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Transmitted Via Overnight Delivery

April 14, 2014

Mr. Dave Dickerson
U.S. Environmental Protection Agency, Region I
5 Post Office Square (Mail Code OSR)
Boston, MA 02109-3912

Re: GE-Pittsfield/Housatonic River Site
Unkamet Brook Area (GECD170)
Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder

Dear Mr. Dickerson:

In accordance with EPA's letter dated February 14, 2014, enclosed for EPA's review is GE's *Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder.*

Please call with any questions regarding the enclosed report.

Sincerely,

Richard W. Gates/cre

Richard W. Gates
Senior Project Manager-Environmental Remediation

Enclosure

SDMS Doc ID 555790

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General Electric Company
Pittsfield, Massachusetts

Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder

Volume I of II

April 2014

Revised Final Removal Design/ Removal Action Work Plan for Unkamet Brook Area-Remainder

Revised Final RD/RA Work Plan

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1. Introduction

1.1 General

On October 27, 2000, 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 entered by the United States District Court for the District of Massachusetts. The CD requires (among other things) the performance of Removal Actions to address polychlorinated biphenyls (PCBs) and other hazardous constituents present in soils, sediment, and groundwater in several Removal Action Areas (RAAs) located in or near Pittsfield, Massachusetts. These RAAs are part of the GE-Pittsfield/Housatonic River Site. For each Removal Action, the CD and accompanying *Statement of Work for Removal Actions Outside the River* (SOW, Appendix E to the CD) establish Performance Standards that must be achieved, as well as specific work plans and other documents that must be prepared to support the Removal Actions for each RAA. For most of the Removal Actions, these work plans/documents include the following: Pre-Design Investigation Work Plan, Pre-Design Investigation Report, Conceptual Removal Design/Removal Action (RD/RA) Work Plan, and Final RD/RA Work Plan.

For the Unkamet Brook Area RAA, GE submitted to EPA a Pre-Design Investigation (PDI) Work Plan in November 2002, a Revised PDI Work Plan in May 2003, and a response to EPA's July 17, 2003 conditional approval of the latter on July 30, 2003. Thereafter, between February 2004 and December 2008, GE submitted to EPA a PDI Report and numerous supplements and related documents, each of which was approved or conditionally approved by EPA.[1] In one of those conditional approval letters, dated February 22, 2007, EPA directed GE to split the Unkamet Brook Area into two portions for purposes of submitting future deliverables, conducting additional sampling and remediation, and schedule tracking. These portions have been designated Unkamet Brook Area-West and Unkamet Brook Area-Remainder, and are shown on Figure 1-1.

In accordance with that request, GE previously prepared and submitted to EPA the following work plans for Unkamet Brook Area-West:

- *Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area-West* (West Conceptual Work Plan), dated February 12, 2009, conditionally approved by EPA in a letter dated December 14, 2009;

[1] In addition, EPA and GE agreed upon a modification to the CD to reflect the sampling approaches at Unkamet Brook proposed by GE and approved by EPA. That Fifth Modification of Consent Decree was filed with the District Court on May 25, 2007.

- *Conceptual Removal Design/Removal Action Work Plan Addendum for Unkamet Brook Area-West* (West Conceptual Addendum), dated March 12, 2010, conditionally approved by EPA in a letter dated March 30, 2010;

- *Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-West* (West Final Work Plan), dated July 16, 2010, conditionally approved by EPA in a letter dated February 14, 2011); and

- *Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-West* (West Revised Final Work Plan), dated April 14, 2011, conditionally approved by EPA in a letter dated July 5, 2011.

For Unkamet Brook Area-Remainder, GE previously prepared and submitted to EPA the following work plans:

- *Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area–Remainder* (Remainder Conceptual Work Plan), dated March 26, 2009, conditionally approved by EPA in a letter dated December 16, 2009;

- *Addendum to Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area–Remainder* (Remainder Conceptual Addendum), dated January 29, 2010, approved by EPA in a letter dated July 19, 2010; and

- *Second Addendum to Conceptual Removal Design/Removal Action Work Plan Addendum for Unkamet Brook Area–Remainder* (Remainder Second Addendum), dated August 16, 2010, approved by EPA in a letter dated September 29, 2010.

Following the submittal of these work plans, GE developed and discussed with EPA a number of interim draft deliverables that addressed various issues to be included in the Final RD/RA Work Plan for the Remainder Area. Based on those discussions, GE submitted a *Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* to EPA in April 2013. EPA issued a conditional approval letter for that work plan on February 14, 2014. In response, GE has prepared this *Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* (Revised Remainder Final Work Plan) to address the conditions in EPA's conditional approval letter.

This revised work plan addresses mainly the Remainder Area. However, as discussed with EPA, the remediation activities within the entire Unkamet Brook Area (including Unkamet Brook Area-West and Unkamet Brook Area-Remainder) will be performed in an integrated manner based on considerations of constructability, efficiency, and overall project schedule. In addition, consistent with EPA's February 22, 2007 conditional approval letter, it is anticipated that a single Final Completion Report for the entire Unkamet Brook Area

Removal Action will be submitted upon completion of the remediation and restoration activities, as described further in Section 8.4.

The Remainder Conceptual Work Plan and Remainder Conceptual Addendum presented: (1) a summary of the soil and brook sediment data used to evaluate Unkamet Brook Area-Remainder; (2) a description of the applicable Performance Standards in the CD and SOW for soils and sediments in this area, including the pre-established remedial actions for certain portions of this area; (3) evaluations of the existing data for both PCBs and the non-PCB constituents listed in Appendix IX of 40 CFR 264 (excluding pesticides and herbicides), plus benzene, 2-chloroethyl vinyl ether, and 1,2-diphenylhydrazine (Appendix IX+3) to assess the need for soil remediation in those areas not subject to pre-established remediation actions; (4) where necessary, a conceptual proposal for remediation activities; and (5) evaluations of both PCBs and non-PCB constituents in soil under post-remediation conditions (where relevant) to demonstrate that the proposed remediation activities will achieve the applicable Performance Standards. As indicated in those documents, remediation activities are necessary to address PCB and non-PCB constituents in certain areas within Unkamet Brook Area-Remainder.

This Revised Remainder Final Work Plan presents a summary of the pertinent pre-design investigations performed within the Unkamet Brook Area; a summary of the PCB and non-PCB evaluation procedures and results (including a few revisions to those presented in the prior submittals); design information; an evaluation of the impact of the proposed soil and sediment remediation on flood storage capacity; a discussion of Contractor selection; a detailed implementation plan; a summary of post-construction activities; and information regarding the anticipated time frame for construction activities. Additional details regarding the specific components and organization of this Final Work Plan are provided in Section 1.3.

1.2 Site Description

The Unkamet Brook Area (West and Remainder Areas combined) generally encompasses the eastern portion of the GE Plant Area in Pittsfield, as well as a number of non-GE owned properties between the GE Plant Area and the Housatonic River (Figure 1-1). The boundaries of this approximately 135-acre area are shown on Figure 1-2. In accordance with EPA's December 16, 2009 letter conditionally approving the Remainder Conceptual Work Plan, Parcel L12-3-1 and a portion of Parcel L11-4-12 (containing active railroad tracks and ballast) are excluded from the limits of the Unkamet Brook Area RAA and are not covered by the CD.

The Unkamet Brook Area contains several commercial and industrial properties (under a variety of ownerships), as well as several undeveloped recreational properties and areas (also under a variety of ownerships). The properties located within Unkamet Brook Area-West, including their ownership and uses, were described in the West Revised Final Work

Plan. Unkamet Brook Area-Remainder includes: (a) Unkamet Brook itself, which is largely an open channel that flows from north of Dalton Avenue (north of the RAA) through the RAA until it discharges into the Housatonic River; (b) GE's former interior landfill, which is located on both sides of the brook in the northern portion of the RAA, with the western side covered by a parking lot used by SABIC Innovative Plastics (SABIC) and the eastern side part of an undeveloped wetland; (c) additional undeveloped land owned by GE east of Unkamet Brook; (d) a developed area located between Merrill Road and railroad tracks of CSX Transportation, Inc. (CSX), which includes properties owned by local businesses; and (e) undeveloped non-GE-owned land on both sides of Unkamet Brook between the railroad tracks and the Housatonic River (see Figures 1-1 and 1-2).

Apart from Unkamet Brook and the former interior landfill (described below), Unkamet Brook Area-Remainder consists of the following separate averaging areas, as shown on Figure 1-2:

- The eastern, GE-owned, non-industrial portion of Parcel K12-9-1 (deemed to be in recreational use) excluding the former interior landfill and the inundated (palustrine/emergent) wetland areas (Area 9F on Figure E-1 in Attachment E to the SOW);

- The northern inundated (palustrine/emergent) wetland area (0- to 1-foot depth increment only) within GE-owned Parcel K12-9-1, located generally to the east of the former interior landfill (Area 9G on Figure E-1 in Attachment E to the SOW);

- The southern inundated (palustrine/emergent) wetland area (0- to 1-foot depth increment only) within GE-owned Parcel K12-9-1, located to the south of the former interior landfill (Area 9H on Figure E-1 in Attachment E to the SOW);

- Parcel L12-1-5, a privately owned commercial/industrial property located south of Parcel K12-9-1 adjacent to where Unkamet Brook passes beneath Merrill Road;

- Parcel L12-1-4, a privately owned commercial/industrial property located along Merrill Road, south of Parcel L12-1-5;

- A portion of Parcel L12-1-101, a privately owned commercial/industrial property located along Merrill Road, south of Parcel L12-1-4;

- A narrow linear portion of Parcel L11-4-12, which is located to the east of Parcels L12-1-5, -4, and -101, is owned by CSX, contains railroad tracks as part of a rail siding, and is considered to be in commercial/industrial use (referred to herein as the "rail siding

portion" of Parcel L11-4-12),[2] but excluding from this RAA the active railroad tracks themselves and the associated ballast, which is assumed to extend to 10 feet on either side of the centerline of the railroad tracks;

- A portion of Parcel L12-2-1, a vacant property located to the east of the rail siding portion of Parcel L11-4-12 and owned by the Commonwealth of Massachusetts – specifically, the Massachusetts Board of Regional Community Colleges for the use of Berkshire Community College; and

- A portion of Parcel L11-4-11, a vacant property owned by CSX located in the southernmost portion of Unkamet Brook Area–Remainder. As discussed in the Remainder Conceptual Work Plan, this averaging area also includes another, relatively small portion of adjacent Parcel L11-4-12 (also owned by CSX) located immediately to the south of Parcel L11-4-11, as shown on Figure 1-2. For the remainder of this document, references to the Parcel L11-4-11 averaging area also include this small portion of adjacent Parcel L11-4-12 to the south of Parcel L11-4-11.

In addition to the above, the SOW establishes three separate reaches of Unkamet Brook as averaging areas for the evaluation of sediments within the brook: Area 9J (north of Merrill Road); Area 9K (south of Merrill Road and north of the railroad tracks); and Area 9L (south of Merrill Road and the railroad tracks). The horizontal limits of these averaging areas were originally shown on Figure E-1 in Attachment E to the SOW but have been revised based on top-of-bank survey information collected for the portion of Unkamet Brook located south of Merrill Road and associated discussions with EPA. Additional information associated with the determination of those top-of-bank limits is presented in Sections 3.2.2, 5.3.3, and 7.5.2.2. As discussed in this revised work plan, GE has decided to satisfy the applicable Performance Standards for the brook by conducting sediment removal activities to a depth of one foot below existing grade within the top-of-bank limits along the entire length of Unkamet Brook located within this RAA (with the exception of the portion of the brook within the former interior landfill that is subject to re-routing as described herein, as well as certain portions of the brook with very steep banks, as further described in Section 5.3.3).

The former interior landfill is located within Parcel K12-9-1 (Figure 1-2). Pursuant to the CD and SOW, GE is required to install an impermeable cap/engineered barrier system over the former landfill area as the selected remedy for this area. To facilitate that installation, GE will re-route the portion of Unkamet Brook that passes within the former interior landfill to flow via its approximate former channel, beyond the eastern edge of the former landfill.

[2] This narrow linear area was identified in prior submittals as Parcel K11-4-2 and, before that, as Parcel L11-4-112. It is actually part of a larger CSX property, designated Parcel L11-4-12, situated to the west and south of the Unkamet Brook Area.

Additional information related to the brook re-routing and impermeable cap/barrier system is provided in Sections 5.7, 5.9.1, 7.5.3 and 7.5.11.

1.3 Scope and Format of Work Plan

Section 3.4 of the SOW contains specific requirements regarding the information that must be included in Final Work Plans. To satisfy those requirements, the remainder of this document is presented in eight sections. The title and a brief overview of each section are presented below.

Section 2 – Summary of Pre-Design Activities, summarizes the pre-design and supplemental investigation activities conducted by GE within the Unkamet Brook Area, the results of which were used to determine the need for and extent of remediation actions to address PCBs and other Appendix IX+3 constituents at the averaging areas located within Unkamet Brook Area-Remainder.

Section 3 – Summary of PCB and Appendix IX+3 Evaluation Procedures, describes the applicable Performance Standards and evaluation procedures for PCBs and other Appendix IX+3 constituents at Unkamet Brook Area-Remainder. It includes a description of the applicable PCB Performance Standards for the recreational and commercial/industrial soil averaging areas, the former interior landfill, and the sediments within Unkamet Brook, as well as the procedures used to evaluate PCBs in soil at the relevant averaging areas under existing and, where necessary, post-remediation conditions. It also describes the applicable Performance Standards for non-PCB Appendix IX+3 constituents and the procedures used to evaluate those constituents. Finally, it summarizes the applicable Performance Standards for the natural resource restoration/enhancement (NRR/E) activities required to be implemented at Unkamet Brook Area-Remainder under the CD and SOW.

Section 4 – Summary of PCB and Appendix IX+3 Evaluation Results, provides a summary of the PCB and non-PCB evaluations for the averaging areas (as well as utility corridors) located within Unkamet Brook Area-Remainder, as presented in the Conceptual Work Plan and Remainder Conceptual Addendum, with revisions where necessary. It also includes a summary of the proposed remediation actions (i.e., soil or sediment removal/replacement and/or the installation of an engineered barrier, as necessary) for those areas and a showing that they will achieve the Performance Standards.

Section 5 – Design Information, presents additional, detailed design-related information for the remediation actions to be conducted at Unkamet Brook Area-Remainder. Such information includes descriptions, along with technical drawings and specifications, regarding performance of the remediation and restoration actions, including soil and sediment removal (including culvert cleaning), backfilling of excavated areas, re-routing of Unkamet Brook and a sewer line, installation of engineered barriers, and NRR/E activities.

This section also includes a discussion of the potential impacts on flood storage capacity from the performance of the proposed remediation within the 100-year floodplains of Unkamet Brook and the Housatonic River, identification of site-specific Applicable or Relevant and Appropriate Requirements (ARARs), and a description of the procedures to be implemented to ensure attainment of those ARARs.

Section 6 – Contractor Selection, discusses the anticipated process for selecting a Remediation Contractor for implementation of the remediation and restoration activities to be conducted at Unkamet Brook Area-West and Unkamet Brook Area-Remainder together.

Section 7 – Implementation Plan, describes site-specific implementation components for the remediation activities. It presents a number of general implementation activities that will apply to both Unkamet Brook Area-West and Unkamet Brook Area-Remainder (consistent with or, where necessary, as modifications to those in the West Revised Final Work Plan); and it provides the specific implementation details for the remediation and restoration activities at Unkamet Brook Area-Remainder. This section includes descriptions of the project participants and their roles and responsibilities, Contractor submittal requirements, site preparation activities, construction-related activities for the various remediation components, and the surface water and ambient air monitoring to be conducted during construction. As noted in this section, certain implementation-related logistics are currently unknown and will be provided to EPA in a Supplemental Information Package (SIP) once a Remediation Contractor has been selected.

Section 8 – Post-Construction Activities, identifies the various activities to be performed following implementation of the remediation and restoration activities for the entire Unkamet Brook Area (i.e., both Unkamet Brook Area-West and Unkamet Brook Area-Remainder). These activities will include: execution and recordation of Grants of Environmental Restrictions and Easements (EREs); notifications of Conditional Solutions for other properties that do not achieve residential Performance Standards; project closeout activities (i.e., submittal of a Completion of Installation of Restoration Work Report and performance of an inspection of installed NRR/E measures, performance of a Pre-Certification Inspection, and preparation and submittal of a Final Completion Report); and Post-Removal Site Control activities, as well as monitoring and maintenance activities for the NRR/E measures.

Section 9 – Schedule, presents a proposed schedule for upcoming activities to be performed at the entire Unkamet Brook Area, including selection of a Remediation Contractor, submittal of a SIP, and initiation of remediation activities. It also discusses post-construction reporting.

The discussions in the above-referenced sections are supported by tables, figures and other information presented in several appendices, as described in subsequent sections of this Revised Remainder Final Work Plan.

Finally, it should be noted that this Revised Remainder Final Work Plan evaluates the need for and scope of response actions to achieve the ***soil- and sediment-related*** Performance Standards set forth in the CD and SOW. Groundwater at the Unkamet Brook Area is being addressed separately as part of GE's groundwater-related activities for Groundwater Management Areas (GMAs) 3 and 4 pursuant to the CD and SOW. At this time, these activities consist of the performance of a groundwater monitoring program, along with continuation of groundwater/non-aqueous-phase liquid (NAPL) recovery operations at GMA 3. For GMA 4, these activities include performance of a long-term monitoring program.

2. Summary of Pre-Design Investigation Activities

2.1 General

The remediation activities described in this Revised Remainder Final Work Plan are based on the results of pre-design investigation activities performed by GE and EPA at the Unkamet Brook Area. Since the Remainder Conceptual Work Plan provided a detailed description of the pre-design investigation activities, as well as the corresponding data tables presenting the results of those investigations, only a summary of those investigations is provided here. It should be noted that Section 2.2 summarizes the pre-design activities performed by GE within the entire Unkamet Brook Area (West and Remainder combined) since the majority of these activities were performed across the entire RAA prior to EPA's direction that the RAA be divided into Unkamet Brook Area-West and Unkamet Brook Area-Remainder.

2.2 Summary of Pre-Design Soil Investigations

The pre-design investigation activities for the Unkamet Brook Area consisted of the following:

- Review of historical soil investigations conducted prior to October 2002.

- Pre-design investigations conducted by GE between May 2003 and April 2005 in accordance with GE's PDI Work Plan, Revised PDI Work Plan, and subsequent related sampling proposals, generally including the collection and analysis of soil and sediment samples for analysis of PCBs and, for certain of those samples, other Appendix IX+3 constituents.

- Investigation activities conducted by EPA at the Unkamet Brook Area during GE's pre-design investigations as well as on prior occasions. The validated results of these EPA analyses were provided to GE as part of a data exchange agreement between GE and EPA. These data have been considered in the removal action evaluations for the Unkamet Brook Area (excluding the sample results rejected during EPA's data validation process).

- Supplemental pre-design investigations conducted by GE between March 2007 and December 2008 in accordance with a number of supplemental sampling proposals.[3]

[3] These consisted of GE's *Supplement to the Pre-Design Investigation Report for Unkamet Brook Area Removal Action* (Supplement to PDI Report) dated July 27, 2007, conditionally approved by EPA on March 26, 2008; *Proposal for Additional Supplemental PCB Pre-Design Investigations* (Additional

- Performance of a detailed site survey, including paved and unpaved areas, surface elevations and topography, property boundaries and easements, certain utilities (e.g., manholes, catch basins, etc.), soil sample locations, and other site features. The results of the detailed site survey were incorporated into the figures presented in the West and Remainder Conceptual Work Plans and subsequent documents related to the Unkamet Brook Area.

The results of the pre-design activities listed above were the basis for the PCB and Appendix IX+3 evaluations presented in the Remainder Conceptual Work Plan and Remainder Conceptual Addendum. The corresponding data summary tables providing the results of soil and sediment sampling activities at Unkamet Brook Area–Remainder were provided in Appendices A, B, and D of the Remainder Conceptual Work Plan and Attachments B, G, and H of the Remainder Conceptual Addendum.

Supplemental Investigations Proposal) dated October 3, 2007, approved by EPA on October 10, 2007; *Second Supplement to the Pre-Design Investigation Report for Unkamet Brook Area Removal Action* (Second Supplement) dated April 24, 2008, conditionally approved by EPA on June 30, 2008; *Third Supplement to the Pre-Design Investigation Report for Unkamet Brook Area Removal Action* (Third Supplement) dated July 29, 2008, conditionally approved by EPA on November 4, 2008; and *Scope of Supplemental Investigations and Status Updat*e (Supplemental Investigations/Status Update Letter) dated September 12, 2008, conditionally approved by EPA on November 4, 2008.

3. Summary of PCB and Appendix IX+3 Performance Standards and Evaluation Procedures

3.1 General

This section summarizes the procedures used by GE to determine the need for remediation actions within Unkamet Brook Area–Remainder to achieve the Performance Standards set forth in the CD and SOW for PCBs and other Appendix IX+3 constituents. This section includes a summary of the applicable Performance Standards and evaluation procedures for PCBs in soils and sediments (Section 3.2) and a summary of the applicable Performance Standards and evaluation procedures for non-PCB Appendix IX+3 constituents (Section 3.3). In addition, this section includes a summary of the Performance Standards in the CD and SOW for NRR/E activities at Unkamet Brook Area-Remainder.

3.2 Summary of PCB Evaluation Procedures

This section provides an overview of the PCB evaluation procedures for Unkamet Brook Area-Remainder, including: (1) a description of the PCB Performance Standards for soils; (2) a description of the PCB Performance Standards for sediments; (3) a summary of the PCB evaluation procedures for each averaging area; and (4) a summary of the utility corridor PCB evaluation procedures.

3.2.1 PCB-Related Performance Standards for Soils

For Unkamet Brook Area-Remainder, the Performance Standards related to the presence of PCBs in soil are set forth in Paragraph 25 of the CD and Section 2.2.2 of the SOW. The pertinent Performance Standards related to the presence of PCBs in soil at Unkamet Brook Area-Remainder are summarized below.

<u>GE-Owned Non-Industrial Area</u>

The undeveloped portion of Parcel K12-9-1 (shown in orange on Figure 1-2), excluding the two inundated palustrine/emergent wetland areas located to the east and south of the former interior landfill, is a GE-owned, non-industrial area. This area is subject to the following Performance Standards:

- GE must execute and record an ERE for this parcel in accordance with Section XIII of the CD.

- If the spatial average PCB concentration exceeds 10 ppm in the top foot or 15 ppm in the 1- to 3-foot depth interval, GE must remove and replace soils as necessary to achieve those spatial average PCB concentrations for the intervals specified.

- If the spatial average PCB concentration in the top 15 feet of soil exceeds 100 ppm after incorporating the anticipated performance of any remediation actions for the 0- to 1-foot and 1- to 3-foot depth intervals, GE must install an engineered barrier in accordance with the specifications for such barriers in Attachment G of the SOW.

- GE must evaluate potential changes to the current flood storage capacity of the Unkamet Brook floodplain due to the performance of the remediation actions described above and, if such actions will reduce the current flood storage capacity, provide flood storage compensation in the same general area to the extent practical. To achieve such compensation, however, GE is not required to remove soils from the former interior landfill prior to installation of any barrier or cap.

- Where utilities potentially subject to emergency repair requirements are present and the spatial average PCB concentration for the soils in the utility corridor exceeds 200 ppm in the 1- to 6-foot depth interval, GE must evaluate whether additional response actions are necessary for that corridor and submit that evaluation and a proposal for such response actions to EPA, if needed. In addition, if a new subgrade utility is installed or an existing subgrade utility is repaired or replaced in the future, GE must ensure that the spatial average PCB concentration of the backfill material does not exceed 25 ppm.

GE-Owned Inundated (Palustrine/Emergent) Wetlands

There are two separate inundated (palustrine/emergent) wetlands areas located within Parcel K12-9-1, as outlined in purple on Figure 1-2. Consistent with information provided in previous documents relating to Unkamet Brook, each of these areas is considered a separate averaging area – the northern inundated wetland east of the brook (excluding the former interior landfill) (Area 9G), and the southern inundated wetland (Area 9H). For these areas, the CD and SOW establish the following Performance Standards (in addition to the execution and recording of an ERE for this parcel, as noted above):

- GE must calculate the existing Exposure Point Concentration (EPC) for PCBs in the top foot of soil in each wetland. For each such wetland area, the EPC must be either: (a) the spatial average PCB concentration, calculated using the protocols contained in Attachment E to the SOW, provided that PCB data are available from an appropriate sampling grid, with a minimum 25-foot sample grid spacing within such wetland area; or (b) the 95% Upper Confidence Limit (UCL) on the arithmetic mean (95% UCL) of the PCB data (or the maximum PCB concentration if the 95% UCL exceeds the maximum).

- If the PCB EPC in the top foot of soil in each such wetland area exceeds 1 ppm, GE must either remove and replace soils or provide a soil surface cover as necessary to achieve a 1 ppm EPC. The loss of any wetlands will be considered to be mitigated through the payment that GE has made pursuant to Paragraph 114.b of the CD.

- GE must evaluate potential changes to the current flood storage capacity of the Unkamet Brook floodplain due to the performance of the remediation actions described above and, if such actions will reduce the current flood storage capacity, provide flood storage compensation in the same general area to the extent practical. To achieve such compensation, however, GE is not required to remove soils from the former interior landfill prior to installation of any barrier or cap.

