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*Baseline Monitoring  
Program Proposal for  
Former Oxbow Areas  
A and C Groundwater  
Management Area*

General Electric Company  
Pittsfield, Massachusetts

December 2000



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# 1. Introduction

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## 1.1 General

On October 7, 1999, a Consent Decree (CD) executed by the General Electric Company (GE), the United States Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MDEP), and several other government agencies was lodged in the United States District Court for the District of Massachusetts (Court). The CD was formally entered by the Court on October 27, 2000. The CD governs (among other things) the performance of response actions to address polychlorinated biphenyls (PCBs) and other hazardous constituents in soils, sediment, and groundwater in several areas at and near Pittsfield, Massachusetts that collectively comprise the GE-Pittsfield/Housatonic River Site (the Site).

The CD provides for the performance of numerous Removal Actions at the Site in areas located outside the Housatonic River. Some of those Removal Actions relate to the soils in various Removal Action Areas (RAAs) designated in the CD and an accompanying *Statement of Work for Removal Actions Outside the River* (SOW) (which is Appendix E to the CD). Other Removal Actions relate to the groundwater, as well as non-aqueous-phase liquid (NAPL) (if any), in a number of these areas. For purposes of the latter, the areas at and near the GE Pittsfield facility have been divided into five Groundwater Management Areas (GMAs), some of which include multiple RAAs, based on the geographical proximity of such RAAs and similarities in hydrogeologic conditions. These GMAs are described, together with the Performance Standards established for the Removal Actions at and related to them, in Section 2.7 of the SOW, with further details presented in Attachment H to the SOW (Groundwater/ NAPL Monitoring, Assessment, and Response Programs).

The CD and the SOW require GE to develop and submit a baseline groundwater monitoring program proposal for each GMA. GE's baseline monitoring program proposal for the Former Oxbow Areas A and C GMA (also known as, and referred to herein as, GMA 5) is presented in this *Baseline Monitoring Program Proposal for Former Oxbow Areas A and C Groundwater Management Area* (GMA 5 Baseline Monitoring Proposal). As shown on Figure 1, GMA 5 occupies an area of approximately 7 acres located on the south side of the Housatonic River to the southwest of the GE facility.

This Proposal summarizes the currently available hydrogeologic information for GMA 5 and, based on that information, proposes baseline groundwater monitoring activities that will be used to identify and support any future groundwater-related response actions at Former Oxbow Areas A and C. This Proposal meets the requirements for baseline monitoring program proposals for GMAs, as set forth in Attachment H to the SOW. As specified in Attachment H, each such proposal must include (where applicable) the following items:

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- C Summary of historical groundwater data;
  - C Results of any updated monitoring well inventory performed since 1995 (if available);
  - C A proposal to conduct baseline monitoring at the locations/wells identified in Attachment H to the SOW, with any additions or modifications proposed by GE;
  - C A proposal regarding the groundwater constituents to be subject to baseline monitoring, considering initially all compounds listed in Appendix IX of 40 CFR Part 264 plus 2-chloroethylvinyl ether, benzidine, and 1,2-diphenylhydrazine (Appendix IX+3), as applicable to the monitoring objective, with any proposed well-specific limitations based on prior data from such well(s);
  - C Identification of existing and proposed wells to be monitored for the presence and thickness of NAPL;
  - C An assessment of existing NAPL recovery systems and/or programs (if any), including proposals to optimize NAPL recovery, if appropriate;
  - Proposals regarding other groundwater quality parameters to evaluate intrinsic/natural processes that may mitigate groundwater impacts (if applicable), and regarding wells (if any) to be subject to hydraulic conductivity testing;
  - Identification of other potential sources, as well as an evaluation of the need for additional monitoring for potential preferential pathways near occupied buildings;
  - Proposed frequency and duration of baseline monitoring activities (including quarterly water level monitoring and semi-annual groundwater quality monitoring for at least two years); and
  - C A schedule for baseline field activities, assessments, and reporting.

The baseline activities proposed to address the above requirements in this GMA 5 Baseline Monitoring Proposal have been based on information obtained from prior hydrogeologic investigations. Over the last several years, seven monitoring wells or temporary well points have been installed within GMA 5 and groundwater samples have

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been collected and analyzed. As part of the preparation of this GMA 5 Baseline Monitoring Proposal, GE has further reviewed the available hydrogeologic data within GMA 5. The results of this review (summarized herein) generally confirm that the baseline monitoring activities identified in the SOW are sufficient to assess current conditions and support future groundwater-related response actions within GMA 5. However, as described herein, some modifications to the baseline monitoring program described in Attachment H to the SOW have been identified and are proposed.

## **1.2 Format of Document**

The remainder of this GMA 5 Baseline Monitoring Proposal is presented in four sections. Section 2 provides a summary of pertinent background information concerning GMA 5, including a brief description of the former oxbows that comprise GMA 5 and a summary of the historical groundwater analytical data. Section 3 discusses the applicable Performance Standards identified in the CD related to groundwater and NAPL within GMA 5. Section 4 identifies additional baseline data needs and describes the baseline monitoring program proposed by GE to satisfy those data needs. Finally, Section 5 presents the proposed schedule for the baseline field and reporting activities.

The investigations and monitoring activities that have been performed to date within GMA 5 have not identified the presence of any NAPL. As a result, certain NAPL-related components of the baseline monitoring proposals (as outlined in Attachment H to the SOW) are not applicable, and are not addressed in this plan. However, in the event that NAPL is observed during implementation of the baseline groundwater monitoring program, GE will make the appropriate notifications and take appropriate response actions to address such NAPL, as described in Section 4.4.2 of this Proposal, and will incorporate actions to address such NAPL in future reports on this program.

## 2. Background Information

### 2.1 General

As discussed above, the CD and the SOW provide for the performance of groundwater-related Removal Actions at a number of GMAs. Some of these GMAs include multiple RAAs to reflect the fact that groundwater may flow across several RAAs. The GMAs within the Site and the associated RAAs are detailed in the following table and shown on Figure 1:

Groundwater Management Area (GMA)	GMA Name	Removal Action Area (RAA)
1	Plant Site 1	40s Complex 30s Complex 20s Complex East Street Area 2 - South East Street Area 2 - North East Street Area 1 - South East Street Area 1 - North Lyman Street Area Newell Street Area II Newell Street Area I Silver Lake Area
2	Former Oxbows J and K	Former Oxbow Areas J and K
3	Plant Site 2	Unkamet Brook Area (east of Plastics Ave.)
4	Plant Site 3	Hill 78 Consolidation Area Building 71 Consolidation Area Hill 78 Area - Remainder Unkamet Brook Area (west of Plastics Ave.)
5	Former Oxbows A and C	Former Oxbow Areas A and C

The remainder of this section discusses pertinent background information concerning GMA 5, including a summary of the former oxbows which comprise the GMA, the general hydrogeologic setting, the principal potential sources of groundwater contamination in the area, prior groundwater analytical results, and the most recent inventories of the condition of monitoring wells in the GMA.

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## 2.2 Description of Former Oxbow Areas A and C Groundwater Management Area

In an effort to reduce flooding potential of the Housatonic River, the City of Pittsfield, in a joint program with the United States Army Corps of Engineers in the late 1930s and early 1940s, altered the natural course of the river through the urban areas of Pittsfield to form a relatively straight channel. A total of 11 oxbows or low-lying areas, which had previously conveyed river flows, were isolated from the newly formed channel of the river. Two of these former oxbows areas (Former Oxbows A and C) are located adjacent to each other within GMA 5, as shown on Figure 2. These two oxbow areas are owned by parties other than GE and are briefly described below.

