slight pitch towards the north (parallel to the river but not towards it). The chance of the drilling operation causing sedimentation in the river is minimal due to the setback distance and level topography. The

soils near the surface are comprised of fill including sand, gravel, large concrete pieces, and some loam material which was most likely used as cover for the fill area.

To the east of the monitoring well location there is a low area which ponds water during storm events and contains a dominance of hydrophytic vegetation. While it does not appear that this area would be regulated under the Massachusetts Wetlands Protection Act due to its size and apparent isolation from a regulated water body, the drill rig shall avoid this area when accessing the ROA01 location. This can be accomplished by entering the well site from directly behind the laundromat (located to the south of ROA01) and exiting in the same manner.

2. ROA02

Vegetation identified in monitoring well location:

Common Name	Species Name	Hydric Category	Abundance
Red Clover	Trifolium pratense	FACU-	VA
Daisy Fleabane	Erigeron annuus	FACU	U
Queen Anne's Lace	Daucus carota	UPL	U-M
Timothy	Phleum pratense	FACU	U
Trembling Aspen	Populus tremula	FACU	U
Pussy Willow	Salix discolor	FACW	U
Kentucky Bluegrass	Poa pratensis	FACU	U-M
Ryegrass	Lolium perenne	FACU-	M
Spotted Knapweed	Centaurea maculosa	UPL	M
White Sweet Clover	Melilotus alba	FACU-	M

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	A
Fragrant Bedstraw	Galium triflorum	FACU	M
False Nettle	Boehmeria cylidrica	FACW+	VA

Proposed monitoring well location ROA02 is marked with a five foot wooden stake painted with fluorescent orange paint. ROA02 is located 160 feet from the wetland bordering the Housatonic River and approximately 180 feet from the edge of water. This monitoring well is located outside of the 100-foot buffer zone and the drilling operation will not have an impact on

the river or associated bordering vegetated wetland. However, there is a small depression in the field 45 feet to the west of location ROA02 which ponds water after storm events and contains a dominance of hydrophytic vegetation. This depression is isolated from the wetland vegetation bordering the river and it does not appear that it would be regulated by the Massachusetts Wetlands Protection Act.

Access and exit from location ROA02 should avoid the depression mentioned above and the one mentioned in the description of ROA01. This can be accomplished by entering from the existing dirt roadway which has no wetland vegetation and extends down the middle of the field area.

OXBOW B

There are two monitoring wells proposed for Oxbow B which are located on the north side of the Housatonic River west of Lyman Street. The easternmost monitoring well is designated ROB01 and the westernmost monitoring well has been designated ROB02. Both monitoring wells are to be drilled through existing asphalt and thus there is no vegetation associated with the monitoring well locations.

1. ROB01

Vegetation identified in monitoring well location:

None; location is an existing paved area

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	M
Japanese Knowtweed	Polygonum cuspidatum	FACU-	U-M
False Nettle	Boehmeria cylidrica	FACW+	A

Monitoring well ROB01 is marked with an "x" in fluorescent orange paint on the asphalt and is located 30 feet from the nearest wetland boundary and 35 feet from the edge of water. There is no curbing associated with the parking areas thus any drilling fluids and sediment associated with the operation shall be collected and will not be allowed to enter the river.

2. ROB02

Vegetation identified in monitoring well location:

None; location is an existing paved area

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	M
Japanese Knowtweed	Polygonum cuspidatum	FACU-	U
False Nettle	Boehmeria cylidrica	FACW+	M

Location ROB02 is marked with an "x" and in fluorescent orange paint on the asphalt and is located 30 feet from the nearest wetland boundary and 33 feet from the edge of water. There is no curbing surrounding this parking area thus drilling fluids and sediment shall be contained and will not be allowed to enter the river.

OXBOW C

There are two monitoring wells proposed for Oxbow C which is located at the northwestern end of Day and Ashley Streets on the south side of the Housatonic River. The westernmost monitoring well has been designated ROC01 and the easternmost monitoring well has been designated ROC02. Both monitoring wells in Oxbow C shall be placed in field areas dominated by early successional non-wetland species and are easily accessible by a drill rig.

1. ROC01

Vegetation identified in monitoring well location:

Common Name	Species Name	Hydric Category	Abundance
Red Clover	Trifolium pratense	FACU-	VA
Daisy Fleabane	Erigeron annuus	FACU	U
Bugle	Ajuga reptans	UPL	U
Common St. Johnswort	Hypericum perforatum	UPL	M
Bladder Campion	Silene cucubalas	UPL	M
Black-eyed Susan	Rudbeckia hirta	FACU-	U
Timothy	Phleum pratense	FACU	U

Trembling Aspen	Populus tremula	FACU	U
Kentucky Bluegrass	Poa pratensis	FACU	U
Cypress Spurge	Euphorbia cyparissias	UPL	U
Spotted Knapweed	Centaurea maculosa	UPL	U
White Sweet Clover	Melilotus alba	FACU-	A
Cottonwood	Populus deltoides	FAC	U
Ox-eye Daisy	Chrysanthemum leucanthemum	UPL	U
Yarrow	Achillea millefolium	FACU	U
Black Raspberry	Rubus occidentalis	NI	U
Mullein	Verbascum thapsus	UPL	U

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Trembling Aspen	Populus tremula	FACU	U
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	A
Riverbank Grape	Vitis riparia	FACW	U-M
Japanese Knotweed	Polygonum cuspidatum	FACU	A

Location ROC01 is located in the same field as the monitoring wells associated with Oxbow A and can be accessed from the dirt road through this field. Monitoring well ROC01 is marked with fluorescent pink flagging tape and is 190 feet from the wetland vegetation bordering the Housatonic River. There is a badly eroded drainage channel which receives water from a culvert at the end of Day street located 71 feet away from the proposed monitoring well. The vegetation list above is for this drainage ditch and, in a strict interpretation of the Act, this channel could be considered an intermittent stream. Therefore, we will assume that the nearest wetland boundary to location ROC01 is 71 feet away. The topography in this location is level around the monitoring well but it drops sharply 10 feet to the east of the location down to the drainage channel. Any fluids and sediment associated with the drilling shall be collected and brought off site.

2. ROC02

Vegetation identified in monitoring well location:

Common Name	Species Name	Hydric Category	Abundance
Red Clover	Trifolium pratense	FACU-	VA
White Clover	Trilfolium repens	FACU-	U-M

Wild Strawberry	Fragaria virginiana	FACU	A
Timothy	Phleum pratense	FACU	M
Cypress Spurge	Euphorbia cyparissias	UPL	M
Spotted Knapweed	Centaurea maculosa	UPL	U
Black Raspberry	Rubus occidentalis	NI	U
Red Osier Dogwood	Cornus stolonifera	FACW	U
Multiflora Rose	Rosa multiflora	FACU	A
Riverbank Grape	Vitis riparia	FACW	M
Ashleaf Maple	Acer negundo	FAC+	U-M
Reedcanary Grass	Phalaris arundinacea	FACW+	U
Rough Cinquefoil	Potentilla recta	UPL	U

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	U
Ashleaf Maple	Acer negundo	FAC+	VA
Riverbank Grape	Vitis riparia	FACW	M
Ostrich Fern	Matteuccia struthiopteris	FACW	A
Honeysuckle	Lonicera spp.		U-M
False Nettle	Boehmeria cylidrica	FACW+	U-M
Dames Rocket	Hesperis matronalis		U

While a few of the species near the monitoring well location are designated FACW species, there was not a dominance of wetland vegetation in this area. ROC02 is marked with a five foot wooden stake painted with fluorescent orange paint and a strip of fluorescent pink flagging tape. It is located 55 feet from the nearest wetland boundary and 77 feet from the edge of water. This location is accessible from Day Street and drilling will not require the removal of any mature woody vegetation. The topography in this location is level and the threat of sedimentation to the wetland is minimal.

OXBOW E

Only a single monitoring well ROE01 is proposed in Oxbow E and it is located outside of the 100-foot buffer zone. The topography in this area is level and the chance of any fluids or sediment associated with the drilling reaching the river are minimal.

OXBOW F

There is one monitoring well proposed for Oxbow F and it is designated ROF01. ROF01 is located on Northeast Utilities property adjacent to the GE Newell Street parking lot and south of the Housatonic River. The property consists of a mix of early successional vegetation (both woody and herbaceous), however, there is a cleared, dirt roadway which has no wetland vegetation which runs through the property.

Vegetation identified in monitoring well location:

Common Name	Species Name	Hydric Category	Abundance
Wild Strawberry	Fragaria virginiana	FACU	U
Cypress Spurge	Euphorbia cyparissias	UPL	A
Spotted Knapweed	Centaurea maculosa	UPL	M
Black Raspberry	Rubus occidentalis	NI	U
Ashleaf Maple	Acer negundo	FAC+	U
Rough Cinquefoil	Potentilla recta	UPL	U-M
Yarrow	Achillea millefolium	FACU	M
Trembling Aspen	Populus tremula	FACU	M-A

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	M
Ashleaf Maple	Acer negundo	FAC+	VA
Riverbank Grape	Vitis riparia	FACW	U
Honeysuckle	Lonicera spp.		U-M
Dames Rocket	Hesperis matronalis		VA
Red Osier Dogwood	Cornus stolonifera	FACW	A
American Elm	Ulmus americana	FACW-	M

Monitoring well ROF01 is marked by a strip of fluorescent flagging tape and is located 33 feet from the closest wetland boundary and at least 60 feet from the edge of water. The topography is level in the monitoring well area, however, there are drop-offs 30 feet to the west and 40 feet to the north. Access to this monitoring well can be gained along the dirt roadway (which does not contain wetland vegetation) off of Newell Street and it is not necessary to remove any mature woody vegetation for the drilling operation.

GE NEWELL STREET PARKING LOT

It is proposed to place three wells designated RNS09, RNS10, and RNS11 in the GE Newell Street Parking Lot located north of Newell Street and south of the Housatonic River.

1. RNS09

Vegetation identified in monitoring well location:

None; location is adjacent to an existing paved area

Vegetation identified within closest wetland boundary:

Common Name	Species Name	Hydric Category	Abundance
Cottonwood	Populus deltoides	FAC	U
Ashleaf Maple	Acer negundo	FAC+	M-A

The bordering vegetated wetland in this area is very narrow and there are only approximately six individual plants near the monitoring well. The monitoring well has been designated RNS09 and is located 20 feet from the edge of water in the sand bordering the asphalt parking area east of the covered walkway which spans the river. RNS09 is marked with fluorescent orange paint sprayed on a steel plate. Access can be gained through the parking area. This well is located close to the edge of water and any fluids associated with the drilling shall be contained and will not be allowed to enter the river.

2. RNS10

Vegetation identified in monitoring well location:

None; location is in the paved parking lot about 200 feet south of RNS09; thus it is about 220 feet from the Housatonic River and no impact is likely.

3. RNS11

Vegetation identified in monitoring well location:

None; location is in the paved parking lot about 160 feet south of RNS09; thus it is about 180 feet from the Housatonic River (outside of the 100-foot buffer zone) and no impact is likely.

If you have any questions concerning the information in this report, please contact us at your convenience.

Sincerely,
ASSOCIATED ENVIRONMENTAL SCIENTISTS, INC.

Randall P. Christensen
Environmental Biologist

cc. Hill Engineering
AES, Inc. File

APPENDIX D

PITTSFIELD ZONING MAP

nw

ne

PITTSFIELD ZONING MAP
SECTION TWO OF TWO SECTIONS
FEB 17, 1973
Donald H Eder MAYOR
PRESIDENT OF CITY COUNCIL
Leonard J Grabon CITY CLERK

PONTOOSUC LAKE

ONOTA LAKE

SILVER LAKE

GOODRICH POND

MOREWOOD LAKE

MUD POND

RICHMOND POND

PITTSFIELD STATE FOREST

PITTSFIELD AIRPORT

BERKSHIRE COMMUNITY COLLEGE CAMPUS

Housatonic River

Southwest Branch Housatonic River

sw

se

PREPARED BY
PITTSFIELD PLANNING BOARD
BASE MAP BY
Technical Planning Associates tpa

Scale 1" = 600'

Revisions October 1984

PITTSFIELD ZONING MAP

ADOPTED FEBRUARY 17, 1973
THE CITY COUNCIL OF PITTSFIELD, MASSACHUSETTS

Donald H Eder, MAYOR — Leonard J Grabon, CITY CLERK — John F Fraser, PRESIDENT OF CITY COUNCIL

LEGEND

RESIDENCE DISTRICTS
R-43 = Single Family 43,560 sq ft per lot
R-20 = Single Family 20,000 sq ft per lot
R-12 = Single Family 12,000 sq ft per lot
R-6 = Single Family 6,000 sq ft per lot
Two Family 7,500 sq ft per lot
R-G = Garden Apartments
R-M = Multi-Family

BUSINESS DISTRICTS
B-C = Grouped Business
B-G = General Business
B-D = Downtown Business
C-W-S = Commercial, Warehousing and Storage

INDUSTRIAL DISTRICTS
I-L = Light Industrial
I-G = General Industrial

SPECIAL DISTRICTS
LDI = Limited Industrial

Zone Boundary = ---

Section One of Two Sections

101 96 03

161

APPENDIX E

UTILITY DRAWINGS

DAY ST.