Non-GE-Owned Commercial/Industrial Properties

The four non-GE-owned commercial/industrial averaging areas within Unkamet Brook Area-Remainder are the rail siding portion of Parcel L11-4-12 (but excluding the railroad tracks themselves and the associated ballast) and Parcels L12-1-4, L12-1-5, and L12-1-101 (portion), as shown in green on Figure 1-2.[4] For these properties, GE is required to use "best efforts" (as defined in the CD) to obtain an ERE from each property owner; and in fact, at GE's request, the owners of Parcels L12-1-4, L12-1-5, and L12-1-101 have executed EREs on their properties.[5] Where an ERE cannot be obtained, GE must implement a Conditional Solution in accordance with Paragraph 34 of the CD; this applies to the rail siding portion of Parcel L11-4-12, owned by CSX. The applicable PCB Performance Standards for these properties are as follows:

- For each property for which an ERE is obtained (i.e., Parcels L12-1-4, L12-1-5, and L12-1-101):

  - If the spatial average PCB concentration in the top foot in the unpaved portion exceeds 25 ppm, GE must remove and replace soils as necessary to achieve that spatial average PCB concentration. In addition, since each averaging area is over one-half acre, GE must remove any soils containing PCB concentrations greater than 125 ppm (the applicable not-to-exceed [NTE] level for commercial/industrial properties] in the top foot of the unpaved portion.

[4] The Remainder Conceptual Work Plan also indicated that Parcel L12-3-1 was a non-GE-owned commercial/industrial property within this RAA. However, as previously indicated, in accordance with EPA's December 16, 2009 conditional approval letter for that work plan, that property has been excluded from the limits of the Unkamet Brook Area and is not covered by the CD.

[5] These EREs were recorded in the Berkshire Middle District Registry of Deeds as follows: For Parcel L12-1-4, on May 4, 2012 in Book 4953, Page 1; for Parcel L12-1-5, on January 30, 2012 in Book 4890, Page 56; and for Parcel L12-1-101, on May 4, 2012 in Book 4952, Page 269. For each of these properties, in accordance with the applicable ERE, GE will record a Notice of Completion (and, if necessary, revised Plan of Restricted Area) following completion of the remediation actions at the property.

- If the spatial average PCB concentration in the top foot in the paved portion exceeds 25 ppm, GE must remove and replace soils as necessary to achieve that spatial average concentration or enhance the existing concrete/asphalt surface in accordance with the specifications for pavement enhancement in Attachment G to the SOW.[6]

- If the spatial average PCB concentration in the 1- to 6-foot depth interval exceeds 200 ppm (considering the paved and unpaved portions together), GE must remove and replace soils as necessary to achieve that spatial average PCB concentration.

- If the remaining spatial average PCB concentration in the top 15 feet of soil exceeds 100 ppm (after incorporating the anticipated performance of any remediation actions for the 0- to 1-foot and 1- to 6-foot depth intervals), GE must install an engineered barrier (in accordance with Attachment G to the SOW) in those areas determined to cause the exceedance of the 100 ppm spatial average concentration.

- For each area subject to pavement enhancement or an engineered barrier, GE must provide appropriate flood storage compensation, if necessary, in the same general area in accordance with the CD and SOW.

- Where utilities potentially subject to emergency repair requirements are present and the spatial average PCB concentration for the soils in the utility corridor exceeds 200 ppm, GE must evaluate whether additional response actions are necessary for that corridor and submit that evaluation and a proposal for such response actions to EPA, if needed. In addition, if a new subgrade utility is installed or an existing subgrade utility is repaired or replaced in the future, GE must ensure that the spatial average PCB concentration of the backfill material does not exceed 25 ppm.

· For the property where an ERE is not obtained (i.e., the rail siding portion of Parcel L11-4-12):

  - GE must conduct remediation actions as necessary to meet the same Performance Standards described above for properties for which an ERE is obtained, except that GE must remove and replace soils as necessary to meet a spatial average PCB concentration of 25 ppm in both the 0- to 1-foot (considering the combined paved and unpaved areas together) and 0- to 3-foot depth intervals.

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[6] As discussed further below, GE has elected to evaluate each of these properties (including the paved portions) as entirely unpaved.

- GE must also meet the other conditions for a Conditional Solution specified in the CD.

Non-GE-Owned Recreational Properties

The two non-GE-owned recreational averaging areas within Unkamet Brook Area-Remainder are portions of Parcels L12-2-1 and L11-4-11, as shown in pink on Figure 1-2. GE is required to use "best efforts" (as defined in the CD) to obtain an ERE from each such property owner. If an ERE cannot be obtained, GE must implement a Conditional Solution in accordance with Paragraph 34 of the CD. Parcel L12-2-1 is owned by the Commonwealth of Massachusetts – specifically, the Massachusetts Board of Regional Community Colleges for the use of Berkshire Community College (BCC). The Commonwealth agreed in the CD (¶ 62.b) that, for its properties at the Site for which GE is required to seek an ERE (and subject to certain conditions which would be met here), the Commonwealth would execute an ERE or, for properties subject to Article 97 (formerly Article 49) of the State Constitution (which require specific legislative authorization for the grant of an easement such a standard ERE), would execute a Notice ERE, as described in the CD. Based on a review of the deed to the Commonwealth for Parcel L12-2-1, it appears that that property may have been subject to Article 97 of the State Constitution at the time of entry of the CD, but is not currently subject to that article. Nevertheless, the Massachusetts Division of Capital Asset Management and Maintenance (MassDCAMM), which manages the BCC property, has advised GE, EPA, and MDEP that a standard ERE grant cannot be executed for that property without specific legislative authorization, similar to the situation for Article 97 property. In these circumstances, GE anticipates that a Notice ERE will be executed for this property.[7] For Parcel L11-4-11, the property owner (CSX) has advised GE that it elected not to execute an ERE for that property.

Based on this information, the applicable PCB Performance Standards for these averaging areas are as follows:

· For the averaging area where an ERE will be obtained (i.e., the portion of Parcel L12-2-1 within this RAA, assuming that a Notice ERE will be executed):

  - If the spatial average PCB concentration in the top foot exceeds 10 ppm, GE must remove and replace soils as necessary to achieve that spatial average concentration. In addition, since this averaging area is over one-half acre, GE shall remove soils containing PCB concentrations greater than 50 ppm (the applicable NTE level for recreational areas) in the top foot of unpaved soils.

[7] In the event that a Notice ERE cannot be obtained for this property, GE will advise EPA and MDEP, and the parties will discuss how to proceed.

- If the spatial average PCB concentration in the 1- to 3-foot depth interval exceeds 15 ppm, GE must remove and replace soils as necessary to achieve that spatial average.

- If the remaining spatial average PCB concentration in the top 15 feet of soil exceeds 100 ppm (after incorporating the anticipated performance of any remediation actions for the 0- to 1-foot and 1- to 3-foot depth intervals), GE must install an engineered barrier (in accordance with Attachment G to the SOW) in those areas determined to cause the exceedance of the 100 ppm spatial average concentration. In such areas subject to engineered barriers, GE must provide appropriate flood storage compensation, if necessary, in the same general area in accordance with the CD and SOW.

- Where utilities potentially subject to emergency repair requirements are present and the spatial average PCB concentration for soils in the utility corridor exceeds 200 ppm, GE must evaluate whether additional response actions are necessary for that corridor and submit that evaluation and a proposal for such response actions to EPA, if needed. In addition, if a new subgrade utility is installed or an existing subgrade utility is repaired or replaced in the future, GE must ensure that the spatial average PCB concentration of the backfill material does not exceed 10 ppm in the top 3 feet and 25 ppm for greater depths.

· For the averaging area where an ERE will not be obtained (i.e., the portion of Parcel L11-4-11 within this RAA):

- GE must conduct remediation actions as necessary to meet the same Performance Standards described above, except that GE must remove and replace soils as necessary to meet a spatial average PCB concentration of 10 ppm in both the 0- to 1-foot and 0- to 3-foot depth intervals (rather than achieving a spatial average of 15 ppm in the 1- to 3-foot depth interval).

- GE must also meet the other conditions for a Conditional Solution specified in the CD.

<u>Former Interior Landfill</u>

The former interior landfill, located within Parcel K12-9-1 and shown in brown on Figure 1-2, is subject to the following Performance Standards (in addition to the execution and recording of an ERE for this parcel, as noted above):

- In the unpaved (eastern) portion of the former landfill, GE must install an engineered landfill cap in accordance with the requirements described for landfill caps in Attachment G to the SOW. GE must then plant vegetation on the surface of the cap as provided in Attachment I to the SOW.

- In the currently paved (western) portion of the former landfill area, GE must install an asphalt engineered barrier in accordance with the specifications described in Attachment G to the SOW.

- GE must re-route an approximate 600-foot section of Unkamet Brook currently located within the former interior landfill limits to flow via its approximate former channel, which makes a gradual meander to the east beyond the eastern edge of the former interior landfill.

- GE must evaluate potential changes to the current flood storage capacity of the Unkamet Brook floodplain due the performance of the actions described above and, to the extent necessary and practical, provide flood storage compensation in the same general area. However, to achieve such compensation, GE is not required to remove soils from the former interior landfill prior to installation of the barrier/cap. Further, the excavations conducted to modify the surface topography in the phragmites areas (as described in Section 3.4) will be considered to provide the necessary flood storage compensation for any loss of flood storage capacity resulting from the installation of the barrier/cap over the former interior landfill.

3.2.2 PCB-Related Performance Standards for Sediments

As previously indicated, the portion of Unkamet Brook located within the limits of the former interior landfill is subject to re-routing. For the remainder of Unkamet Brook, Paragraph 25 of the CD and Section 2.2.2 of the SOW establish sediment Performance Standards that are applicable to the three separate sections identified in Section 1.2 (shown on Figure 1-2). These are: Area 9J (north of Merrill Road); Area 9K (south of Merrill Road and north of the railroad tracks); and Area 9L (south of Merrill Road and the railroad tracks). The following Performance Standards are established in the CD and SOW for the brook sediments in these areas:

- GE must calculate the existing EPC for PCBs in the top foot of sediments for each of the three reaches of the brook. For each such reach, the EPC is required to be either: (a) the spatial average PCB concentration, calculated using the protocols contained in Attachment E to the SOW, provided PCB data are available for transects located along each reach at an appropriate spacing, with a minimum spacing of 25 feet; or (b) the 95% UCL of the PCB data (or the maximum PCB concentration if the 95% UCL exceeds the maximum).

- If the PCB EPC in the top foot of sediments in each reach exceeds 1 ppm, GE must remove and replace brook sediments as necessary to achieve that PCB EPC.

As previously indicated, GE has decided to satisfy these Performance Standards by conducting sediment removal activities within the three brook reaches (except for the portion located within the former interior landfill, which is subject to re-routing) to a depth of one foot below existing grade from the top of one bank to the top of the opposing bank. Due to uncertainties regarding the top-of-bank locations for the portion of Unkamet Brook located south of Merrill Road, GE and EPA had numerous discussions which resulted in the top-of-bank limits shown on Figure 3-1. Further, approximately one month prior to implementation of sediment removal activities or at another time agreed upon with EPA, GE and EPA will conduct a joint site walk to confirm and stake out the top-of-bank limits for the portion of Unkamet Brook located south of Merrill Road. The Remediation Contractor will subsequently establish survey control for the required sediment removal activities by surveying the agreed-upon top of bank limits (as well as any necessary transects and additional survey control points) that will be used to document the performance of the remediation activities. Upon completion of the sediment removal activities, these areas will be backfilled with clean soil fill materials and riprap from an off-site source.

3.2.3 Area-Specific PCB Evaluation Procedures

Section 3.2.4 of the Remainder Conceptual Work Plan detailed the general procedures used to evaluate PCB concentrations in soil and sediment on an area-specific basis for the properties/averaging areas located within Unkamet Brook Area-Remainder. As discussed in that section and noted above, averaging calculations for the Unkamet Brook sediments were not necessary since GE has decided to perform sediment removal to a depth of one foot from top-of-bank to top-of-bank along the entire length of Unkamet Brook within the RAA (except for the portion of the brook located within the limits of the former interior landfill, which will be re-routed, and certain portions of the brook with very steep banks, as further described in Section 5.3.3). In addition, as discussed in the Remainder Conceptual Work Plan, GE has proposed to conduct soil removal/replacement activities in the top foot of the northern inundated wetland area (Area 9G) to achieve a post-remediation EPC below 1 ppm, and has also proposed to conduct soil removal/replacement within the entire top foot of the southern inundated wetland area (Area 9H), thus eliminating the need for averaging calculations in that area.

For the remaining soil averaging areas, the PCB evaluation procedures were established in Attachment E to the SOW (Protocols for PCB Spatial Averaging) and described in Section 3.2.4 of the Remainder Conceptual Work Plan. They generally involved the following steps: (1) for areas where NTE levels apply, comparing the discrete PCB concentrations in the top foot of soil in unpaved areas (or areas evaluated as unpaved) to the applicable NTE levels; (2) comparing the existing spatial average PCB concentrations for the relevant depth increments at each area to the applicable PCB Performance Standards; (3) at areas where

there were exceedances of the applicable NTE levels or other Performance Standards, developing a remediation proposal (soil removal or placement of an engineered barrier, as applicable) to address those exceedances; and (4) evaluating those properties/averaging areas in their post-remediation condition (considering soil removal and backfilling and installation of an engineered barrier where required) to ensure that the proposed remediation would achieve the Performance Standards.

The property/averaging area-specific PCB evaluation results were initially presented in Section 4 of the Remainder Conceptual Work Plan with supporting documentation (i.e., Thiessen polygon maps and averaging tables) in Appendix C to that plan. In response to a comment in EPA's December 16, 2009 conditional approval letter for that work plan, GE reviewed the extent of paved and unpaved areas at the soil averaging areas and determined that all areas previously considered to be paved can be considered to be entirely unpaved for the purpose of applying the soil-related Performance Standards. GE then evaluated the need to revise the prior evaluations based on that assumption and presented the results of that evaluation and, where necessary, revised evaluations of certain areas in the Remainder Conceptual Addendum, with supporting information in Attachments G and H to that addendum.

In both the Remainder Conceptual Work Plan and the Remainder Conceptual Addendum, Parcel L12-1-5 was evaluated as a commercial property that would be subject to a Conditional Solution, since the owner of that property had previously advised GE that it did not wish to execute an ERE for that property. However, the property owner subsequently changed its mind and, as discussed above, has executed an ERE for that property. Accordingly, GE has revised the evaluations for that property and developed a revised remediation proposal under the requirements applicable to properties with an ERE. The revised evaluation and remediation proposal for Parcel L12-1-5 is presented in Section 4.2.

3.2.4 Utility Corridor Evaluations

As discussed in the Remainder Conceptual Work Plan, GE conducted various survey activities during the performance of the pre-design activities to identify the utilities present within the Unkamet Brook Area that were subject to further evaluation and to identify the associated depth of those evaluations. As part of those surveys, GE performed a preliminary screening evaluation to determine which corridors were subject to future evaluation in the Remainder Conceptual Work Plan. That screening evaluation consisted of the following steps:

- First, GE reviewed the existing PCB data within approximately 50-foot-wide bands centered on each utility and identified discrete PCB concentrations exceeding the PCB comparison criteria of 200 ppm. Utility corridors that did not contain PCB analytical results above 200 ppm within that band were not subject to further evaluation, since the average PCB concentration in such corridors would necessarily be less than 200 ppm.

- Next, GE reviewed the average PCB concentrations for each soil boring located within the 50-foot band and identified individual soil borings with average PCB concentrations exceeding the comparison criteria of 200 ppm. Utility corridors that did not contain soil borings with average PCB concentrations greater than 200 ppm were also not subject to further evaluation.

The results of GE's preliminary utility survey were provided in GE's *Fourth Supplement to the Pre-Design Investigation Report for Unkamet Brook Area Removal Action* (Fourth Supplement), dated December 3, 2008, conditionally approved by EPA by letter of December 30, 2008. As indicted therein, Utility Corridors #1 and #2 (located north and south of the former interior landfill) were identified for evaluation of the 1- to 6-foot depth increment and Utility Corridors #3 through #7 were identified for evaluation from the ground surface to the estimated depth of the utility bedding. Each corridor was evaluated by calculating spatial average PCB concentrations for the 1- to 6-foot depth increment (for Utility Corridors #1 and #2) or from the ground surface to the estimated depth of the utility bedding (for Utility Corridors #3 through #7). The results of the utility corridor evaluations were presented in Section 4.12 of the Remainder Conceptual Work Plan (with supporting documentation provided in Appendix C of that document). However, based on the above-mentioned revised remediation proposal for Parcel L12-1-5 (which contains all or portions of Utility Corridors #3 through #5), those utility corridor evaluations have been revised; and the revised evaluations are described in Section 4.3.

3.3 Summary of Non-PCB Appendix IX+3 Constituent Evaluation Procedures

This section summarizes the procedures used to evaluate non-PCB Appendix IX+3 constituents in soil. As noted above, for certain areas within Unkamet Brook Area-Remainder, GE will conduct specified soil or sediment remediation actions. These include removal/replacement of the top foot of sediments in Unkamet Brook (except for the portion to be re-routed), removal/replacement of the top foot of soils in the entire southern inundated wetland area, and installation of a landfill cap or engineered barrier over the former interior landfill. As a result, no evaluation of non-PCB constituents was necessary for the Unkamet Brook sediments, the southern inundated wetland, or the interior landfill.

For the remaining averaging areas, as with PCBs, the non-PCB Appendix IX+3 constituents have been evaluated first for each averaging area in its existing condition; and then, for each area where the applicable Performance Standards are not met, remediation has been identified and post-remediation conditions have been evaluated to ensure achievement of the Performance Standards. This section includes an overview of the applicable Performance Standards for non-PCB Appendix IX+3 constituents in soil and the procedures used to assess achievement of those standards at these areas.

3.3.1 Applicable Performance Standards

The applicable Performance Standards for non-PCB Appendix IX+3 constituents in soils at Unkamet Brook Area-Remainder, as set forth in Section 2.2.2 of the SOW, consist of the following:

- For dioxins and furans, total Toxicity Equivalency Quotient (TEQ) concentrations must be calculated using the Toxicity Equivalency Factors (TEFs) published by the World Health Organization (WHO) in 1998 (van den Berg J. *et al*., *Environ. Health Perspectives*, Vol. 106, No. 12, Dec. 1998). For each averaging area and relevant depth increment, either the maximum TEQ concentration or the 95% UCL of the TEQ data must be below certain Preliminary Remediation Goals (PRGs) developed or approved by EPA for dioxin/furan TEQs. The dioxin/furan PRGs specified in the SOW include the following: for industrial/commercial areas, 5 parts per billion (ppb) in the top foot of soil and 20 ppb in subsurface soil; and for recreational areas, 1 ppb in the top foot and 1.5 ppb in the 1- to 3-foot depth interval. In addition, at EPA's request, GE previously agreed to compare the maximum or 95% UCL TEQ concentrations to the following TEQ criteria (although these are not specified in the CD or SOW): 5 ppb for the 0- to 3-foot depth increment at commercial areas that will not have EREs; 1 ppb for the 0- to 3-foot depth increment at recreational areas that will not have EREs; and 20 ppb for soils below 3 feet at any recreational area. (For convenience, these additional criteria are considered PRGs in this Revised Remainder Final Work Plan.)

- For other non-PCB constituents, any combination of the following must be achieved: (1) maximum concentrations of individual constituents that do not exceed certain Screening PRGs established or approved by EPA (as discussed below); and (2) for the remaining constituents, average concentrations that either: (a) do not exceed the Method 1 soil standards set forth in the Massachusetts Contingency Plan (MCP) (or Method 2 standards, if developed); or (b) are shown through an area-specific risk evaluation to have cumulative risk levels that do not exceed (after rounding) an excess lifetime cancer risk (ELCR) of 1×10^{-5} and a non-cancer Hazard Index (HI) of 1.0.

In June 2012, EPA advised GE that, based on a new non-cancer Reference Dose (RfD) that the Agency had developed for dioxin and placed in its Integrated Risk Information System (IRIS), EPA had developed "revised evaluation criteria" for dioxin/furan TEQs in soil at the Unkamet Brook Area; and it requested GE to re-evaluate the dioxin/furan soil data from this RAA against those criteria. Those revised evaluation criteria apply to TEQ concentrations calculated using revised TEFs issued by EPA in 2010, and consist of the following levels: (a) For areas evaluated as residential, 0.12 ppb in the top foot of soil and in subsurface soils; (b) for recreational areas with an ERE, 0.4 ppb in the top foot of soil, 0.6 ppb in the 1- to 3-foot depth interval, and 20 ppb in the 3- to 15-foot depth interval; (c) for recreational areas without an ERE, 0.4 ppb in the top foot and top three feet of soil and 20 ppb in the 3- to 15-foot depth interval; (d) for commercial areas with an ERE, 3 ppb in the

top foot of soil and 20 ppb in the 1- to 15-foot depth interval; and (e) for commercial areas without an ERE, 3 ppb in the top foot and top three feet of soil and 20 ppb in the 3- to 15-foot depth interval.

In response, GE noted that these revised evaluation criteria do not constitute Performance Standards under the CD and SOW, and that EPA does not have the authority under the CD to require GE to apply those criteria or to conduct additional remediation based on their application. However, GE agreed voluntarily to perform the dioxin/furan data re-evaluation using EPA's revised evaluation criteria (while reserving its rights), as discussed further in Sections 3.3.2 and 4.4.

3.3.2 Overview of Evaluation Process

The initial task performed in the evaluation of the non-PCB constituents in soils at Unkamet Brook Area-Remainder was to assess such constituents in soil at each averaging area under existing conditions, based on all available Appendix IX+3 data collected from that area, without considering PCB-related remediation. This assessment consisted of several steps:

- First, a screening step was conducted, which generally involved comparison of the maximum concentrations of all detected constituents (other than dioxin/furan TEQs) to the applicable PRGs developed by EPA Region 9 and set forth in Exhibit F-1 to Attachment F of the SOW or certain surrogate PRGs previously approved by EPA (jointly referred to as Screening PRGs). Additional details regarding this screening step were provided in Section 3.3.3 of the Remainder Conceptual Work Plan.

- Second, for dioxin/furan TEQs, the maximum concentration at each area and relevant depth increment was compared in the Remainder Conceptual Work Plan to the applicable dioxin/furan PRG specified in the SOW (or agreed to by GE). Additional details regarding this evaluation step were provided in Section 3.3.4 of the Remainder Conceptual Work Plan.

- Third, for those constituents (other than dioxin/furan TEQs) that were not screened out in Step 1, the existing average concentrations of each such constituent were calculated for the relevant depth increments. These average concentrations were then compared to the MCP Method 1 soil standards for such constituents. (As discussed in the Remainder Conceptual Work Plan, average concentrations of sulfide and copper were compared to derived Method 2 soil standards.) Additional details regarding this evaluation step were provided in Section 3.3.5 of the Remainder Conceptual Work Plan.

- Fourth, for averaging areas where there were exceedances of the Method 1 soil standards in any depth increment but such exceedances were not significantly above the Method 1 soil standards, an area-specific risk evaluation was conducted for the same constituents evaluated in Step 3 and in accordance with the procedures specified for such evaluations in the SOW. Additional details regarding this evaluation step were provided in Section 3.3.6 and Appendix E of the Remainder Conceptual Work Plan.[8]

In accordance with Technical Attachment F to the SOW, the above-described comparisons and evaluations of non-PCB constituents, following the initial screening step, were performed for the same depth increments used for the PCB evaluations.

At averaging areas where the evaluations indicated the need for additional remediation to address non-PCB Appendix IX+3 constituents in soil, a soil removal/replacement proposal was developed. For such areas, an evaluation was then conducted under anticipated post-remediation conditions. This evaluation consisted of repeating Steps 2 through 4 of the above-described process, as necessary, to demonstrate that the proposed response actions would achieve the applicable Performance Standards for non-PCB Appendix IX+3 constituents.

The averaging area-specific Appendix IX+3 evaluation results were initially presented in Section 4 of the Remainder Conceptual Work Plan, with supporting documentation provided in Appendices D (Appendix IX+3 sample location figures and evaluation tables) and E (Risk Evaluation) of that document. In response to a comment in EPA's December 16, 2009 conditional approval letter for that work plan, revised Appendix IX+3 evaluation tables for the Parcel K12-9-1 recreational averaging area and a revised risk evaluation for that area were presented in Attachment B of the Remainder Conceptual Addendum.

On October 8, 2012, in response to EPA's request, GE submitted a *Re-evaluation of Dioxin/Furan Soil Data from Unkamet Brook Area*, including both the Remainder and West Areas, using EPA's "revised evaluation criteria" for dioxin, listed in Section 3.3.1. In that submission, GE noted that it reserved the right to contest any EPA requirement for additional remediation based on application of those criteria, since they are not Performance Standards under the CD and SOW. Based on discussions with and comments from EPA, GE has revised that re-evaluation and considered the need for additional soil removal. That revised evaluation (Revised Dioxin Re-evaluation) is

[8] As discussed in 3.3.6 the Remainder Conceptual Work Plan, since there is no applicable risk evaluation scenario for the 0- to 15-foot depth increment at recreational properties, the average concentrations in that depth increment at recreational properties that were subject to risk evaluations were compared to the Upper Concentration Limits (UCLs) for soil, as specified in the MCP, in lieu of risk-based concentrations.

discussed in Section 4.4, and includes a voluntary proposal to expand the soil removal limits in two areas (one in the Remainder Area and one in the West Area).