### *Former Oxbow Area A*

This approximately 5-acre area appears to have formerly been a backwater area of the Housatonic River and occupies a large open field on the south side of the Housatonic River, north of Elm Street and Newell Street. The majority of this generally flat area is undeveloped and covered with grass and low brush. Although the majority of this area is undeveloped, commercial businesses occupy a portion of the parcels along Elm Street to the south of the former oxbow. Specifically, a gas station, laundromat, and car wash are located at the southwestern portion of the former oxbow area.

Former Oxbow Area A was previously investigated through the installation of well points near the edge of the Housatonic River in 1988, and through a soil and groundwater investigation conducted by GE in 1991-92 under its 1990 Administrative Consent Order (ACO) with MDEP pursuant to the Massachusetts Contingency Plan (MCP). The results of these investigations are summarized in a document entitled *MCP Phase I and Interim Phase II Report for Former Housatonic River Oxbow Areas A, B, C, J, and K* (BBL, February 1996) (Interim Phase II Oxbow Report), which was an update of an earlier (April 1992) report and was submitted to both MDEP and EPA (together, the Agencies).

### *Former Oxbow Area C*

This approximately 2-acre area is located immediately east of Former Oxbow Area A, on the south side of the Housatonic River, near the northwest end of Day Street. This generally flat area is undeveloped and covered with grass and low brush. The southeastern side of the area is bordered by residential properties along Day Street and Ashley Street. This area is undeveloped. Two fields are present within this area and are occasionally mowed.



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Like Former Oxbow Area A, Former Oxbow Area C was previously investigated through the installation of well points in 1988 and a soil and groundwater investigation performed in 1991-92 under the 1990 ACO and the MCP. The results of these investigations are likewise summarized in the 1996 Interim Phase II Oxbow Report.

In addition, in October 1995, GE notified MDEP of a potential “imminent hazard” in this area under 310 CMR 40.0321(2)(b) of the MCP, based on the detection of PCBs in surficial soils at concentrations greater than 10 ppm and within 500 feet of a residence. This notification resulted in the performance of a series of IRA-related activities at Oxbow Area C. The initial IRA activities included additional soil sampling and analysis to delineate the presence of PCBs in surficial soils, the installation of perimeter fencing around the affected area of the site, and the posting of warning signs at the site. A supplemental IRA Plan was subsequently developed and submitted to the MDEP on May 27, 1997. The supplemental IRA Plan proposed various IRA activities including performance of additional soil sampling, performance of a wetlands evaluation, removal of surficial soil, and development and implementation of an enhanced re-vegetation program in certain areas of the site. GE performed the IRA removal action and re-vegetation activities between September 22, 1997 and October 31, 1997. In total, 330 cubic yards of surficial soil (0- to 6-inches) were removed, and approximately 1,100 sq. ft. of area was planted to further enhance the vegetative cover/barrier already present in that area.

## **2.3 Hydrogeologic Setting**

### **2.3.1 General**

In addition to the prior soil sampling which was performed in the area during the 1991-92 MCP investigations and subsequent activities, four monitoring wells, three temporary well points and six soil borings were installed across GMA 5. Data collected at the time of soil boring/monitoring well installation (e.g., lithologic descriptions of the subsurface materials), subsequent groundwater monitoring at these locations, and investigations conducted within the nearby Plant Site 1 GMA (GMA 1) provide a database of hydrogeologic information from which this GMA 5 Baseline Monitoring Proposal has been prepared. Although some variations in the hydrogeologic setting within GMA 5 may exist depending on the specific location, the available data support a general assessment of subsurface conditions and groundwater hydraulics within GMA 5 and are sufficient for the development of this GMA 5 Baseline Monitoring Proposal.

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In general, two unconsolidated hydrogeologic units are present within GMA 5. These units are briefly described below:

***Surficial Deposits*** - This unit generally consists of heterogenous fill materials and alluvial sands and gravels. These sands and sandy gravels are well-sorted and were deposited as glacial outwash and/or in association with recent depositional processes within the Housatonic River. Isolated peat deposits are also present, typically at depths corresponding to the bottom elevations of the river and the former oxbows. At certain locations within GMA 5, non-native fill materials are present above the alluvial deposits. These fill materials typically consist of sand, gravel, cinders, brick, and wood.

The alluvial unit extends from ground surface to depths of at least 25 feet. Fill materials, where present, have been observed to depths of 7 to 17 feet. From a hydrogeologic perspective, the fill and the sand/gravel deposits act as a single unit. All of the existing monitoring wells within GMA 5 are screened within this unit, as it is the upper and primary water-bearing unit within the GMA. Groundwater is encountered under unconfined conditions within this unit at depths between eight and fifteen feet below ground surface.

***Glacial Till*** - Based on boring results at nearby locations within the Lyman Street Area and Newell Street Area II (within GMA 1), glacial till underlies the alluvial deposits and typically consists of dense silt containing varying amounts of clay, sand, and gravel. Discontinuous sandy lenses also have been identified in the till within the central portion of the Lyman Street Area to the north of GMA 5. Till is generally encountered at depths beginning at approximately 20-25 feet beneath the Lyman Street Area to the north and at approximately 40 feet at Newell Street Area II to the east. No wells or borings have been installed to till beneath GMA 5.

The unconsolidated units at GMA 5 overlie bedrock. Based on information obtained from nearby areas, bedrock occurs at depths up to approximately 50 to 60 feet near the Housatonic River. The bedrock consists of white coarse-grained marble associated with the Stockbridge Formation.

### **2.3.2 Groundwater Flow**

Groundwater at GMA 5 generally flows toward the Housatonic River and is primarily influenced by the existing topography and the area's location (adjacent to the river). Figure 3 illustrates generalized water table conditions, using groundwater data obtained during the installation of monitoring wells in this area. The existing groundwater

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elevation database is not sufficient to determine average groundwater elevations. However, the data that do exist indicate that groundwater depths are in the range of 8 to 15 feet below the ground surface (see Table 1).

A drainage ditch extends northeast from Former Oxbow Area A into Former Oxbow Area C. The ditch then turns toward the northwest and discharges into the Housatonic River, bisecting Former Oxbow Area C. The presence of this drainage ditch, which serves as a City of Pittsfield stormwater discharge point, may locally influence groundwater flow in its immediate vicinity, but the overall flow direction is still toward the Housatonic River.

## **2.4 Potential Impacts to Groundwater Quality**

Based on current information, the principal sources which could potentially affect groundwater quality within GMA 5 appear to include the former oxbows and other outside sources. These potential sources are described below.

**Former Oxbows** - As a result of the straightening of the Housatonic River channel in the late 1930s and early 1940s, Former Oxbows A and C were isolated from the newly formed channel of the river. These oxbows were subsequently filled with materials originating from the GE facility as well as other sources. There are no available records which provide information regarding the specific type or origin of the fill materials, or parties involved in the filling activities. The former oxbow areas are labeled as “disposal areas” on rechannelization drawings developed by the City of Pittsfield in 1940. These areas were publicly accessible and it is likely that a variety of industries and/or individuals contributed fill material. A review of historical photographs indicates that the former river channel in Oxbow Area A and other portions of this area were filled prior to 1969. Filling of this area allegedly continued until into the 1980s. Review of these photographs also indicates that large portions of Former Oxbow Area C were filled prior to 1956, while other portions were not filled until the 1970s.