MYSTIC ST.

NEWELL ST.

MEADOW LANE

ELM ST.

D.M.H. 0+14

C.B. D.M.H. 4+31.3

D.M.H. 6+65.3

W.B. 579-P. 31
Outlet 983.80

C.B.

Drain Easement
Reg. of Deeds-6-1-1918
Book 380 - P. 29

D.M.H. 11+73.5

D.M.H. 14+83.6

See Plan W.S. 110

1913

Redrawn from plan W.S. 98

D.M.H.
980.48
14
+83.6

D.M.H. D.M.H. D.M.H. D.M.H.

979.00

48 Inch Circular Pipe

0.10' : 100'

975

0 2 3 4 +31.3 5 6 +14 7 8 +63.3 9 10 11 +73.5 12 13

WEST UNION ST.

MONROE ST.

JOHN ST.

D.M.H. 0+0

D.M.H. 0+39.7

D.M.H. 3+45

Drain Easement in
Reg. of Deeds 6-23-1836
Book 302 - Page 310

0-16.5'

WEST BRANCH HOUS. RIVER

D.M.H. D.M.H. D.M.H.

24 Inch Iron Pipe 18" 12 Inch Vitrified Pipe

987.63 0.45' : 100' 983.79 985.25 988.77 0.44' : 100' 990.60

W.B. W.S. 353-P. 73 1930

980

-1.5 0-10.0 0 +39.7 1 2 3 +45

Redrawn from plan W.S. 35

98

WHIPPLE ST.

N

See Plan No 12c

FENN ST.

Comm. of Mass. to City of Pitts. Right to Build & Maintain Weir & Conduit. Reg. B. 438 - P. 280.

Weir 7+31.2

D.M.H. 7+27.4

D.M.H. 5+15.1

D.M.H. 7+55

D.M.H. 5+14

D.M.H. 3+73

D.M.H. 1+57

D.M.H. 0+73

72.2

D.M.H. 0+22

D.M.H. 1+95.7

EAST ST.

COVE ST.

D.M.H. 0+23

D.M.H. 4+48.9 +0

D.M.H. 3+56

D.M.H. 3+37

Redrawn from plans No 105 & 168

12' Drain Easement Recorded 8-8-28 in Reg. of Deeds B. 448 - P. 471.

D.M.H. 1+16.5

Headwall 0+0

HOUSATONIC RIVER

Weir Detail
Scale 1" = 4'

5'0"

A

A

B

B

6.0

12"

12"

4.0

976.10

5" Plank

2" Sheeting 12' Long

6.0'

4.0'

4.0'

6.0'

Section on A-A

D.M.H.

18 Inch Vitrified Pipe

1.88' : 100'

978.12

18 Inch Vitrified Pipe

977.70

0.36' : 100'

976.90

976.40

18" V.t.

975.35

24" V.t.

975.04

977.03

976.36

974.78

12 Inch R.C. Pipe

1.94' : 100'

980.42

982.72

N.B. No 337 - P. 3

1928

970

+55 7 6 +14 5 4 +73 3 2 +57 1 +73 +23 0 +22 1 +55.7

N.B. No 601 - P. 66

1936

576.10

Weir H.W.

575.66

574.85

574.78

574.69

574.53

574.21

574.05

48" C.I.

48" Concrete

0.18' : 100'

48" C.I.

970

D.M.H.

7 +12.4 +31.2

6 5+15.1

4 4+48.9

3 +56

3+05 +37

2

1 +16.5 +55

0

See Plan No 56 EOB Culvert Detail

Car Wash

Laundromat

S.M.H. 49+06

52" Permanent Sewer Easement

Car Wash

48" Eastern Intercepting Sewer Contract Plan N:o 2 Sheet N:o 6

24" C.I. Sewer Abandoned in 1960

S.M.H. 61+52

Plan N:o 111

S.M.H. 54+69

S.M.H. 54+02

E. 1ST. ST.

Sept. Plan N:o 162

CROSIER AVE.

MYSTIC ST.

S.M.H.

S.M.H.

S.M.H.

S.M.H.

48 Inch R.C. Pipe

0.06' : 100'