3.4 Performance Standards and Other Requirements for Natural Resource Restoration/Enhancement Activities

Technical Attachment I to the SOW sets forth the Performance Standards and other requirements for the NRR/E activities that must be carried out at the Unkamet Brook Area. These Performance Standards and other requirements require GE to conduct the following activities:

- Remove the existing stand of phragmites located in the wetland area east of Unkamet Brook; and excavate the surface soil in that area to approximately one foot below shallow groundwater, as determined during the month of May (total excavation depth of a minimum of two feet depending on the nature and quality of the soil), to minimize the possibility for natural re-establishment of phragmites in the area. Following the surface topography adjustment, GE must allow for the re-development of the wetlands community through natural succession, and ensure that invasive species do not repopulate these areas through actions described in Section 8 of Attachment I to the SOW.

- After re-routing Unkamet Brook to its approximate original channel, stabilize the western bank of the new channel (which will abut the former interior landfill) and plant a vegetative community along that bank, consisting of a diverse native herbaceous community that will not interfere with the integrity of the landfill cap.

- In areas east of the new channel that are disturbed by activities associated with re-routing Unkamet Brook, seed those areas with an herbaceous seed mixture.

- After installation of the landfill cap over the unpaved portion of the former interior landfill, plant on the surface of the cap an herbaceous vegetative community that will not interfere with the integrity of the cap.

- Place bluebird boxes along the edges of the former interior landfill area adjacent to the wetlands.

Attachment I to the SOW sets forth more specific requirements relating to these activities.

In the Remainder Conceptual Work Plan and subsequent discussions with EPA, GE agreed to conduct the above-described phragmites removal actions both in the main phragmites area located south of Dalton Avenue (which is more extensive than the area referenced in Attachment I to the SOW) and also in the smaller area located in the vicinity of the northernmost portion of the former interior landfill. These areas are described in Section

5.10.1. In addition, GE agreed to address phragmites within the former interior landfill as part of landfill cap installation activities – i.e., by treating the existing vegetation with an appropriate herbicide application, removing the above-grade portions of the phragmites plants, and then installing the landfill cap (which will prevent light from promoting growth of subsurface plant material and curtail plant growth through the liner). Full phragmites removal will not be conducted within the former interior landfill area, since that would require excavation within the landfill.

GE and EPA also agreed during discussions that GE would plant native trees and shrubs (in addition to a native herbaceous community) on the eastern side of the re-routed brook, but that those trees and shrubs would not be subject to any post-planting monitoring or maintenance activities.

Finally, although the SOW specifies a minimum spacing of 300 yards between the bluebird boxes, GE and EPA have agreed, based on input from the Trustees, that the bluebird boxes along the edges of the former interior landfill will be installed approximately 300 feet apart.

4. Summary of PCB and Appendix IX+3 Evaluation Results

4.1 General

The Remainder Conceptual Work Plan presented the results of the area-specific PCB and non-PCB Appendix IX+3 evaluations that were performed in accordance with the evaluation procedures described in Section 3 of that document. That Work Plan presented the following information for each soil averaging area located within Unkamet Brook Area-Remainder:

- Description of area and identification of applicable Performance Standards;
- Evaluation of existing conditions with respect to PCBs and discussion of the need for remediation to address PCBs;
- Evaluation of existing conditions with respect to other Appendix IX+3 constituents and discussion of the need for remediation to address these constituents;
- Description of the proposed remediation action, if any (as shown on Figures 4-1 and 4-2 of that work plan); and
- Evaluation of post-remediation conditions with respect to PCBs and other Appendix IX+3 constituents (if required) to demonstrate achievement of the Performance Standards.[9]

The Remainder Conceptual Work Plan also presented the utility corridor evaluations for PCBs under both existing and post-remediation (where applicable) conditions. Supporting documentation was provided in Appendices C (Thiessen polygon maps and averaging tables for PCB evaluations [including utility corridor evaluations]), D (sample location figures and averaging tables for Appendix IX+3 evaluations), and E (area-specific risk evaluations of non-PCB Appendix IX+3 constituents in soil) of that document.

[9] For Area 9G, the northern inundated wetland, since GE proposed to remove all soil from the top foot in a portion of that wetland, an evaluation of that area against the Performance Standards was performed only under post-remediation conditions. For Area 9H, the southern inundated wetland, since GE proposed to remove all soil from the top foot in that wetland, no evaluations based on averaging were necessary.

Following submittal of the Remainder Conceptual Work Plan, GE revised certain of the PCB and non-PCB evaluations in response to EPA's comments in its December 16, 2009 conditional approval letter for that document, and presented the results of those revised evaluations in the Remainder Conceptual Addendum. As mentioned in Section 3, these revised evaluations consisted of the following:

- In response to Comment #25 in EPA's conditional approval letter, GE reviewed the extent of "paved" and "unpaved" areas and determined that all areas previously considered paved during the development of the Remainder Conceptual Work Plan would be considered unpaved for the purpose of meeting the soil-related Performance Standards. This decision caused modifications to PCB evaluations for Parcels L12-1-4 and L12-1-101. The revised PCB evaluations and associated polygon maps for those two parcels were provided in Attachments G and H of the Remainder Conceptual Addendum.

- In response to Comment #4 in EPA's conditional approval letter, GE revised the non-PCB Appendix IX+3 evaluations and associated risk evaluation for the non-industrial/recreational portion of Parcel K12-9-1. The revised Appendix IX+3 evaluations and the revised risk evaluation for that averaging area were provided in Attachment B of the Remainder Conceptual Addendum.

In addition, in response to Comment #11 of EPA's December 16, 2009 conditional approval letter, GE considered performing additional soil removal at Parcel L12-2-1 within the polygon associated with sample location E-BB14 to a depth of three feet. As demonstrated in Tables C-45 and C-46 of the Remainder Conceptual Work Plan, such additional removal is not required to satisfy the applicable Performance Standards, nor is such removal necessary to facilitate constructability. Therefore, no additional soil removal is proposed in the referenced polygon at Parcel L12-2-1.

As noted earlier in this document, the evaluations in the Remainder Conceptual Work Plan and Addendum assumed that Parcel L12-1-5 would not be subject to an ERE, and therefore evaluated that property under the Performance Standards applicable to commercial properties subject to a Conditional Solution. However, as further mentioned above, the owner of that property has since executed an ERE for the property. As a result, the PCB and non-PCB evaluations for that property have been revised to reflect the execution of the ERE. The results of these revised evaluations, together with a revised remediation proposal for that property, are provided in Section 4.2, with supporting information in Appendix A.

In addition, since Parcel L12-1-5 contains all or portions of three of the utility corridors that were evaluated in the Remainder Conceptual Work Plan, the utility corridor evaluations have been revised in light of the revised remediation proposal for that property. Those revised evaluations (including proposed additional soil removal) are presented in Section 4.3, with supporting information in Appendix B.

As discussed in Section 3.3, at EPA's request, GE has re-evaluated the dioxin/furan soil data from the Unkamet Brook Area in light of the "revised evaluation criteria" developed by EPA based on its new non-cancer RfD for dioxin. That re-evaluation is summarized in Section 4.4 and presented in Appendix C.

Finally, Section 4.5 provides an overall summary of the PCB and non-PCB evaluation results and the soil and sediment remediation actions for Unkamet Brook Area-Remainder, including estimated soil and sediment removal volumes and the areas of engineered barrier installation. The limits of soil and sediment remediation and engineered barrier installation are depicted on Figures 4-1 and 4-2.

4.2 Revised Evaluations for Parcel L12-1-5 (Commercial/Industrial)

Parcel L12-1-5 is a privately owned commercial/industrial property bordered to the east by the rail siding portion of Parcel L11-4-12, to the north and west by Merrill Road, and to the south by Parcel L12-1-4 (Figure 1-2). Since this property is now subject to an ERE, and since GE has previously elected to evaluate this entire property (even the paved portions) as unpaved, the applicable PCB Performance Standards require the following: (a) removal/replacement of soils in the top foot as necessary to achieve a spatial average PCB concentration of 25 ppm in that depth increment; (b) since this property is greater than 0.5 acre, removal of any discrete locations in the top foot that contain PCB concentrations exceeding the applicable NTE level of 125 ppm for commercial/industrial properties; (c) soil removal/replacement as necessary to achieve a spatial average PCB concentration of 200 ppm in the 1- to 6-foot depth increment; and (d) installation of an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

The remainder of this section provides details regarding the revised evaluations for Parcel L12-1-5 under existing conditions, the proposed remediation for this property, and the revised evaluations under post-remediation conditions, with supporting information in Appendix A.

4.2.1 PCB Evaluation – Existing Conditions

The first step in the evaluation process involved the identification of any soil samples in the top foot of the property (treating the entire property as unpaved, as discussed above) containing PCB concentrations greater than the applicable NTE level of 125 ppm. This step

resulted in the identification of four soil sample locations (RAA10-E-T10, RAA10-E-T11, RAA10-E-T12, and RAA10-E-X10) in the top foot of soil with polygons that contain PCBs at concentrations in excess of the NTE level. As a result, GE will excavate the soil located within the polygons associated with the above sample locations.[10]

The next step involved the use of available PCB soils data and the spatial averaging procedures described in Section 3.2.4 of the Remainder Conceptual Work Plan to calculate an average PCB concentration for each of the relevant depth increments, using the Thiessen polygon mapping provided in Figures A-1 through A-11 in Appendix A. The following table presents the existing average PCB concentrations that were calculated for this property, together with references to the corresponding tables in Appendix A and the applicable Performance Standards:

Depth Increment	Appendix A Table Reference	Existing Average PCB Concentration (ppm)	Performance Standard (ppm)
0 – 1’	A-1	66.29	25
1 – 6’	A-2	429.47	200
0 – 15’	A-3	296.41	100

As indicated in the preceding table, the existing average PCB concentration in each depth increment exceeds the corresponding Performance Standard. In addition, as noted above, there are four exceedances of the NTE level at this property. As a result, remediation is required to achieve the PCB Performance Standards for this averaging area.

4.2.2 Appendix IX+3 Evaluation – Existing Conditions

The non-PCB Appendix IX+3 data used in the evaluations for the Parcel L12-1-5 were presented in Table D-19 of the Remainder Conceptual Work Plan and are included as Table A-4 in Appendix A. The locations of these Appendix IX+3 soil samples are illustrated on Figures A-12 through A-14. These data are the basis for the Appendix IX+3 evaluations presented in this section.

[10] In the Remainder Conceptual Work Plan, GE noted that it had elected to remove soils containing PCB concentrations above 125 ppm from paved areas associated with those particular sample locations in response to a comment in a prior EPA conditional approval letter dated June 30, 2008. Since GE is now electing to treat the entire property as unpaved, those same soils would be removed under the current proposal.

4.2.2.1 Screening Evaluation

Consistent with the protocols established in the SOW and summarized in Section 3.3.3 of the Remainder Area Conceptual Work Plan, the maximum concentrations of all detected constituents (other than dioxins/furans) were compared to their corresponding Screening PRGs. Table A-5 identifies the detected constituents and provides a comparison of the maximum detected concentration of each of those constituents to the applicable Screening PRGs. As shown in that table, two constituents – benzo(a)prene and arsenic – have maximum detected concentrations that exceed their corresponding Screening PRGs. These constituents were retained for further evaluation, along with dioxin/furan TEQs

4.2.2.2 Evaluation of Retained Constituents

The next component of the Appendix IX+3 evaluation involved comparison of the average concentrations of both benzo(a)pyrene and arsenic to the applicable MCP Method 1 soil standards and comparison of maximum dioxin/furan TEQ concentrations to the applicable EPA PRGs.

Tables A-6 through A-8 present the evaluations of retained constituents for the 0- to 1-foot, 1- to 6-foot, and 0- to 15-foot depth increments, respectively. As indicated in those tables, all dioxin/furan TEQ concentrations are below the applicable PRGs,[11] and the average concentrations of benzo(a)pyrene and arsenic are less than the applicable Method 1 soil standards for each applicable depth increment. Therefore, no remediation for Appendix IX+3 constituents is necessary to achieve the non-PCB Performance Standards at Parcel L12-1-5.

4.2.3 Proposed Remediation

Based on the results of the PCB evaluations described above, GE proposes to conduct soil removal/replacement, as well as installation of an engineered barrier within this property in the areas and to the limits shown on Figure A-15. This remediation will include the excavation and off-site disposal of an estimated 2,505 *in-situ* cubic yards (cy) of soil and installation of an estimated 0.12 acre of engineered barrier to achieve the soil-related Performance Standards at this property (plus removal of an additional 185 cy of soil to

[11] As shown in Table 12A of GE's Revised Dioxin Re-evaluation in Appendix C, the TEQ concentrations calculated for this property using the revised TEFs issued by EPA in 2010 are also below EPA's "revised evaluation criteria" for TEQs.

address the utility corridor standards, as discussed in Section 4.3 below). Implementation of this remediation and potential modifications are discussed in Section 4.2.5.[12]

4.2.4 PCB Evaluation – Post-Remediation Conditions

The proposed remediation shown on Figure A-15 will result in removal of all soils containing PCBs in excess of the NTE level and achievement of the PCB Performance Standards for the relevant depth increments, as indicated in the following table:

Depth Increment	Appendix A Table Reference	Post-Remediation Average PCB Concentration (ppm)	Performance Standard (ppm)
0 – 1’	A-9	12.20	25
1 – 6’	A-10	134.54	200
0 – 15’	A-11	99.16[1]	100

Note:

1. In calculating the average post-remediation concentration for the 0- to 15-foot depth increment, data collected from samples beneath the proposed engineered barrier have been excluded.

4.2.5 Implementation and Potential Modifications

Similar to numerous remedial excavations implemented at other properties, GE anticipates that Remediation Contractor will be able to implement the proposed remediation at Parcel L12-1-5 to the limits shown on Figure A-15 using standard construction procedures. Specifically, GE anticipates that the Remediation Contractor will: (1) remove the existing site features east and south of the building (e.g., the miscellaneous concrete pads, air conditioning units, and handicap access ramp); and (2) implement any necessary excavation stabilization measures for the six-foot excavation adjacent to the building, the headwall for Culvert #3 (shown on Technical Drawings 25 and 26 in Appendix D), and the three-foot and six-foot removals adjacent to Merrill Road (e.g., trench boxes, steel sheeting, etc. and/or certain operational measures such as performing the excavation[s] in sections that only expose a portion of the structure/feature requiring stabilization), as required to complete the proposed excavations. To the extent that the Remediation Contractor, in

[12] Since the building at this property contains a full basement, GE has determined that there is no need to leave a wedge of soil in place angling down and away from the structure, to support the building’s foundation during the six-foot excavation adjacent to the building. As noted in Section 4.2.5, the potential need for any special procedures for that excavation (e.g., excavation supports, excavation in sections, etc.) will be determined in conjunction with the Remediation Contractor and, if necessary, provided in the SIP.

consultation with GE, determines that any of the soils adjacent to the building, culvert headwall, and/or Merrill Road cannot be removed to the limits shown on Figure A-15, proposed modifications to the limits of soil removal will be presented in the SIP (if such a determination is made prior to construction), along with revised evaluations of the post-remediation conditions (if necessary) demonstrating achievement of the applicable Performance Standards.

As noted in Section 4.2.4, the anticipated post-remediation average PCB concentration for the 0- to 15-foot depth increment is slightly below the applicable Performance Standard of 100 ppm. Therefore, to ensure achievement of that Performance Standard, the Remediation Contractor will be required to implement the remediation activities at Parcel L12-1-5 in the following manner. First, the six-foot excavations adjacent to the building, culvert headwall, and Merrill Road will be performed to demonstrate (through survey documentation) that these excavations were performed to the limits shown on Technical Drawing 26 in Appendix D. In the event that those excavations cannot be completed to the specified limits, and the Remediation Contractor is required to leave soils to support the building, culvert headwall, and/or roadway, additional remediation activities will be performed elsewhere on the property as necessary to ensure achievement of the applicable Performance Standards. Such remediation would likely consist of additional soil removal and/or installation of an engineered barrier to address soils in the 1- to 3-foot depth increment at sampling location RAA10-E-V10 (which contains PCBs at a concentration of 1,080 ppm) that are not already proposed for removal as part of the evaluations for Utility Corridor #4 (as further described in Section 4.3). In such an instance, GE will provide a revised remediation proposal and post-remediation PCB averaging evaluations demonstrating achievement of the applicable Performance Standards to EPA prior to implementing the remediation activities at the remainder of the property.

Finally, prior to and during construction, GE will coordinate with the City of Pittsfield and Massachusetts Department of Transportation (MassDOT), as appropriate, regarding the implementation of the remediation activities to be performed adjacent to Merrill Road and the potential need for any traffic controls (e.g., lane reductions) to facilitate safe implementation of the remediation activities.

4.3 Revised Utility Corridor Evaluations

As noted in Section 3.2.1, the applicable Performance Standards require that, where utilities potentially subject to emergency repair requirements are present and the spatial average PCB concentration for the soils in the utility corridor exceeds 200 ppm, GE must evaluate the need for additional response actions. As explained in Section 3.2.4, GE reviewed the PCB data from samples located within an approximately 50-foot-wide band of existing utilities to determine which utility corridors required further evaluation. Through that screening evaluation, GE identified seven utility corridors within Unkamet Brook Area-Remainder that required further evaluation. Those corridors, along with the associated

evaluation depths, were identified in the Fourth Supplement (as conditionally approved in a letter from EPA to GE dated December 30, 2008) and consisted of the following:

- Remainder Utility Corridor #1: This corridor contains the portion of the sanitary sewer line located north of the former interior landfill.

- Remainder Utility Corridor #2: This corridor contains the portion of the sanitary sewer line located south of the former interior landfill.

- Remainder Utility Corridor #3: This corridor contains the storm drain entering the northern portion of Parcel L12-1-5.

- Remainder Utility Corridor #4: This corridor contains the gas line entering Parcel L12-1-5 to the south of the building.

- Remainder Utility Corridor #5: This corridor contains the sanitary sewer located along the northwestern portions of Parcels L12-1-101, L12-1-4, and L12-1-5.

- Remainder Utility Corridor #6: This corridor contains the portion of sanitary sewer running north-south from Merrill Road on the rail siding portion of Parcel L11-4-12. However, since, as noted above, the active railroad tracks on this property and associated ballast (within 10 feet from the centerline of the tracks) have been excluded from this RAA and from coverage by the CD, GE has also excluded from the utility evaluations any utility corridor soils within 10 feet of the centerline of the tracks.

- Remainder Utility Corridor #7: This corridor contains the portion of sanitary sewer originating at the southern end of Utility Corridor #6 and extending southeast towards the Housatonic River.

The locations of these utility corridors are shown on Figure B-1 (for Utility Corridors #1 and #2, no polygon mapping required) and Figures B-2 through B-8 (for Utility Corridors #2 through #7, with polygon mapping) in Appendix B.

As described in the Second Supplement, utility corridors within Unkamet Brook Area-Remainder other than Utility Corridors #1 through #7 did not require further evaluation since none of the samples within the relevant utility-related depth increments had discrete concentrations of PCBs above the 200 ppm comparison level.

The evaluations of the above-listed utility corridors were presented in Section 4.12 of the Remainder Conceptual Work Plan (with supporting documentation provided in Appendix C of that document). The following table presents the existing average PCB concentrations that were calculated for each utility corridor, including references to the corresponding table in Appendix C of the Remainder Conceptual Work Plan:

Utility Corridor	Table Reference (in Appendix C to Remainder Conceptual Work Plan)	Existing Average PCB Concentration (ppm)
Remainder Utility Corridor #1	C-54	97.42
Remainder Utility Corridor #2	C-55	37.66
Remainder Utility Corridor #3	C-56	847.84
Remainder Utility Corridor #4	C-58	570.08
Remainder Utility Corridor #5	C-60	56.19
Remainder Utility Corridor #6	C-62	79.40
Remainder Utility Corridor #7	C-64	4.75

As indicated in the table above, the existing spatial average PCB concentrations in Utility Corridors #1, #2, #5, #6, and #7 are below the 200 ppm comparison level; therefore, no additional evaluations were required for those corridors. The Remainder Conceptual Work Plan proposed remediation activities at several properties to achieve the soil-related Performance Standards applicable to each property. Where appropriate, those remediation activities were incorporated into post-remediation utility corridor evaluations for Utility Corridors #3 through #7. The proposed remediation activities included the removal of the top three feet of soil to address sampling location RAA10-E-V10, which included soils associated with Utility Corridor #4. As shown in that document, the incorporation of the proposed remediation activities into the utility corridor evaluations resulted in post-remediation average PCB concentrations less than the 200 ppm comparison criterion for Utility Corridors #3 and #4 and further reduced the average PCB concentrations for Utility Corridors #5 through #7.

However, in light of the revised remediation proposal for Parcel L12-1-5 (which no longer requires remediation to address soils associated with RAA10-E-V10 to achieve the property-specific Performance Standards), additional soil removal is required to achieve a post-remediation average PCB concentration less than the 200 ppm comparison criterion in Utility Corridor #4. The proposed additional removal and a revised post-remediation evaluation of Utility Corridors #3 through #7 are described below.

As shown on Figures B-2 through B-8, Utility Corridors #3 and #4 and a portion of Utility Corridor #5 are located within Parcel L12-1-5. Based on the results of the PCB and Appendix IX+3 evaluations summarized in Section 4.2, GE is proposing to remove an estimated 2,505 *in-situ* cy from Parcel L12-1-5 to satisfy the property-specific Performance Standards. In addition, GE proposes to remove an additional 185 cy of soil from Utility Corridor #4 to achieve a post-remediation average PCB concentration less than the

comparison criterion of 200 ppm. Therefore, the proposed remediation activities for Parcel L12-1-5 will involve removal of a total of an estimated 2,690 cy of soil. These proposed remediation activities have been incorporated into revised post-remediation evaluation tables associated with Utility Corridors #3 through #5, which are presented in Tables B-1 through B-3 in Appendix B. In addition, the remediation activities proposed at other properties to achieve the applicable property-specific Performance Standards were previously incorporated into the post-remediation evaluations of Utility Corridors #6 and #7 presented in the Remainder Conceptual Work Plan. For ease of reference, the following summary table presents the post-remediation average PCB concentrations that were calculated for Utility Corridors #3 through #7, including references to the corresponding tables in Appendix B of this document or Appendix C of the Remainder Conceptual Work Plan.

Utility Corridor	Table Reference	Post-Remediation Average PCB Concentration (ppm)
Remainder Utility Corridor #3	B-1 Appendix B hereto	3.02
Remainder Utility Corridor #4	B-2 Appendix B hereto	28.77
Remainder Utility Corridor #5	B-3 Appendix B hereto	47.85
Remainder Utility Corridor #6	C-63 Rem. Conceptual Work Plan	43.59
Remainder Utility Corridor #7	C-65 Rem. Conceptual Work Plan	2.80

As indicated above, the post-remediation spatial average PCB concentration in each of the utility corridors subject to evaluation is below the 200 ppm comparison level.

4.4 Summary of Re-evaluation of Dioxin/Furan Data

As discussed in Section 3.3, at EPA's request, on October 8, 2012, GE submitted a re-evaluation of the dioxin/furan soil data at the Unkamet Brook Area (including both the Remainder and West Areas) in light of the "revised evaluation criteria" developed by EPA based on its new non-cancer RfD for dioxin. Based on discussions with and comments from EPA, GE has revised that re-evaluation, which is included in Appendix C. That Revised Dioxin Evaluation demonstrates that, at most properties/averaging areas with dioxin data in the Unkamet Brook Area, the dioxin/furan TEQ concentrations under either

currently existing conditions or conditions that would exist following previously proposed soil removals would be below EPA's "revised evaluation criteria." As also noted in that appendix, while reserving its rights, GE is voluntarily proposing to expand the soil removals in two areas: (1) a limited horizontal expansion of the previously approved one-foot soil removal limits around sample UFP2-L3 on Parcel L11-4-11 in Unkamet Brook Area-Remainder: and (2) an expansion of the previously approved one-foot removal around sample E-P15 on Parcel L12-2-2 in Unkamet Brook Area-West to a depth of three feet, plus a slight horizontal expansion of that removal area to the west to connect with an existing three-foot removal on the rail siding portion of Parcel L11-4-12.[13] These expanded removal limits are shown on Figures C-2A and C-2B in Appendix C, and the revised removal limits for Parcel L11-4-11 are included in Figure 4-2, as well as the relevant Technical Drawings included herein. The Revised Dioxin Re-evaluation shows that, following those soil removals, the remaining TEQ concentrations at all properties/averaging areas within the Unkamet Brook Area will be below EPA's "revised evaluation criteria" for dioxin TEQs.

4.5 Overall Summary

Based on the Performance Standards in the CD and SOW and the RD/RA evaluations presented in the Remainder Conceptual Work Plan, the Remainder Conceptual Addendum, and the prior sections, GE will perform the following remediation actions at Unkamet Brook Area-Remainder:

- Soil removal/replacement at nine averaging areas – the non-industrial portion of Parcel K12-9-1, the northern and southern inundated wetlands, Parcel L12-1-5, Parcel L12-1-4, and the portions of Parcels L12-1-101, L11-4-12, L12-2-1, and L11-4-11 within this RAA;

- Re-routing of the section of Unkamet Brook within the former interior landfill to flow through its approximate former channel via a route agreed upon by GE and EPA (as discussed further below);

- Sediment removal/replacement within the three reaches of Unkamet Brook (Areas 9J, 9K, and 9L) (excluding the section to be re-routed); and

[13] Although this Revised Remainder Final Work Plan does not generally address Unkamet Brook Area-West, this revised removal area on Parcel L12-2-2 is described and shown in Appendix C to provide documentation of that change.