**Other Sources** - In addition to fill materials that have been placed within the former oxbows, it is possible that there are other potential contributing sources of hazardous materials to GMA 5. Commercial businesses present within or upgradient of GMA 5 include a gas station, laundromat and car wash. These operations are located adjacent to Former Oxbow Area A, in the southwest corner of the GMA.

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## 2.5 Summary of Groundwater Analytical Data

Groundwater analytical data collected from GMA 5 have been previously summarized in reports prepared under the MCP program conducted under the 1990 ACO. These reports, which have been submitted to the Agencies, include the 1996 Interim Phase II Oxbow Report, as well as an *Immediate Response Action Completion Report; Oxbow Area C* (BBL, December 1997) and an *MCP Phase II Scope of Work; Former Housatonic River Oxbow Areas A, B, C, J, and K* (O'Brien & Gere Engineers, Inc., April 1998).

The investigations described in the above reports produced analytical data from seven groundwater samples collected between October 1988 and January 1992. The groundwater analyses conducted during these investigations are summarized in Table 2, and pertinent groundwater analytical data are summarized in Appendix A. Tables presenting analytical results for pesticides/herbicides are not included in Appendix A, as these constituents were not detected in any of the groundwater samples that were analyzed for pesticides/herbicides.

These existing groundwater data were collected and analyzed using standard and approved procedures at the time of the previous investigations. These data were considered in the development of the proposed baseline monitoring activities discussed in Section 4 below. However, since the existing database is not being considered at this time for use in assessing achievement of the groundwater Performance Standards or as the basis for proposing to limit the analyte list for the baseline monitoring program, a complete assessment of the quality of these data for quality assurance/quality control (QA/QC) parameters has not been completed at this time. GE may conduct such an assessment of particular historical data at selected locations in support of proposals for future modifications to the baseline or long-term monitoring programs, and will present the results of any such assessments in the pertinent proposals.

Since the installation of the existing monitoring wells in the early 1990s, a well inventory has not been performed within GMA 5. However, an inventory/inspection of each existing well proposed for inclusion in the baseline monitoring program for GMA 5 will be conducted prior to commencement of the baseline monitoring activities, as discussed in Section 4.2.4 below.

# 3. Summary of Applicable Performance Standards

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## 3.1 General

The Performance Standards that are applicable to the groundwater-related Removal Actions at the GMAs under the CD are set forth in Section 2.7 and Attachment H (Section 4.0) of the SOW. They relate primarily to the groundwater quality and NAPL-related conditions that must ultimately be achieved for the GMAs and the long-term monitoring programs that will be performed at the GMAs (after completion of the baseline monitoring programs) to assess achievement of those conditions. However, it is important to understand these Performance Standards in the context of the baseline monitoring program, since they provide the criteria for evaluating the results from that program and for conducting further response actions.

The applicable groundwater quality Performance Standards are summarized in Section 3.2. As noted above, previous investigations at GMA 5 have not identified the presence of NAPL at this GMA. However, the Performance Standards related to NAPL are summarized in Section 3.3 for reference purposes in the event that NAPL is found at this GMA.

## 3.2 Groundwater Quality Performance Standards

In general, the Performance Standards for groundwater quality are based on the groundwater classification categories designated in the MCP (310 CMR 40.0932). The MCP identifies three potential groundwater categories that may be applicable to a given site. One of these, GW-1 groundwater, applies to groundwater that is a current or potential source of potable drinking water. None of the groundwater at any of the GMAs at the Site is classified as GW-1 groundwater. However, the remaining MCP groundwater categories are applicable to GMA 5 and are described below:

- Ⓒ GW-2 Groundwater - Groundwater is classified as GW-2 if it is located within 30 feet of an existing occupied building and has an average annual depth of 15 feet or less. Under the MCP, VOCs present within GW-2 groundwater represent a potential source of organic vapors to the indoor air of the overlying occupied structures.
  
- Ⓒ GW-3 Groundwater - By MCP definition, all groundwater at a site is classified as GW-3 since it is considered to ultimately discharge to surface water.

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The CD and the SOW allow for the establishment of standards for GW-2 and GW-3 groundwater at the GMAs through use of one of three methods, as generally described in the MCP. The first, known as Method 1, consists of the application of pre-established numerical "Method 1" standards set forth in the MCP for both GW-2 and GW-3 groundwater (310 CMR 40.0974). These "default" standards have been developed to be conservative and will serve as the initial basis for evaluating groundwater at GMA 5. The MCP Method 1 standards for GW-2 and GW-3 groundwater are listed in Appendix B. (In the event of any discrepancy between the standards listed in this appendix and those published in the MCP, the latter shall be controlling.) For constituents for which Method 1 standards do not exist, the MCP provides procedures, known as Method 2, for developing such standards ("Method 2 standards") for both GW-2 (310 CMR 40.0983(2)) and GW-3 (310 CMR 40.0983(4)) groundwater. For such constituents, Attachment H to the SOW states that GE must use these MCP procedures or alternate procedures approved by EPA to develop Method 2 standards, or provide a rationale for why such standards need not be developed. For constituents whose concentrations exceed the applicable Method 1 or Method 2 standards, GE may develop and propose to EPA alternative GW-2 and/or GW-3 standards based on a site-specific risk assessment. This procedure is known as Method 3 in the MCP. Upon EPA approval, these alternative risk-based GW-2 and/or GW-3 standards may be used in lieu of the Method 1 (or Method 2) standards. Of course, whichever method is used to establish such groundwater standards, GW-2 standards will be applied to GW-2 groundwater and GW-3 standards will be applied to GW-3 groundwater.

Based on consideration of the above points, the specific groundwater quality Performance Standards for GMA 5 consist of the following:

1. At monitoring wells designated as compliance points to assess GW-2 groundwater (i.e., groundwater located at an average depth of 15 feet or less from the ground surface and within 30 feet of an existing occupied building), groundwater quality shall achieve any of the following: (a) the Method 1 GW-2 groundwater standards set forth in the MCP or, for constituents for which no such standards exist, Method 2 GW-2 standards developed using procedures in the MCP or approved by EPA (unless GE provides and EPA approves a rationale for not developing such Method 2 standards); or (b) alternative risk-based GW-2 standards developed by GE and approved by EPA as protective against unacceptable risks due to volatilization and transport of volatile chemicals from groundwater to the indoor air of nearby occupied buildings; or (c) a condition, based upon a demonstration approved by EPA, in which constituents in the groundwater do not pose an unacceptable risk to occupants of nearby occupied buildings via volatilization and transport to the indoor air of such buildings.

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2. Groundwater quality shall achieve the following standards at the perimeter monitoring wells designated as compliance points for GW-3 standards: (a) the Method 1 GW-3 groundwater standards set forth in the MCP or, for constituents for which no such standards exist, Method 2 GW-3 standards developed using procedures in the MCP or approved by EPA (unless GE provides and EPA approves a rationale for not developing such Method 2 standards); or (b) alternative risk-based GW-3 standards proposed by GE and approved by EPA as protective against unacceptable risks in surface water due to potential migration of constituents in groundwater.

These Performance Standards are to be applied to the results of the individual monitoring wells included in the monitoring program. As discussed in Section 4 of this GMA 5 Baseline Monitoring Proposal, several existing and proposed wells have been selected as the compliance points for attainment of the Performance Standards identified above.