969.73

969.24

970.30

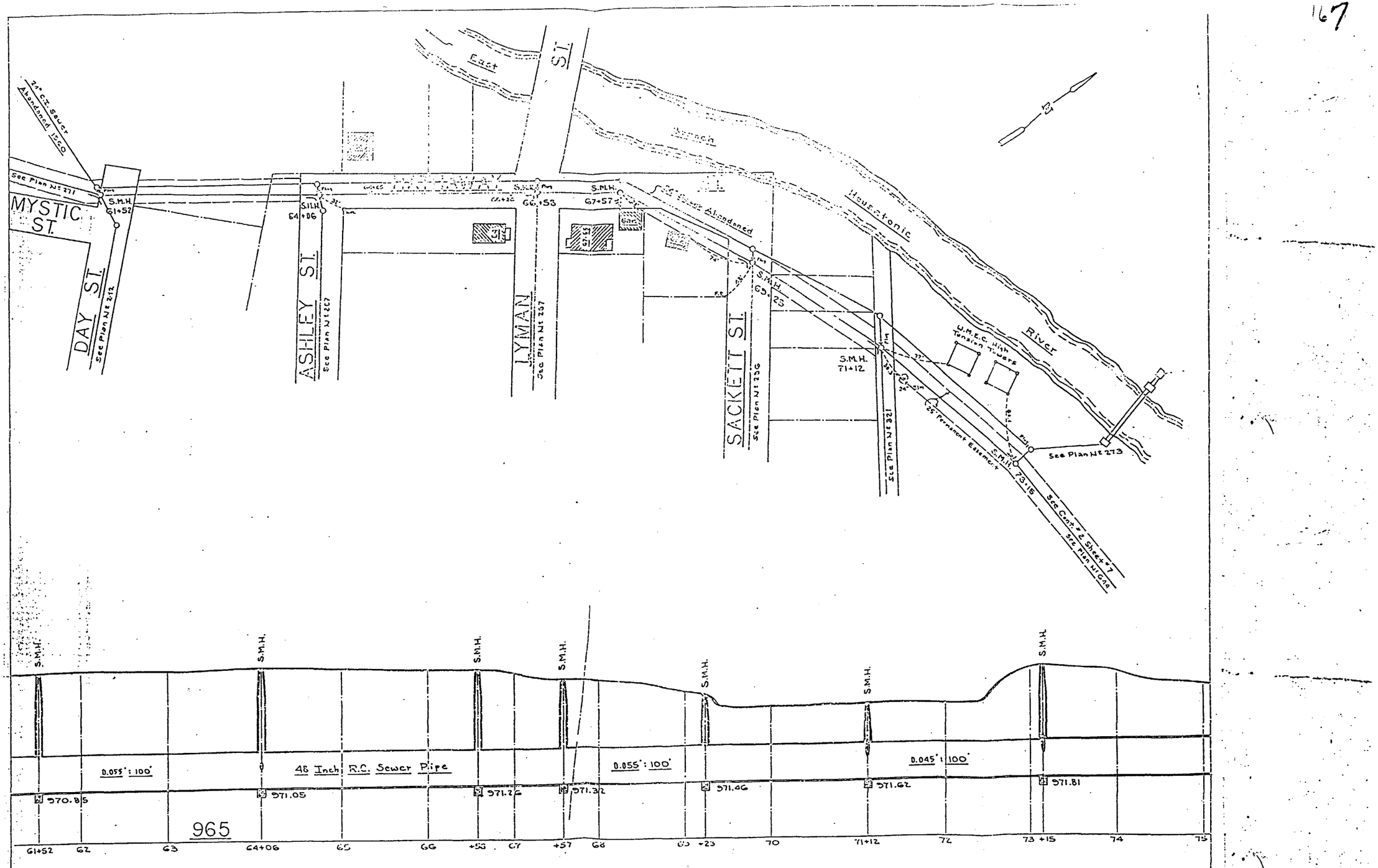
971.50

965

47+20.5 48 49+0 50 51 52 53 54+02 55 56 +69 57 58 59 60

Location in N.D. 553-P26 Elevations from Cont. "2 Record Plan 1062

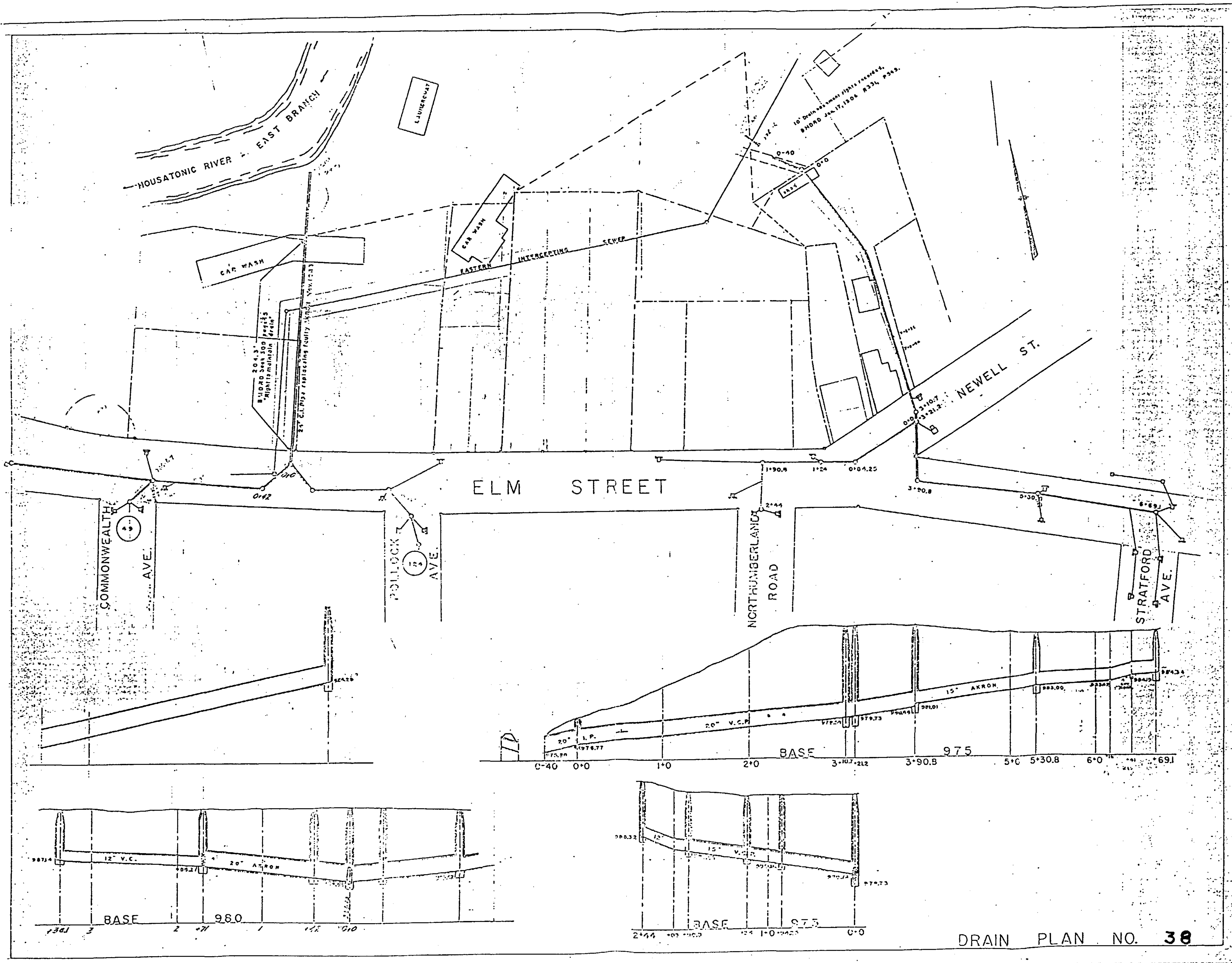
271



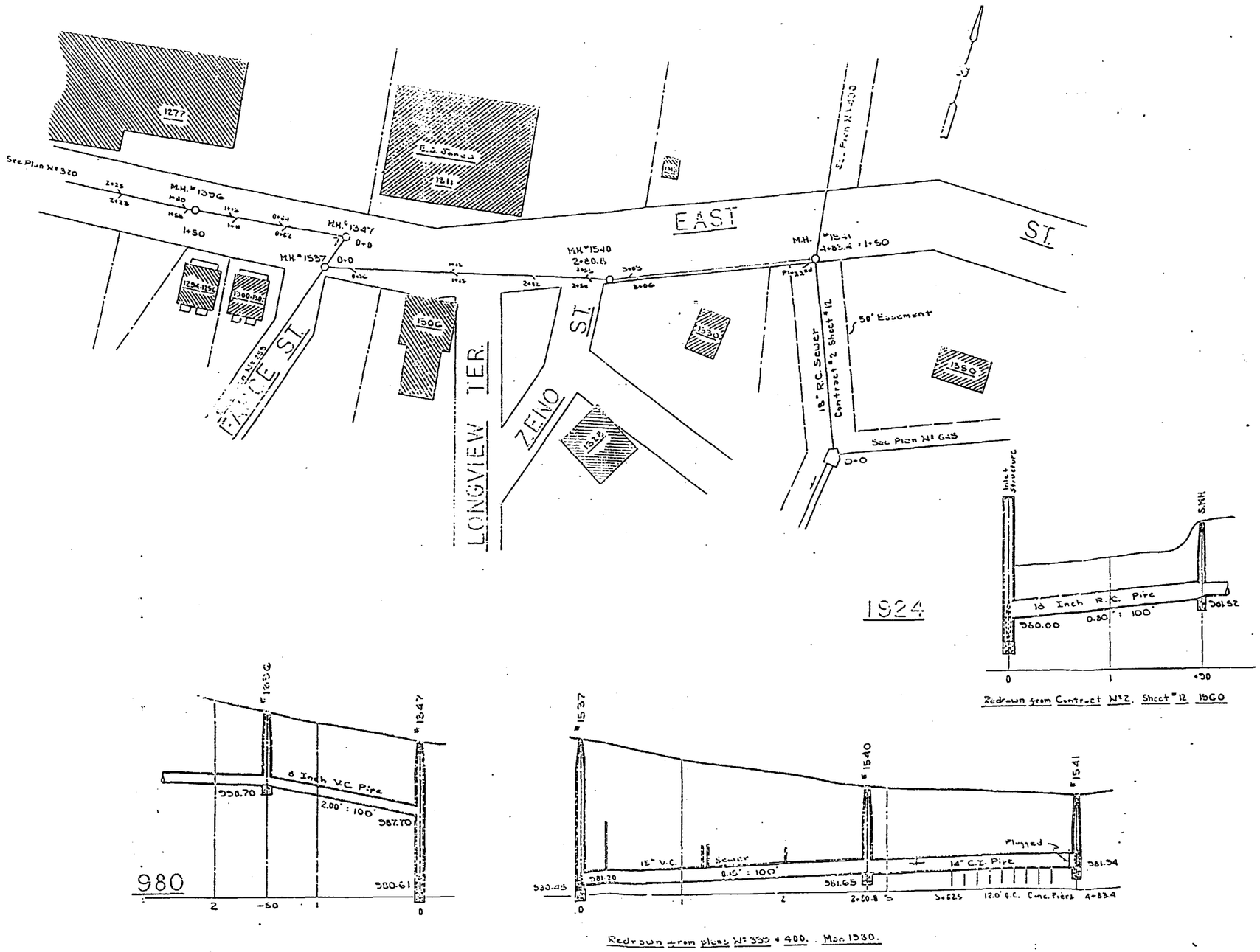
Location in W.B. 553 - P. 26 Elevations taken from Cont.ª 2 Sheet.ª 7 1962

Abandoned 24" Sewer Redrawn from plan Nº 272

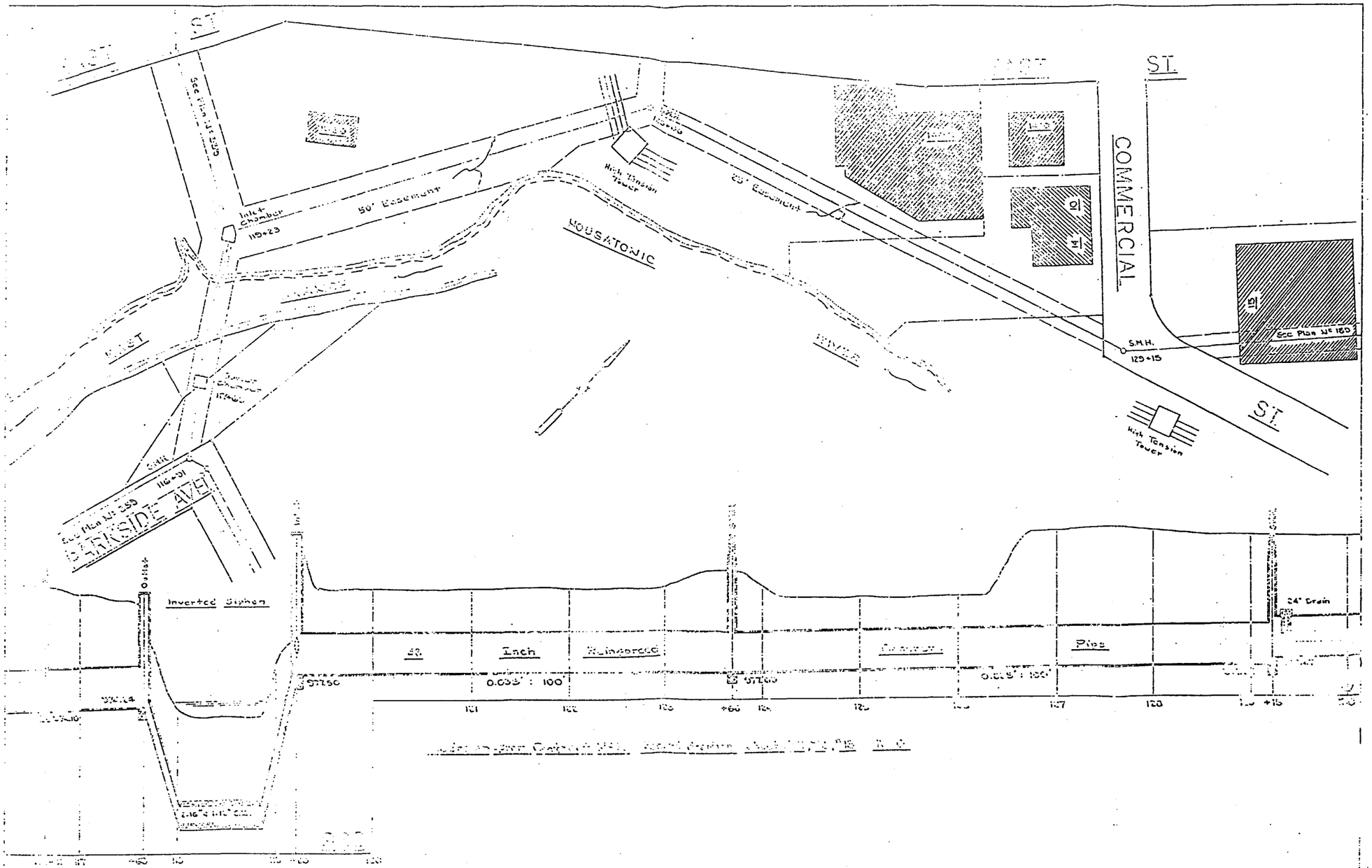
272



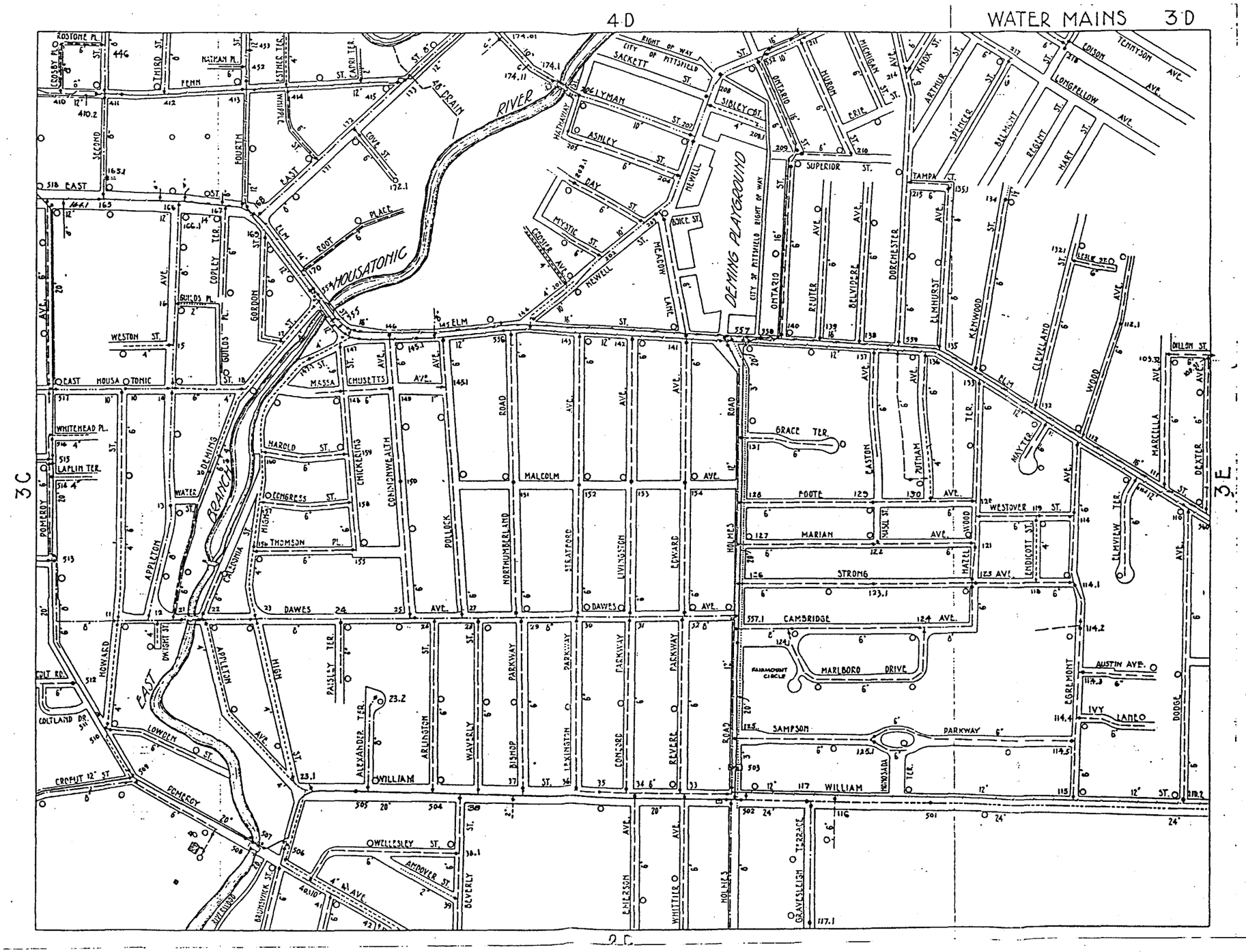
DRAIN PLAN NO. 38


1277
E.S. Jones
1311
See Plan N° 320
M.H. N° 1336
1+50
M.H. N° 1347
0+0
M.H. N° 1527
0+0
EAST
ST.
M.H. N° 1540
2+80.6
M.H. N° 1541
4+83.4 : 1+50
See Plan N° 1400
1294-1296
1280-1282
PACE ST.
See Plan N° 283
1306
LONGVIEW TER.
ZENO
ST.
1328
1330
1350
18" R.C. Sewer
Contract N°2 Sheet N°12
50' Easement
See Plan N° 645
0+0
Inlet Structure
S.M.H.
16 Inch R.C. Pipe
560.00
0.80 : 100'
561.52
0
1
+50
1924
Redrawn from Contract N°2. Sheet N°12 1960
980
8 Inch V.C. Pipe
550.70
2.00 : 100'
547.70
550.61
2
-50
1
0
N° 1537
N° 1540
N° 1541
15" V.C. Sewer
0.15 : 100'
Plugged
14" C.I. Pipe
581.20
581.65
581.94
530.45
12.0' O.C. Conc. Piers
3+82.5
4+83.4
Redrawn from plans N° 399 & 400. Mar 1930.

170


EAST ST.
See Plan No 389
BERKSIDE AVE
Inlet Chamber
119+23
50' Easement
HOUSATONIC
RIVER
High Tension Tower
25' Easement
EAST ST.
COMMERCIAL
ST.
S.M.H.
125+15
See Plan No 160
High Tension Tower
Inverted Siphon
24" Reinforced Concrete Pipes
0.035' : 100'
0.015' : 100'
24" Drain
121
122
123
+60
124
125
126
127
128
129
+15

645


4D
3D
3C
3E
RIVER
HOUSATONIC
EAST BRANCH
DEMING PLAYGROUND
CITY OF PITTSFIELD RIGHT OF WAY
SACKETT ST.
HOLLYMAN ST.
ASHLEY ST.
RAY ST.
MYSTIC ST.
NEWELL ST.
MEADOW LANE
SUPERIOR ST.
TAMPA ST.
ELM ST.
WESTON ST.
EAST HOUSATONIC ST.
WHITEHEAD PL.
LAFLIN TER.
POMEROY
APPLETON AVE.
HAROLD ST.
CONGRESS ST.
THOMSON PL.
DAWES AVE.
MALCOLM AVE.
GRACE TER.
FOOTE
MARIAN AVE.
STRONG
CAMBRIDGE
MARLBORO DRIVE
FAIRMONT CIRCLE
SAMPSON PARKWAY
WILLIAM ST.
WESTOVER
ELMVIEW TER.
AUSTIN AVE.
IVY LANE
DODGE
HOWARD
COLTLAND DR.
LOWDEN ST.
CROFUT ST.
WELLESLEY ST.
ANDOVER ST.
ARVID AVE.
BEVERLY
WHITTIER
HOLMES
GRAVESLEIGH TERR.
ROSTONE PL.
COSBY PL.
NATMAN PL.
PENN
CAPRI TER.
COVE ST.
ROOT PLACE
GOULDS PL.
COPLEY TER.
GORDON
MASSACHUSETTS AVE.
CHICKERING
COMMONWEALTH
POLLOCK ROAD
NORTHUMBERLAND
STRATFORD
LIVINGSTON
EDWARD ROAD
PAISLEY TER.
ALEXANDER TER.
ARLINGTON
WAVERLY
BISHOP PARKWAY
LEXINGTON
CONCORD
REVERE
ONTARIO
HURON
ERIE
MICHIGAN AVE.
ARTHUR
SPENCER
BELMONT
REGENT
HART
LONGFELLOW AVE.
TENNYSON AVE.
EDISON
DORCHESTER
ELMHURST
KENWOOD
CLEVELAND
WOOD
MARCELLA
DEXTER
DILLON ST.
EGREMONT
BERK 32"
BERK 30"
BERK 24"
BERK 20"
BERK 16"
BERK 12"
BERK 8"
CI 16"
CI 12"
CI 10"
CI 8"
CI 6"
CI 4"

WATER MAINS

5D

4C

4E

3D

SPRINGSIDE PARK

SILVER LAKE

SEE #437

EAST BRANCH HOUSATONIC

ALBANY & BOSTON RAILROAD

LAKE

CANYON

ROAD

ABBOTT ST.