- Installation of vegetative and asphalt engineered barriers over the former interior landfill on Parcel K12-9-1 and a combination vegetative/asphalt engineered barrier at Parcel L12-1-5 in accordance with the requirements of the CD and SOW.[14]

As noted above, the limits of these remediation activities are shown on Figures 4-1 and 4-2. The following table presents a summary of the conditions that will be present at each averaging area within Unkamet Brook Area-Remainder following the proposed remediation (using either existing or post-remediation data, as appropriate) with respect to PCBs and non-PCB Appendix IX+3 constituents (as applicable) in soil and/or sediment. The table also provides estimated removal action quantities associated with the remediation actions proposed for each averaging area (where appropriate). Further, this table demonstrates that the proposed remediation (i.e., soil and sediment removal/replacement and/or engineered barrier installation) will achieve the Performance Standards applicable to each of those averaging areas.

Depth Increment	Applicable PCB Performance Standard (ppm)	Existing/Post-Remediation PCB Average or Maximum (ppm)[1]	Existing/Post-Remediation Appendix IX+3 Conditions[2]	Most Recent Backup Information Document	Estimated Removal Quantities
Parcel K12-9-1 (Non-Industrial/Recreational)					
0-1' (avg)	10	0.93	All dioxin/furan TEQs are below PRGs; other retained constituents have been shown by area-specific post-remediation risk evaluation to have cancer risks and non-cancer hazards below SOW benchmarks in all depth increments,[3] with lead less than the applicable RBC.	Remainder Conceptual Work Plan (for PCBs); Remainder Conceptual Addendum (for non-PCBs)	8,155 *in-situ* cy of soil removal [4]
1- 3' (avg)	15	4.49			
0-15' (avg)	100	5.62			
Northern Inundated (Palustrine/Emergent) Wetland Area (Area 9G)					
0 -1' (avg)	1	0.60	All dioxin/furan TEQs are below PRGs; all other retained constituents are below Method 1 soil standards in all depth increments.	Remainder Conceptual Work Plan	3,170 *in-situ* cy of soil removal

[14] In addition to these remediation actions, GE will perform NRR/E activities to meet the requirements specified in Attachment I to the SOW and described in Section 3.4 above.

Depth Increment	Applicable PCB Performance Standard (ppm)	Existing/Post-Remediation PCB Average or Maximum (ppm)[1]	Existing/Post-Remediation Appendix IX+3 Conditions[2]	Most Recent Backup Information Document	Estimated Removal Quantities
Southern Inundated (Palustrine/Emergent) Wetland Area (Area 9H)					
0 -1' (avg)	1	No evaluation necessary, since all soil in top foot will be removed and replaced with clean backfill.		Remainder Conceptual Work Plan	920 *in-situ* cy of soil removal
Parcel L12-1-5 (Commercial/Industrial)					
0 -1' NTE[5]	125	96	All dioxin/furan TEQs are below PRGs; all other retained constituents are below Method 1 soil standards in all depth increments.	Section 4.2	2,690 *in-situ* cy of soil removal and 0.12 acre of engineered barrier
0-1' (avg)	25	12.20			
1- 6' (avg)	200	134.54			
0 -15' (avg)	100	99.16			
Parcel L12-1-4 (Commercial/Industrial)					
0 – 1' NTE[5]	125	96	All dioxin/furan TEQs are below PRGs; all other retained constituents are below Method 1 soil standards in all depth increments.	Remainder Conceptual Addendum (for PCBs); Remainder Conceptual Work Plan (for non-PCBs)	1 *in-situ* cy of soil removal
0-1' (avg)	25	20.00			
1 -6' (avg)	200	29.84			
0 -15' (avg)	100	26.24			
Parcel L12-1-101 (Commercial/Industrial)					
0 – 1' NTE[5]	125	71	All dioxin/furan TEQs are below PRGs; all other retained constituents are below Method 1 soil standards in all depth increments.	Remainder Conceptual Addendum (for PCBs); Remainder Conceptual Work Plan (for non-PCBs)	100 *in-situ* cy of soil removal
0-1' (avg)	25	7.61			
1 -6' (avg)	200	9.39			
0 -15' (avg)	100	7.65			

Depth Increment	Applicable PCB Performance Standard (ppm)	Existing/Post-Remediation PCB Average or Maximum (ppm)[1]	Existing/Post-Remediation Appendix IX+3 Conditions[2]	Most Recent Backup Information Document	Estimated Removal Quantities
Rail Siding Portion of Parcel L11-4-12 (Commercial/Industrial)					
0-1' NTE[5]	125	89	All dioxin/furan TEQs are below PRGs; all other retained constituents are below Method 1 soil standards in all depth increments.	Remainder Conceptual Work Plan	1,570 *in-situ* cy of soil removal
0-1' (avg)	25	10.59			
0- 3' (avg)	25	18.39			
1-6' (avg)	200	135.08			
0-15' (avg)	100	84.76			
Parcel L12-2-1 (Recreational)					
0 -1' NTE[5]	50	49	All dioxin/furan TEQs will be below PRGs after remediation to address 0-0.5' sample at UFP2-R1; other retained constituents have been shown by area-specific post-remediation risk evaluation to have cancer risks and non-cancer hazards below SOW benchmarks in all depth increments,[3] with lead less than the applicable RBC.	Remainder Conceptual Work Plan	480 *in-situ* cy of soil removal
0-1' (avg)	10	1.10			
1-3' (avg)	15	14.07			
0 -15' (avg)	100	3.61			
Parcel L11-4-11 (Recreational)					
0 -1' NTE[5]	50	49	All dioxin/furan TEQs will be below PRGs after remediation to address 0-1' sample at RAA10-E-LL14; all other retained constituents are below Method 1 soil standards in all depth increments.	Remainder Conceptual Work Plan (+ Appendix C hereto for TEQs)	2,760 *in-situ* cy of soil removal
0-1" (avg)	10	2.56			
0- 3' (avg)	10	3.37			
0 -15' (avg)	100	1.31			
Unkamet Brook Sediments (Including Culvert Cleaning, But Excluding Re-routed Channel Soils/Sediments)					
0-1'	1	No evaluation necessary, since all sediments in top foot will be removed and replaced with clean backfill.[6]		Remainder Conceptual Work Plan	1,850 *in-situ* cy of sediment removal

Depth Increment	Applicable PCB Performance Standard (ppm)	Existing/Post-Remediation PCB Average or Maximum (ppm)[1]	Existing/Post-Remediation Appendix IX+3 Conditions[2]	Most Recent Backup Information Document	Estimated Removal Quantities
Re-Routed Brook Channel Soils/Sediments (Not otherwise subject to removal to achieve Performance Standards)					
NA[7]	NA[7]	NA[7]	NA[7]	Sections 5.7 and 7.5.3	4,300 *in-situ* cy of soil/sediment removal [7]
Former Interior Landfill					
NA[8]	NA[8]	NA[8]	NA[8]	Remainder Conceptual Work Plan	2,030 *in-situ* cy for removal of the vegetated islands and 7 acres of engineered barrier

Notes:

1. PCB values are spatial average concentrations, except for NTE levels which represent the maximum remaining concentration in the 0- to 1-foot within unpaved areas (or areas evaluated as unpaved).
2. Dioxin/furan TEQ concentrations have been compared to the PRGs specified in the SOW (or agreed to by GE). Comparisons to EPA's revised evaluation criteria for dioxin are presented in GE's Revised Dioxin Evaluation in Appendix C and discussed in Section 4.4.
3. For the 0- to 15-foot depth increment, the average concentrations are below the MCP UCLs, which were used in lieu of risk-based concentrations in this evaluation, as noted in Section 3.3.2.
4. The estimated removal volume for Parcel K12-9-1 assumes the removal of two feet of material within the two phragmites areas. However, the Performance Standards require a minimum of two feet of removal or one foot below the shallow water table elevation, as observed in the month of May. As a result, the total volume of material subject to removal could be revised based upon the total depth of excavation in these areas.
5. NTE level = maximum PCB concentration in top foot of soil in unpaved area (or areas evaluated as unpaved). All averaging areas have been evaluated as unpaved.
6. GE has decided to satisfy the applicable Performance Standard for Unkamet Brook by removing sediments to a depth of 1 foot from top-of-bank to top-of-bank within the entire stretch of Unkamet Brook located within Unkamet Brook Area–Remainder (with the exception of the portion of the brook located within the limits of the former interior landfill, which is subject to re-routing, and certain portions of the brook with very steep banks, as further described in Section 5.3.3).
7. The Performance Standards for the former interior landfill require GE to re-route the 600-foot long portion of Unkamet Brook currently located within the limits of the former landfill to a location outside the eastern boundary of the engineered cap to be placed over the former landfill. The soils/sediments currently within the limits of the proposed alignment for the re-routed brook were evaluated using the Performance Standards applicable to Parcel K12-9-1 (non-industrial portion) and the northern inundated wetland. Any soils/sediments requiring removal to achieve those Performance Standards are reflected in this table under those items. The additional volume of soils/sediments reflected in this line item is required to complete the re-routing of Unkamet Brook; however those soils/sediments are not subject to any additional Performance Standards. As a result, no averaging calculations or further evaluations are necessary for those soils/sediments.
8. The Performance Standards for the former interior landfill require GE to install an impermeable cap/engineered barrier system over the former landfill area. As a result, no averaging calculations or further evaluations are necessary for this area. To facilitate construction of the impermeable cap/engineered barrier, the existing vegetated islands and approximately three inches of underlying material will be removed and asphalt shims installed prior to construction of the asphalt-covered engineered barrier. Such materials will be characterized appropriately for off-site disposal.

As indicated in the above table, the remediation actions to be conducted at Unkamet Brook Area-Remainder will involve the excavation of a total of an estimated 26,175 *in-situ* cubic yards of soil and 1,850 *in-situ* cubic yards of sediment, and the installation of an estimated 7.1 acres of engineered barrier.

In preparation for these upcoming remediation activities and as requested by EPA following the submittal of the April 2013 Remainder Final Work Plan, temporary cover materials were placed over certain portions of the unpaved roadways located on Parcel L11-4-11 in August and September 2013. Specifically, Maxymillian Technologies, Inc., under contract to GE, installed a layer of woven geotextile and 12 inches of gravel material over the soils subject to future remediation that are located within the limits of the unpaved roadways on this property, as illustrated on Figure 4-2 and Technical Drawing 21. Prior to soil excavation in this area, the gravel materials will be removed, stockpiled, and sampled for potential reuse as subsurface fill materials (as further described in Sections 5.5 and 5.9.1). The woven geotextile materials will be handled and disposed of along with the underlying excavated soils (the procedures for which are described in Sections 7.5.4 and 7.5.5).

5. Design Information

5.1 General

This section discusses the remediation and restoration actions that have been identified to meet the applicable Performance Standards established in the CD and SOW as they relate to Unkamet Brook Area-Remainder. These activities generally involve: removal and off-site disposal of soils, sediments, and associated materials; backfilling of excavations with clean material; the cleaning of culverts; re-routing a portion of Unkamet Brook; realignment of a sanitary sewer line; installation of engineered barriers; installation of NRR/E measures; and general site restoration. These and other pertinent components of the construction activities are discussed in the remainder of this section.

As discussed in Section 6, GE will select a Remediation Contractor to perform the remediation and restoration actions proposed herein. Section 6 provides further details regarding that selection process, and Section 7 provides additional site-specific implementation details associated with construction of the various design components. As previously indicated in this Revised Remainder Final Work Plan, and based on discussions with EPA, GE is proposing to conduct remediation actions within the entire Unkamet Brook Area RAA (i.e., Unkamet Brook Area-West and Unkamet Brook Area-Remainder combined) in an integrated fashion.

5.2 Technical Drawings and Specifications

GE has developed detailed design information for the various remediation and restoration actions to be performed at Unkamet Brook Area-Remainder. The various design details are summarized in this document, but are more specifically described in the Technical Drawings and Specifications developed by GE for use in selecting a Remediation Contractor. These Technical Drawings and Specifications are provided in Appendices D and E, respectively, and include project-specific construction quality assurance requirements related to soil and sediment removal, re-routing of a portion of Unkamet Brook, backfilling and restoration, and engineered barrier installation, as well as other construction elements.

Certain of the plans comprising GE's Project Operations Plan (POP) provide additional design, construction, and implementation-related information relevant to construction activities. The most current EPA-approved version of the POP (submitted on July 2, 2013, and approved by EPA on July 23, 2013) will be used for this project. The POP contains a series of plans that address several common aspects of the Removal Actions Outside the River and apply to various activities to be conducted as part of those Removal Actions. Collectively, these plans describe the minimum requirements, general activities, protocols, and methodologies applicable to these Removal Actions. These plans include a Waste Characterization Plan, Soil Cover/Backfill Characterization Plan, Site Management Plan,

Ambient Air Monitoring Plan, and a Contingency and Emergency Procedures Plan. The POP also includes a Construction Quality Assurance Plan (CQAP), which provides technical requirements related to items such as backfill, topsoil, seeding, mulch, engineered barrier components, etc. In addition, the CQAP specifies activities that are relevant to certain of the construction activities, such as soil placement and grading/compaction, survey control, liner/barrier component placement, etc. The general provisions of the POP are applicable to the Unkamet Brook Area–Remainder construction activities and are incorporated herein by reference.

5.3 Soil and Sediment Removal Activities

As described in Section 4.5, GE will remove an estimated 26,175 *in-situ* cubic yards of soil and 1,850 *in-situ* cubic yards of sediment from 12 averaging areas within Unkamet Brook Area-Remainder to satisfy the applicable Performance Standards specified in the SOW or as otherwise agreed between GE and EPA. These areas include the northern and southern inundated wetlands and the seven other parcels (or portions of parcels) listed in Section 4.5, along with the three reaches of Unkamet Brook. The limits of soil and sediment removal are illustrated on Technical Drawings 3 and 4 for properties north of Merrill Road and Technical Drawings 22 and 23 for properties south of Merrill Road, and are discussed further below.

5.3.1 Soil Removal in Inundated Wetlands

The horizontal limits of the one-foot soil removals at the northern and southern inundated (palustrine/emergent) wetlands were specified in the Remainder Conceptual Work Plan. Since that time, based on discussions with EPA, the horizontal limits of removal at the southern inundated wetland area have been slightly modified to match the surrounding topographical toe-of-slope. Those revised limits, as well as the horizontal removal limits in the northern inundated wetland area, as shown on Technical Drawing 3. Based on those limits, a total of an estimated 4,085 in-situ cy of soil will be removed from the inundated wetlands.

Prior to initiating excavation activities for these wetlands, the horizontal limits of removal will be surveyed and staked in the field. As agreed with EPA, the elevations of the toe-of-slope around the perimeter of the southern inundated wetland will also be established and reported in the field to provide a baseline for comparison of the post-excavation survey elevations. Soil removal will then be conducted to a minimum depth of one foot, using appropriate excavation procedures and equipment for work in inundated wetlands (to be determined in conjunction with the Remediation Contractor and specified in the Operations Plan to be included in the SIP). During the performance of these removal activities, interim and final field survey measurements will be made to verify that the target removal depths/elevations/grades (as appropriate) have been achieved for each area. These survey activities are described in Section 7.4.6.

Following completion and documentation of the soil removal activities, the inundated wetlands will be restored by placing suitable backfill materials and reconstructing wetlands in these areas, as described in Sections 5.11 and 7.5.6.2. The provisions specified in the Technical Drawings, Technical Specifications, and the POP (including the Soil Cover/Backfill Characterization Plan and the CQAP) will be utilized during the removal and backfill activities.

5.3.2 Soil Removal at Other Properties

In general, the horizontal limits and depths of soil removal at the seven other parcels (or portions of parcels) listed in Section 4.5 were specified in the Remainder Conceptual Work Plan as modified by the Remainder Conceptual Addendum. Since that time, a couple of further adjustments have been made: (1) the removal limits at Parcel L12-1-5 have been modified based on the owner's execution of an ERE, as described in Section 4.2; and (2) GE has agreed to a limited expansion of the horizontal removal limits at Parcel L11-4-11 based on EPA's revised dioxin evaluation criteria, as discussed in Section 4.4. The revised soil removal limits are shown on Technical Drawings 22 (for Parcel L11-4-11) and 26 (for Parcel L12-1-5).

Prior to initiating excavation activities for these areas, the horizontal limits of removal will be surveyed and staked in the field. Soil removal will then be conducted with conventional excavation equipment. During the performance of these removal activities, interim and final field survey measurements will be made to verify that the target removal depths/elevations/grades (as appropriate) have been achieved for each area. These survey activities are described in Section 7.4.6.[15]

Following completion and documentation of the soil removal activities, backfill will be placed and compacted to re-establish the original grade, as discussed in Sections 5.5 and 7.5.6.1. The provisions specified in the Technical Drawings, Technical Specifications, and the POP (including the Soil Cover/Backfill Characterization Plan and the CQAP) will be utilized during the removal and backfill activities.

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[15] In addition, as discussed in Section 4.2.5, the Remediation Contractor will be required to perform the six-foot deep excavations adjacent to the building, culvert headwall, and Merrill Road on Parcel L12-1-5 prior to the other excavations on that property, so as to demonstrate (through survey documentation) that the six-foot removals were performed to the limits shown on Technical Drawing 26. In the event that those excavations cannot be completed to the specified limits, and the Remediation Contractor is required to leave soils to support the building, culvert headwall, and/or roadway, additional remediation activities will be performed elsewhere on the property (as necessary) to ensure achievement of the applicable Performance Standards. In that case, GE will provide a revised remediation proposal and post-remediation PCB averaging evaluations demonstrating achievement of the applicable Performance Standards to EPA prior to implementing the remediation activities at the remainder of the property.

5.3.3 Sediment Removal in Unkamet Brook

The sediment removal from the three reaches in Unkamet Brook (excluding the portion to be re-routed) will be to a minimum depth of one foot. The horizontal limits of this sediment removal will be from the top-of-bank to top-of-bank on each side of the brook, with the exception of the steep sections between the downstream end of Culvert #2 and the upstream end of Culvert #3 and between the downstream end of Culvert #3 and the upstream end of Culvert #4, where removal will extend from toe-of-slope to opposite toe-of-slope, and subject to any necessary further adjustments based on field conditions. The limits of sediment removal from the brook are shown on Technical Drawings 4 (north of Merrill Road) and 23 (south of Merrill Road) and will result in the removal of an estimated 1,850 *in-situ* cy of sediments from Unkamet Brook. As indicated thereon, it is anticipated that the limits of sediment removal in the portions of Unkamet Brook located south of Merrill Road will be as designated by the survey provided to EPA on October 25, 2012 and subsequently approved by EPA in an electronic mail dated November 7, 2012, as depicted on Figure 3-1. However, approximately one month prior to implementation of sediment removal activities or at another time agreed upon with EPA, GE and EPA will conduct a joint site walk to confirm and stake out the top-of-bank limits for the portion of Unkamet Brook located south of Merrill Road. The Remediation Contractor will subsequently establish survey control for the required sediment removal activities by surveying the agreed-upon top of bank limits (as well as any necessary transects and additional survey control points) that will be used to document the performance of the remediation activities. If necessary due to changed field conditions, modifications to these limits will be made in the field based on the following guidelines:

- If the top-of-bank observed in the field at the start of remediation differs from the design staking by more than one foot horizontally in any area, GE and EPA will discuss the need for adjusting the extent of excavation.

- The lateral limits of sediment remediation will not be reduced based on field observations.

- Depending on field conditions, GE and EPA will also discuss the potential for including in the sediment removal limits certain water-covered, potential depositional areas that are located east of the railroad tracks on Parcels L12-2-1 and/or L11-4-11 in close proximity to the brook and that have a sediment (rather than underwater vegetation) bottom.

To the extent possible, the sediment removal from Unkamet Brook will be performed in the dry, with the brook flow diverted through bypass pumping and the removal areas dewatered prior to excavation. The water diversion, bypass pumping, and dewatering activities are described in Section 7.5.2.3. The following approach will be used for the sediment removal from each section of the brook:

- First, one foot of material will be excavated from each bank.

- Next, in areas where a channel bottom exists (i.e., where the channel is not in the shape of a "V" with no bottom), the lowest existing elevation within the channel in the relevant section of the brook will be determined in the field by the Remediation Contractor (based on constructability considerations), and one foot will be subtracted from that elevation. The resulting calculated elevation will equal the target removal elevation across the entire brook bottom for that section of the brook. Sediment removal will then occur from toe-of-slope to toe-of-slope across the brook channel (except where GE and EPA agree otherwise, as discussed above).

- The channel bottom (where present) and adjacent banks will be restored through placement of one foot of imported clean material along the channel bottom and on each bank in accordance with the requirements of the applicable Technical Drawings

During the performance of the removal actions, interim and final field survey measurements will be made to verify that the target removal depths, elevations, or grades (as appropriate) have been achieved. These survey activities are described in Section 7.4.6.

Further discussion of the post-removal backfilling of these excavated brook areas with silty-sand material and stone to restore the brook channel and banks to the design elevations/grades is provided in Sections 5.5 and 7.5.7.

5.3.4 Culvert Investigation and Cleaning

Prior to the performance of the sediment removal activities for downstream portions of Unkamet Brook, the Remediation Contractor will remove accumulated sediment within the four culverts that convey Unkamet Brook underneath certain surface features (e.g., railroad tracks, Merrill Road, etc.). The four culverts subject to investigation and sediment removal activities (Culvert #1 through Culvert #4) are shown on Technical Drawings 4 (Culverts #1 and #2) and 23 (Culverts #2 through #4). In preparation for culvert cleaning activities, GE collected survey data and attempted to conduct video inspections of each culvert pipe in August 2013 to gauge the quantity of sediment present, verify the materials of construction, and provide an understanding of each culvert's condition. The video inspections were successfully conducted in Culverts #1 through #3; however, video inspection at Culvert #4 was not completed due to high water levels. Additional information regarding these investigations/inspections is provided below.

In support of the remedial design and flow modeling/sensitivity analysis (described in Section 5.6), survey data were collected from the Dalton Avenue culvert as well as Culverts #1 through #4. While that survey was successful in determining the location and dimensions of those structures, the invert data and sediment thicknesses are estimated at culverts that were partially inundated and/or obscured by accumulated sediments at the

time of the survey. As a result, the Remediation Contractor will be required to confirm the outfall invert elevations following the installation of the water diversion and bypass pumping equipment described in Section 7.5.2.3. If any culvert is determined to have different invert elevations from those presented in the technical drawings, GE will evaluate the potential need for revisions to design of the re-routed brook (described in Section 5.7) and/or the restoration design for the culvert aprons (described in Section 7.5.9.1).

As indicated in the table on Technical Drawing 30, Culvert #1 consists of twin corrugated metal 48-inch diameter culverts, each 40 feet in length. The video inspections indicated that both culvert pipes are in fair condition and functioning normally (one of the two culverts was previously thought to be partially blocked). The western culvert contains approximately 0.85 foot of sediment and a small amount of debris located near the upstream end. The eastern culvert has a joint displacement approximately 8 feet from the upstream end, protruding approximately 6 to 8 inches into the pipe barrel, and contains approximately 1.9 feet of sediment. As this culvert is on GE property, GE is planning to slip-line the culvert (following any necessary sediment removal) to repair the joint displacement.

Culvert #2 also consists of twin corrugated metal 48-inch diameter culverts, each extending approximately 110 feet beneath Merrill Road. The video inspections indicated that both culvert pipes are in fair condition and functioning normally, each with approximately 0.35 foot of sediment. The eastern pipe has an offset joint approximately 21 feet from the downstream end. The western pipe has an offset joint approximately 26 feet from the upstream end. GE has previously advised EPA that GE is not responsible for the repair or maintenance of culverts located on properties not owned by GE.

Culvert #3 is approximately 575 feet in length. The video inspection of Culvert #3 was attempted from the downstream end of the culvert. It was determined that the downstream end of Culvert #3 is an approximately 10-foot diameter steel pipe, while the upstream end of the culvert is a 3-foot by 3-foot box culvert, similar to those in Culverts #1 and #2. The material and size of the downstream end of the culvert indicate that it could be constructed of underground storage tanks or similar structures, with the ends removed and connected together at the joints. It could not be determined where the material and size of the culvert pipes change between the upstream and downstream ends. The downstream end of the pipe contained approximately 2 to 3 feet of debris and approximately 4 feet of sediment.