### **3.3 NAPL Performance Standards**

As previously noted, NAPL has not been observed to date at GMA 5. However, in the event that NAPL is observed in the future, the NAPL-related Performance Standards set forth in Section 2.7 and Attachment H of the SOW will ultimately apply. Those Performance Standards are as follows:

1. Containment, defined as no discharge of NAPL to surface waters and/or sediments, which shall include no sheens on surface water and no bank seeps of NAPL.
2. For areas near surface waters in which there is no physical containment barrier between the wells and the surface water, elimination of measurable NAPL (i.e., detectable with an oil/water interface probe) in wells near the surface water bank that could potentially discharge NAPL into the surface water, in order to prevent such discharge and assist in achieving groundwater quality Performance Standards.
3. For areas adjacent to physical containment barriers, prevention of any measurable LNAPL migration around the ends of the physical containment barriers.

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4. For NAPL areas not located adjacent to surface waters, reduction in the amount of measurable NAPL to levels which eliminate the potential for NAPL migration toward surface water discharge areas or beyond GMA boundaries, and which assist in achieving groundwater quality Performance Standards.
  
  5. For NAPL detected in wells designated to assess GW-2 groundwater (i.e., located at average depths of 15 feet or less from the ground surface and within a horizontal distance of 30 feet from an existing occupied building), a demonstration that constituents in the NAPL do not pose an unacceptable risk to occupants of such building via volatilization and transport to the indoor air of such building. Such demonstration may include assessment activities such as: NAPL sampling, soil gas sampling; desk-top modeling of potential volatilization of chemicals from the NAPL (or associated groundwater) to the indoor air of the nearby occupied buildings; or sampling of the indoor air of such buildings. If necessary, GE shall propose corrective actions, including, but not limited to, containment, recovery, or treatment of NAPL and impacted groundwater.



## 4. Proposed Baseline Monitoring Program

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### 4.1 General

This section describes the baseline monitoring activities proposed by GE for groundwater within GMA 5. This section has been developed based on a review of the available hydrogeologic information associated with GMA 5 (Section 2), as well as the applicable groundwater quality Performance Standards summarized in Section 3.2 of this document. The anticipated baseline monitoring activities for GMA 5 were previously identified in Attachment H to the SOW, and were collectively developed between GE and the Agencies prior to execution of the CD. Since entry of the CD, GE has conducted additional review of the available data related to the hydrogeologic setting and groundwater conditions within GMA 5. These activities have resulted in certain proposed modifications to the baseline monitoring program initially identified in Attachment H to the SOW.

This section describes GE's proposed baseline monitoring program for groundwater at GMA 5, including the modifications to the baseline program identified in Attachment H to the SOW. Specifically, Section 4.2 presents GE's proposed baseline monitoring activities for groundwater at GMA 5, including the evaluations conducted to support those proposed activities. Section 4.3 outlines GE's proposed data assessment activities, and Section 4.4 describes the required notification activities associated with the baseline monitoring activities, as well as the requirements relating to interim response actions, if needed, in accordance with Attachment H to the SOW. Finally, Section 4.5 describes the various reporting requirements that are applicable to the baseline monitoring program.

The Data Quality Objectives (DQOs) for this proposed baseline monitoring program are: (a) to obtain the necessary data on groundwater conditions in GMA 5 to meet the baseline monitoring requirements specified in Attachment H to the SOW; (b) to provide a baseline database for the subsequent development and implementation of a long-term monitoring program for this GMA and ultimately for evaluating the impact of soil-related response actions on groundwater quality and assessing achievement of the groundwater quality Performance Standards described in Section 3; and (c) to determine the need for interim response actions to the extent required by Attachment H to the SOW.

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## 4.2 Baseline Groundwater Monitoring

### 4.2.1 Evaluations and Overview

To develop the baseline groundwater monitoring program for GMA 5, GE reviewed and evaluated a number of factors. It began by reviewing the baseline groundwater monitoring program described in Attachment H to the SOW and considering the need for additions or modifications to that program. In this connection, GE considered appropriate locations for both sentinel wells and perimeter wells, as described in Attachment H to the SOW. According to Attachment H, sentinel wells for GMA 5 fall into two categories:

- GW-2 Sentinel Wells -- wells located within or close to areas where the GW-2 groundwater classification applies (i.e., shallow groundwater near occupied buildings); these wells are to be considered compliance points for the GW-2 standards; and
- General and Source Area Sentinel Wells -- wells located within potential contaminant source areas and spatially distributed across the GMA.

Sentinel wells will not be considered compliance points for the GW-3 standards. However, general/source area sentinel wells will be used to provide an early indication of groundwater conditions that could exceed GW-3 standards in the downgradient perimeter wells.

Perimeter wells are those intended to monitor groundwater quality along the outer boundary of the GMA. All downgradient perimeter wells are to be used as compliance points for the GW-3 standards. Upgradient perimeter wells are generally intended to assess the quality of groundwater entering the GMA. However, in some cases, perimeter wells may be located near existing occupied buildings where GW-2 classification criteria apply, and will be monitored for compliance with the GW-2 standards. The criteria for selecting locations for sentinel and perimeter monitoring wells are described in Section 5.1 of Attachment H to the SOW. (Attachment H also provides for the establishment, where applicable, of natural attenuation monitoring wells to assess intrinsic and natural processes that may mitigate groundwater impacts. However, as recognized in Attachment H, these types of wells are not currently applicable to GMA 5.)

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In this context, GE evaluated the usability of existing monitoring wells to serve as sentinel wells (either GW-2 sentinel wells or general/source area sentinel wells) or perimeter wells for the baseline monitoring program. In doing so, GE considered the locations of these wells relative to occupied buildings, to known/suspected source areas, and to the GMA boundary; and for those wells that were appropriately located, GE considered the depth and length of their well screens to ensure that they would monitor the appropriate groundwater. Based on this evaluation, and taking into account the wells preliminarily identified in Attachment H to the SOW for the baseline monitoring program, GE selected the existing wells that could serve as sentinel or perimeter wells in this program and identified locations for the installation of additional wells to fill in any gaps.

In addition, GE evaluated the need for establishing monitoring well pair clusters to assess achievement of the GW-2 and GW-3 standards. Based on this evaluation, there is no need for use of such clusters at GMA 5, because both the GW-2 and the GW-3 standards at this GMA apply to relatively shallow groundwater (i.e., groundwater within 15 feet of the ground surface near occupied buildings or groundwater that could discharge to surface water).

Based on the above-described evaluations, a baseline groundwater monitoring program, consisting of three existing monitoring wells and five new monitoring wells was selected for GMA 5. The locations of these wells are depicted on Figure 5 and described in Table 3. As discussed further in Section 4.2.4, prior to commencement of this baseline monitoring program, a well inventory/inspection will be conducted for each existing well included in the program to provide an update on the condition of the wells. GE will complete any necessary repairs, replacement, or resurveying that are identified during this well inventory.

In accordance with Attachment H to the SOW, this baseline monitoring program will be conducted over a period of at least two years and will include water level monitoring on a quarterly basis and groundwater sampling and analysis on a semi-annual basis. A further and more specific discussion of the proposed baseline monitoring activities for GW-2 and GW-3 groundwater is presented below. All well installation activities for the new wells and all groundwater measurement, sampling, and analysis activities will be conducted in accordance with the procedures set out in GE's approved Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP).