SPRINGSIDE AVE.

HULL AVE.

STODDARD

MYRTLE

PLEASURE

COURTLAND ST.

PINE

GLENWOOD

GROVE

TYLER

BURBANK

ORCHARD ST.

WILLOW ST.

MAPLE ST.

LINCOLN

SECOND

PLEASANT ST.

MAMUN ST.

ADAM ST.

MONTELLOMA PL.

POND ST.

AVON PL.

COLEMAN TER.

WALLACE PL.

LAKE

THIRD

FOURTH

SILVER ST.

LANCKTON CT.

WILLINGTON AVE.

CHERRY

SPRING

WINTER

CURTIS

RUSSELL ST.

OAK

FRANCO TER.

KELLOGG

BROWN

PARKER

PLUMKETT

FOREST

PLACE

WOODLAWN

SCAMMELL

DRAPER

SADLER

DICKINSON

NORMAN

PERRINE

ALDEN

STANLEY

CRAIGIN

BENEDICT

CASTPARK

TANNER

SPRING SIDE

LAND

CLOSED

WESTMINSTER

HARVARD

DARTMOUTH

DALTON

PITTSFIELD

DELANCY

ELBERON

RIDGEWAY

BRIGHTON

SPRUCE ST.

OHIO

NEW

CON

LENOX

CONNECTICUT

DELAWARE

YORK

ISLAND

HAMPSHIRE

ROAD

JERSEY AVE.

PARKSIDE

PEMBROKE

RADCLIFFE

TENNYSON

LONGFELLOW

EDISON

MELVILL

HOPE

ARCH

MILFORD

LOCKWOOD

WINTHROP

LOMBARD

MILBOX AVE.

HERBERT

RICHARDSON

ALLESIO

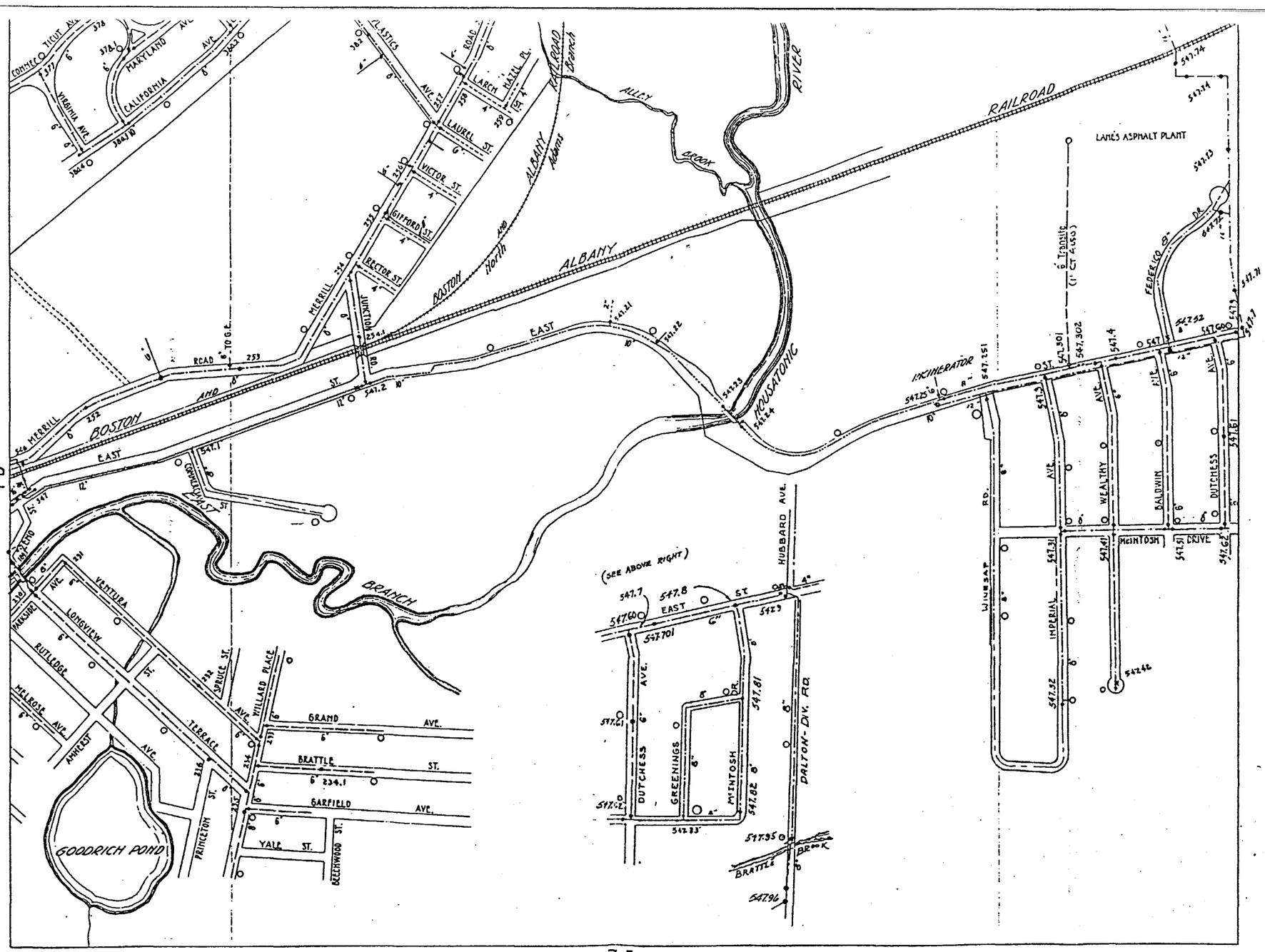
CHELSEA

VERMONT

OTTAWA ST.

FRANKLIN ST.

SCHOOL


4 D
3 E
BOSTON AND ALBANY RAILROAD
BOSTON AND ALBANY RAILROAD
North Adams Branch
HOUSATONIC RIVER
ALLEY BROOK
LANE'S ASPHALT PLANT
MERRILL
JUNCTION
EAST
ST.
RD.
AVE.
DR.
CRESCENT ST.
BRANCH
CONNECTICUT AVE.
MARYLAND AVE.
CALIFORNIA AVE.
VIRGINIA AVE.
ALASTICS ROAD
LARCH HAZEL PL.
LAUREL ST.
VICTOR ST.
GIFFORD ST.
HECTOR ST.
VENTURA
LONGVIEW
RUTLEDGE
PRESCOTT
MELROSE AVE.
AMHERST AVE.
SPRUCE ST.
WILLARD PLACE
TERRACE
PRINCETON ST.
GOODRICH POND
GRAND AVE.
BRATTLE ST.
GARFIELD AVE.
YALE ST.
BEECHWOOD ST.
HUBBARD AVE.
(SEE ABOVE RIGHT)
DUTCHESS AVE.
GREENINGS
McINTOSH
DALTON-DIV. RR
BROOK
IMPERIAL RD.
WINESAP
WEALTHY
BALDWIN
DUTCHESS
FREDERICK DR.
6" TRANSITE (1" CT 4.953)
INCINERATOR

APPENDIX F

SOIL BORING LOGS AND WELL CONSTRUCTION LOGS

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: FP-1 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Footpath Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 28 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.5	5-9-7-5	Sand, fine, brown (70%); sand, medium, brown (20%)
				gravel, medium to coarse, rounded (10%).
2	4	1.0	6-7-6-5	Sand; fine (80%); gravel, medium, rounded (20%).
4	6	1.2	6-5-3-3	Sand, medium, tan to brown (85%); gravel, medium to
				coarse (20%), rounded.
6	8	0.8	4-5-6-3	Sand, medium, brown (90%); gravel, medium, rounded
				(10%).
8	10	1.0	6-5-4-5	Cinder, ash and angular gravel, medium to coarse (70%);
				sand, medium, brown (30%).
10	12	0.7	4-3-3-6	Sand, fine, tan to brown (85%); gravel, fine to medium,
				angular (10%); trace cinder and ash fragments.
12	14	0.6	3-6-4-3	Sand, medium, brown to tan (100%).
14	16	1.2	3-4-4-5	Same as above.
16	18	1.0	4-6-5-8	Sand, medium, brown to gray-brown (80%); coarse,
				varicolored (20%).
18	20	0.4	3-7-4-4	Same as above.
20	22	0.6	6-5-4-5	Sand, coarse, (85%); medium, tan (15%).
22	24	0.8	3-4-6-5	Sand, medium to fine, gray-brown (90%); coarse (10%).
24	26	0.4	4-6-4-3	Sand, medium (50%); coarse (50%); all gray-brown.
26	28	0.5	3-3-5-2	Sand, coarse, (60%); varicolored; medium, brown (40%).
28	30	0.4	3-4-2-4	Silt, dense, gray (90%); gravel clasts, black (10%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: FP-2 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Footpath Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	1.1	5-7-.	Sand, medium to coarse, brown (80%); gravel, medium to
			10-12	coarse (20%).
2	4	0.7	3-8-6-13	Sand, silty, fine, dark brown (70%); gravel, coarse,
				angular (25%); trace cinder fragments.
4	6	0.9	5-3-3-3	Cinder and brick fragments, black and red-orange (90%);
				silty, fine sand, brown (10%).
6	8	0.5	3-6-8-9	Silt, brown to dark brown (80%); gravel, fine to medium,
				trace very coarse (20%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: FP-3 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Footpath Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	1.6	3-4-5-5	Sand, fine to medium, dark brown to brown (80%); gravel,
				medium to coarse, angular (20%).
2	4	0.5	3-3-5-6	Silt, dark brown (60%); sand, fine to medium, brown
				(30%); gravel, medium to coarse (10%).
4	6	0.7	6-8-7-8	Sand, fine to medium, brown (90%); gravel, fine to
				medium (10%).
6	8	0.8	3-6-9-4	Brick and concrete fragments, very coarse to coarse
				(90%); trace silt and sand, brown.

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: FP-4 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Footpath, Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 8 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.8	12-11-	Sand, fine to medium, brown to dark brown (80%);
			10-10	gravel, fine to medium, rounded (20%).
2	4	1.0	11-8-8-5	Silt, brown to dark brown, micaceous (70%); sand, fine,
				brown (20%); gravel, medium to coarse (10%).
4	6	1.4	4-5-7-5	Silt, brown, moderately dense, micaceous (80%); sand,
				fine, brown (15%); trace fine gravel.
6	8	2.0	4-6-4-4	Silt, olive-brown, dense, mottled brown and orange
				throughout, micaceous (100%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: YB-1 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Pittsfield, MA DRILLING STARTED: 10/6/89 DRILLING COMPLETED: 10/6/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.8	30-32-	Sand, medium, brown to dark brown (80%); gravel, medium
			22-20	to coarse (20%); angular fragments.
2	4	0.9	12-12-	Sand, fine (40%) to medium (30%); brown to dark brown;
			9-9	gravel, medium to coarse (30%); orange mottling
				throughout.
4	6	0.5	10-60-	Sand, fine (50%) and silt (30%), brown; gravel, medium
			12-72	to coarse (20%).
6	8	1.3	7-7-5-7	Silt (40%) and sand, very fine (40%), dark brown;
				gravel, medium (15%); trace cinder fragments; sharp
				contact at 7 ft with sand, fine, tan (100%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: YB-2 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Pittsfield, MA DRILLING STARTED: 10/6/89 DRILLING COMPLETED: 10/6/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.8	15-22-	Sand, fine, brown (70%); gravel, medium to coarse (30%).
			12-17	
2	4	0.7	12-12-	Silt, brown (70%); gravel clasts, fine to medium,
			9-8	angular (30%) embedded throughout.
4	6	1.0	7-7-8-5	Sand, fine, brown (80%); gravel, fine to medium, as
				cinder fragments (20%).
6	8	0.5	4-4-5-6	Same as above with no fill material (gravel is broken
				quartzose fragments).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: YB-3 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Pittsfield, MA DRILLING STARTED: 10/6/89 DRILLING COMPLETED: 10/6/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.6	9-7-9-7	Sand, fine brown to dark brown (80%); gravel, fine to
				medium, rounded to angular (20%).
2	4	0.9	6-6-5-5	Sand, same as above (60%); gravel, medium to coarse,
				angular (40%).
4	6	1.8	4-3-4-5	Sand, silty, fine, light brown (85%), micaceous;
				gravel, fine to medium (15%).
6	8	2.0	5-3-3-4	Silt, olive-brown to gray, moderately dense, micaceous
				(80%); sand, fine, light brown (10%); gravel, fine to
				medium, rounded, varicolored (10%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: YB-4 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Pittsfield, MA DRILLING STARTED: 10/6/89 DRILLING COMPLETED: 10/6/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	1.1	9-8-8-13	Sand, fine, brown (90%); gravel, medium, as angular
				cinder fragments (10%); orange mottling in places.
2	4	0.6	6-8-9-13	Sand, fine, light brown to brown (50%); gravel, medium
				to coarse, as cinder, brick, and coal fragments,
				angular (50%).
4	6	1.0	6-5-6-7	Sand, medium, dark brown (50%); silt, brown (40%);
				gravel, medium to coarse, angular (10%).
6	8	1.6	5-3-3-9	Silt, light brown, loose, micaceous (95%); trace fine
				gravel and fine sand.