GE will provide the culvert data (e.g., invert elevations, sediment measurements, etc.) and video inspection results to the Remediation Contractor to assist in determining the proposed methods for culvert cleaning and sediment removal.[16] The Remediation Contactor's proposed cleaning methods will be included in its Operations Plan, which will be submitted as part of the SIP, as further described in Section 7.3.1. In general, it is anticipated that the culvert cleaning activities will proceed in an upstream to downstream direction (i.e., from Culvert #1 to Culvert #4). These activities will be performed following the sediment removal in the adjacent upstream portion of the brook channel and prior to the sediment removal activities in the adjacent downstream portion of the brook channel. It is anticipated that sediment removal activities within the culverts will be performed in the dry, similar to sediment removal activities within the brook, and will remove at least the top foot of sediments from the culverts. Additional details regarding the currently anticipated procedures for culvert cleaning activities are provided in Section 7.5.2.5 as well as on Technical Drawings 4 (Culverts #1 and #2) and 23 (Culverts #2 through #4).[17]

5.3.5 Handling of Removal Materials

Based on a review of the analytical data located within the limits of the remediation actions, the soils and sediments subject to removal will be transported to and properly disposed of at appropriate off-site disposal facilities, as further described in Sections 7.5.4 and 7.5.5. It is currently anticipated that, to the extent possible, excavated materials will be directly loaded into transportation vehicles for transportation to the appropriate off-site disposal facility. However, temporary stockpiling of soils and sediments may be performed, if necessary, so that the Remediation Contractor's excavation production rate is not impacted by the timing, availability, and/or loading of vehicles for the transportation of excavated materials to off-site disposal facilities. In this connection, there are four types of locations for such temporary stockpiles: (1) inside certain buildings at the GE Plant Area; (2) in the paved parking lot over the former interior landfill that will be subject to installation of an asphalt-covered engineered barrier; (3) outdoor areas subject to future excavation; and (4) outdoor areas not subject to future excavation or engineered barrier placement. Regardless of the type of stockpile that will be used, the Remediation Contractor will be required to construct dumping/loading ramps, raised pads/mats, or stone tracking areas at the entrances to the stockpiles to minimize the potential for spreading of contaminated liquids/materials associated with the stockpiles by the vehicle tires. Additional details

[16] GE does not believe that a video inspection of Culvert #4 will be necessary for these purposes. However, in the event that the Contractor believes that such an inspection would be helpful to assist in determining proposed methods for culvert cleaning and sediment removal, the inspection can be conducted at an appropriate time when water levels allow.

[17] The measures to be implemented at Culverts #1 through #4 (after cleaning), as well as other culverts, to protect against erosion or scour in areas adjacent to the culverts are described in Section 7.5.9.1.

regarding the construction and operation of each type of temporary stockpile location are provided below.

Inside Buildings – Excavated materials subject to disposal requirements under the Toxic Substances Control Act (TSCA) and/or as hazardous waste under the Resource Conservation and Recovery Act (RCRA) may be temporarily stockpiled within Building 14, Building 65, or another existing building at the GE facility or a temporary structure to be constructed within the Unkamet Brook Area, as determined by GE (in consultation with EPA). In the event that excavated materials are stockpiled within any of these buildings, the excavated materials will be placed in lined, bermed stockpile areas. Excavated materials that are placed within such buildings will not be stockpiled for a period longer than 90 days prior to transportation to an appropriate off-site disposal facility. The procedures and routes for transport of such materials to Buildings 14 and 65 are discussed in Section 7.5.4.

In Parking Lot Portion of Former Interior Landfill Subject to Engineered Barrier Installation – As discussed further in Section 7.4.7, GE plans to remove the vegetated islands within the parking lot portion of the former interior landfill and to install asphalt shims over those island areas to create a contiguous asphalt layer to allow for the subsequent installation of the asphalt-covered engineered barrier over this portion of the former landfill. This portion of the engineered barrier will be constructed in two phases (as described in Section 5.9.1) to accommodate continued use of one half of the employee parking lot (used by GE's lessee SABIC Innovative Plastics) during the construction period while the other half of the parking lot may be used to stage clean construction materials and/or to stage and dewater excavated materials. Following placement of the asphalt shims, and prior to the construction of the engineered barrier, this area will be used to temporarily stage and dewater excavated soils and sediments. To facilitate dewatering of such materials, a temporary dewatering area will be constructed over this paved area. This dewatering area will include berms and a welded high-density polyethylene (HDPE) liner with sufficient durability to withstand construction traffic (e.g., dump trucks and loaders), which will be sloped to a sump/collection area. In addition, the materials stockpiled within the dewatering area will be covered with heavy-duty impermeable tarps, which will be appropriately anchored, when active loading or unloading of materials is not expected to occur for an extended period of time (i.e., longer than four hours) and at the end of each working day, as well as during precipitation events. In accordance with 40 CFR 761.65(c)(9), these covers will be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to the stress of daily operation. Specifically, at a minimum, heavy-duty impermeable tarps will be used for covers. Also, excavated materials will never be combined with sediments/soils having a different TSCA or RCRA designation (i.e., TSCA and non-TSCA sediments/soils will not be mixed together and sediments/soils constituting RCRA hazardous waste will not be mixed with other sediments/soils). The excavated materials placed in this area will be removed within 30 days or as soon thereafter that the materials in the stockpile are sufficiently dewatered for

transport and can be placed into vehicles for transportation to a temporary in-building stockpile at the GE facility or to an off-site disposal facility.

Outdoor Areas Subject to Future Excavation – This type of "working" stockpile will be located in dry areas that are on or adjacent to active excavation areas and are subject to future excavation, and will be used to facilitate loading of vehicles for transportation to the appropriate off-site disposal facility or to other on-site temporary stockpiles. Such stockpiles will typically be small in volume (e.g., 100 cubic yards or less). Since these temporary stockpiles will be constructed in areas subject to future excavation, which will have perimeter erosion and sedimentation controls, the use of separate bottom liners and berms will not be needed, unless such areas will be used for material dewatering as further described below. However, such temporary stockpiles will be covered by an impermeable cover, which will be appropriately anchored, when active loading or unloading of materials is not expected to occur for longer than four hours and at the end of each working day, as well as during precipitation events. In accordance with 40 CFR 761.65(c)(9), these covers will be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to the stress of daily operation. At a minimum, heavy-duty impermeable tarps will be used for covers. Excavated materials will only be stockpiled over soils with a similar TSCA/RCRA designation and will never be combined with soils having a different TSCA/RCRA designation. The excavated materials placed in such outdoor temporary staging areas on GE-owned property will be removed from these areas within 30 days or as soon thereafter that the materials in the stockpiles are sufficiently dewatered for transport to a temporary in-building stockpile at the GE facility or to an off-site disposal facility. At non-GE-owned properties, excavated materials will be removed within 7 days of placing such materials in the stockpile(s), unless otherwise approved by EPA. Finally, excavated materials will not be stockpiled overnight within the 10-year floodplain at either GE-owned or non-GE-owned properties.

Outdoor Areas Not Subject to Future Excavation or Engineered Barrier Placement – There may also be a need to temporarily stage excavated materials in outdoor areas that are not subject to future excavation or engineered barrier placement if no other areas are available – e.g., in the event that certain excavated materials need gravity dewatering close to their point of excavation (prior to transportation) and there are no other available staging areas in the vicinity. The temporary stockpiles in these areas will be constructed on bermed areas lined with polyethylene, and will, if possible, be located on top of currently paved areas. The excavated materials within such temporary stockpiles will be covered with an impermeable cover at all times, except when materials handling is ongoing. In accordance with 40 CFR 761.65(c)(9), the liners and covers used in this manner will be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to the stress of daily operation. Specifically, at a minimum, heavy-duty impermeable tarps will be used for covers and welded 30-mil HDPE sheeting will be used for bottom liners for these staging areas when stockpiling saturated soils and sediments. As with the other temporary outdoor staging areas discussed above, there will be no mixing

of TSCA material with non-TSCA material or material constituting RCRA hazardous waste with non-RCRA material at such stockpiles. Again, excavated materials that are placed in such temporary staging areas on GE-owned property will be removed from these areas within 30 days or as soon thereafter that the materials in the stockpiles are sufficiently dewatered for transport and can be placed into vehicles for transportation to a temporary in-building stockpile at the GE facility or to an off-site disposal facility. At non-GE-owned properties, excavated materials will be removed within 7 days of placing such materials in the stockpile(s), unless otherwise approved by EPA. Finally, excavated materials will not be stockpiled overnight within the 10-year floodplain at either GE-owned or non-GE-owned properties.

Regardless of the type/location of stockpile used, the Remediation Contractor will first attempt to dewater excavated materials removed below the water table within the excavation area or within working stockpiles designed to direct dewatered liquids back into excavation areas. For any indoor or outdoor stockpile area that will used for excavated materials containing water (despite attempts to dewater such materials at the excavation area), HDPE sheeting will be utilized to line the stockpile area(s) and the stockpiles will be sloped to a collection area/sump to facilitate water collection and removal. Any water collected within the temporary stockpile areas will be placed inside tanker trucks and transported to GE's Building 64G Water Treatment Facility (WTF) for treatment and discharge.

While stockpiles are operational, the Remediation Contractor will maintain appropriate signage within and/or adjacent to any stockpile to document the type of stockpiled materials and date the materials were placed in the stockpile. Inspections of the stockpiled materials will be performed weekly. For outdoor stockpiles, the Remediation Contractor will control potential windborne emissions from the stockpiles by spraying them with water during periods of active loading or unloading of materials and by covering the stockpile(s) with heavy-duty impermeable tarps when not in use, as described above. Further, if any storm drains or catch basins are present in the vicinity of the temporary stockpiles, the Remediation Contractor will install, regularly inspect, and maintain filter fabric, hay bales, or approved equivalent controls around those features. Upon removal and transportation of all stockpiled materials, the Remediation Contractor will remove any accumulated materials from the building floor(s) or outdoor stockpile area on paved surfaces by sweeping or other mechanical means. The Remediation Contractor will also pressure wash the floor/pavement and the wash water will be collected and transported to the Building 64G WTF for treatment and discharge.

5.4 Excavation Stabilization

For removal areas where excavations will exceed four feet in depth (i.e., two excavations on Parcel L12-1-5) and where Contractor personnel will enter the excavations to perform work, the Remediation Contractor will be required to evaluate sidewall stability in accordance with

Occupational Health and Safety Administration (OSHA) requirements, and implement protective measures, as appropriate. These methods will be identified by the Remediation Contractor and may include benching the excavation or installation of a temporary earth-retaining structure (e.g., steel sheetpiles, soldier beam and lagging, trench boxes, etc.). For any temporary earth-retaining structure that is planned to be used by the Remediation Contractor, a Professional Engineer licensed in the Commonwealth of Massachusetts will be required to design and stamp the system.

In addition, the excavations along the railroad tracks on the rail siding portion of Parcel L11-4-12 may require excavation supports designed in accordance with the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering. The Remediation Contractor will be required to develop a design compliant with this document for review by CSX. GE will assist the Remediation Contractor in coordinating with CSX for the submittal, review, and approval of any necessary support of excavation design.

Finally, any soils removed as part of the benching of excavations or installation of temporary earth-retaining structures will be disposed of along with the adjacent excavated materials at an appropriate off-site disposal facility.

Additional information regarding the installation of excavation stabilization controls is provided in Section 7.5.1.1.

5.5 Backfilling Excavations

This section addresses the backfilling of the soil and sediment excavations discussed in Section 5.3. (It does not address the placement of backfill material in the re-routed section of Unkamet Brook, which will be discussed in Section 5.7.)

Soil Excavations – In general, for the soil excavations, common backfill and/or topsoil will be placed and compacted as appropriate to re-establish the original grade (or, where an engineered barrier will be placed, the subgrade elevation for that barrier). Areas designated for one foot of soil removal and the top foot of inundated wetland areas will be restored with topsoil only. For soil removal areas greater than one foot in depth, backfill will be placed to within six inches of the final grade, and the top six inches will be restored with topsoil.

As discussed with EPA and described elsewhere in this revised work plan (e.g., Sections 7.5.4 and 7.5.6.1), certain limited amounts of removed or excavated materials may be sampled and reused as subsurface backfill in soil removal areas if they meet the criteria for such reuse, as specified in the Soil Cover and Backfill Characterization Plan (part of the POP). Such materials include those generated as part of: (a) the re-routing of Unkamet Brook; (b) removal of the vegetated islands in the paved portion of the former interior landfill (to facilitate construction of the engineered barrier over that area); (c) excavation of certain

items outside soil removal areas (namely, anchor trenches, the parking lot north outlet drainage channel, and/or manholes associated with the realigned sanitary sewer); and/or (d) the removal of the temporary road cover materials on Parcel L11-4-11 (as described in Section 7.4.7).[18] To assess the suitability of such removed or excavated materials for use as backfill, GE will stockpile the materials and collect samples at a frequency of one sample per 100 cy for analyses of PCBs and other Appendix IX+3 constituents, as well as for grain size and moisture content analyses. The results of this sampling will be used to determine whether such materials meet the criteria for reuse in the Soil Cover and Backfill Characterization Plan or will be transported off-site for disposal. Prior to any on-site reuse of these materials, the sampling results will be provided to EPA, along with a showing that the materials meet the applicable criteria for reuse.

In addition, backfill and access road materials left over from the recently completed Silver Lake Area Removal Action may be used as subsurface backfill in soil removal areas provided that it is shown, based on the prior sampling data for these materials, that the materials meet the applicable criteria for reuse at this RAA.

Sediment Excavations – For the sediment excavations in Unkamet Brook, a minimum six-inch layer of clean backfill (consisting of silty sand) and a six-inch layer of stone (riprap) will be placed as soon as practicable after excavation to restore the brook channel and banks to the design elevations/grades. The silty-sand layer will have a minimum total organic carbon (TOC) content of 0.5% as measured in a stockpile prior to placement (at a frequency of one sample for every 500 cy), but post-placement monitoring will not be required to confirm that level of TOC. The stone to be used will be sufficiently sized to withstand transport and/or erosion as a result of normally anticipated or average current velocities associated with flow events ranging from the one-year flow event up to the 100-year flow event (estimated by the Federal Emergency Management Agency [FEMA]), as predicted by the hydraulic model (see Section 5.6 and Appendix F). Additional details regarding backfill material performance standards for sediment excavation areas are provided on Technical Drawings 4, 23, and 31 and the Technical Specifications.

Following the placement of these materials in the brook, GE will add a blended sand/topsoil mixture and an appropriate seed mix (namely, the New England Conservation/Wildlife Seed Mix) into the void spaces of the riprap in certain bank areas of the brook (but not the channel), as discussed in Section 5.11 and 7.5.7. However, as discussed with EPA, since this addition is not part of the required remediation or restoration, post-placement monitoring and maintenance of such material and any resulting vegetation will not be required.

[18] As discussed in Section 5.9.1, these materials may also be placed beneath the vegetative engineered barrier to be constructed over a portion of the former interior landfill if they meet the criteria specified in Section 5.9.1.

Material Sources – For off-site sources of backfill and topsoil materials, the specific sources will be identified by the selected Remediation Contractor. These backfill/topsoil materials will originate from either existing or new sources of backfill material. Existing sources of backfill/topsoil material consist of those sources that have been previously used for other GE remediation projects in Pittsfield and have been previously qualified for such use in submittals to EPA and/or MDEP. The sample data presented in those documents include analyses for PCBs and Appendix IX+3 volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals, as well as pH and TOC for topsoil sources. If existing, approved sources of backfill materials have been used by GE within the past 18 months, or within six months for the topsoil source, these prior analytical data will not be resubmitted to EPA.

For any backfill or topsoil materials from a source that has not already been identified and characterized, representative samples of proposed fill materials will be collected and analyzed for PCBs and Appendix IX+3 VOCs, SVOCs, and metals, as required by GE's approved Soil Cover/Backfill Characterization Plan provided as Attachment B to the POP. Specifically, backfill materials from an undisturbed source will be sampled at an approximate frequency of one sample per 2,000 cy for analysis of PCBs and one representative sample per 5,000 cy for the analysis of Appendix IX+3, and at an approximate frequency of one composite sample per 2,000 cy for materials that have been stockpiled from prior excavation/handling activities. In addition, for proposed sources of materials to be used as topsoil or as backfill in Unkamet Brook (as well as in the construction of the re-routed portion of the brook (discussed below), representative samples will be analyzed for TOC and, for topsoil only, pH at a frequency of one sample per 500 cy.

The name of the proposed backfill/topsoil source location(s) and (if necessary) the results of the analyses for PCBs and Appendix IX+3 VOCs, SVOCs, and metals, and for pH and TOC, if applicable, will be submitted to EPA in the SIP (or another supplemental submission) prior to the use of such material.

Information regarding the measurement, composition, installation, and (for engineered barrier components) construction quality assurance requirements of acceptable backfill materials/barrier components is provided in the Technical Drawings and Technical Specifications.

5.6 Unkamet Brook Flow Modeling/Sensitivity Analyses

Appendix F of the Remainder Conceptual Work Plan presented a summary of previous Unkamet Brook hydrologic and hydraulic modeling activities. In response to EPA comments, supplemental flow monitoring/modeling information was presented in Attachment E of the Remainder Conceptual Addendum and Attachment A of the Remainder Second Addendum.

In accordance with the Remainder Second Addendum, GE subsequently performed additional modeling to support the remedial design activities. Specifically, the hydraulic model was updated to incorporate new information regarding the dimensions and conditions of the various culverts that convey Unkamet Brook waters. In addition, the model was reconfigured for post-remediation conditions to incorporate changes in floodplain elevations and channel alignment associated with certain design modifications, including the following: the re-routed brook channel alignment; removals in the phragmites areas and to facilitate the brook re-routing; installation of the landfill engineered barrier/cap; modifications to the design of the sanitary sewer realignment (as discussed in Section 5.8); and changes to culvert geometry associated with the planned culvert cleaning and the slip-lining of one of the twin culverts passing underneath the rail spur at the Culvert #1 location.

A series of design flow rates, ranging from the one-year flow event up to the 100-year flow event was developed based on application of EPA's Hydraulic Simulation Program-FORTRAN (HSPF) hydrologic (watershed) model and information published by FEMA. The post-remediation conditions model was used to evaluate the effects, if any, of the above-mentioned changes resulting from the remediation activities on water surface elevations and brook velocities within and upstream of the project area. In accordance with the Remainder Second Addendum, additional sensitivity analyses were also performed to assess post-remediation conditions for various Manning's coefficients and amounts of sediment blockage in certain culverts over the range of design flows. A summary of these additional modeling activities is provided in Appendix F.

The results from the model analyses indicate that, during most flow regimes, the predicted water surface elevations within the system under both existing and post-remediation conditions are controlled by the hydraulic structures within the system and blockages within the culverts. However, at the highest flow events evaluated (i.e., 50- and 100-year flow events), the predicted water surface elevation is controlled by the backwater effect created by the elevated stage height in the Housatonic River. The results from the model simulations of post-remediation conditions indicate that the changes to the channel alignment and floodplain topography associated with the completed remediation will not adversely affect flood elevations or velocities upstream of or within the project area. The reduced cross-sectional area and slight increase in the invert elevation associated with slip-lining one of the rail spur culverts is predicted to have a small impact (≤ 0.4 foot) on predicted water surface elevations upstream of the rail spur, but only at lower flows and not in other project areas. However, the model sensitivity analyses indicate that this small predicted increase in water surface elevations at low flows will be offset by the reductions in the amount of blockage resulting from the culvert cleaning activities described in Section 5.3.4 and the slip-lining of one of the twin culverts at the Culvert #1 location, which will result in increased conveyance efficiency for the culverts.

5.7 Unkamet Brook Re-routing

In accordance with the CD and SOW, GE will re-route an approximate 600-foot section of Unkamet Brook which is currently located within the limits of the former interior landfill to a location that is generally coincident with its former channel (i.e., a gradual meander around the eastern edge of the former interior landfill). These re-routing activities will be conducted to facilitate construction of an engineered barrier over the former interior landfill (as discussed below) and to eliminate brook flows within the former interior landfill. The alignment of the re-routed brook is shown on Technical Drawing 5, and a typical cross-section of the re-routed brook is provided as Detail 1 on Technical Drawing 31. Design calculations for the re-routed brook channel are included in Appendix G.

The soil/sediment excavations for the re-routed brook channel will be conducted using appropriate excavation procedures and equipment, including, where necessary, procedures and equipment designed for work in wetland environments. The specific procedures and equipment will be determined in conjunction with the Remediation Contractor and described in the Operations Plan to be included in the SIP. As noted in Section 5.5, certain excavated materials generated during the brook re-routing process may be used as subsurface backfill in soil removal areas if they can be shown to meet the criteria for such reuse in the Soil Cover and Backfill Characterization Plan, or may be placed as fill materials beneath the vegetative engineered barrier to be constructed over a portion of the former interior landfill (discussed below) if they meet the criteria specified in Section 5.9.1.

After excavation and prior to placement of backfill material in the re-routed channel, a geotextile fabric will be placed on top of any *in-situ* soils/sediments that have been shown to contain PCB concentrations at or above 50 ppm. A six-inch layer of silty sand will then be placed throughout the re-routed channel and banks. Like similar material to be used in the excavations in the existing brook channel, this material will have a TOC content of 0.5% as measured in a stockpile prior to placement (at a frequency of one sample for every 500 cy), but post-placement monitoring will not be required to confirm that level of TOC. A six-inch layer of stone riprap will then be placed on top of the silty-sand layer. Additional information regarding brook re-routing activities and subsequent restoration can be found in Sections 5.10.2, 7.5.3, and 7.5.8, as well as on Technical Drawings 5, 6, and 31 and in the Technical Specifications.

5.8 Sanitary Sewer Realignment

Pursuant to Condition No. 3 of EPA's November 4, 2008 conditional approval letter, GE has elected to realign the portion of the sanitary sewer line that runs through the former interior landfill. Based on discussions with EPA, the realigned portion of the sanitary sewer line will be located above the engineered barrier components to be installed over the former interior landfill (as discussed below). As shown on Technical Drawing 14, the realigned sewer line will be located to the northeast of its current alignment generally within the existing Unkamet

Brook channel (that is subject to re-routing as discussed in the previous section). In support of the design for the realignment of the sanitary sewer, GE surveyed the pipe inverts within several manholes along the existing sanitary sewer to confirm the record drawing data (upon which the sewer realignment was based) and to determine the best location south of the former interior landfill to reconnect the realigned section to the existing pipeline. The supplemental survey data indicate that the portion of the existing sewer pipeline located between the former interior landfill and the manhole just north of Building 120W has settled over one foot, such that the pipe invert elevations increase as the pipeline proceeds in a downstream (southerly) direction.

Based on these data, GE has elected to extend the realigned portion of the sanitary sewer line to the manhole north of Building 120W, as indicated on Technical Drawing 14. Extending the realignment to this location, combined with the installation of additional support structures for the realigned portion of the pipeline (as further described below), should restore the flow conditions to be consistent with the original design. As indicated on Technical Drawing 14, the realigned sewer line will connect to the existing sewer line outside of the northern and southern limits of the engineered barrier. Details 1 and 2 on Technical Drawing 35 provide details illustrating the transition for the realigned sanitary sewer pipeline between the engineered barrier/landfill cap area and the adjacent areas north and south of the former interior landfill.

To further assess the geotechnical nature of the soils along the proposed realignment, GE performed supplemental geotechnical investigation activities (i.e. cone-penetration test [CPT] soundings) in the vicinity of the proposed sewer realignment. The results of the CPT soundings indicate that a compressible soil layer is present beneath the proposed alignment of the sewer. The thickness of this soil layer ranges from 17 to 42 feet. Based on the findings from the CPT soundings, the compressible soil layer could be characterized as soft clay and clayey silt to soft silt. Historical borings in the area of the proposed sewer alignment also noted the presence of a compressible soil layer at depth and described this layer as soft, organic silt to silt with small amounts of organic material. A layer of medium-dense to dense sand follows the soft soils in both the CPT soundings and historical investigations. Additional details regarding the supplemental geotechnical investigations are provided in Appendix H.

Based on the results of the supplemental geotechnical investigation, it was determined that additional structural support will be necessary for the realigned sewer piping and associated manholes. The structural support will consist of helical piles extending through the compressible soil layer to bear in the underlying medium-dense sand layer. The anticipated pile depths range from 25 to 55 feet below the proposed sewer invert. A reinforced concrete slab will be installed on top of the piles to transfer the loads from the realigned sewer and backfill/cover soils to the helical piles. Details associated with the structural supports for the realigned sanitary sewer are provided on Technical Drawings 32 and 33. As indicated thereon, the helical piles and concrete slab will be installed prior to placement

of the lower liner for the engineered barrier, where required (i.e., within the limits of the former interior landfill). Further, as shown in Detail 6 on Technical Drawing 32, an additional flexible membrane liner will be placed over the top of the backfill surrounding the realigned sewer pipe to direct infiltrating precipitation to the indicated lateral collection pipe and thus facilitate the drainage of the engineered barrier components. Additional information related to the sewer realignment activities is provided in Section 7.5.10, on Technical Drawings 14, 32, and 33, and in the Technical Specifications.

The design information provided herein for the realigned sanitary sewer line has been provided to the City of Pittsfield Department of Public Works for review and approval. Any potential future design modifications will also be provided to the City Department of Public Works for review and approval.

5.9 Installation of Engineered Barriers

Two engineered barriers will be installed at the Unkamet Brook Area-Remainder – one over the former interior landfill on Parcel K12-9-1 and one over a portion of Parcel L12-1-5, as described below.

5.9.1 Former Interior Landfill Engineered Barrier/Cap

At Parcel K12-9-1, an asphalt-covered engineered barrier will be installed over the current employee parking lot portion of the former interior landfill area and a vegetative engineered barrier/landfill cap will be constructed over the remaining portions of the former interior landfill. Based on discussions with EPA, GE has agreed voluntarily to expand the horizontal limits of the engineered barrier (from those shown in the SOW and previously approved by EPA) to coincide with the toe-of-slope on the eastern side of the vegetative barrier and to cover the southeastern corner of the former landfill as indicated by the topography.[19] The revised horizontal limits of this engineered barrier are shown on Technical Drawings 2, 3, 10, 14, and 16. The total extent of the engineered barrier to be placed over the former interior landfill is approximately 7 acres.