#### **4.2.2 GW-2 Monitoring**

The existing groundwater elevation database is not sufficient to delineate specific areas within GMA 5 where the average annual depth to groundwater is 15 feet or less. However, the depth-to-groundwater data that exist indicate

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that the depth to water is less than 15 feet in three of the four existing monitoring wells (see Table 1), including both of the existing wells within Former Oxbow Area A, which contains occupied buildings.

Although the baseline groundwater monitoring program outlined in Attachment H to the SOW did not include any GW-2 wells in GMA 5, GE has evaluated the need for and appropriate locations for GW-2 sentinel/compliance wells, considering the presence of occupied structures located above the potentially shallow groundwater areas, as well as considering the existence of potential preferential pathways located below the groundwater table near occupied or potentially occupied buildings. The occupied structures at GMA 5 and the utility lines that could potentially serve as preferential pathways to such structures are depicted on Figure 4.

As shown on Figure 4, the utility lines at GMA 5 include sewer lines and storm drains. A 48-inch sewer line extends along much of the southern boundary of the GMA. An abandoned 24-inch sewer line spur was formerly utilized in the Oxbow Area C portion of the GMA, near the end of Day Street. Currently, a 48-inch storm drain enters the GMA near the end of Day Street and (presumably) discharges into the drainage ditch at this location. A 24-inch storm drain extends north from Elm Street to the Housatonic River across the western portion of the GMA. The sewer lines are mapped as being present at elevations of approximately 969 to 970 feet, which is below the assumed water table in this area. However, the storm drains are shown to exist at elevations of 980 feet or higher, which is above the water table. Therefore, the sewer lines are considered potential preferential pathways, but the storm drains are not.

Based on the above-described assessment, GE proposes initially to include three wells in this area as GW-2 sentinel wells. These wells are existing well A-1 and proposed new wells GMA5-1 and GMA5-3, as identified in Table 3 and on Figure 5. The rationale for selection of these wells is as follows:

- C Well A-1 will be used primarily as a downgradient GW-3 perimeter monitoring well, as indicated in Table 3. However, GE also proposes to conduct GW-2 monitoring at this well due to the proximity of a laundromat.
- C Proposed well GMA5-1 (identified in Attachment H to the SOW as PROP-6) will be used primarily as an upgradient GW-3 perimeter monitoring well. However, based on the presence of the 48-inch sewer line which extends below the assumed water table near this location (as shown on Figure 4), GE proposes to designate this well for GW-2 monitoring as well. GE also proposes to modify the location of this well to enable

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monitoring to be conducted nearer to the automated car wash building and two other buildings located along the upgradient edge of the GMA, along Elm Street.

- C GE proposes to add well GMA5-3 as a monitoring location due to the proximity of the car wash and associated office space. As discussed in the next section, GE also proposes to use this well as an additional downgradient GW-3 perimeter well.

These GW-2 monitoring wells will provide adequate coverage for the existing occupied buildings at GMA 5 and for the potential preferential pathways to occupied or partially occupied buildings. (Note that although proposed well GMA5-2 is located near a storm drain line and sewer line, as shown on Figure 4, that well is not proposed for GW-2 monitoring at this time, since no buildings are present in that portion of GMA 5 and since the storm drain line is not located below the water table at this GMA.) Since these wells will be monitored for both GW-3 and GW-2 purposes, they will initially be monitored for all Appendix IX+3 constituents, as discussed in the next section. However, the analytes that will be relevant to the GW-2 monitoring at these wells will consist of the VOCs listed in Appendix IX of 40 CFR Part 24, plus 2-chloroethylvinyl ether.

In addition to the three wells identified as GW-2 sentinel wells on Table 3 and Figure 5, additional GW-2 wells may be proposed once baseline activities are initiated if, prior to or during the baseline monitoring program, additional buildings are constructed at GMA 5. Additionally, if subsequent monitoring indicates that the average annual depth to groundwater at the wells currently proposed for GW-2 monitoring is greater than 15 feet, GE may propose to discontinue GW-2 monitoring at those locations.

### **4.2.3 GW-3 Monitoring**

The existing and proposed wells established to monitor GW-3 groundwater fall into two categories:

- Perimeter Wells -- wells located near the boundary of the GMA. All downgradient perimeter wells will be considered compliance points for the GW-3 standards, while upgradient perimeter wells designated for GW-3 monitoring will be used to assess the quality of groundwater entering the GMA.

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- General/Source Area Sentinel Wells -- wells that are spatially distributed across the GMA to monitor groundwater downgradient of known/suspected sources and to provide areal coverage to monitor for potential unknown sources.

The proposed baseline monitoring program for GW-3 monitoring includes a total of eight wells: six perimeter wells and two general/source area sentinel wells. The locations of these wells are identified in Table 3 and on Figure 5. (In addition, as noted above, one upgradient perimeter well located near an existing potential preferential pathway has been established for GW-2 monitoring in addition to GW-3 monitoring, and two downgradient perimeter wells will be used for both GW-2 and GW-3 monitoring.)

Initially, these wells will be monitored for all Appendix IX+3 constituents. However, as the baseline monitoring program proceeds, GE may propose to reduce the analyte list at certain well locations if appropriate. For example, depending on the results of the initial round of sampling, GE may propose to eliminate analysis for pesticides and herbicides from future sampling rounds at the monitoring wells in this GMA. The existing groundwater monitoring database indicates that these compounds have not been detected in groundwater at GMA 5.

As previously mentioned, the baseline monitoring activities proposed herein have been slightly modified relative to the scope of activities identified in Attachment H to the SOW. Specific to monitoring related to GW-3 groundwater, the following modifications have been incorporated into this GMA 5 Baseline Monitoring Proposal:

- C Change in location and designation of proposed well GMA5-1. This well (identified in the SOW as PROP-6) will be used as an upgradient GW-3 perimeter monitoring well, as well as a GW-2 sentinel well near a potential preferential pathway and occupied structure (as discussed in Section 4.2.2). GE proposes to shift the location of this well to the southwest (as shown on Figure 5) to ensure that the well is outside of the former river channel and therefore will provide a representative monitoring point for groundwater entering the GMA, and also to bring this well closer to an existing occupied structure (i.e., the car wash) for GW-2 monitoring purposes.
- C Addition of proposed well GMA5-3 as a GW-3 perimeter well. This newly proposed well, which was added to serve as a GW-2 sentinel well for the nearby car wash (as discussed in the previous section), will also be used to provide baseline data along the southwest perimeter of Oxbow Area A.

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#### 4.2.4 Inventory/Inspection of Existing Monitoring Wells

Prior to the commencement of the baseline monitoring activities, GE will conduct an inventory of the existing wells proposed for inclusion in the baseline program. This well inventory will involve an inspection of each such well to assess its overall integrity and condition. Items to be verified will include:

- Ⓒ presence of well identification marker;
- Ⓒ condition of well head and surface seal;
- Ⓒ comparison of height of well casing relative to grade and total well depth to previously reported values; and
- Ⓒ depth to water.

Any discrepancies between actual and previously reported measurements and any items needing repairs will be noted. GE will then complete any necessary repairs and perform any necessary resurveying, as identified during the well inventory. In the event that the inventory indicates that a particular well has been destroyed or is no longer in sufficiently good condition for monitoring, GE will replace that well with a new well at approximately the same location, and will so notify EPA.