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: YB-5 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: East Street Pittsfield, MA DRILLING STARTED: 10/6/89 DRILLING COMPLETED: 10/6/89

TOTAL DEPTH DRILLED: 6 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	0.8	6-6-7-5	Sand, fine, dark brown (80%); gravel, medium, as rock
				fragments (15%); trace small cinder fragments.
2	4	0.6	2-2-	Sand, fine, brown (85%); gravel, medium (10%); trace
			20-27	cinder fragments.
4	6	0.9	21-22-	Sand, fine, brown (60%); silt, brown (25%); gravel, fine
			17-16	to medium (10%), trace coarse.
6	8	1.8	7-7-4-5	Silt, light brown, loose, micaceous (95%); trace fine
				gravel.

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: SA-1 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: Smith Auto Electric Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 10 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	1.2	5-6-6-5	Sand, fine, brown (50%); silt, brown, dense (45%); trace
				fine to medium gravel, rounded.
2	4	0.5	6-3-3-3	Sand, medium to coarse, brown (60%); gravel, medium to
				coarse (40%).
4	6	1.0	3-5-3-7	Sand, medium, brown (90%); gravel, fine to medium (10%).
6	8	1.0	7-3-5-8	Sand, fine, brown (85%); silt, brown, loose (10%).
8	10	1.6	5-5-5-6	Silt, brown to dark brown, moderately dense, micaceous
				(100%).
10	12	2.0	6-4-4-5	Silt, olive-brown to gray-brown, dense, micaceous
				(100%).

GERAGHTY & MILLER, INC.

SAMPLE/CORE LOG

BORING: SA-2 PROJECT NO: NY0360SS06 PAGE: 1 of 1

SITE LOCATION: Smith Auto Electric Pittsfield, MA DRILLING STARTED: 10/5/89 DRILLING COMPLETED: 10/5/89

TOTAL DEPTH DRILLED: 10 ft HOLE DIAMETER: 4 in. TYPE OF SAMPLE/ CORING DEVICE: Split-Barrel Core

LENGTH & DIAMETER OF CORING DEVICE: 2 ft x 1.5 in. SAMPLING INTERVAL: 2 ft

LAND-SURFACE ELEVATION: ( ) SURVEYED ( ) ESTIMATED DATUM:

DRILLING FLUID USED: None DRILLING METHOD: Hollow-Stem Auger

DRILLING CONTRACTOR: Soil & Material Testing DRILLER: Gilley HELPER: Gary

PREPARED BY: T. Loukides HAMMER WEIGHT: 140 lb. HAMMER DROP: 30 inches

SAMPLE DEPTH (FT BELOW LAND SURFACE)		CORE RECVRY (FT)	BLOW COUNTS PER 6 INCHES	SAMPLE/CORE DESCRIPTION
FROM	TO			
0	2	1.0	8-7-5-5	Sand, medium to coarse, gray-brown (40%); gravel and
				concrete fragments, coarse (60%).
2	4	1.0	4-5-	Same as above.
			40-37	
4	6	1.2	10-12-	Sand, medium to coarse, dark brown (70%); gravel, medium
			15-18	to coarse (20%); concrete fragments.
6	8	0.8	9-6-5-5	Silt, brown to dark brown, micaceous (90%); gravel, fine
				to medium, rounded (10%).
8	10	0.9	3-4-3-5	Sand, silty, fine, brown to dark brown (100%), slightly
				micaceous.
10	12	1.2	4-5-5-4	Same as above.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well A-1 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area A, Elm Street Drilling Started 11-7-91 Drilling Completed 11-7-91

Total Depth Drilled 24 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 984.24 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.2	5-12-14-21	ROA010002	SAND (70%) brown, coarse-grain, loose; Gravel (30%) small to
					medium, subrounded.
2	4	1.6	8-22-24-30	ROA010204	SAND (75%) brown to olive-brown, coarse at top, finer at base,
					slightly moist; Gravel (25%) small to large, subangular
					to subrounded.
4	6	1.8	8-11-25-35	ROA010406	SAND (75%) brown, coarse to fine at top, grading to gray-brown,
					medium to fine at base; Gravel (20%) small to medium, sub-
					rounded; Asphalt (5%) pieces at 5.5 ft, asphalt odor, moist
					above asphalt, dry below.
6	8	1.7	9-18-21-19	ROA010608	SAND (70%) brown to gray, medium to coarse, dry, loose at top,
					tight at base; Gravel (30%) small to medium, subangular to
					subrounded.
8	10	1.6	12-14-23-37	ROA010810	SAND (80%) brown to gray, coarse to fine, moist, loose at top,
					tight at base; Gravel (15%) small to medium, subangular;
					Brick, and mortar pieces (5%).
10	12	1.0	18-35-29-15	ROA011012	SAND (65%) brown, coarse, moist at top, to gray, fine, tight at
					base; Gravel (25%) small to medium, subangular; Grey Sandstone
					fragments (10%).
12	14	1.9	6-6-7-5	ROA011214	SAND (80%) brown, coarse at top to black, fine to medium at base
					moist; Gravel (20%) small to medium, subangular.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well A-1

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
14	16	0.4	6-7-3-3	ROA011416	SAND (40%) brown, coarse, wet at top; change at approx. 15.0
					feet to Sand (50%) black, fine, natural, wet; Silt
					(10%) fine, black, with organics.
16	18	1.6	2-5-3-4	ROA011618	SAND (80%) black, fine, wet with organics, grading to coarse
					Sand/Gravel (20%) (appears as river gravel) at base.
18	20	2.0	2-4-4-5	ROA011820	SAND (95%) fine, black interlayered with coarse, gray sand;
					Silt (5%) black, within fine sand layers; trace organic
					roots; orange mottling in coarse sand layer near base.
20	22	0.5	7-16-5-3	ROA012022	SAND/GRAVEL mixture (100%); coarse brown, wet sand and small
					rounded gravel.
22	24	1.0	3-12-9-7	ROA012224	SAND/GRAVEL mixture (70%) as above; change to Sand (20%)
					very fine, light yellow-brown with trace fine, light-brown
					Gravel (10%) small to medium, within fine sand/silt layer.
					Some coarse sand/gravel mixture as above at very base of
					spoon.
					Depth to Water = 14 ft
					Bottom of Fill = approximately 15.0 ft

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well A-2 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area A, Elm Street Drilling Started 11-20-91 Drilling Completed 11-20-91

Total Depth Drilled 16 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	0.7	3-30-12-20	ROA2B0002	SAND (85%) dark brown, fine to coarse, moist, Gravel (10%) small
					to large, subangular to subrounded; Brick (5%) red, crushed.
2	4	2.0	5-9-13-14	ROA2B0204	SAND (75%) brown, fine to coarse, dry to moist; Gravel (25%)
					small to large, angular to rounded.
4	6	1.2	4-4-5-3	ROA2B0406	SAND (85%) brown to olive-brown, to stained black, moist, fine
					to coarse; hydrocarbon odor; Gravel (15%) small to medium, sub-
					angular to subrounded.
6	8	0.9	5-3-2-2	ROA2B0608	SAND (85%) brown to stained black, fine to medium, moist to wet;
					strong hydrocarbon odor; Gravel (10%) small to medium, sub-
					rounded; Asphalt (5%).
8	10	1.3	2-8-40-49	ROA2B0810	SAND (60%) brown to slightly stained black, fine to coarse-
					grain, dry; Gravel (40%) large, angular; piece of cement in
					shoe; cement layer holding water above it.
10	12	0.3	10-70/R	ROA2B1012	Poor recovery: CONCRETE (70%) large pieces; Sand (30%) brown,
					medium-grain, moist. Spoon refusal on concrete at approx. 11 ft.
					Auger to 12 feet. Trace brick.
12	14	0.4	21-43-26-30	ROA2B1214	SAND (50%) brown, medium-grain, wet; Gravel (40%) small to
					medium, subrounded; change to coarse Sand/Gravel mixture (10%)
					at approximately 14 feet.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well A-2 Page 2 of 2

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	SAMPLE ID	Sample/Core Description
14	16	0.2	38-18-18-18	ROA281416	Natural SAND (100%) black-brown, very fine-grain, wet; trace
					roots, organics.
					Depth to Water = 13 feet
					Bottom of Fill = 14 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well A-3 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area A, Elm Street Drilling Started 1-6-91 Drilling Completed 1-6-91

Total Depth Drilled 22 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 985.3 feet ☐ Surveyed ☐ Estimated Datum

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller G. Rustemeyer Helper J.Massimiano

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.0	7-10-24-29	ROA380002	SAND (65%) brown to dark-brown, fine to coarse, moist; Gravel (30%) small to large, rounded; Fill Material (5%) wood, brick.
2	4	0.6	7-18-27-38	ROA380204	SAND (70%) brown to black, fine to coarse, moist; Gravel (20%) small to medium, subrounded; Fill Material (10%) wood, brick.
4	6	1.0	4-18-70/R	ROA380406	BRICK (50%) broken and crushed; Sand (40%) brown, fine to coarse; Wood (5%) and Gravel (5%) small, rounded. Spoon refusal at approximately 5.5 feet, auger to 6 feet.
6	8	1.5	5-33-24-23	ROA380608	SAND (80%) olive-brown to stained black, fine to medium-grain, hydrocarbon odor; Gravel (20%) small to medium, subrounded; Trace crushed brick.
8	10	1.5	6-6-8-13	ROA380810	Same as above, but no brick, moist.
10	12	1.7	2-4-17-30	ROA381012	SAND (85%) olive-green to stained black, moist, fine to medium, hydrocarbon odor; Gravel (15%) small to medium, subrounded; trace brick, graphite.
12	14	1.6	4-9-60/R	ROA381214	SAND (55%) olive-green to stained black, wet, fine; Gravel (45%) large angular; strong Asphalt/tar odor, trace wood near base of spoon.
14	16	0.9	9-11-2-2	ROA381416	SAND (70%) olive-green to stained black, wet, fine to medium; Gravel (30%) large, angular; trace coal, brick; strong Asphalt/tar odor.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well A-3 Page 2 of 2

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
16	18	1.0	2-6-2-2	ROA3B1618	SAND (50%) olive-green to stained black, fine to medium,
					wet, slight asphalt/tar odor; Gravel (10%) small to large,
					angular; change at approx. 17 feet to natural Sand (20%)
					brown, fine with abundant organics, roots, reeds (20%).
18	20	2.0	12-7-7-4	ROA3B1820	SAND (75%) grey, coarse, wet, no odor; Gravel (25%) small,
					rounded, in seams within sand.
20	22	2.0	1-5-7-5	ROA3B2022	SAND and GRAVEL as above (100%).
					Depth to Water at approximately 12 feet
					Bottom of fill at approximately 17 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well B-1 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area B, Lyman Street Drilling Started 11-21-91 Drilling Completed 11-21-91

Total Depth Drilled 20 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 981.88 feet [X] Surveyed [ ] Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	2.0	4-9-8-8	ROB1B0002	SAND (60%) brown, coarse, dry, loose; Gravel (20%) small to
					medium, subangular; Other Fill (20%) coal, glass, brick, wood.
2	4	0.6	10-13-15-10	ROB1B0204	SAND (70%) brown, coarse to fine, dry, loose; Gravel (10%)
					small, subangular; Other Fill (20%) coal, glass, wood, brick.
4	6	0.3	1-1-1-1	ROB1B0406	Poor Recovery: SAND (50%) brown, medium, dry, loose; Wood Fill
					(50%) pieces.
6	8	2.0	2-1-3-2	ROB1B0608	SAND (as above) and Other FILL (50%); change at 7 ft to natural
					Sand (40%) brown to black, coarse, moist, with trace organic
					Roots (5%) and small rounded Gravel (5%).
8	10	2.0	2-1-2-1	ROB1B0810	Natural SAND (90%) dark brown, fine to medium-grain, moist;
					Organic Roots and Reeds (5%); Gravel (5%) very small, rounded.
10	12	2.0	2-1-4-4	ROB1B1012	Same as above, with thin interbedded layers of coarse, olive-
					brown sand, sand coarsening towards base of spoon, moist to wet.
12	14	2.0	2-3-1-2	ROB1B1214	Same as above, wet.
14	16	2.0	1-2-2-2	ROB1B1416	Same as above, wet.
16	18	0.9	2-1-1-2	ROB1B1618	Same as above with trace fine, olive-brown Silt, and larger
					Gravel, wet.
18	20	1.1	1-1-1-1	ROB1B1820	SAND (70%) coarse to medium, olive-brown, wet; Silt (30%)
					gray, fine, wet.
					Depth to Water = 10 feet Bottom of Fill = 7 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well B-1 Page 2 of 2