The engineered barrier to be placed over the former interior landfill will comply with the general requirements for such barriers set forth in Technical Attachment G to the SOW, including, for the vegetative portion of the barrier, the specified requirements for a landfill cap. In accordance with that technical attachment, the asphalt-covered engineered barrier in the parking lot portion of the former interior landfill will have a minimum thickness of one foot, and the vegetative engineered barrier/landfill cap constructed over the eastern portion

[19] As also agreed with EPA, the previously proposed one-foot soil removals in those expanded engineered barrier areas will no longer be required, and these expansions will not require revision of the relevant RD/RA evaluations provided in the Remainder Conceptual Work Plan.

of the former interior landfill will have a minimum thickness of two feet. Cross-sections depicting these cover configurations are provided on Technical Drawings 17 and 18. The asphalt engineered barrier has been designed to ensure that no overtopping of the perimeter curbing occurs during a 10-year flood event. The design calculations for this portion of the barrier are included in Appendix G.

As mentioned in Section 5.3.5, the asphalt-covered engineered barrier will be constructed in two phases to accommodate continued use of one half of the SABIC employee parking lot throughout construction, while the other half of the parking lot may be used for construction support (i.e., staging clean materials) and/or the staging and dewatering of excavated materials, as necessary. Technical Drawings 11 through 13 provide details regarding the phased construction of the asphalt-covered engineered barrier, including the construction of a temporary access road and fencing to isolate vehicles hauling construction- or remediation-related materials from non-construction traffic associated with the SABIC employee parking lot.

As discussed with EPA, certain materials generated during removal or excavation activities at the Unkamet Brook Area may be placed as fill materials beneath the vegetative engineered barrier/landfill cap at the former interior landfill if they meet specified criteria. Such materials consist of excavated or removed materials generated as part of: (a) the re-routing of Unkamet Brook; (b) the removal of the vegetated islands in the paved portion of the former interior landfill; (c) the excavation of certain items (namely, anchor trenches, the parking lot north drainage swale, or manholes associated with the sanitary sewer realignment) outside soil removal areas; and/or (d) removal of the temporary road cover materials on Parcel L11-4-11. In addition, backfill and/or access road materials left over from the recently completed Silver Lake Area Removal Action may be used for this purpose. The criteria for placement of these materials beneath the vegetative engineered barrier/landfill cap at the former interior landfill are as follows:

- The total volume of such excavated soil/sediment that will be placed beneath the barrier will not exceed the volume of clean fill that would otherwise be required to construct the engineered barrier;

- The average PCB concentration of any excavated soil/sediment proposed for placement under the landfill barrier must be less than 2 ppm with a maximum concentration less than 10 ppm;

- The non-PCB constituent concentrations must either have maximum constituent concentrations less than the PRGs listed in the SOW for residential soil or average concentrations comparable to or lower than the MCP Method 1 soil standards for unrestricted use; and

- The material to be placed under the former landfill barrier must meet the requirements for use as backfill materials as specified in Soil Cover and Backfill Characterization Plan (Attachment B of the POP) and must have the appropriate geotechnical properties to support the engineered barrier components.

In response to comments from EPA, GE has elected to include in the design certain measures for the management of any potential gas that might collect under these engineered barriers. Specifically, the design for the engineered barrier/landfill cap over the former interior landfill will include geocomposite vent strips designed to convey any generated gas to four underground collection pipes located in the vicinity of subgrade high points that will exist following construction of the proposed subgrade for the engineered barrier/cap. Any gasses collected in those pipes will then be conveyed upward through vertical pipes from which they will be vented to the atmosphere at four select locations, as shown in Technical Drawing 16.

Further details concerning the design and installation of the engineered barrier/landfill cap over the former interior landfill are provided in Section 7.5.11, in Technical Drawings 10 through 19 and 32 through 39 (which also include details regarding the sanitary sewer realignment and the gas collection and venting features), and in the Technical Specifications. In addition, NRR/E activities will be performed for the vegetative engineered barrier portion of the former interior landfill. The scope of these NRR/E activities is described in Section 5.10.3.

5.9.2 Engineered Barrier at Parcel L12-1-5

The engineered barrier at Parcel L12-1-5 will consist in large part of a vegetative engineered barrier; however, potions will be asphalt-covered to replace a sidewalk and portions of a parking area. The horizontal extent of the engineered barrier at this property, including the vegetative and asphalt-covered portions, is shown on Technical Drawings 27 (site restoration plan) and 28 (subgrade and final grading plan). The total extent of this engineered barrier is approximately 0.12 acre.

In accordance with the applicable requirements for such barriers in Technical Attachment G to the SOW, the minimum thickness of the combination asphalt-covered/vegetative engineered barrier on Parcel L12-1-5 is one foot. A cross-section depicting the engineered barrier at this property is provided on Technical Drawing 29, and Technical Drawing 27 provides information regarding the various cover configurations for this barrier. Further details concerning the design of the engineered barrier are contained in the Technical Drawings and the Technical Specifications. Details regarding installation of this barrier are included in Section 7.5.11.

5.10 NRR/E Activities

In accordance with the Performance Standards and other requirements discussed in Section 3.4, GE will implement a number of NRR/E measures within the Unkamet Brook Area-Remainder. These measures are described below, with additional details to be provided in the Remediation Contractor's Operations Plan that will be included in the SIP.

5.10.1 Phragmites Removal

As indicated in the Remainder Conceptual Work Plan, and based on subsequent discussions with EPA, GE will remove the existing large stand of phragmites located in the wetland area east of Unkamet Brook and south of Dalton Avenue (which is more extensive than the 3-acre phragmites area referenced in Attachment I to the SOW) and also the smaller phragmites stand located in the vicinity of the northernmost portion of the former interior landfill (not identified in the SOW). These areas are shown on Technical Drawing 3. To the extent that the phragmites observed in the field in these general areas within the Unkamet Brook Area extend beyond the limits shown on that drawing, GE will remove the existing horizontal extent of phragmites in these general areas within Unkamet Brook Area-Remainder.

GE treated the phragmites removal areas with herbicide in September 2013. GE will treat those areas with herbicide again in the summer of 2014. This treatment will be conducted at least three weeks prior to initiating phragmites removal activities, if those activities are performed in 2014, to facilitate the removal and reduce the potential for dispersion during removal. If the phragmites removal will be conducted in 2015, GE will evaluate the need to treat those areas with herbicide again in 2015 (again, at least three weeks prior to initiating the removal) to facilitate the removal. Subsequently, in accordance with the SOW, GE will excavate the surface and near-surface soil and associated phragmites in these areas to approximately one foot below shallow groundwater, as determined during the month of May, or to a minimum of two feet (whichever is greater), depending on the nature and quality of the soil. In the course of these removal activities, GE will attempt to remove all rhizomes within the specified removal depth to reduce future re-colonization.

Cross-sections depicting horizontal removal limits within the phragmites areas are provided on Technical Drawing 8. Note that Technical Drawing 8 also identifies two relatively small portions of the phragmites areas that will require the placement of backfill. Specifically, backfill will be required to be placed: (1) along the northern portion of the phragmites area located adjacent to Dalton Avenue to provide bank stabilization at the toe of the roadway embankment; and (2) within the southernmost portion of the smaller phragmites area between the relocated brook channel and the landfill cap associated with the former interior landfill for constructability/runoff purposes. In addition, the Remediation Contractor will review the applicable MassDOT regulations for excavations adjacent to state highways and implement the phragmites removal activities in accordance with the requirements of those

regulations (incorporating any specified setbacks or restrictions on the depth of excavation adjacent to such roadways). If that review indicates a potential conflict between those regulations and the plans for implementation of these remediation activities along Dalton Avenue, GE will inform EPA of the conflict and propose appropriate modifications to the scope of those removal activities. Finally, the final slope of the backfilled areas in these two phragmites removal areas will be as steep as possible to prevent the re-establishment of phragmites.

In addition, GE will address phragmites within the former interior landfill as part of landfill cap installation activities. Specifically, GE will treat the existing vegetation with an appropriate herbicidal application (on the same occasions as the forthcoming treatment(s) described above), remove the above-grade portions of the phragmites plants, and then install the landfill cap, which will prevent light from promoting growth of subsurface plant material and will curtail plant growth through the liner. Full phragmites removal will not be conducted within the former interior landfill area, since that would require excavation within the landfill.

Following the soil removals in the phragmites removal areas, GE will allow for the re-development of the wetlands community through natural succession (as provided in Section 4.2.1 of Attachment I of the SOW), unless GE and EPA agree that an alternative approach, such as installation of “plugs” or “live mats” of native wetlands species, is likely to be more effective. If GE and EPA agree on installation of such plugs or mats, their placement will not require an offset for flood storage compensation. GE will attempt to prevent the re-colonization of these areas by invasive species through actions described in Section 8 of Technical Attachment I of the SOW. Consistent with NRR/E inspections at other RAAs and with Section 8 of Attachment I of the SOW, following removal, the former phragmites areas will be visually inspected twice a year for three years, once in the fifth year, and once in the seventh year. If phragmites have returned to cover greater than 5% by area at each inspection, the phragmites will be re-treated with herbicide. These post-removal monitoring and maintenance activities will be described in greater detail in GE’s Post-Removal Site Control/Restoration Project Monitoring and Maintenance Plan (to be provided separately, as noted in Section 8.5).

5.10.2 Re-vegetation along Re-routed Brook

Once the section of Unkamet Brook has been re-routed to the east of the former interior landfill as shown on Technical Drawing 5, GE will plant an herbaceous native vegetative community along the western bank of the new channel to ensure bank stability. A cross-section showing the proposed brook restoration is provided on Technical Drawing 31. The herbaceous community will be established using a seed mix consisting of warm-season grasses and wild flowers that include species that are: (1) native to Berkshire County; (2) applicable to the hydrologic regime of this area; and (3) not plant species listed by the Commonwealth of Massachusetts as endangered, threatened, or of special concern or

plants on the State Watch List. Consistent with comments and approvals provided by the Trustees for other RAAs, and as indicated in the Technical Specifications in Appendix E, it is anticipated that the grassland species to be used for the western bank of the new channel will include the following mixture of native warm-season grass and wildflower species (known as New England Conservation/Wildlife Mix): common milkweed *(Asclepias syriaca)*, New England aster *(Aster novae-angliae)*, wild bergamot *(Monarda fistulosa)*, golden alexanders *(Zizia aurea)*, Canada wild-rye *(Elymus canadensis)*, creeping red fescue *(Festuca rubra)*, switch grass *(Panicum virgatum)*, little bluestem *(Schizachyrium scoparium)*, indian grass *(Scorghastrum nutans)*, and showy tick trefoil *(Desmodium canadense).* Further, to ensure soil stability and prevent erosion, a nurse crop of annual rye-grass (*Lolium temulentum*) will be added to the seed mixture. The grassland seed mixture will be installed at an application rate of 30 pounds per acre, with an additional 10 pounds per acre of annual rye-grass to a maximum depth of ¼ inch. Subsequent to seeding, a straw mulch layer between ¼ and ½ inch thick will be installed. Following completion of the restoration activities, areas of sparse vegetation (if any) will be subject to re-seeding and mulching activities.

Areas east of the new channel that are disturbed by activities associated with re-routing Unkamet Brook will be restored in one of three ways: (1) areas that do not become inundated will be restored with the New England Conservation/Wildlife Mix (described above); (2) areas that are periodically inundated will be restored with a wetland seed mix (i.e., the New England Wetmix); and (3) areas that are permanently inundated will be restored, to the extent practical, through the placement of a minimum of one foot of clean topsoil in an uncompacted state, followed by the placement of plugs or live mats of native wetland species, as also discussed in Section 7.5.6.2.

In addition, although not required as an NRR/E measure, GE has agreed to plant a variety of trees and shrubs along the eastern side of the re-routed brook channel. As further discussed in Section 7.3.2, a tree and shrub inventory will be conducted, which will include an inventory of the existing trees and shrubs in the area that will lie east of the re-routed brook; and based on that inventory, a restoration planting plan will be developed, which will include a plan for plantings on the eastern side of the re-routed brook. As agreed with EPA, since these tree and shrub plantings are not required as part of either remediation or NRR/E measures, they will not be subject to any monitoring or maintenance requirements following installation.

Finally, as requested by EPA, GE will add a blended sand/topsoil mixture and the New England Conservation/Wildlife Seed Mix into the void spaces of the riprap in certain bank areas along the re-routed brook, although this is not part of the NRR/E measures. Specifically, as discussed further in Section 7.5.8, to avoid restricting flow, these materials will be used to fill the voids within the riprap in the top third to top half of the brook banks. Again, as agreed with EPA, since these activities are not part of the required remediation or

restoration, no monitoring or maintenance will be required for these materials or any resulting vegetation.

5.10.3 Vegetative Landfill Cap Restoration

Following construction of the engineered barrier over the unpaved portion of the former interior landfill, GE will plant the surface of that barrier with an herbaceous vegetative community that will develop into native grassland that can provide a habitat for a variety of small mammals and birds without interfering with the integrity of the engineered barrier. GE anticipates utilizing a seed mix developed to facilitate achieving the herbaceous cover performance standards. Specifically, GE will use the same seed mix of warm-season grasses and wild flowers that was described in Section 5.10.2. Similarly, to ensure soil stability and prevent erosion, a nurse crop of annual rye-grass will be added to the seed mixture. The grassland seed mixture will be installed at an application rate of 30 pounds per acre, with an additional 10 pounds per acre of annual rye-grass to a maximum depth of ¼ inch. Subsequent to seeding, a straw mulch layer between ¼ and ½ inch thick will be installed. Following completion of the restoration activities, areas of sparse vegetation (if any) will be subject to re-seeding and mulching activities.

5.10.4 Installation of Bluebird Boxes

GE will install bluebird boxes along the edges of the engineered barrier at the former interior landfill adjacent to the wetlands. Although the SOW specified a minimum spacing of 300 yards between bluebird boxes installed in NRR/E areas, GE will, consistent with comments provided by the Trustees at other RAAs, install such boxes in this area utilizing a minimum spacing of 300 feet between boxes. Specifically, GE will install four bluebird boxes between the vegetated landfill cap and the re-routed portion of Unkamet Brook at the locations shown on Technical Drawing 7.

5.11 Restoration of Affected Non-NRR/E Areas

Apart from the NRR/E areas described above, restoration activities will be conducted in the other areas at Unkamet Brook Area-Remainder that are subject to remediation actions or are otherwise disturbed by the performance of those actions. For the portions of Unkamet Brook that are not re-routed, GE will place a minimum six-inch layer of sandy silt covered with a six-inch layer of stone riprap, as described in Section 5.5. Then, as in the re-routed portion of the brook, GE will add the silty-sand mixture and the New England Conservation/Wildlife Seed Mix into the void spaces in the riprap in the top third to top half of the banks, but only in brook areas with a flat bottom. No such materials will be placed in brook areas that do not have a flat bottom. Again, as agreed with EPA, post-placement monitoring and maintenance of the added material and any resulting vegetation will not be conducted.

The affected inundated wetland areas will be restored, to the extent practical, through the placement of a minimum of one foot of clean topsoil in an uncompacted state. Affected portions of these wetlands that are periodically inundated will be restored with the New England Wetmix, while permanently inundated portions of these wetlands will be restored with plugs or live mats of native wetland species, as also discussed in Section 7.5.6.2.

The other non-NRR/E areas (i.e., those outside the brook and the inundated wetlands) that are remediated or affected by the remediation will be returned to their pre-remediation condition to the extent practicable. Specifically, areas that are currently paved will be repaved, and areas that are currently covered with grass will be reseeded with an appropriate standard grass seed and mulch mixture. These activities are also described in Section 7.5.6.2 and will be conducted in accordance with the relevant Technical Specifications.

In addition, trees and shrubs that are removed during the remediation activities will be replanted. As discussed in Section 7.3.2, prior to the commencement of remediation activities, GE will inventory the trees and shrubs within the limits of the remediation actions and in other likely affected areas and will provide that inventory along with a restoration planting plan for these areas to EPA for approval.

For affected areas that are owned by parties other than GE, GE will conduct discussions with the property owners regarding the restoration on their properties, and will take those discussions into account in developing restoration plans (or modifications to previous plans) for those properties. GE will submit any such restoration plans or modifications to EPA prior to implementation.

5.12 Flood Storage Capacity

Portions of certain averaging areas within Unkamet Brook Area-Remainder are located within the 100-year floodplain of the Housatonic River or Unkamet Brook. Some of the remediation and related activities would change pre-construction ground surface and topography of the affected areas and thus result in some effect on the flood storage capacity of the floodplain. These include the removal to be conducted within the phragmites area, the re-routing of a portion of Unkamet Brook, the installation of the engineered barrier/landfill cap over the former interior landfill, and the extension of the sanitary sewer realignment within a portion of the former brook channel (outside the limits of the engineered barrier/landfill cap). The remaining remediation and restoration actions at Unkamet Brook Area-Remainder have been designed in such a manner as to re-establish the pre-construction ground surface and topography of the affected areas, so that there would be no or minimal net change in flood storage capacity associated with these actions. Removal within the phragmites areas is anticipated to extend to a minimum depth of two feet below existing grade with no backfilling, thus having a positive impact on flood storage capacity. Similarly, the re-routing of a 600-foot section of Unkamet Brook to the east of the

former interior landfill will increase flood storage capacity through the removal of soils/sediments necessary to construct the re-routed brook channel.

With respect to the installation of the engineered barrier/landfill cap over the former interior landfill, the SOW provides: "GE shall, to the extent practicable, provide Flood Storage Compensation in the same general area. However, to achieve such compensation, GE shall not be required to remove soils from the interior landfill prior to installation of the barrier/cap, because EPA has determined that such removal is not practicable" (SOW, p. 30). The SOW also states that "[t]he shallow surface excavation conducted to accomplish the surface topography modification [within the phragmites areas] will also provide flood storage compensation for any loss of flood storage capacity resulting from the capping of the former interior landfill area." (SOW Attachment I, p.8). Consistent with these provisions, the loss in flood storage capacity resulting from the installation of the landfill barrier/cap will be considered to be offset, to the extent practicable, by the flood storage gains associated with the soil removal activities within the two phragmites areas.

In accordance with a comment in EPA's February 14, 2014 conditional approval letter, GE has prepared a revised design-level Flood Storage Assessment for the entire Unkamet Brook Area Removal Action excluding the capping of the former interior landfill and the removals in the two phragmites areas. This revised Flood Storage Assessment has considered the overall changes to flood storage capacity associated with the performance of the following remediation activities: the re-routing of a portion of Unkamet Brook; soil removal/replacement; engineered barrier installation (other than the capping of the former interior landfill), including the re-grading for the engineered barrier to be installed in Unkamet Brook Area-West adjacent to the former interior landfill to promote proper drainage; and installation of a portion of the realigned sanitary sewer within a portion of the former brook channel located south of the former interior landfill. The West Revised Final Work Plan estimated that the engineered barrier installation in the West Area would result in a net loss of approximately 70 cy of flood storage capacity. That estimate has now been increased based upon the design revisions necessitated by the extension of the realignment for the sanitary sewer (as discussed in Section 5.8) and associated revisions to the transition details between the former interior landfill cap and the West Area engineered barrier. For the Remainder Area, as indicated above, it is currently expected that the soil removal/replacement activities and engineered barrier installation activities (exclusive of the former interior landfill) required to achieve the soil-related Performance Standards will have no appreciable impact on flood storage capacity since those activities are designed to restore the remediation areas to pre-construction grades/elevations. Therefore, the only activities included in this Flood Storage Assessment are: (1) the engineered barrier installation (including re-grading) in the West Area; (2) the proposed re-routing of a portion of Unkamet Brook; and (3) the installation of a portion of the realigned sanitary sewer within a portion of the former brook channel located south of the former interior landfill.

The revised Flood Storage Assessment is presented in Appendix I (Table I-1). For the above-referenced activities, GE calculated the gains or losses in flood storage capacity on a foot-by-foot basis by using Terramodel site modeling software. This software determines the impacts on flood storage volume by calculating the difference between the existing ground surface and the proposed datum elevations over the area removed (brook re-routing) or added (the West Area engineered barrier and the fill materials over the portion of the realigned sanitary sewer located south of the former interior landfill). The proposed ground surface was also designed and modeled using Terramodel software and is depicted with the final grading contours and elevations shown on the Technical Drawings. In summary, the calculations included in the revised Flood Storage Assessment (Table I-1) indicate that the remediation activities covered by that assessment will result in net losses of flood storage capacity between elevations 987 and 991 and at elevation 994-995. However, those net losses will be offset by net gains at lower elevations (between elevations 984 and 987), resulting in an overall net gain in flood storage capacity of approximately 2,590 cy within the 100-year floodplain in the evaluation area.

In the Final Completion Report for the entire Unkamet Brook Area (i.e., West and Remainder Areas combined), GE will compare the final, surveyed as-built topography to the pre-remediation, surveyed topography to demonstrate that: (a) the remediation activities achieved the elevations and requirements approved or specified by EPA during the design process; and (b) flood storage compensation was obtained (and the location thereof) for any loss of flood storage capacity resulting from the remediation activities conducted at this RAA, excluding the installation of the barrier/cap over the former interior landfill area, as to which any loss of flood storage capacity will be compensated for, to the extent practicable, by the soil excavation in the phragmites areas, as noted above. That report will provide will an analysis, on a foot-by-foot basis, of the gains and losses in flood storage capacity resulting from the remediation and restoration activities performed at the entire RAA, excluding the capping of the former interior landfill and the removals in the two phragmites areas.

5.13 Applicable or Relevant and Appropriate Requirements

The remediation and restoration activities to be conducted in Unkamet Brook Area-Remainder will be subject to several ARARs. Specifically, these activities will be subject to the following ARARs identified in Technical Attachment B to the SOW: (1) the chemical-specific ARARs identified in Table 1; (2) the action-specific ARARs identified in Table 2, subsection B ("Soil Removal"), subsection C ("Surface Cover Activities"), subsection D (Re-routing of Unkamet Brook and Capping Former Unkamet Brook Landfill"), subsection E ("Sediment Removal from Unkamet Brook"), subsection F ("Capping/Restoration of Inundated Wetlands Near Unkamet Brook"), subsection G (Natural Resource Restoration/Enhancement Activities"), and potentially subsection K ("Other"); and (3) the location-specific ARARs identified in Table 3, subsection A ("Rivers, Streams, and Lakes") and subsection B ("Floodplains, Wetlands, and Banks"). If free product or intact drums are

encountered during excavation activities, these materials will be removed for on-site storage at the GE Plant Area and subsequently disposed of off-site. Storage of any such materials on-site at the GE Plant Area prior to off-site disposal will be performed in accordance with the ARARs identified in Table 2, subsection H ("Temporary On-Site Storage of Free Product, Drums, and Equipment That Will Be Disposed of Off-Site") of Technical Attachment B to the SOW.

A summary of the ARARs that were considered with respect to the remediation and restoration actions described herein, along with the associated project component(s) and means by which the ARAR is addressed by the design and implementation activities, is as follows:

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
Chemical-Specific ARARs		
Clean Water Act, National Ambient Water Quality Criteria for PCBs *National Recommended Water Quality Criteria: 2002* (EPA-822-R02-047, 2002)	· Sediment removal and backfilling · Re-routing of Unkamet Brook · Other activities affecting surface water of brook	· Performance of remediation and restoration actions in accordance with approved work plans. To the extent that the water quality criteria are not attained in the brook, EPA has determined that no further response actions will be required to attain those criteria as part of this Removal Action.
Massachusetts Water Quality Criteria for PCBs *Massachusetts Surface Water Quality Standards* 314 CMR 4.05(5)(e)	· Same as above	· Same as above.
Action-Specific ARARs		
TSCA Regulations (PCB Remediation Waste) 40 CFR 761.61	· Soil and sediment removal and backfilling · Surface cover activities · Re-routing of Unkamet Brook · Capping former interior landfill	· EPA has determined that Removal Actions conducted in accordance with the CD and SOW will not pose an unreasonable risk of injury to health or the environment.
TSCA Regulations (Decontamination) 40 CFR 761.79	· Equipment cleaning used in all construction activities	· Will be attained by cleaning equipment as necessary in accordance with TSCA regulations (see Section 7.7).

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
TSCA Regulations (Storage for Disposal) 40 CFR 761.61 40 CFR 761.65	· Temporary storage of removed materials	· Temporary storage of free product and liquids in tanks or containers at GE's existing on-plant tank system or hazardous waste storage facility, both of which meet the long-term PCB storage requirements of TSCA. · Temporary storage of drums and other equipment in containers at GE's existing on-plant hazardous waste storage facility, which meets the long-term PCB storage requirements of TSCA.
TSCA Regulations (PCB Marking Requirements) 40 CFR 761.40	· Temporary storage of removed materials	· Marking PCB items in accordance with these requirements.
TSCA Spill Cleanup Policy 40 CFR 761, subpart G *(Not ARAR, but To Be Considered [TBC])*	· New PCB spills (if any) during on-site activities	· GE will consider and address cleanup policy for any new PCB spills that occur during the work.
Clean Water Act NPDES Regulations (Storm water Discharges) 40 CFR 122.44(k) 40 CFR 122.26(c)(ii)(C) 40 CFR 125.100-.104	· All construction activities	· Implementation of erosion and sedimentation controls (Section 7.4.5). · Implementation of turbidity control measures in brook (Section 7.5.2.7).
RCRA Hazardous Waste Regulations (Identification and Listing of Hazardous Waste – Toxicity Characteristics) 40 CFR 261.24	· Soil and sediment removal	· GE will review the relevant Appendix IX+3 data from the soils and sediments to be excavated, using a conservative screening tool (i.e., dividing the total sample results by 20) and compare the results to allowable concentration limits associated with the Toxicity Characteristic Leaching Procedure (TCLP) under these regulations. GE will also perform TCLP sampling activities where needed to supplement the existing Appendix IX+3 data and compare those data to the allowable concentration limits under these regulations. The results of the sampling and evaluations will be included in the forthcoming SIP. Based on these results, the applicability of EPA's and MDEP's regulations governing non-PCB hazardous waste will be determined and the appropriate off-site disposal facility will be selected for the disposal of excavated materials.