#### 4.2.5 Hydraulic Monitoring

In accordance with Attachment H to the SOW, during the baseline monitoring period, GE will perform quarterly measurements of groundwater elevations at the existing and new wells proposed for groundwater quality monitoring in GMA 5 (listed in Table 3). In addition, as part of the previously proposed baseline monitoring program for GMA 1, GE has proposed to perform surface water elevation monitoring at a number of locations within the Housatonic River between the Newell Street and Lyman Street Bridges, as well as at Silver Lake. This surface water elevation monitoring will be performed at staff gauges located at:

- Ⓒ East Street Area 2 - South;
- Ⓒ Lyman Street Area; and
- Ⓒ Silver Lake.

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These surface water elevation measurements, particularly those collected from the nearby Lyman Street Area, will be utilized in the assessment of the groundwater elevation data collected from GMA 5. As such, GE proposes no additional surface water elevation monitoring beyond the GMA 1 effort.

No hydraulic conductivity data have been collected at during prior investigations at GMA 5. To address this data gap and to provide comprehensive coverage across GMA 5, GE proposes to conduct hydraulic conductivity tests at each of the eight wells proposed for inclusion in the baseline monitoring program.

### **4.3 Data Quality Assessment**

As discussed in Section 2.5 above, the existing groundwater data from GMA 5 have not been fully reviewed for data quality because those data are not being considered at the present time for the purpose of achieving the groundwater quality Performance Standards or for proposals to limit the constituents to be analyzed for in the baseline groundwater monitoring program. In the future, GE may conduct a more thorough assessment of the quality of historical groundwater data at selected locations in support of modifications which may be proposed to the baseline or long-term monitoring programs. GE will present the results of any such data quality assessments in conjunction with the applicable proposals for modification.

All future groundwater analytical data collected during the baseline monitoring program will undergo data validation in accordance with the applicable procedures set forth in the FSP/QAPP. The results will be presented in the pertinent reports submitted on the baseline monitoring program, as described in the next section.

### **4.4 Notification and Interim Response Actions**

Section 6.2 of Attachment H to the SOW establishes requirements relating to GE's notification to EPA and MDEP of certain findings during the course of the baseline monitoring program. In some circumstances, these notifications will include proposals for interim response actions to address certain groundwater issues (or NAPL-related issues if identified). This section describes the requirements of Attachment H to the SOW for such notifications and proposals (if required) for interim response actions. It should be noted that, although some notification requirements are consistent with the MCP's reporting requirements for releases to surface water or groundwater, the notification and reporting requirements described below are limited to those set forth in



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Attachment H to the SOW; they do not supersede or negate the MCP's reporting requirements or any other applicable reporting requirements under federal or state law.

#### **4.4.1 Groundwater Quality-Related Notifications**

Upon obtaining knowledge of sampling data from a well containing category GW-2 groundwater within 30 feet of a school or occupied residential structure and having a total VOC concentration equal to or greater than 5 ppm, GE will notify EPA and MDEP within 72 hours unless such exceedance was previously observed and reported to EPA. GE will provide the data from each such event in the next monthly progress report for overall work at the Site. Subsequent exceedances for a given well will also be indicated in the next monthly progress report for the Site.

If an exceedance of a groundwater Upper Concentration Limit (UCL), as set forth in the MCP (310 CMR 40.0996(5)), is indicated in a groundwater sample from any monitoring well, and such an exceedance was not previously observed and reported to EPA, GE will notify EPA and MDEP within 14 days of obtaining knowledge of such results. (For convenience, the UCLs are listed, along with the Method 1 GW-2 and GW-3 standards, in Appendix D.) GE will also provide the data and identify specifically each such exceedance in the next monthly progress report for overall work at the Site. Subsequent exceedances of a UCL for a given well will be identified in the next monthly report. The monthly progress report for overall work at the Site will also identify any wells which were sampled and provide the sampling results for all constituents which exceeded the applicable GW-2 or GW-3 standards.

#### **4.4.2 NAPL-Related Notifications**

As previously mentioned, the presence of NAPL has not been documented within GMA 5. However, if, during the baseline monitoring program, NAPL is observed to be discharging to surface water and creating a sheen on the water, GE will notify EPA and MDEP within two hours of obtaining knowledge of such observation. This will be followed by written notice to EPA within seven days. The written notification will include a proposal to EPA for interim response actions to contain such discharge. Upon EPA approval, GE will conduct the approved interim response actions to contain the NAPL discharge.

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If, on subsequent occasions, NAPL is observed to be discharging to surface water or creating a sheen on the water in a location in which such NAPL discharge was previously observed and reported to EPA and measures are in place to effectively contain the sheen, GE will notify EPA of the continued presence of such NAPL in the next monthly progress report for overall work at the Site.

If a NAPL thickness of greater than or equal to 1/2-inch is observed in any monitoring well, GE will notify EPA and MDEP within 72 hours of obtaining knowledge of such a condition, unless (on subsequent occasions) such conditions are consistent with the types, nature, and quantities of NAPL which were previously observed and reported to the Agencies. This notification will be followed by written notice to the EPA within 60 days. The written notification will include a proposal to EPA for interim response actions to be conducted, which may include NAPL sampling, additional assessment/monitoring, or NAPL removal activities. Upon EPA approval, GE will conduct the approved interim response actions. If a NAPL thickness of greater than or equal to 1/8-inch, but less than 1/2-inch is observed in a monitoring well, GE will notify EPA and MDEP in the next monthly progress report, unless (on subsequent occasions) the results are consistent with the types, nature, and quantities of NAPL which were previously observed and reported to the Agencies.

## **4.5 Reporting Requirements**

Separate from the notification requirements discussed above, Section 6.3 of Attachment H to the SOW establishes requirements relating to GE's reporting of baseline activities to the Agencies. That section requires GE to submit interim reports on the baseline monitoring program after each round of groundwater quality monitoring, as well as a final report on the overall baseline monitoring program at the conclusion of the program. These reports are described in Sections 4.5.1 and 4.5.2 below.

### **4.5.1 Baseline Groundwater Quality Interim Reports**

Following the receipt of data from each semi-annual round of groundwater quality monitoring at GMA 5, in accordance with the schedule described in Section 5.4.1, GE will prepare and submit a summary report describing the field activities and presenting the monitoring results from that round and the subsequent water level monitoring round. GE will also provide an electronic submittal of the analytical and locational (e.g., X-Y-Z coordinates) data for the round being reported in a format compatible for entry into an ArcInfo GIS System.

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Each such summary report will compare the results from that event to the prior data from the GMA and also to the Method 1 (or 2) GW-2 or GW-3 standards at applicable well locations. If the sampling results for GW-2 compliance wells indicate: (1) an exceedance of the Method 1 (or 2) GW-2 standards in a well in which such exceedance had not previously been found; or (2) the GW-2 standard has previously been exceeded and groundwater concentration is greater than or equal to 5 ppm total VOCs (if such an exceedance was not previously addressed), GE will propose appropriate interim response actions. These response actions may include: resampling of the groundwater; increasing the sampling frequency to quarterly intervals; additional well installation and sampling (taking into account the proximity of any known or any newly defined potential soil-related contaminant sources and/or potential preferential pathways); soil gas sampling; modeling of potential volatilization of chemicals from the groundwater to the indoor air of the nearby occupied buildings; sampling of the indoor air of such buildings; an evaluation of the potential risks related to volatilization to such indoor air; the development of a risk-based alternative GW-2 standard; and/or active response actions, including, but not limited to, containment, recovery, or treatment of impacted groundwater and/or NAPL.