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
18	20	1.1	1-1-1-1	R0818182O	SAND (70%) coarse to medium, olive-brown, wet; Silt (30%)
					grey, fine, wet.
					Depth to Water = 10 feet
					Bottom of Fill = 7 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well B-2 Project/No. AY05002 Page 1 of 1

Site Location GE/Oxbow Area B, East Street, Johnson Ford Drilling Started 11-22-91 Drilling Completed 11-22-91

Total Depth Drilled 18 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 978.53 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	2.0	4-2-3-4	R08280002	SAND (85%) dark brown, moist, tight, fine-grain; Organic
					Material (15%) roots, reeds, leaves.
2	4	2.0	4-3-3-4	R08280204	SAND (90%) dark brown, moist, fine-grain, grading to grey-brown,
					coarse; Organic Material (10%) roots, leaves.
4	6	2.0	1-1-2-1	R08280406	SAND (80%) dark brown to grey-brown, fine to coarse, moist;
					Organic Material (20%) roots, reeds.
6	8	2.0	1-3-1-4	R08280608	SAND (90%) dark brown to grey-brown, moist, laminated, fine to
					coarse layers; Organic Material (10%) roots, reeds.
8	10	2.0	1-2-2-1	R08280810	Interlayered fine and coarse SAND (100%) dark brown to grey
					brown; moist to wet, trace organics.
10	12	0.9	4-2-3-3	R08281012	SAND (60%) dark brown, fine-grain, to grey, coarse-grain;
					Silt (40%) dark brown, very-fine grain; wet; large roots in
					spoon; trace organics.
12	14	2.0	1-1-1-1	R08281214	SAND (70%) dark brown, fine-grain to grey-brown, coarse-grain,
					wet; Silt (30%) dark brown, very-fine grain; trace organics.
14	16	1.0	1-3-3-5	R08281416	SAND (70%) grey-brown, coarse-grain, wet; Gravel (30%) medium,
					rounded, near base of spoon.
16	18	0.9	5-3-2-5	R08281618	Same as above.
					Depth to Water = 9 feet
					No fill observed.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well C-1 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area C, Elm Street Drilling Started 11-6-91 Drilling Completed 11-6-91

Total Depth Drilled 24 feet Hole Diameter 6 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 988.10 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	0.9	5-10-15-29	ROC010002	SAND (90%) brown, fine to coarse, dry, loose; Gravel (10%) small to medium, subrounded. Large gravel piece in shoe.
2	4	1.1	4-10-9-16	ROC010204	SAND (80%) brown to black, fine to coarse, loose at top to slightly compact at base; Gravel (20%) small to medium, sub-angular to subrounded.
4	6	1.2	3-6-23-28	ROC010406	SAND (60%) brown to olive-brown, fine to coarse, moist, tight; Rock fragments (30%) white, broken, angular; Gravel (10%) small, subangular to subrounded.
6	8	0.4	37-26-13-9	ROC010608	SAND (70%) dark brown, moist, tight, medium to coarse-grain; Rock fragments (20%) large piece in shoe; Gravel (10%) small, subangular to subrounded.
8	10	1.2	10-14-8-6	ROC010810	SAND (85%) dark brown to gray-black, medium to coarse-grain, moist; Gravel (10%) small, subangular to subrounded; Rock fragments (5%) large broken piece, white and pink.
10	12	1.6	7-20-31-11	ROC011012	SAND (85%) brown to black, medium to coarse-grain, moist; Gravel (10%) small, subangular; Rock (5%) white, angular, large; trace graphite pieces.
12	14	1.0	18-50-40-63	ROC011214	SAND (50%) brown, medium-grain, moist; Rock (30%) large, white, broken, angular pieces; Wood (20%) large pieces near base of spoon. (Pushing wood down with auger plug)

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well C-1 Page 2 of 2

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
14	16	0.4	40/60R	ROC011416	SAND (80%) brown, medium-grain, moist; Wood pieces (10%);
					Graphite (10%); trace small gravel; auger to 16 ft. Spoon
					refusal at 15 ft. Pushing wood fill down with auger plug.
16	18	0.7	4-70-38-27	ROC011618	SAND (80%) brown, medium to coarse-grain, wet; Gravel (10%)
					small, subangular; Wood (10%) large pieces.
18	20	0.2	7-10-10-13	ROC011820	SAND (80%) as above; Gravel (20%) medium, subrounded; wet.
20	22	1.8	8-6-6-9	ROC012022	SAND (60%) brown to gray-brown, coarse, wet; Gravel (40%)
					small, rounded; natural roots and reeds.
22	24	1.0	13-10-10-13	ROC012224	Coarse SAND and GRAVEL mixture (100%) brown-gray, coarse
					sand, with medium rounded gravel.
					Depth to Water = 16 ft
					Bottom of Fill = approximately 15 ft

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well C-2 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area C, Day Street Drilling Started 11-4-91 Drilling Completed 11-5-91

Total Depth Drilled 20 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 986.46 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used Water Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	0.7	12-20-20-20	ROC020002	SAND (70%) olive-brown, fine, dry; Gravel (20%) small to large, subangular; Brick (10%) red, crushed.
2	4	0.6	14-15-7-8	ROC020204	BRICK (100%) red, crushed; no soil recovery, no sample submitted.
4	6	1.0	29-7-8-10	ROC020406	SAND (70%) olive-brown to black, fine to medium, dry; Gravel (10%) small, subangular; Fill (20%) wood, brick.
6	8	0.6	8-9-10-10	ROC020608	SAND (75%) as above; Gravel (10%) small, subangular; Fill (15%) wood, brick; slightly moist.
8	10	1.0	8-6-4-4	ROC020810	SAND (80%) brown to black, fine to medium, strong hydrocarbon odor; Gravel (10%) small, subangular; Wood (10%) fill; moist to wet, oily sheen observed on sediments.
10	12	2.0	3-3-3-4	ROC021012	SAND (50%) black, fine to coarse, wet, hydrocarbon odor; Gravel (50%) subrounded, small to medium; oily sheen observed on sediments.
12	14	1.0	2-5-5-6	ROC021214	SAND (70%) olive-brown, fine to coarse, wet; Gravel (30%) small, subrounded; trace brick and wood; hydrocarbon odor, no oily sheen observed in sample.
14	16	0.5	12-10-5-3	ROC021416	SAND and Gravel as above (50%) to approximately 15 ft; change to Sand (40%) black, fine to coarse, laminated with black organic material; trace fine black silt; hydrocarbon odor, no sheen.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well C-2 Page 2 of 2

Prepared By A. LaSarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
16	18	0.1	2-2-1-2	ROC021618	Poor recovery; GRAVEL (95%) small to medium, angular; Sand
					(5%) brown, as coating on gravel. Not enough soil for
					sample. Oily sheen observed on water in spoon.
18	20	0.4	1-3-3-4	ROC021820	SAND and GRAVEL washdown (50%); Sand (50%) black, fine,
					with black organic material laminae.
					Depth to Water = approximately 8 ft
					Bottom of Fill = approximately 15 ft

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well C-3 Project/No. AY05002 Page 1 of 1

Site Location GE/Oxbow Area C, Elm Street Drilling Started 11-20-91 Drilling Completed 11-20-91

Total Depth Drilled 14 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.1	13-5-18-22	ROC3B0002	SAND (80%) black to brown, fine to coarse, dry, loose; Gravel
					(15%) small to large, subangular to subrounded; Other Fill
					Material (5%) brick, coal.
2	4	2.0	6-9-8-8	ROC3B0204	SAND (70%) black to brown, medium to coarse-grain, dry, loose;
					Gravel (15%) small, subangular; Coal (15%) black, crushed and
					pieces. Very slight hydrocarbon odor.
4	6	1.2	9-17-12-5	ROC3B0406	SAND (85%) olive-brown to black, fine to coarse, slightly moist;
					Gravel (15%) small to medium, subangular to subrounded; Other
					Fill Material (5%) coal; very slight hydrocarbon odor.
6	8	1.8	12-10-8-10	ROC3B0608	SAND as above (35%) with Gravel (10%) and Coal (5%); slight
					hydrocarbon odor; 7-8' change to natural Sand (50%) fine, brown,
					with orange mottling, trace organic roots.
8	10	2.0	11-9-5-5	ROC3B0810	SAND (95%) olive-brown to brown, orange mottling, fine-grain,
					slightly moist; Gravel (5%) small, rounded; trace organic roots
					and reeds.
10	12	2.0	6-6-3-3	ROC3B1012	SAND as above (100%) orange mottling, fine-grain, moist.
12	14	2.0	4-4-3-4	ROC3B1214	SAND (100%) olive-brown, fine at top grading to grey-brown,
					coarse at base; wet.
					Depth to Water = approximately 12 feet
					Bottom of Fill = approximately 7 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well E-1 Project/No. AY05002 Page 1 of 2

Site Location GE/Oxbow Area E, E. of Lyman St. P. Lot Drilling Started 11-13-91 Drilling Completed 11-13-91

Total Depth Drilled 24 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 987.97 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.2	2-5-10-7		SAND (80%) red-brown, medium-grain; Coal pieces (10%) crushed,
					red/black; Gravel (10%) small, subangular.
2	4	1.0	3-4-5-10		SAND (60%) red-brown as above, dry, loose; Coal (40%) small
					pieces, and crushed, red/black.
4	6	0.7	2-7-8-5		SAND (70%) as above; Coal (25%); Gravel (5%) as above; dry,
					loose.
6	8	0.8	4-5-7-8		SAND (85%) red-brown as above; Coal fragments (5%) small or
					crushed, red/black; Gravel (10%) small, black, some white
					sandstone.
8	10	1.8	12-21-34-41		SAND (70%) red-brown as above; Fill (25%) metal scraps, coal
					fragments, white powdered mortar; Gravel (5%) small to medium.
10	12	2.0	26-50-45-54		Top 6" is brown SAND (25%), coarse-grain, wet with some gravel;
					6-12" is white powderized mortar (25%); 12-18" is change to
					black sand (40%), medium-grain with trace black, fine, silt
					(10%) pieces of shiny metal (lead?) at top of spoon.
12	14	1.8	24-23-14-21		SAND (85%) gray, brown and orange, mottling apparent in base of
					spoon, fine, wet; Gravel (15%) predominantly in top of spoon;
					trace small coal pieces, probably wash.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well E-1

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID.	Sample/Core Description
14	16	1.9	7-4-2-3		SAND (90%) brown to stained black, fine-grain, slight hydro-
					carbon odor; Gravel (10%) predominantly near top of spoon,
					small, subrounded.
16	18	1.3	4-3-5-6		SAND (95%) brown to gray, medium-grain, wet, no apparant
					staining or odor; trace organics, roots; Gravel (5%) small,
					rounded, near top of spoon.
18	20	1.8	11-2-1-1		SAND (90%) brown-gray, slight black staining in layers near
					middle of spoon, wet, coarser at top to finer grain
					near base; Wood (10%) appears as pieces of roots; trace
					black organics.
20	22	1.2	3-3-1-2		SAND (60%) gray-brown, medium-grain, wet; Silt (40%) brown
					to olive-brown, fine, wet; trace organic material, roots.
22	24	0.1	2-2-8-10		Poor recovery, same as above.
					Depth to Water = approximately 14 feet
					Bottom of Fill = approximately 12 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well E-2 Project/No. AY05002 Page 1 of 2

Site Location Oxbow Area E, Pittsfield, Massachusetts Drilling Started 3-25-91 Drilling Completed 3-25-91

Total Depth Drilled 22 feet Hole Diameter 6.5 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2' x 2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller Ed Helper George

Prepared By A. LaMarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2	1.0	6-6-5-5	SAND (80%) black to red-black, medium to coarse, slight hydrocarbon odor; crushed Coal and Cinders (20%), black to red.
2	4	1.1	4-3-4-5	SAND (50%) black to red-black, medium to coarse; large Coal fragments with some crushed Coal (50%).
4	6	1.2	5-3-7-19	Coal fragments (20%) upper two-inches; thin (0.5") yellow-brown sand layer (10%); SAND (50%) brown-red to black, fine to medium, with Coal fragments (20%) as above.
6	8	1.1	25-12-11-10	SAND (40%) red-brown to black, medium; Coal fragments (30%) crushed and whole; Glass fragments (20%) shiny, black; Gravel (10%) medium, angular to subangular.
8	10	1.1	8-10-11-11	SAND (50%) red-brown to black, medium; Coal fragments (50%) crushed and whole, black and orange.
10	12	1.2	7-6-8-9	SAND (50%) as above; Coal fragments (50%) as above.
12	14	1.2	8-13-13-11	SAND (50%) red-brown to black, medium; Coal fragments (50%) black, orange; trace Brick in shoe.
14	16	1.3	6-6-6-5	Same as above, moist in shoe.
16	18	1.5	5-10-7-6	SAND (90%) red-brown at top, medium, to brown and black, fine to medium at base, wet; Gravel (10%) fine, rounded; trace orange mottling in sand.
18	20	2.0	5-3-32-27	SAND (80%) red-brown, medium at top; Oil at approximately 19 feet, saturated soil, hydrocarbon odor; Coal (20%) saturated with oil (washdown).