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
RCRA Hazardous Waste Regulations (Storage of Hazardous Waste) 40 CFR 264, Subparts I and J 40 CFR 262.34	· Temporary storage of removed materials if they constitute hazardous waste under RCRA	· Temporary storage of free product and liquids in tanks or containers at GE's existing on-plant tank system or hazardous waste storage facility. · Temporary storage of drums and other equipment in containers at GE's existing on-plant hazardous waste storage facility. · Storage of materials in tanks will be limited to 90 days or less and will meet the substantive requirements for up to 90-day accumulation in tanks. · Materials in containers will be stored at GE's hazardous waste storage facility, which meets the requirements for long-term storage of hazardous waste in containers.
RCRA Hazardous Waste Management/Disposal Facility Regulations (Preparedness and Prevention) 40 CFR 264, Subpart C	· Temporary storage of removed materials if they constitute hazardous waste under RCRA	· GE's existing on-plant hazardous waste storage facility meets these requirements.
RCRA Hazardous Waste Management/Disposal Facilities Regulations (General) 40 CFR 264.13 - .19	· Temporary storage of removed materials if they constitute hazardous waste under RCRA	· Operation of GE's existing on-plant hazardous waste storage facility meets these requirements.
RCRA Hazardous Waste Management/Disposal Facility Regulations (Closure) 40 CFR 264.111 - .115	· Temporary storage of removed materials if they constitute hazardous waste under RCRA	· Upon termination of operations, GE's existing on-plant hazardous waste storage facility will be closed in accordance with the substantive requirements of these regulations.
RCRA Hazardous Waste Management/Disposal Facility Regulations (Closure and Post-Closure Requirements) 40 CFR 264.111 40 CFR 264.117 40 CFR 264.310(a) 40 CFR 264.310(b)(1)&(2)	· Capping and post-capping monitoring and maintenance of former interior land fill to the extent it already contains material that constitutes RCRA hazardous waste	· Final landfill cover will meet standards in 264.310(a) for landfill cover design and construction. Post-closure monitoring and maintenance will be conducted in accordance with Attachment J to SOW and Post-Removal Site Control Plan (see Section 8.5).

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
RCRA Hazardous Waste Management/Disposal Facility Regulations (Corrective Action Groundwater Monitoring and Protection) 40 CFR 264, Subpart F	· Post-capping monitoring of former interior land fill to the extent it already contains material that constitutes RCRA hazardous waste	· Groundwater monitoring and response actions (if necessary) will be conducted in accordance with Attachment H to SOW under GMA 3 program. To the extent these measures do not meet all requirements in the regulations, EPA has determined that attainment is not practicable.
Massachusetts Air Pollution Control Requirements 310 CMR 7.09	· All construction activities	· Implementation of dust control measures (as necessary) and air monitoring (Sections 7.5.1.3 and 7.6.2, respectively).
Massachusetts Hazardous Waste Regulations (Storage of Hazardous Waste) 310 CMR 30.680, 30.690 310 CMR 30.340	· Temporary storage of removed materials if they constitute non-PCB hazardous waste under state regulations	· See discussion of Federal RCRA Hazardous Waste Regulations (Storage of Hazardous Waste) above.
Massachusetts Hazardous Waste Regulations (Closure) 310 CMR 30.580	· Temporary storage of removed materials if they constitute non-PCB hazardous waste under state regulations	· See discussion of Federal RCRA Hazardous Waste Regulations (Closure) above.
Massachusetts Hazardous Waste Regulations (Landfill Closure and Post-Closure Care) 310 CMR 30.582 310 CMR 30.592 310 CMR 30.633(1) 310 CMR 30.633(2)(a)&(e)	· Capping and post-capping monitoring and maintenance of former interior land fill to the extent it already contains material that constitutes non-PCB hazardous waste under state regulations	· Final landfill cover will meet standards in 30.633 for landfill cover design and construction. Post-closure monitoring and maintenance will be conducted in accordance with Attachment J to SOW and Post-Removal Site Control Plan (see Section 8.5).
Massachusetts Hazardous Waste Regulations (Corrective Action Groundwater Monitoring and Protection) 310 CMR 30.672	· Post-capping monitoring of former interior land fill to the extent it already contains material that constitutes non-PCB hazardous waste under state regulations	· See discussion of Federal RCRA Hazardous Waste Regulations (Corrective Action Groundwater Monitoring and Protection) above.

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
Location-Specific ARARs		
Clean Water Act Section 404 Requirements 33 USC 1344 33 CFR Parts 320 & 323 40 CFR Part 230, Subparts A through I	· Sediment and soil removal and backfilling in Unkamet Brook and wetlands · Re-routing of Unkamet Brook to the extent it involves discharge of dredged or fill material into brook or wetlands · Phragmites removal to the extent it involves discharge of dredged or fill material into brook or wetlands	· No practical alternative with less adverse impact on aquatic ecosystem. · Implementation of all practicable measures to minimize adverse impact on brook and wetlands, including erosion and turbidity controls. · Current information indicates no likely impact on threatened and endangered (T&E) species. · No significant loss of flood storage capacity from these activities and no significant net increase in flood stage or velocities (Section 5.12) · Restoration of disturbed banks and wetlands (Sections 5.10.2, 5.11, 7.5.7, and 7.5.8).
Fish & Wildlife Coordination Act Requirements 16 USC 661 et seq. 40 CFR 6.302(g)	· Sediment removal and backfilling in Unkamet Brook · Re-routing of Unkamet Brook	· It is anticipated that EPA has consulted or will consult with Fish & Wildlife Service and MA Dept of Fisheries & Wildlife, as necessary, to determine measures to protect fish and wildlife from required activities modifying Unkamet Brook. · Such measures will include erosion and sedimentation controls (Section 7.4.5) and restoration of aquatic habitat (Sections 5.5, 5.11, 7.5.6.2, 7.5.7, and 7.5.8).
Executive Order for Wetlands Protection Exec. Order 11990 (1977) 40 CFR Part 6, App. A 40 CFR 6.302(a) *(Not ARAR, but TBC)*	· Soil and sediment removal and backfilling in wetlands · Phragmites removal	· No practical alternative with less adverse impact on wetlands. · Implementation of erosion and sedimentation controls (Section 7.4.5). · Restoration of affected wetlands habitat (Sections 5.5, 5.11, 7.5.6.2, 7.5.7, and 7.5.8.).
Executive Order for Floodplain Management Exec. Order 11988 (1977) 40 CFR Part 6, App. A 40 CFR 6.302(b) *(Not ARAR, but TBC)*	· Soil and sediment removal and backfilling in floodplain · Phragmites removal	· No practical alternative with less adverse impact on floodplain. · Implementation of erosion and sedimentation controls (Section 7.4.5). · No significant loss of flood storage capacity from these activities (Section 5.12). · Implementation of actions to minimize harm to and within the floodplain (Section 5.12). · Restoration of affected floodplain habitat (Sections 5.5, 5.11, and 7.5.6.2).

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
Mass. Clean Water Act Water Quality Certification Regulations 314 CMR 9.06	· Soil and sediment removal and backfilling in Unkamet Brook and wetlands · Re-routing of Unkamet Brook to the extent it involves discharge of dredged or fill material into brook or wetlands · Phragmites removal to the extent it involves discharge of dredged or fill material into brook or wetlands	· No practical alternative with less adverse impact on aquatic ecosystem. · Implementation of all practical measures to minimize adverse impacts on wetlands and land under water. · Implementation of erosion and sedimentation controls for storm water discharges (Section 7.4.5) · No substantial long-term adverse impacts to the integrity of surface waters.
Mass. Clean Water Act Water Quality Certification Regulations 314 CMR 9.07	· Sediment removal in Unkamet Brook	· Current information indicates no significant fisheries in area. · Restoration of aquatic habitat (Sections 5.5, 5.11 7.5.6.2, 7.5.7, and 7.5.8).
Massachusetts Wetlands Protection Act and Regulations MGL c. 131 § 40 310 CMR 10.53(3)(q) 310 CMR 10.54-.58	· Soil and sediment removal and backfilling in Unkamet Brook, wetlands, 100-year floodplain, and other resource areas · Re-routing of Unkamet Brook · Capping former interior landfill · Phragmites removal	· No practical alternative with less adverse impact on resource areas. · Implementation of all practical measures to minimize adverse impact on wetlands and other resource areas. · Implementation of erosion and sedimentation controls for storm water discharges (Section 7.4.5). · Implementation of actions to minimize impact of hydrological changes during work (including turbidity controls), to the extent practicable. · Provision of compensatory flood storage to offset loss in flood storage capacity per Section 5.12. · No significant net increase in flood stage or velocities. · Restoration of disturbed vegetation (Sections 5.10.2, 5.11, 7.5.6.2, 7.5.7, and 7.5.8).

6. Contractor Selection

Following EPA's approval of this Revised Remainder Final Work Plan, GE will select a qualified Remediation Contractor to complete the remediation and restoration actions for both Unkamet Brook Area-West and Unkamet Brook Area-Remainder. To accomplish this, GE will provide prospective Remediation Contractors with appropriate documentation that describes the combined project, provides the Technical Drawings and Technical Specifications for completing the work, and solicits bids from the prospective Contractors. GE and its Supervising Contractor (ARCADIS) will then review the potential Contractor bids for completeness, relevant experience, the proposed work schedule, and the Contractor's financial status. After the review is complete, GE will select the Remediation Contractor and initiate a contractual agreement.

Upon selection, the Remediation Contractor will be responsible for providing several submittals to GE, including those discussed in Section 7.3.1 of this Revised Remainder Final Work Plan. GE will subsequently provide the Contractor information and relevant submittals to EPA in the SIP covering both Unkamet Brook Area-West and Unkamet Brook Area-Remainder, as described in Section 9 of this Revised Remainder Final Work Plan.

7. Implementation Plan

7.1 General

As indicated in Section 5.2, the POP contains a series of plans that address several common aspects for Removal Actions Outside the River. As relevant, the most up-to-date approved version of those plans will be followed during implementation of the remediation and restoration activities. As a supplement to the implementation-related procedures specified in those plans, this section provides additional details regarding construction activities. Specifically, this section identifies the requirements for project-specific plans to be submitted by the selected Remediation Contractor, describes site-specific elements of the site preparation and construction activities, and summarizes the project-specific surface water and ambient air monitoring to be conducted.

As noted above, GE is proposing to conduct the remediation and restoration actions for the entire Unkamet Brook Area (including Unkamet Brook Area-West and Unkamet Brook Area-Remainder) in an integrated manner based on constructability, efficiency, and overall project schedule. The approved West Revised Final Work Plan set forth implementation details for the activities in the West Area. This section of the Revised Remainder Final Work Plan describes a number of general implementation activities that will apply to both the West and the Remainder Areas (consistent with or, where necessary, as modifications to those in the West Revised Final Work Plan); and it provides additional implementation details for the remediation and restoration activities at Unkamet Brook Area-Remainder. It also includes references to GE's Contingency Plan for Potential Overtopping of Flow Barriers, Observations of NAPL, and Discovery of Intact Vessels (Contingency Plan), which is provided in Appendix J.

As noted in this section, certain implementation-related logistics are currently unknown and will be provided to EPA in the SIP once a Remediation Contractor has been selected.

7.2 Project Participants

To the extent possible, the following table identifies the key project participants involved in the design and implementation of the Unkamet Brook Area Removal Action (for the West and Remainder Areas combined), along with their project roles and contact information:

Organization/Contact	Role	Address and Phone Number
United States Environmental Protection Agency Dave Dickerson	- Lead regulatory agency. - Review and approval of Final Work Plans. - Oversight of response actions.	U.S. Environmental Protection Agency Mail Code OSRR07-1 5 Post Office Square, Suite 100 Boston, MA 02109-3912 (617) 918-1329
Massachusetts Department of Environmental Protection John Ziegler	- Lead regulatory agency for Grants of Environmental Restrictions and Easements. - Review and comment to EPA on all GE submittals.	Western Regional Office 436 Dwight Street Springfield, MA 01103 (413)-755-2228
Natural Resource Trustees for the GE Pittsfield/ Housatonic Site Karen Pelto, Lead Administrative Trustee	- Review and approve submittals and activities relating to natural resource restoration/enhancement measures	Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup One Winter Street, 8th Floor Boston, Massachusetts 02108 (617)-292-5785
General Electric Company Richard W. Gates	- Supervise pre-design, construction, and documentation activities related to the Unkamet Brook Area Removal Action (for both West and Remainder Areas). - Supervise implementation of the remediation and restoration activities to ensure that they are conducted in accordance with the CD. - Direct/coordinate activities of the Remediation Contractor and other GE-contracted organizations. - Responsible for preparation of a single Final Completion Report for Unkamet Brook Area Removal Action.	159 Plastics Avenue Building 59 Pittsfield, MA 01201 (413) 448-5909

Organization/Contact	Role	Address and Phone Number
ARCADIS James M. Nuss, P.E., LSP	- Supervising Contractor for GE. - Review Remediation Contractor submittals. - Project coordination and documentation. - Provide technical assistance related to the implementation of the remediation and restoration actions. - Conduct surface water monitoring in Unkamet Brook during construction activities affecting brook. - Assist in verifying that the remediation and restoration actions are complete and performed in accordance with the Final Work Plans. - Prepare a single Final Completion Report for Unkamet Brook Area Removal Action.	6723 Towpath Road P.O. Box 66 Syracuse, NY 13214 (315) 671-9230
Berkshire Environmental Consultants, Inc. Maura Hawkins	- Design and implement ambient air monitoring in conjunction with construction activities.	152 North Street, Suite 250 Pittsfield, MA 01201 (413) 443-0130
Remediation Contractor (To be determined)	- Provide submittals identified in Section 7.3.1. - Implement all construction-related activities.	(To be determined)

7.3 Pre-Mobilization Submittals

7.3.1 Remediation Contractor Submittals

Once selected, the Remediation Contractor will be required to provide certain pre-mobilization submittals to demonstrate that the Contractor: (a) has an adequate understanding of the scope of the Removal Action; (b) has developed a project-specific sequence that can efficiently perform all on-site activities within the allowable schedule; (c) will utilize acceptable materials, products, and procedures; and (d) will perform all activities in a manner that is protective of on-site workers and the surrounding community. Certain of those submittals relate to the manner in which the work activities will be implemented and, as such, will supplement the information and procedures presented in this plan.

The required submittals include an Operations Plan, Health and Safety Plan (HASP), Contingency Plan, and identification of backfill/barrier material sources. The Operations Plan, Contingency Plan and analytical data for the backfill sources will be submitted in the SIP to EPA for review and approval.

Operations Plan

The purpose of the Operations Plan is to summarize the materials, procedures, timelines, and controls that the Contractor intends to utilize during project activities. The plan will be prepared in consultation with GE and its Supervising Contractor and will include (at a minimum) the following:

- The Contractor's qualifications package (if requested by GE);
- List of equipment to be used on-site;
- The Contractor's proposed plan for controlling vehicular and pedestrian traffic, noise, and dust during the performance of construction activities;
- A map of all proposed access roads to be used during implementation of the remediation activities;
- Proposed excavation support design (if applicable) or alternate excavation stabilization measures;
- The Contractor's proposed plan for water diversion/bypass pumping and storm water management (including run-on, run-off, and flows from outfalls discharging to Unkamet Brook), erosion control, and control of resuspension in Unkamet Brook;
- The Contractor's proposed approach for implementing the remediation and restoration activities described in the West Revised Final Work Plan and the Remainder Revised Final Work Plan, as approved by EPA;
- Work schedule, including the Contractor's proposed plan for the timing/sequencing of the remediation activities (including the proposed culvert cleaning procedures) and backfilling/restoration of the sediment removal and re-routed brook areas (including the adjacent/abutting bank soil removal areas);
- Materials handling and staging approach; and
- Equipment cleaning procedures.

HASP

The HASP will identify the Remediation Contractor's project-specific health and safety procedures, and will be developed to address the minimum requirements established in the POP and 29 CFR 1910 and 1926. The plan will address those activities to be undertaken by the Contractor and present required information including, but not limited to, the following (as applicable):

- Training;
- Identification of key personnel (including the Contractor's Health and Safety Officer);
- Medical surveillance;
- Site hazards;
- Work zones;
- Personal safety equipment and protective clothing;
- Personal air monitoring;
- Personnel/equipment cleaning;
- Confined space entry;
- Construction safety procedures;
- Standard operating procedures and safety programs; and
- Material safety data sheets.

Contingency Plan

The Contingency Plan will set forth procedures for responding to emergency conditions or events that may occur during the performance of the Removal Action and will include (at a minimum) the following information:

- A spill prevention control and countermeasures plan for all materials brought onto the work site;
- Emergency vehicular access/egress;

- Evacuation procedures of personnel from the work site;

- For work areas that include or are adjacent to a surface water drainageway, a flood control contingency plan identifying measures to protect those areas and the waterway from impacts in the event of high water and/or flood conditions;

- A contingency plan for addressing potential overtopping of the flow barriers during work in Unkamet Brook (including a requirement that all in-stream excavations be backfilled and/or temporarily protected at the end of each day if significant precipitation is anticipated or forecasted), potential observations of NAPL during construction activities, and potential discovery of relatively intact drums, capacitors, or other vessels during excavations – all to be consistent with GE's Contingency Plan in Appendix J;

- A list of all contact personnel with phone numbers and procedures for notifying each;

- Routes to local hospitals; and

- Identification of responsible personnel who will be in a position at all times to receive incoming phone calls and to dispatch Contractor personnel and equipment in the event of an emergency situation.

Identification of Backfill/Barrier Material Sources

The Remediation Contractor will be required to prepare a submittal(s) specifying the sources and, if necessary, the corresponding analytical data for: (a) proposed backfill/topsoil sources to be used in soil excavation areas; (b) proposed sources of the backfill and riprap materials to be used in Unkamet Brook; and (c) proposed sources of the materials to be used in construction of the engineered barriers and landfill cap.

Other Required Submittals

In addition to these submittals, the Remediation Contractor will be required to provide GE with various other submittals over the course of this project. The overall purpose of such submittals is to verify that the materials and procedures used in the construction activities are consistent with the design of the Removal Action. In accordance with the POP, all Contractor submittals will be tracked to confirm their receipt and approval. A copy of the Technical Submittal Register associated with the Unkamet Brook Area-Remainder is provided in Appendix K. A copy of the Technical Submittal Register associated with Unkamet Brook Area-West was provided as in Appendix C of the West Revised Final Work Plan.

Finally, at least three days prior to the delivery to the work site of any materials covered by Technical Specification 02212 (Topsoil, Seeding, and Mulch) or Technical Specification 02222 (Fill Materials), GE will provide the following information to EPA: (1) an updated version of the Contractor Submittal Tracking Form; (2) copies of the Contractor submittals associated with these Technical Specifications; and (3) documentation verifying that the submittals are acceptable and meet the requirements of the Technical Specifications.

7.3.2 Tree/Shrub Inventory and Planting Plan

In addition to the submittals by the Remediation Contractor, an inventory will be conducted of all trees and shrubs that will be removed due to the remediation activities (e.g., soil/sediment removal, placement of the engineered barrier, brook re-routing, etc.) or that may be damaged by the performance of such activities. This inventory will include an identification of the species and size of the trees/shrubs that need to be removed to facilitate performance of the remediation activities or that may be damaged by those activities, including any trees removed to facilitate construction of support zones and staging areas. A scaled figure showing the approximate locations of the trees/shrubs that need to be removed will also be prepared as part of this inventory.

Once completed, the results of this inventory will be used to create a tree/shrub restoration planting plan, which will be submitted to EPA for review and approval. That plan will provide for the replacement of any trees/shrubs that will be removed to facilitate the soil removal or engineered barrier placement activities. As discussed in Section 5.10.2, it will also include a plan for plantings on the eastern side of the re-routed Unkamet Brook (including an estimated number of native trees and shrubs), although this is not required as part of remediation or NRR/E measures. The tree/shrub planting plan will provide the following information:

- A scaled figure depicting the planting areas;

- A tabulated listing (by species and quantity) of the trees/shrubs to be installed within each planting area (which will include an identification of appropriate alternate species native to Berkshire County to replace any non-native or invasive species identified during the tree/shrub inventory); and

- Detailed planting specifications (e.g., stock size, fertilization requirements, etc.) for the trees and shrubs to be installed.

7.4 Site Preparation

Immediately prior to or following mobilization to the work area, the selected Remediation Contractor will perform several site preparation activities to establish the necessary site controls, features, and procedures for subsequent implementation of the construction activities. These activities include the following:

- Obtaining utility clearances;
- Establishing site controls and access;
- Monitoring well decommissioning and protection;
- Installing erosion and sedimentation control measures;
- Establishing survey control;
- Surface preparation; and
- Utility abandonment.

General information regarding various site preparation activities (e.g., coordinating with local utilities, permitting, verifying existing conditions, establishing work areas, etc.) is provided in the general CQAP (part of the POP). The information provided below supplements that CQAP by providing additional site-specific details associated with certain of these activities.

7.4.1 Utility Clearances

Above-ground and underground utilities that could potentially be affected by the construction activities will be identified prior to initiating any intrusive subsurface activities (e.g., soil excavation, etc.). As indicated on Technical Drawings 1, 2, 10, 20, 21, and 25, certain subsurface and above-ground utilities are known to be present within and adjacent to work areas at Unkamet Brook Area-Remainder. These utilities include, but may not be limited to, electrical, storm drain, fire protection, sanitary sewer, and water. The selected Remediation Contractor will be responsible for coordinating with DIGSAFE to determine the locations of all utilities within and adjacent to the work areas prior to the start of the work. Certain of these utilities are located within the removal areas and may require support, abandonment, and/or replacement as part of excavation activities. Utility decommissioning is discussed in Section 7.4.8.

7.4.2 Work Area Security

The level of work area security will depend on the activities being performed and the location of those activities. Security measures will be selected in consultation with the Remediation Contractor and may consist of temporary fencing or barriers, maintenance of sign-in/sign-out sheets, and implementation of safe work practices, as described below.

Temporary Fencing - Temporary construction fencing will be installed, as needed, to delineate and secure areas during ongoing construction activities. While other fencing configurations of equivalent performance may be considered, such temporary fencing is expected to be at least 4 feet in height, constructed of high-density polyethylene, and orange in color. In addition, in accordance with 520 CMR 14.00, temporary fencing around unattended open excavations that are greater than or equal to 3 feet in depth and have 15 feet or less between opposing side walls will be at least 6 feet in height with openings of no more than 4 inches between vertical supports.

Sign-In/Sign-Out Sheet - For the duration of construction activities, a sign-in/sign-out sheet will be maintained for the work site. All on-site personnel and visitors will be required to sign in upon entering the work area and sign out upon leaving.

In addition, safe work practices will also be employed at this work site. These activities may include any of the following:

Daily Safety Meetings - Such meetings, commonly referred to as tailgate meetings, will normally be held with the Remediation Contractor to discuss hazards potentially encountered during the planned daily activities.

Posting of Warning Tape - To restrict access during construction activities, warning tape may be installed at certain locations to delineate certain areas, such as the exclusion zone, contaminant reduction zone, and/or support zone.

Use of Flagmen or Other Signaling Devices - Certain excavation activities in high traffic areas may necessitate the use of flagmen or other signaling devices (e.g., flashing beacons mounted on sawhorses). In addition, certain excavations adjacent to public roads (e.g., the deep excavations on Parcel L12-1-5 abutting Merrill Road) may require a police detail for traffic control. Finally, GE will coordinate with CSX (on behalf of the Remediation Contractor) regarding any railroad flagging services that may be required for the excavations adjacent to the railroad tracks on the rail siding portion of Parcel L11-4-12.

7.4.3 "Clean" Access Area

One or more "clean" transition areas will be established since a number of activities will require periodic access/egress between the work site and adjacent areas. Such areas will

be used for equipment/material delivery and for the positioning of trucks for subsequent loading and off-site transport of excavated materials. It is expected that each access/loading area(s) will be constructed of gravel or a layer of geotextile fabric and will be properly delineated from the adjacent work areas and the remainder of the property. The specific location and construction of the access/loading area(s) will be developed by the Remediation Contractor in accordance with the anticipated progression of the construction actions, as well as other factors such as the layout of the site, traffic patterns, and material handling procedures.

The gravel used for the construction of such access areas will either be stockpiled and used for clean backfill materials or transported to an appropriate off-site disposal facility. After completing soil and sediment removal activities and the other construction activities, the gravel will be sampled to determine if the materials were impacted during the performance of the remediation actions. If the data indicate that those materials were not impacted, the materials will be consolidated for reuse as clean backfill. However, if the gravel was impacted, it will be consolidated for subsequent transportation to an appropriate off-site disposal facility.