For sampling results that indicate an exceedance of Method 1 (or 2) GW-3 standards at downgradient perimeter monitoring wells in a well in which: (1) such exceedance had not previously been found; or (2) the GW-3 standard (Method 1 or 2) has previously been exceeded and the groundwater concentration is greater than or equal to 100 times the GW-3 standard (if such exceedance was not previously addressed), GE will propose interim response actions, which may include: (a) further assessment activities such as resampling; increasing the sampling frequency to quarterly intervals; additional well installation and sampling (taking into account the proximity of any known or any newly defined potential soil-related contaminant sources and/or potential preferential pathways); and/or continuation of the baseline monitoring program; (b) active response actions, including, but not limited to, containment, recovery, or treatment of impacted groundwater; and/or (c) the conduct of a site-specific risk evaluation (taking into account the impacts on adjacent surface water, sediments, or biota) and the proposal of alternative risk-based GW-3 Performance Standards. Upon EPA approval, GE will implement the approved interim response actions.

In any interim summary report, GE may propose, consistent with the requirements of Attachment H to the SOW, modifications to the monitoring frequency and specific wells to be monitored and/or the constituents to be analyzed for during the remaining sampling rounds in the baseline program. In addition, GE will evaluate the results of future pre-design soil investigations performed within Former Oxbows A and C to identify potential soil-related impacts to groundwater. If any new potential soil sources are identified, GE will evaluate the scope of the ongoing

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baseline monitoring program relative to the area of interest and propose, if appropriate, modifications to the baseline program (e.g., installation of new monitoring wells, sampling of existing wells, etc.). Upon EPA approval, GE will implement such modifications for the remaining rounds.

Assuming that the two-year “baseline” period ends prior to the completion of soil-related response actions at Former Oxbows A and C, GE may submit a proposal to EPA for approval to modify and/or extend the baseline monitoring program based on the results of the initial assessment and the estimated timing of future response actions at this area.

#### **4.5.2 Baseline Assessment Final Report and Long-Term Monitoring Program Proposal**

At the conclusion of the GMA 5 baseline field investigation program, in accordance with the schedule described in Section 5.4.2, GE will submit a Baseline Assessment Final Report for this GMA to EPA for review and approval. This report will also include a proposal to EPA for a long-term monitoring program for GMA 5.

The final report on the GMA 5 baseline monitoring program will include:

- Ⓒ An update of the current understanding of hydrogeologic conditions and the extent of groundwater contamination, including a statistical assessment of the “baseline” data and other historical data, if appropriate, and a comparison to the Performance Standards;
- Ⓒ An evaluation of the spatial distribution of constituents within the GMA and the actual migration or potential for migration of such constituents outside the GMA, including an evaluation of groundwater travel time to any receptor (e.g. surface water body/building);
- Ⓒ Identification of the presence or potential presence of previously unidentified sources of groundwater contamination;
- Ⓒ An assessment of the adequacy of the selected monitoring locations;
- Ⓒ A re-assessment of the constituents, locations, and frequencies to be subject to future monitoring;

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- C Identification of areas where the GW-2 Performance Standards apply in addition to the GW-3 Performance Standards;
  - C Identification of the specific wells to be used to measure compliance with the Performance Standards;
  - C An evaluation of variations in groundwater quality from event to event to identify and assess sampling data variability and potential causes for the variability, including seasonal influences;
  - C A summary of any NAPL-related monitoring results and recovery activities; and
  - C A statement of the basis for GE's proposal to EPA for approval of a Long-Term Monitoring Program and/or additional response actions.

The Long-Term Monitoring Program Proposal for GMA 5 will include:

- C The specific areas to be subject to the monitoring (if different from these currently included in GMA 5), along with the supporting rationale;
- C The monitoring locations, along with the supporting rationale;
- C A schedule for plan implementation, including reporting;
- C The frequency of future monitoring events;
- C The constituents to be subject to analysis;
- C Descriptions of statistical techniques to be employed to evaluate data trends;
- C Proposal for any additional investigations, assessments, or interim response actions;
- C Any proposal for risk-based alternative GW-2 or GW-3 Performance Standards; and

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C An outline of the Monitoring Event Evaluation Reports to be submitted under the long-term monitoring program.

## 5. Schedule

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### 5.1 General

Schedule requirements related to the baseline monitoring programs were generally identified in Attachment H to the SOW. This section provides a schedule specifically for conducting the GMA 5 baseline monitoring program.

### 5.2 Field Activities Schedule

The baseline monitoring program for GMA 5 will begin following EPA's approval of this Baseline Monitoring Proposal. GE proposes to conduct the inventory of existing wells, complete any necessary repairs to existing wells proposed for sampling, and install the new monitoring wells described in this Proposal within 45 days after EPA's approval of this Proposal, subject to obtaining the necessary access agreements with the property owners in a timely manner. If GE is unable to obtain access agreements from particular property owners after using "best efforts" (as defined in the CD) to do so, it will so advise EPA and MDEP and seek their assistance in obtaining such agreements pursuant to Paragraph 60.f(i) of the CD. If delays in obtaining access agreements will cause a delay in the schedule proposed above, GE will notify the Agencies and propose for EPA approval a revised schedule for completing the existing well inventory/repairs and the additional monitoring well installations and initiating the baseline monitoring program. Following installation of the proposed new wells, GE will perform well development and hydraulic conductivity testing at the new and existing wells illustrated on Figure 5.

GE proposes to conduct quarterly groundwater level monitoring at the baseline program wells described herein during periods representing winter, spring, summer, and fall conditions for a two-year period beginning with the first of these time periods following the installation of all approved additional baseline monitoring wells, as discussed above. GE will attempt to obtain the quarterly groundwater elevation data during the months of January, April, July, and October, but may, on occasion, collect these measurements at the end of the prior month or the beginning of the next month from the target date if scheduling issues or other unforeseen factors necessitate alterations to the schedule.

GE proposes to conduct semi-annual groundwater quality monitoring at the baseline program wells described herein during periods representing Spring and Fall conditions for a two-year period, coinciding with the Spring and Fall groundwater elevation monitoring events discussed in the previous paragraph. The time periods for semi-

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annual water quality sampling were chosen to adequately assess seasonal variation which may occur during the baseline sampling period. This schedule was selected to obtain data during presumed annual high and low water table conditions and is consistent with the groundwater monitoring schedule previously proposed for nearby GMA 1. GE will attempt to collect groundwater analytical samples during the months of April and October, but may, on occasion, conduct these sampling events during the prior month or the next month from the target date if scheduling issues or other unforeseen factors necessitate alterations to the schedule. GE will make best efforts to avoid scheduling groundwater monitoring at times and locations at which the baseline data could be impacted by ongoing soil/sediment response actions within these former oxbow areas. In addition, GE may propose a modified sampling schedule for selected wells following evaluation of the analytical data as the baseline monitoring program progresses.

### **5.3 Monthly CD Reporting**

In the monthly progress reports for overall work at the Site, GE will provide the observations and results of the GMA 5 baseline monitoring program as follows:

Following a quarterly groundwater elevation monitoring event, the following information will be added to the next monthly progress report for the Site:

- C A listing of the wells which were monitored, and the depths from the well measuring point to groundwater and groundwater/NAPL interfaces (if present);
- C If NAPL was observed in any well at a thickness of greater than or equal to  $\frac{1}{8}$ -inch but less than  $\frac{1}{2}$ -inch, a listing of such well(s), unless the results are consistent with the types, nature, and quantities of NAPL which were previously observed and reported to the Agencies; and
- C If NAPL was observed to be discharging to any surface water and creating a sheen on the water, a listing of such location(s).