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Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well E-2

Prepared By A. LaBarge

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
20	22	1.7	10-12-7-7	SAND (100%) brown to grey, wet, medium-grain. No oil or staining, no hydrocarbon odor.
				Depth to Water at approximately 14 feet
				Bottom of Fill at approximately 16 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well F-1 Project/No. AY05002 Page 1 of 1

Site Location GE/Oxbow Area F, W. of Newll St. P. Lot Drilling Started 11-14-91 Drilling Completed 11-14-91

Total Depth Drilled 18 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. 983.54 feet ☒ Surveyed ☐ Estimated Datum USGS 1929 NGVD

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.3	2-4-6-6	ROF1B0002	SAND (90%) brown, medium to fine-grain top 7", change to gray-
					black, fine-grain, dry, loose, bottom 7", Gravel (10%) small,
					subangular to subrounded.
2	4	1.0	3-4-6-4	ROF1B0204	SAND (95%) brown to gray-black, loose, dry, fine-grain; Gravel
					(5%) small, subrounded; trace coal cinders, red/black.
4	6	0.6	2-4-3-3	ROF1B0406	SAND (95%) gray-black to black, fine-grain, dry, loose; Gravel
					(5%) very small, subrounded.
6	8	0.4	11-11-5-11	ROF1B0608	SAND (90%) brown to gray-black, fine to medium-grain, moist to
					dry, tight to loose; Gravel (10%) small, subrounded.
8	10	0.9	5-10-7-4	ROF1B0810	SAND (90%) brown to stained black, moist to wet, no odor; Gravel
					(10%) small, rounded, stained black.
10	12	2.0	1-1-2-4	ROF1B1012	SAND (90%) stained black, fine to medium-grain, tight, moist
					to wet; Organic roots and reeds (10%).
12	14	0.4	6-7-5-6	ROF1B1214	SAND (90%) black, fine to medium-grain, wet; Gravel (5%) small,
					rounded; Organic Material (5%) roots and reeds.
14	16	0.3	5-19-27-28	ROF1B1416	SAme as above, wet, no odor.
16	18	1.1	3-1-1-1	ROF1B1618	Black SAND as above to 16 ft (50%) grading into brown coarse
					Sand (30%) with medium rounded Gravel (20%).
					Depth to Water = approximately 8 feet
					Bottom of Fill = approximately 10 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well F-2 Project/No. AY05002 Page 1 of 1

Site Location GE/Oxbow Area F, W. of Newell St. P. Lot Drilling Started 11-14-91 Drilling Completed 11-14-91

Total Depth Drilled 12 feet Hole Diameter 10 1/4 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 2'x2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller E. Cotes Helper G. Rustemeyer

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.0	3-8-10-12	ROF2B0002	SAND (60%) brown to yellow-brown, coarse-grain, dry, loose;
					Gravel (40%) small to large, angular to rounded. .
2	4	0.5	10-22-12-17	ROF2B0204	SAND (70%) brown to black, medium to fine-grain, moist; Gravel
					(30%) small to large, angular to rounded.
4	6	1.2	7-10-10-8	ROF2B0406	SAND (80%) red-brown to black, coarse-grain, moist; Gravel (15%)
					small to large, angular to rounded; other Fill material (5%)
					glass, wood.
6	8	1.1	2-1-4-5	ROF2B0608	SAND (85%) olive-brown to stained black, medium to fine-grain
					wet; Gravel (10%) small to medium, subrounded; other Fill (5%)
					metal (nails) and wood.
8	10	1.1	1-2-6-10	ROF2B0810	8-9 ft, SAND as above (30%) with Wood-Fill (20%); 9-10 ft,
					change to olive-green, silty Sand (50%) some black staining,
					trace small gravel, slight hydrocarbon odor.
10	12	1.0	4-14-22-14	ROF2B1012	SAND (90%) brown to stained black, medium to fine; Gravel (10%)
					small, rounded; trace organic material, roots and reeds.
					Depth to Water = approximately 8 feet
					Bottom of Fill = approximately 9 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well K-1 Project/No. AY05002 Page 1 of 1

Site Location GE/Pittsfield, Oxbow Area K Drilling Started 1-31-91 Drilling Completed 1-31-91

Total Depth Drilled 20 feet Hole Diameter 6.65 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 2' x 2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-stem Auger

Drilling Contractor Clean Berkshires, Inc. Driller Ed Cotes Helper George/Chris

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.7	25-3-11-10	R00180002	SAND (60%) brown, fine, dry; Silt (30%) brown, fine, dry;
					Gravel (10%) angular, medium.
2	4	1.9	10-9-4-5	R00180204	SAND (90%) brown-grey, medium, dry; Silt (10%) brown, fine, dry,
					very uniform, well-sorted sand.
4	6	2.0	2-2-1-3	R00180406	SAND (85%) brown-gray, medium, moist, very well-sorted; Organic
					material (15%) reeds, roots, toward base of spoon.
6	8	2.0	2-3-3-2	R00180608	SAND (95%) brown to black, medium to coarse, moist to wet;
					Organic material (5%) reeds, roots, decayed.
8	10	2.0	2-3-3-3	R00180810	Same as above, wet.
10	12	2.0	3-3-3-4	R00181012	SAND (90%) brown-gray to black, medium to coarse, wet; Organic
					material (5%) reeds; very fine gray sand in shoe (5%).
12	14	2.0	2-3-6-8	R00181214	SAND (60%) brown, coarse, wet; Sand (40%) gray, very fine, wet,
					bottom 0.8 feet, interbedded with coarse sand.
14	16	2.0	5-6-8-9	R00181416	SAND (100%) brown to black, very coarse, with interbedded thin
					fine-sand layers (gray), wet.
16	18	2.0	6-3-3-6	R00181618	Same as above.
18	20	2.0	5-7-9-6	R00181820	Same as above.
					Depth to Water at approximately 8 feet
					Bottom of Fill at approximately 6 feet

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well K-2 Project/No. AY05002 Page 1 of 1

Site Location GE/Pittsfield, Oxbow Area K Drilling Started 1-31-91 Drilling Completed 1-31-91

Total Depth Drilled 10 feet Hole Diameter 6.65 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 2' x 2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Hollow-stem Auger

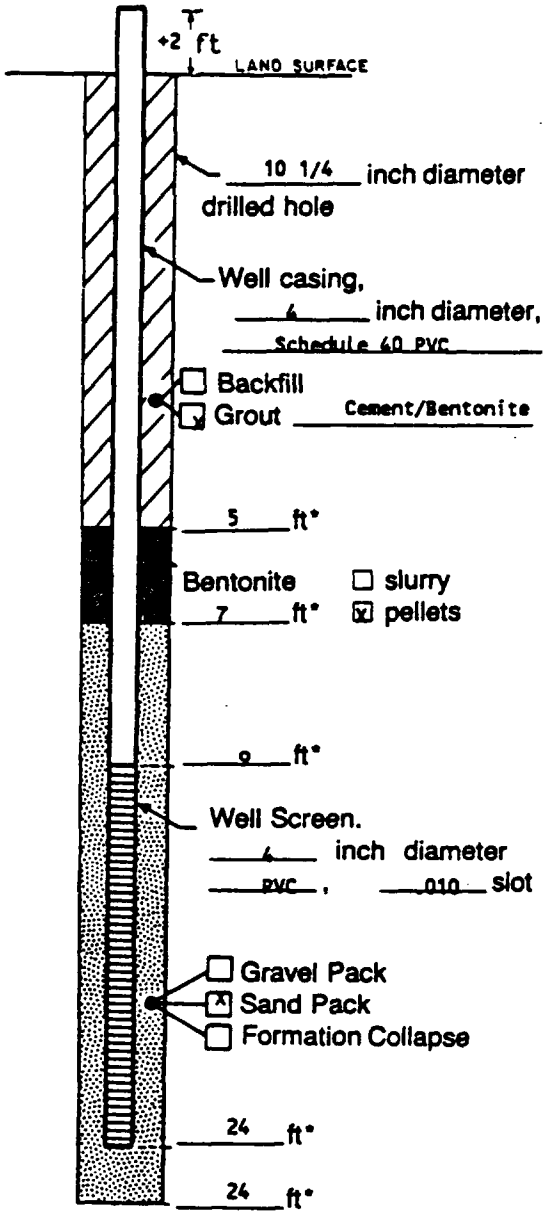
Drilling Contractor Clean Berkshires, Inc. Driller Ed Cotes Helper George/Chris

Prepared By A. LaBarge Hammer Weight 140# Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	SAMPLE ID	Sample/Core Description
0	2	1.6	13-4-5-3	R002B0002	SAND (80%) brown, fine to medium, dry very well sorted sand,
					very uniform; Silt (20%) dark brown, dry.
2	4	2.0	4-3-4-2	R002B0204	SAND (100%) medium-brown, medium, dry, to darker-brown, fine,
					dry, moderately sorted.
4	6	1.6	2-1-1-1	R00B20406	SAND (100%) brown to black, fine to medium, moderate to well
					sorted, wet.
6	8	1.7	1-4-3-3	R002B0608	SAND (30%) brown to black, medium, some cellophane included;
					wood in middle (20%) decayed; Bottom 1 foot is sand (50%)
					brown to gray, coarse, moderately to poorly sorted.
8	10	2.0	3-2-3-4	R002B0810	SAND (100%) brown to gray, medium to coarse, wet, trace organics
					very coarse at bottom, poorly sorted, subrounded.
					Depth to Water at approximately 6 feet
					Bottom of Fill at approximately 7 feet

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well A-1

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum _____ feet ☐ Surveyed

_____ ☐ Estimated

Installation Date(s) 11-7-91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

11-26-91, Compressor with Wilton pump and tubing.

Fluid Loss During Drilling None gallo

Water Removed During Development 110 gallo

Static Depth to Water 14.79 feet below M.

Pumping Depth to Water _____ feet below M.

Pumping Duration 0.5 hours

Yield 4 gpm Date 11-26-91

Specific Capacity _____ gpm/ft

Well Purpose

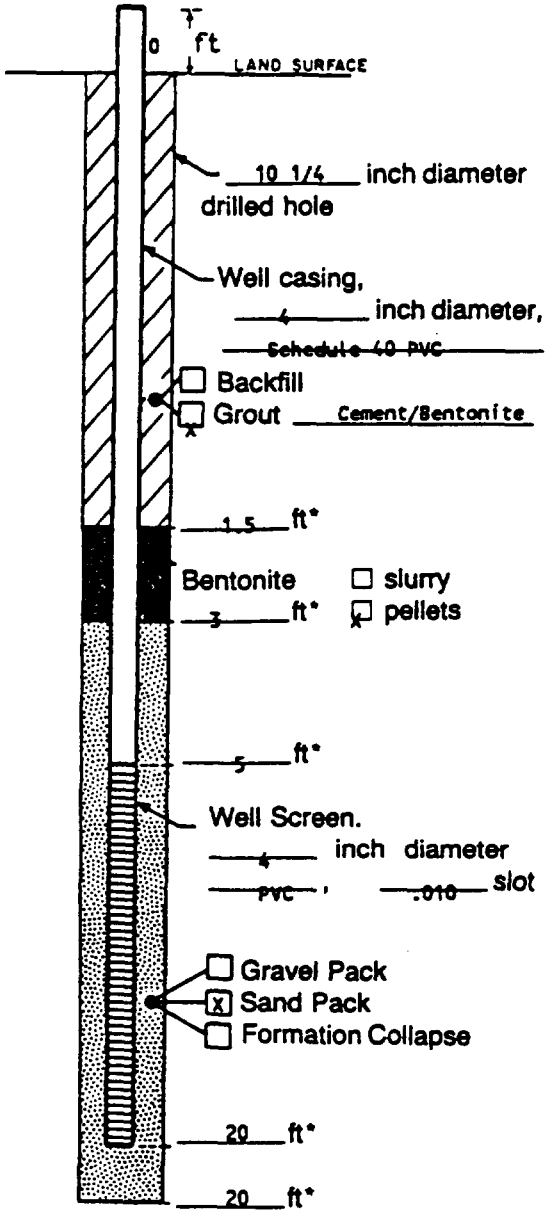
Ground-Water Monitoring Well

Remarks

Prepared by A. LaBarge

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well B-1

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 981.88 feet ☐ Surveyed
USGS 1929 ☐ Estimated

Installation Date(s) 11/21/91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

11-27-91, Compressor with Wilton pump and tubing.