Following a semi-annual groundwater sampling event, the following information will be added to the next monthly progress report for the Site:



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C Each of the items listed above for the associated quarterly groundwater elevation monitoring event; and

C A listing of the wells which were sampled during the event and the analyses to be conducted.

Following receipt of preliminary analytical results from a semi-annual groundwater sampling event, the following information will be added to the next monthly progress report for the Site:

- The analytical results from that monitoring event;
- An identification of any wells containing GW-2 groundwater in which the analytical results indicate an exceedance of an applicable GW-2 standard;
- An identification of any wells where the analytical data indicate an exceedance of a groundwater UCL; and
- An identification of any wells monitored for GW-3 groundwater in which the analytical data indicate an exceedance of an applicable GW-3 standard. These include not only the perimeter wells, but also, as an early warning mechanism, any of the general/source area sentinel wells.

## **5.4 Reporting Schedule**

In addition to the monthly status reports and any time-critical notifications, GE will prepare several reports during the course of the baseline monitoring program for GMA 5. Two types of reports will be prepared: Baseline Groundwater Quality Interim Reports, and the Baseline Assessment Final Report and Long-Term Monitoring Program Proposal. The anticipated content of these reports has been previously discussed in Section 4.5. The proposed schedule for submittal of these reports is presented below.

### **5.4.1 Baseline Groundwater Quality Interim Reports**

As described in Section 4.2.1 of this Proposal, baseline groundwater sampling activities will be performed on a semi-annual basis, in approximately April and October of each year. GE proposes to submit a Baseline Groundwater Quality Interim Reports on these events by the following July 31 and January 31, respectively. This timeframe is based on an anticipated 60-day period for the field samples to be analyzed and reported and the results

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validated, plus an additional 30 days for report preparation. GE anticipates that, if feasible, these reports will also include the water level measurement data (and associated groundwater elevation contour maps) from the two immediately preceding quarterly groundwater elevation monitoring events (i.e., the April and July water level data in the July 31 interim report, and the October and January water level data in the January 31 interim report).

#### **5.4.2 Baseline Assessment Final Report and Long-Term Monitoring Program Proposal**

Following the two-year baseline monitoring program for GMA 5, GE will prepare a Baseline Assessment Final Report and Long-Term Monitoring Program Proposal, which will contain the information described in Section 4.5.2 above. GE proposes to submit this final report and long-term monitoring proposal to EPA within 90 days following submittal of the last Baseline Groundwater Quality Interim Report.

# ***Tables***

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

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**TABLE 1**

**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS  
FORMER OXBOW AREAS A & C GROUNDWATER MANAGEMENT AREA  
SUMMARY OF EXISTING MONITORING WELLS**

<b>Piezometer ID.</b>	<b>Ground Elevation (Feet AMSL)</b>	<b>Measuring Point Elevation (Feet AMSL)</b>	<b>Depth to Top of Screen (Feet BGS)</b>	<b>Screen Length (Feet)</b>	<b>Screen Interval Elevation (Feet AMSL)</b>	<b>Depth to Water (Feet BMP)</b>	<b>Depth to Water (Feet BGS)</b>	<b>Groundwater Elevation (Feet AMSL)</b>
A-1	984.24	986.21	9	15	975.24 - 960.24	14.79	12.82	971.42
A-3	985.3	988.32	7	15	978.3 - 963.3	15.64	12.62	972.68
C-1	988.1	990.9	9	15	979.1 - 964.1	18.30	15.50	972.60
C-2	979.46	980.86	3	15	976.46 - 961.46	9.23	7.83	971.63

Notes:

1. Wells were installed by Geraghty & Miller, Inc. in November 1991.
2. Depth to water measurements were collected in November 1991.
3. Feet AMSL = Feet Above Mean Sea Level
4. Feet BGS = Feet Below Ground Surface
5. Feet BMP = Feet Below Measuring Point

TABLE 2

GENERAL ELECTRIC COMPANY  
PITTSFIELD, MASSACHUSETTS

FORMER OXBOW AREAS A & C GROUNDWATER MANAGEMENT AREA

GROUNDWATER SAMPLING HISTORY

Well ID	Date Collected	Analyses Performed								
		VOCs	SVOCs	Total PCBs	PCDDs/ PCDFs	Pest/ Herb	Total Metals	Filtered Metals	Phenol	Sulfide
<b>Former Oxbow Area A</b>										
WP-9	Oct-88	X	X	X		X		X		
A-1	Dec-91	X	X	X	X	X	X		X	X
A-3	Jan-92	X	X	X	X		X		X	X
<b>Former Oxbow Area C</b>										
WP-7	Oct-88	X	X	X		X		X		
WP-8	Oct-88	X	X	X		X		X		
C-1	Nov-91	X	X	X	X	X	X		X	X
C-2	Nov-91	X	X	X	X		X		X	X

Notes:

1. Source of data:

*MCP Phase I and Interim Phase II Report for Former Housatonic River Oxbow Areas A, B, C, J, and K*  
(BBL, February, 1996)

**TABLE 3**  
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**  
**FORMER OXBOW AREAS A & C GROUNDWATER MANAGEMENT AREA**  
**PROPOSED BASELINE GROUNDWATER MONITORING PROGRAM**

WELL ID*	FORMER OXBOW AREA	MONITORING WELL TYPE	RATIONALE	DEPTH TO TOP OF SCREEN (Feet BGS)	SCREEN LENGTH (Feet)	DEPTH TO GROUNDWATER (Feet BGS) (See Note 3)
A-1	A	GW-2 SENTINEL / PERIMETER (GW-3)	Downgradient perimeter; near existing occupied building.	9	15	12.8
A-3	A	GENERAL/SOURCE AREA SENTINEL (GW-3)	Sentinel in eastern portion of Oxbow Area A	7	15	12.6
<i>GMA5-1</i>	A	GW-2 SENTINEL / PERIMETER (GW-3)	Upgradient perimeter for Oxbow Area A; near potential preferential pathway and existing building; well moved from original proposed location	-	-	-
<i>GMA5-3</i>	A	GW-2 SENTINEL / PERIMETER (GW-3)	Downgradient perimeter for Oxbow Area A; near existing occupied building	-	-	-
<i>GMA5-4</i>	A	PERIMETER (GW-3)	Downgradient perimeter for Oxbow Area A (corresponds to SOW well PROP-5)	-	-	-
C-1	C	GENERAL/SOURCE AREA SENTINEL (GW-3)	Sentinel for Oxbow Area C	9	15	15.5
<i>GMA5-2</i>	C	PERIMETER (GW-3)	Upgradient perimeter for Oxbow Area C (corresponds to SOW well PROP-8)	-	-	-
<i>GMA5-5</i>	C	PERIMETER (GW-3)	Downgradient perimeter for Oxbow Area A (corresponds to SOW well PROP-7)	-	-	-

Notes:

1. \* Well IDs listed in italics are proposed new wells.
2. -: Construction data not available for proposed well.
3. Depths to groundwater measured in conjunction with November 1991 well development activities. Feet BGS = feet below ground surface.
4. Proposed wells GMA5-1, GMA5-2, GMA5-4, and GMA5-5 were previously proposed in the October 1999 Statement of Work for Removal Actions Outside the River (SOW). The generic well IDs which were presented in the SOW have been replaced with GMA-specific designations. For reference purposes, the previous generic well IDs are included in the Rationale column.