Fluid Loss During Drilling None gallons

Water Removed During Development 55 gallons

Static Depth to Water 10.34 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield 1 gpm Date 11-27-91

Specific Capacity _____ gpm/ft

Well Purpose

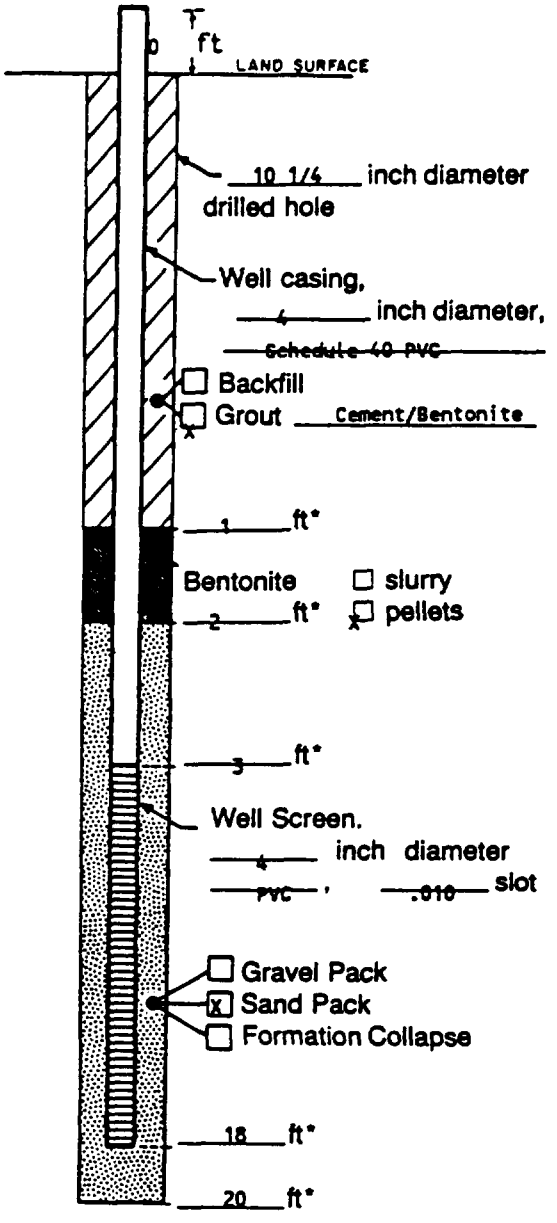
Ground-Water Monitoring Well

Remarks

Prepared by A. LaBarge

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well B-2

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 978.53 feet ☐ Surveyed
USGS 1929 ☐ Estimated

Installation Date(s) 11/22/91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

11-27-91, Compressor with Wilton pump and tubing.

Fluid Loss During Drilling None gallons

Water Removed During Development 110 gallons

Static Depth to Water 6.53 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield 5 gpm Date 11-27-91

Specific Capacity _____ gpm/ft

Well Purpose

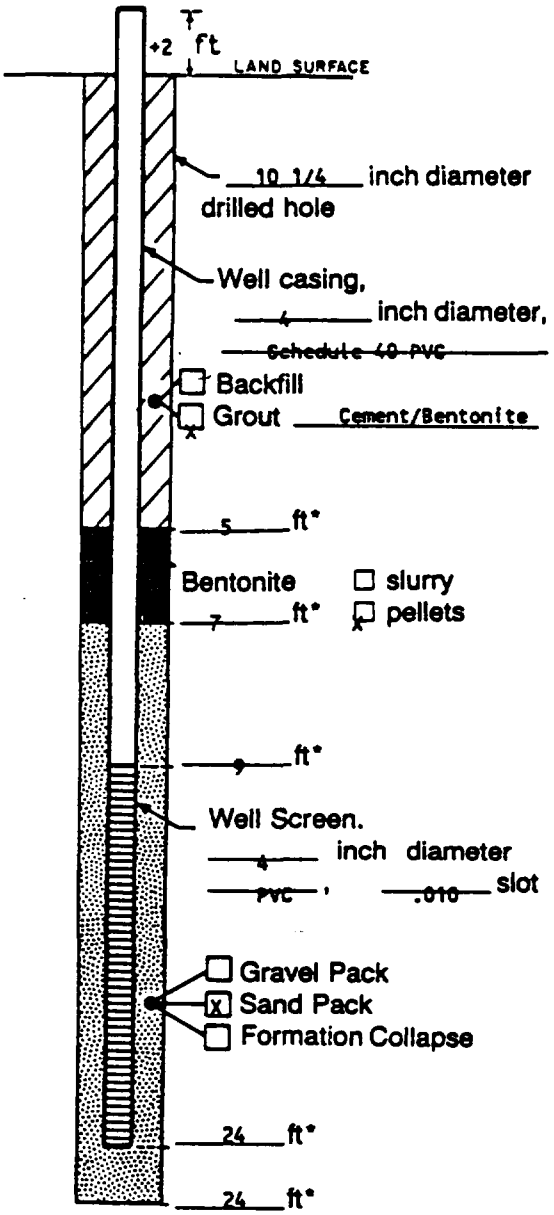
Ground-Water Monitoring Well

Remarks

Prepared by A. LaBarge

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well C-1

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 988.10 feet ☐ Surveyed

USGS 1929 NGVD ☐ Estimated

Installation Date(s) 11-6-91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

11-27-91, Compressor with Wilton pump and tubing.

Fluid Loss During Drilling None gallons

Water Removed During Development 110 gallons

Static Depth to Water 18.30 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield 4.5 gpm Date 11-27-91

Specific Capacity _____ gpm/ft

Well Purpose

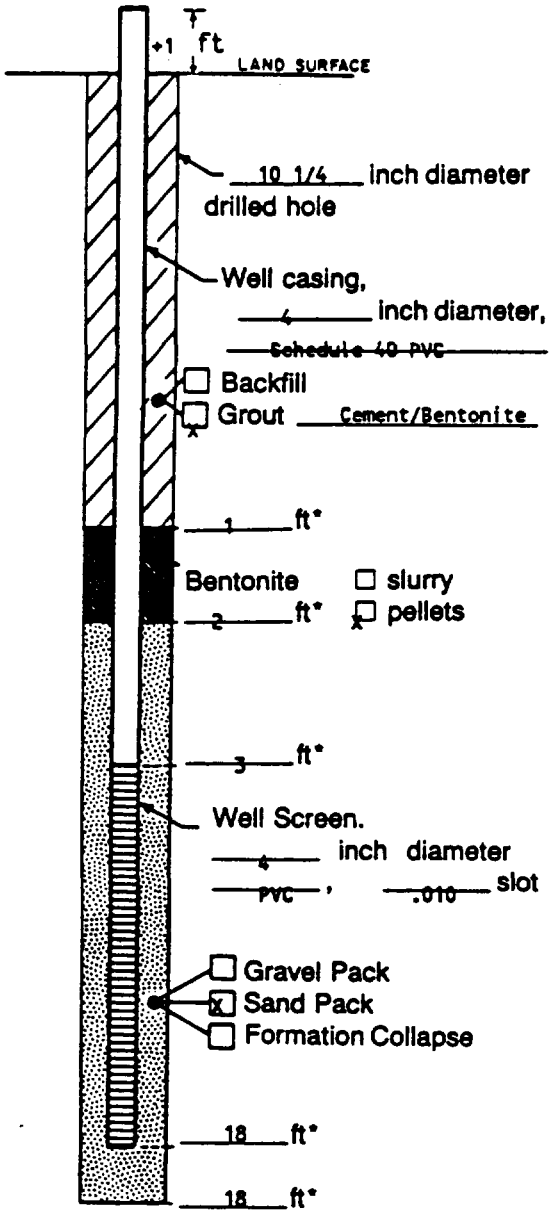
Ground-Water Monitoring Well

Remarks

Prepared by A. LeBarge

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well C-2

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 986.46 feet ☐ Surveyed

USGS 1929 NGVD ☐ Estimated

Installation Date(s) 11-4-91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid Water

Development Technique(s) and Date(s)

11-26-91, 11-27-91, Compressor with Wilton pump and tubing.

Fluid Loss During Drilling 20 gallons

Water Removed During Development 25 gallons

Static Depth to Water 9.23 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield 1 gpm Date 11-26,11-27-91

Specific Capacity _____ gpm/ft

Well Purpose

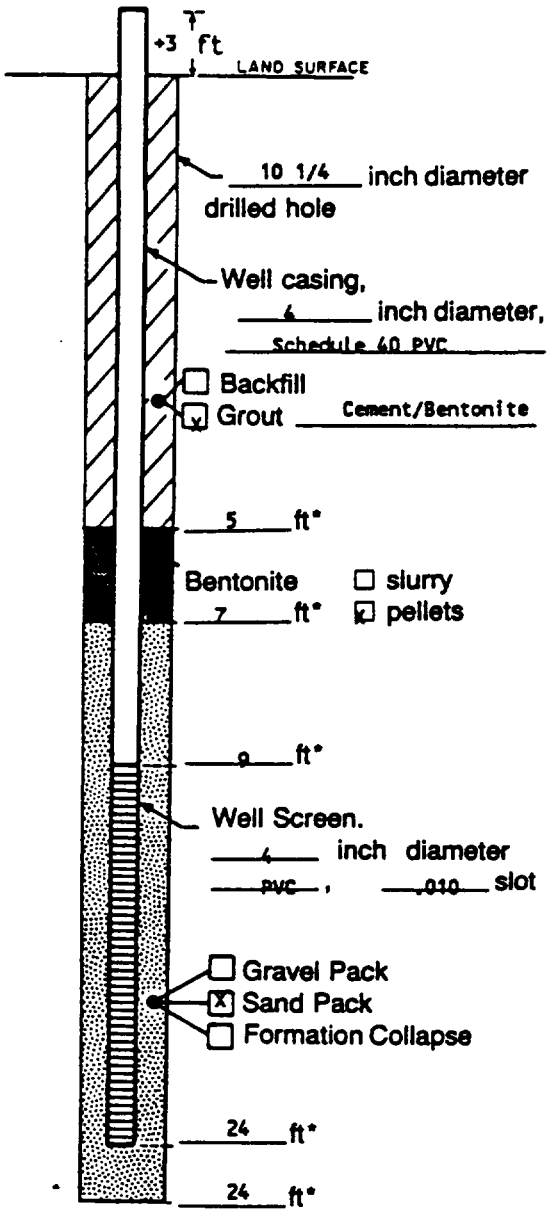
Ground-Water Monitoring Well

Remarks

Prepared by A. LeBorgo

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well E-1

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 987.97 feet ☐ Surveyed
USGS 1929 NGVD ☐ Estimated

Installation Date(s) 11-13-91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
11-27-91, Compressor with Wilton pump and tubing

Fluid Loss During Drilling None gallons

Water Removed During Development 110 gallons

Static Depth to Water 17.35 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield 5 gpm Date 11-27-91

Specific Capacity _____ gpm/ft

Well Purpose
Ground-Water Monitoring Well

Remarks

Prepared by A. LaBarge

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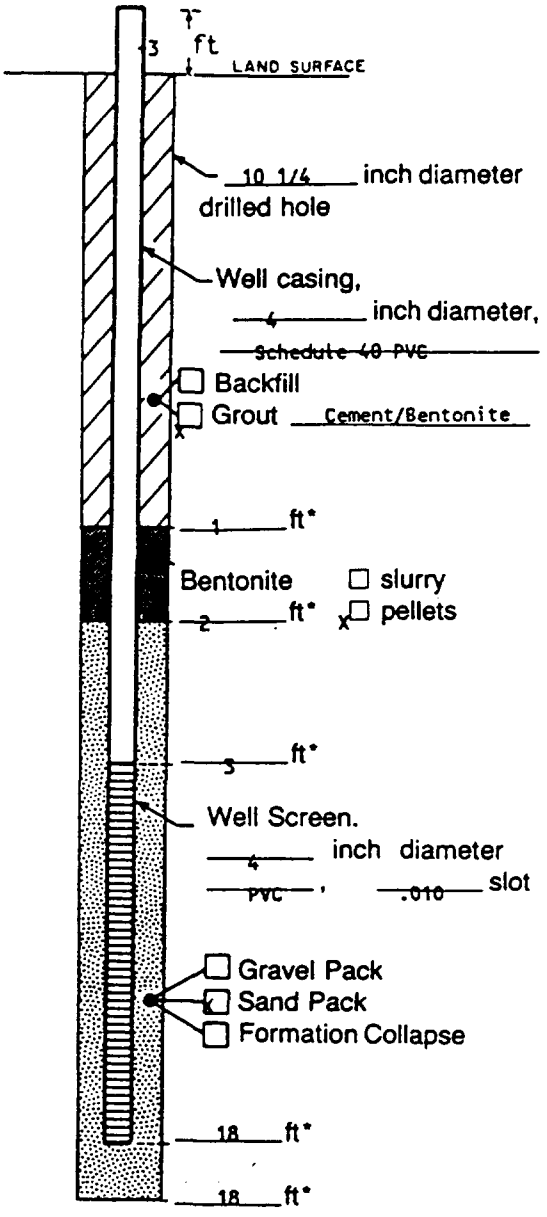
GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project AY05002 Well F-1

Town/City Pittsfield

County Berkshire State MA

Permit No. _____

Land-Surface Elevation

and Datum 983.54 feet ☐ Surveyed

USGS 1929 NGVD ☐ Estimated

Installation Date(s) 11-14-91

Drilling Method Hollow-Stem Auger

Drilling Contractor Clean Berkshires, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

11-26-91, Compressor with Wilton pump and tubing

Fluid Loss During Drilling None gallons

Water Removed During Development 110 gallons

Static Depth to Water 13.84 feet below M.P

Pumping Depth to Water _____ feet below M.P

Pumping Duration _____ hours

Yield 4 gpm Date 11-26-91

Specific Capacity _____ gpm/ft

Well Purpose

Ground-Water Monitoring Well

Remarks

Prepared by A. LaBarge