7.4.4 Monitoring Well Decommissioning/Protection Activities

As previously discussed, the Unkamet Brook Area Removal Action is focused on achieving the soil- and sediment-related Performance Standards set forth in the CD and SOW. However, this RAA contains certain components of the GMA 3 and GMA 4 groundwater/NAPL monitoring programs. Specifically, the groundwater within Unkamet Brook Area–Remainder is part of GMA 3, while the groundwater within Unkamet Brook Area-West is within both GMA 3 and GMA 4. As indicated in Section 1.3, the GMA 3 activities currently consist of the performance of a groundwater monitoring program, along with groundwater/NAPL recovery operations (consisting of two skimmer systems in the southern part of Parcel K12-9-1), and the GMA 4 activities currently consist of long-term monitoring.

As discussed in the West Revised Final Work Plan, two GMA 3 monitoring wells within Unkamet Brook Area-West (wells 78B-R and GMA3-16) will be affected by remediation actions (in that case, installation of an engineered barrier at the industrial portion of Parcel K12-9-1) and will be protected during the performance of remediation activities.[20] In addition, a number of GMA 3 monitoring wells within Unkamet Brook Area-Remainder will or may be affected by the remediation actions to be conducted in that area. GE's plans for addressing these wells are described below.

[20] The monitoring wells within GMA 4 will not be affected by any remediation activities at the entire Unkamet Brook Area.

Based on review of historical records/reports, over 250 wells have previously been installed within the Unkamet Brook Area. However, only some (about one-fourth) of those wells are used in the ongoing groundwater quality monitoring and/or NAPL monitoring and recovery programs, while the others may no longer be present or are otherwise not currently in use. On May 29, 2013, GE submitted to EPA a proposal, as part of the GMA 3 program, to remove, protect, and/or replace a number of monitoring wells within GMA 3 to accommodate the remediation actions at the Unkamet Brook Area. In the same submittal, GE also proposed to decommission other GMA 3 monitoring wells that were no longer considered necessary to the performance of the GMA 3 monitoring activities. EPA provided conditional approval of that proposal in a letter dated August 22, 2013. In that letter, EPA modified the list of monitoring wells approved for decommissioning, and also required GE to provide a separate submittal proposing the specific decommissioning method for each well approved for decommissioning. GE submitted that proposal on well decommissioning methods on March 17, 2014.

It is currently anticipated that the monitoring well decommissioning activities will be performed in conjunction with the site preparation or remediation activities. Following receipt of EPA's approval of GE's proposal on monitoring well decommissioning methods, GE will prepare revised or new technical drawings, as appropriate, to encompass the monitoring well decommissioning activities, along with the well protection and/or replacement activities, that will be performed in connection with the remediation activities in the Unkamet Brook Area. Those revised/new technical drawings will be included in the SIP. At a minimum, the Remediation Contractor will be responsible for protecting any potentially affected wells not subject to decommissioning as part of the remediation activities, replacing any wells that cannot be protected during those activities and that need to remain part of the GMA 3 program, and repairing or replacing any other wells that are damaged during the remediation activities.

The Remediation Contractor will schedule and perform any required well decommissioning activities within the Unkamet Brook Area as part of the site preparation activities if the wells are accessible at that time, or during subsequent remediation activities as the wells become accessible. To ensure that the correct wells are decommissioned, the Remediation Contractor will be required to mark each monitoring well in the relevant areas for verification by GE prior to performing any well decommissioning activities. As required for other Removal Actions, GE will notify EPA at least one week prior to the performance of these field verification activities. Upon verification by GE that the correct wells were identified, the Remediation Contractor will decommission each of the wells in accordance with the approved procedures.

In addition, to facilitate a determination of which additional wells may require repair or replacement following performance of the remediation, the wells not subject to decommissioning within and around the limits of work associated with the remediation activities will be inspected jointly by GE and the Remediation Contractor prior to the

initiation of those activities. Prior to final surface restoration, these wells will be inspected again by GE and the Remediation Contractor, and the results of the two inspections will be compared to determine if any of those wells were damaged during the performance of the remediation and require repair or replacement.

7.4.5 Erosion and Sedimentation Control Measures

Erosion and sedimentation control measures will be implemented to minimize the potential for erosion of exposed soils and subsequent accumulation of materials in site drainage pathways. In addition, these measures will be used to divert rainfall runoff from contacting any soil/sediment stockpile areas and/or entering work areas and open excavations.

Erosion control measures to be implemented at Unkamet Brook Area–Remainder will include placement of hay bales and/or staked silt fencing around the perimeter of the work areas, plus additional area-specific measures, as required. The approximate location and layout of the hay bales/siltation fencing are indicated on Technical Drawings 2 (north of Merrill Road), 10 (former interior landfill), 21 (south of Merrill Road), and 25 (Parcel L12-1-5). Hay bales and/or fencing will be placed at the start of the site work activities and will be maintained until a good stand of vegetation is established. Erosion controls over paved areas are anticipated to consist of hay bales placed end-to-end.

Full-depth silt curtains will also be deployed in the Unkamet Brook channel prior to initiating sediment removal or culvert cleaning activities. Such silt curtains will be installed and maintained such that any water in the channel and any associated site-related or off-site materials that may be in suspension pass through the fabric material, prior to discharge to the Housatonic River, thus mitigating the potential for off-site transport. These silt curtains are described further in Section 7.5.2.7.

In addition to the measures described above, other erosion and sedimentation control measures will be implemented as needed. At a minimum, these will include placement of erosion control measures around any temporary soil stockpiles that are not located on soils subject to future excavation and around any storm drain catch basins adjacent to work areas (with the exception of any catch basins located along the edge of Merrill Road, which will not have such measures).

7.4.6 Survey Control

In accordance with the CQAP, survey controls will be established at the start of the work and maintained throughout construction activities. GE will provide survey benchmarks so that the Remediation Contractor's licensed surveyor can establish appropriate horizontal and vertical control consistent with the existing survey data. Based on a review of the soil removal and engineered barrier areas, the Remediation Contractor's licensed surveyor will establish a minimum 50-foot control grid, supplemented as necessary with control points at

major grade breaks, within the soil removal and engineered barrier areas for use throughout the Unkamet Brook Area Removal Action. Such supplemental control points will be established at the discretion of the licensed surveyor. In addition, the Remediation Contractor will be required to establish the elevation(s) along the toe-of-slope around the perimeter of the southern inundated wetland prior to the initiation of the remediation activities. For sediment removal areas, as discussed in Section 5.3.3, the Remediation Contractor will be required to demarcate the horizontal limits of removal approximately one month in advance of initiating the sediment removal activities so that GE and EPA can conduct a site walk and determine if any modifications to the limits of sediment removal are appropriate. Any such modifications will be based on the guidelines specified in Section 5.3.3. In addition, the Remediation Contractor will be required to demarcate transects at approximate 50-foot intervals along Unkamet Brook that will be maintained throughout construction to document pre-excavation, post-excavation, and post-restoration survey elevation data. In this connection, GE will consider the use of a GPS-based "tin layer" in sediment removal areas to facilitate survey control during the performance of the remediation activities in those areas. All survey control points will be physically marked in the field and subject to EPA review, in accordance with Attachment E, Exhibit E-2, Section 2.2 of the POP.

The Remediation Contractor will be required to perform survey activities at several critical junctures during the performance of the Removal Action, to: (1) establish appropriate horizontal and vertical control prior to the initiation of the soil/sediment removal activities; (2) verify achievement of the horizontal and vertical limits of removal; (3) verify achievement of the required elevations specified in the subgrade and final grading plan for the engineered barriers, as well as the appropriate elevations for the non-barrier backfilled excavations; (4) document achievement of the specified minimum thicknesses of the engineered barriers (one foot for the asphalt-covered engineered barrier over a portion of the former interior landfill and for the combined barrier on Parcel L12-1-5 and two feet for the vegetative engineered landfill cap over the remaining portion of the former interior landfill); and (5) document the final elevations of all restored areas.

To facilitate the performance of the survey activities described above, a survey control spreadsheet will be developed by the Remediation Contractor (in conjunction with the licensed surveyor) upon establishment of the horizontal and vertical control and establishment of the survey control points to be maintained throughout the performance of the remediation activities. The survey control spreadsheet will be submitted to GE and EPA for approval prior to the initiation of soil excavation or barrier construction. At a minimum, the spreadsheet will be populated with columns presenting the following data: a listing of all survey control points to be maintained for the duration of the remediation activities; the northing and easting coordinates for each control point; the pre-construction surveyed elevation at each control point; the design excavation elevation; the as-built excavation elevation (to be filled in upon completion); the removal depth; the design subgrade

elevation; the as-built subgrade elevation (to be filled in upon completion); the design final elevation; and the as-built final elevation (to be filled in upon completion).

To the extent possible, as indicated in Section 5.3.3, the remediation activities to be performed in the brook channel will be performed in the dry through water diversion, bypass pumping, and dewatering of the excavation areas. This same approach may also be used to facilitate excavation in the inundated wetland areas and for brook re-routing. However, it is possible that standing water may obscure the excavation bottom in some such excavation areas. Thus, as agreed by GE and EPA, if that condition should occur, close coordination will be required in the field to confirm that the specified excavation grades have been achieved.

The Remediation Contractor will not be permitted to proceed with subsequent phases of remediation (e.g., to proceed from excavation to backfilling, subgrade liner elevation to barrier construction, backfilling/barrier construction to final surface restoration, etc.) until the survey documentation for the prior phase has been submitted to and approved by GE and EPA. Upon completion of the remediation activities, the final survey measurements provided in the survey control spreadsheet will be compared to the pre-remediation surveyed topography for the purposes of the flood storage comparison, as described in Section 5.12. Additional details regarding specific survey activities associated with the installation of engineered barriers are provided below.

Prior to placing any engineered barrier materials, the Contractor will be required to survey the current elevation at each grid point, plus certain additional locations to be identified at the discretion of the licensed surveyor. Those additional locations will be for the purposes of verifying breaks in topography or other features that might not otherwise be adequately documented via the 50-foot grid. Once the engineered barrier materials are placed, the Contractor will be required to survey final elevations at the 50-foot grid points plus the additional locations identified by GE. The Remediation Contractor will be required to maintain, for the duration of the project, the 50-foot grid points and additional survey locations established during site preparation activities. The survey will be performed to document the engineered barrier thicknesses (relative to the initial survey), and to verify that the final surface grades have been achieved. Placement of the final surface cover materials (i.e., topsoil or asphalt as appropriate) will not be permitted until GE and EPA have reviewed and approved the Remediation Contractor's survey documentation to verify that the specified surface cover thickness has been provided.

7.4.7 Surface Preparation

Various surface preparation activities will be performed prior to or in conjunction with the initial site preparation activities. Such activities will include the installation of access roads (where necessary), clearing the above-grade portions of vegetation within or immediately adjacent to the limits of soil/sediment removal and the areas subject to installation of

engineered barriers, removal of the temporary road cover materials installed on Parcel L11-4-11 in August/September 2013, and certain specific site preparation activities for the currently paved portion of the former interior landfill, all as described below.

Where possible, access to the areas subject to remediation activities will be via existing paved and unpaved roadways. However, certain low-lying, wetland areas will need to be accessed to perform the phragmites removal, monitoring well decommissioning, brook re-routing, sediment removal, and culvert cleaning activities described herein. As a result, it is anticipated that the Remediation Contractor may need to construct access roads within portions of Parcels K12-9-1, L11-4-11, and possibly L12-2-1 to execute the required remediation activities. Specific details regarding the location and construction of any such access roads will be included in the Remediation Contractor's Operations Plan (as indicated in Section 7.3.1).

The above-ground portions of all cleared vegetation will either be reused on site in landscaping applications or disposed of off-site as non-regulated material. In addition, surface features (e.g., fencing, posts/bollards) that would interfere with the performance of the remediation or restoration actions will be removed or relocated for reuse upon completion of the remediation activities. Such features that were removed will be either: (1) disposed of off-site as non-regulated materials, recycled, or set aside for reuse during site restoration if they did not contact soils subject to removal or beneath the engineered barriers (or can be cleaned); or (2) disposed of off-site in accordance with the characteristics of the adjacent soil materials subject to excavation or placement of an engineered barrier. Any subsurface portions of these features will be decontaminated prior to any reuse.

Prior to the initiation of the soil excavation activities on Parcel L11-4-11, the Remediation Contractor will remove the temporary road cover materials installed on that property in August/September 2013. As discussed in Sections 5.5 and 5.9.1, the gravel materials will be removed, stockpiled, and sampled for potential reuse as subsurface fill materials. The woven geotextile materials (which were in contact with the underlying soils) will be handled and disposed of along with the underlying soils.

In addition to the site preparation activities described above, the vegetated islands in the paved portion of the former interior landfill will be removed to facilitate the installation of pavement over these areas for use as a temporary stockpile area for the staging and dewatering of excavated saturated materials. These islands plus approximately three inches of underlying soil will be removed to facilitate the installation of an asphalt-binder course that will be installed to create a contiguous asphalt layer for the subsequent installation of the specified one-foot thick asphalt-covered engineered barrier. The first step in the removal of the islands will involve the clearing the above-grade portions of the existing vegetation. Also, the existing light poles will be removed. Any potentially

hazardous materials (e.g., mercury containing light bulbs) will be removed and the poles will be disassembled for recycling or offsite disposal as non-regulated materials.

As noted in the table in Section 4.5, the removal of the vegetated islands will generate an estimated 2,030 cy of material. Since there are no existing soil data for the vegetated islands, GE will collect samples from the soils comprising the islands (but not below the elevation of the adjacent pavement) prior to or as part of the response actions to determine if the soils are potentially suitable for reuse as subsurface fill materials, as described in Sections 5.5 and 5.9.1. As noted therein, the soil sample data will be provided to EPA prior to any on-site reuse of these materials.

As mentioned above, following the removal of the vegetated islands, asphalt shims will be installed over the unpaved portions of the parking lot to create a contiguous asphalt layer to allow for the subsequent installation of engineered barrier liner components. Following placement of the asphalt shims, and prior to the construction of the asphalt-covered engineered barrier, this area will be used for temporary stockpiling and dewatering of excavated soils and sediments. This temporary stockpile/dewatering area, including the protective measures to be implemented for that use, is described in Section 5.3.5.

Additional information regarding the various surface preparation activities to be performed as part of the Unkamet Brook Area Removal Action are specified on Technical Drawings 2 (north of Merrill Road), 10 (former interior landfill), 21 (south of Merrill Road), and 25 (Parcel L12-1-5).

7.4.8 Utility Decommissioning

As indicated in the previous section, the existing vegetated islands in the western portion of the former interior landfill that is subject to installation of an asphalt-covered engineered barrier parking lot will be removed during the site preparation activities. As a result, GE will also decommission both the irrigation and electrical lines located within those vegetated islands.

In addition to the decommissioning of the irrigation and utility lines within the paved portion of the former interior landfill, GE will relocate the existing sanitary sewer line located beneath the paved portion the former interior landfill as part of the activities associated with the re-routing of a section of Unkamet Brook and the installation of a vegetative engineered barrier over the former interior landfill. As a result, the section of the sanitary sewer line that is currently within the former interior landfill will be decommissioned by inserting plugs at both ends and grouting the line. However, as further described in Section 7.5.10 the relocation of the sanitary sewer line will be performed after the re-routing of Unkamet Brook is complete and the synthetic components of the engineered barrier have been installed. Therefore, the decommissioning of the existing sanitary sewer will not be performed at the same time as the other utility decommissioning activities (i.e., during site preparation).

Section 7.5.10 provides additional details regarding the relocation and decommissioning of the existing sanitary sewer line located within the limits of the former interior landfill.

7.5 Construction Activities

7.5.1 Soil Removal Activities

The remediation actions for Unkamet Brook Area-Remainder will include the excavation of existing soils within the removal limits depicted on Technical Drawings 3 (north of Merrill Road) and 22 (south of Merrill Road). These drawings show the removal areas where the soil is subject to disposal under TSCA requirements (TSCA removal areas) and the removal areas where the soil is not subject to such requirements (non-TSCA removal areas). In addition, based on a screening evaluation and waste characterization sampling conducted in January 2014 (discussed in Section 7.5.4), these drawings provide a preliminary depiction of removal areas where the materials subject to excavation would constitute hazardous waste under RCRA. As further described in Section 7.5.4, GE will perform additional sampling for two samples that exceeded the TCLP regulatory limits for lead to further delineate the areas and volume of soils that will be handled as hazardous waste under RCRA. The results of such delineation sampling and any appropriate revisions to the Technical Drawings included herein will be provided in the SIP. The methods for accessing these removal areas and the equipment to be used for the excavations will be determined by the Remediation Contractor and presented in its Operations Plan. Additional information regarding soil removal activities is provided in the following subsections.[21]

7.5.1.1 Installation of Excavation Controls

For excavations extending to depths greater than four feet and which require Contractor personnel to enter to the excavation to perform work, excavation sidewall stabilization will be required, as discussed in Section 5.4. In addition, for remediation activities performed adjacent to roadways (e.g., Merrill Road) and the rail lines on the rail siding portion of Parcel L11-4-12, excavation controls will be implemented. For such activities, GE and the Remediation Contractor will determine the need for any road or rail traffic controls based upon the implementation approach and, if necessary, will include a traffic control plan in the Remediation Contractor's Operations Plan. If road traffic controls are determined to be necessary, GE and the Remediation Contractor will coordinate with the City of Pittsfield (as necessary and appropriate) regarding the schedule and implementation of such controls prior to the initiation of the remediation activities. For any rail traffic controls, GE will coordinate with CSX (on behalf of the Remediation Contractor) for any railroad flagging

[21] In addition, in the event that relatively intact drums, capacitors, or other vessels are encountered during any excavations, GE and the Remediation Contractor will implement the provisions specified for this situation in the Contingency Plan attached as Appendix J.

services that may be necessary during the remediation activities on Parcel L11-4-12. If additional procedures/controls beyond those discussed above or summarized in Section 5.4 are identified prior to submittal of the forthcoming SIP, such procedures/controls will also be included in that document.

7.5.1.2 Handling of Water Encountered in Excavations

The majority of the soil removals within the Unkamet Brook Area will require excavation to three feet or less. As a result, apart from the excavations in the wetlands and phragmites removal areas (discussed below), water is not expected to be encountered in those excavations. However, the remediation activities require excavation to six feet below ground surface (bgs) at two locations on Parcel L12-1-5. As indicated on Technical Drawing 26, these six-foot excavations will be performed, in part, in the vicinity of the portion of Unkamet Brook on this property. As a result, groundwater and/or surface water could be encountered during the implementation of these excavations. At this time, it is anticipated that sumps equipped with pumps will be sufficient to keep the active excavation areas dry in most conditions. In addition, the Remediation Contractor may elect to perform the soil excavations on this property concurrently with the sediment removal activities for the portion of Unkamet Brook located within and adjacent to this property. In that event, the water diversion and/or bypass pumping activities described in Section 7.5.2.3 would also assist in managing waters within these excavations. If necessary, a tanker truck and possibly temporary water storage tanks will be brought on site to collect accumulated groundwater and/or surface water prior to transporting that water to GE's Building 64G WTF for treatment and discharge.

7.5.1.3 Dust Control

Work areas where excavation activities are yet to be completed will be protected with a cover (e.g., polyethylene sheeting) which will be anchored when such areas are not under active excavation. In addition, if concerns regarding airborne dust are identified or suspected, water will be sprayed to keep the open excavation moist, or other dust suppression measures will be taken as needed to reduce dust. If, after implementing measures to mitigate windborne migration of particulate matter, dust from work zone is still visibly airborne, the Remediation Contractor will immediately discontinue operations until such measures are effective or conditions change such that windborne migration of particulates is no longer an issue.

7.5.1.4 Wetland and Phragmites Removal Activities

Soils within the inundated wetland areas noted on Technical Drawing 3 will be removed to a depth of one foot bgs. In addition, as discussed in Section 5.10.1, the soils in the phragmites areas shown on Technical Drawing 3 will be removed to a depth of approximately one foot below shallow groundwater, as determined during the month of

May, or to a total excavation depth of a minimum of two feet (whichever is greater), depending on the nature and quality of the soil. Further, the perimeter of the phragmites removal areas will be excavated using the steepest slopes possible to minimize the potential for re-colonization of the excavation areas by phragmites.

As noted in Section 7.4.7, temporary roads will likely be constructed by the Remediation Contractor to access the wetland and phragmites removal areas. The procedures and equipment to be used to perform soil removal in these areas will be specified in the Remediation Contractor's Operations Plan. To the extent possible, standing water located in the wetland and phragmites areas will be removed (and/or water will be diverted) to facilitate the excavation activities. However, the materials excavated from the wetland and phragmites areas are likely to have a high water content. If so, those materials will be transported via water-tight trucks to the temporary dewatering stockpile constructed over the paved portion of the former interior landfill (described in Sections 5.3.5, 5.9.1, and 7.4.7) prior to off-site transport and disposal.

7.5.2 Sediment Removal and Culvert Cleaning Activities

GE will conduct the removal of sediments from Unkamet Brook in the dry to the extent practicable. However, sediment removal activities may need to be conducted through the water table on certain occasions based on field conditions. To facilitate removal in the dry, upstream and downstream water flow barriers will be installed in the channel and a bypass conveyance system will be constructed to convey waters around the respective removal areas. Sediments will be removed and transported to an on-site stockpile and dewatering area for dewatering prior to off-site transport and disposal. Additional details regarding the sediment removal and culvert cleaning activities proposed for Unkamet Brook are provided in the following subsections.

7.5.2.1 Storm Water Outfalls

In preparation for the upcoming remediation activities, GE has prepared an inventory and a figure showing the location of each storm water outfall that discharges to the portion of Unkamet Brook subject to sediment removal activities. That information is provided in Table 7-1 and Figure 7-1. Similar to the Unkamet Brook culverts, certain of the outfall structures were obscured by overgrown brush or inundated at the time of the survey/inventory. As a result, the Remediation Contractor will confirm the location, dimensions, and operational status of the various outfalls following the installation of the water diversion and bypass pumping equipment described in Section 7.5.2.3 and/or upon completion of the site clearing/preparation activities described in Section 7.4. If any outfall is determined to have different characteristics from those presented in Table 7-1, GE will evaluate the need for revisions to the outfall protection design described herein.

The Remediation Contractor will be responsible for protecting all of the outfall structures and managing all associated flows during the performance of the sediment and bank soil remediation activities. Similar to the monitoring wells at this RAA, the outfall structures will be inspected jointly by GE and the Remediation Contractor prior to the initiation of the remediation activities. Prior to final surface restoration, these structures will be inspected again by GE and the Remediation Contractor, and the results of the two inspections will be compared to determine if any of those structures were damaged during the performance of the remediation and require repair or replacement. Finally, as part of the brook restoration, GE will install riprap aprons to protect the brook channel restoration from erosion and/or scour associated with the outfall flows. The design calculations for these aprons are provided in Appendix G. As indicated therein, the aprons were conservatively designed assuming the full conveyance capacities of the outfalls. Additional information regarding the design and construction of the riprap aprons are provided on Technical Drawing 30.

7.5.2.2 Limits of Sediment Removal and Estimated Volumes

GE will remove one foot of sediment from within the portions of the Unkamet Brook channel from south of Dalton Avenue to the confluence with the East Branch of the Housatonic River, excluding the section of brook that currently passes through the former interior landfill (which will be re-routed). As discussed in Sections 3.2.2 and 5.3.3, the lateral extent of the sediment removal within the brook channel will be from top-of-bank to opposite top-of-bank, with the exception of: (a) the steep sections between the downstream end of Culvert #2 and the upstream end of Culvert #3 and between the downstream end of Culvert #3 and the upstream end of Culvert #4, where removal will extend from toe-of-slope to opposite toe-of-slope; and (b) any necessary further adjustments resulting from the joint site walk to confirm and, if necessary, modify the top-of-bank limits. The currently delineated sediment removal areas are illustrated on Technical Drawings 4 (north of Merrill Road) and 23 (south of Merrill Road). The total removal volume is estimated to be approximately 1,850 *in-situ* cubic yards. Additional sediment materials will be also removed from the four culverts that convey water through either rail or road crossings over Unkamet Brook, as part of the culvert cleaning activities described in Section 7.5.2.5. All sediment materials generated as part of the excavation and culvert cleaning activities described herein will be managed as specified in Section 7.5.4 before being transported to an appropriate off-site disposal facility as described in Section 7.5.5. Finally, based on the invert elevations of the outfall/culvert pipes and the armor stone calculations, additional sediments beyond the one foot required to be removed to achieve the Performance Standards may also be removed to facilitate installation of scour and erosion aprons around outfall/culvert openings and allow for the placement of the full thickness of armor stone while maintaining finished channel elevations at or below the culvert invert elevation.

7.5.2.3 Water Diversion, Bypass Pumping, Dewatering, and Contingency Plans for Sediment Removal Activities

To accomplish sediment removal and replacement activities in the dry, Unkamet Brook will be divided into manageable segments. Sediment removal activities will be performed in an upstream to downstream direction to prevent impacts to remediated areas. The selected Remediation Contractor will be required to develop procedures for the sediment removal activities, which will include identification of the segments and progression for the brook remediation activities.

For each brook segment, a water flow barrier (e.g., sheetpile dam, earthen berm, and/or sandbags) will be installed across the entire channel both upstream and downstream of the removal area. Where possible, the active flow in the channel will be diverted around the work areas via a system of bypass conveyances (e.g., pumps and pipes). The flow barriers and bypass pumping system will, to the extent practicable, be capable of:

- Withstanding the hydrostatic and hydrodynamic forces associated with retaining water behind the barrier;

- Conveying (e.g., through pumps and/or elevation head) the retained water of Unkamet Brook to areas downstream of the sediment removal areas such that removal can be performed in the dry;

- Management of any flows from the outfalls located within the segment of the brook subject being remediated (as described in Section 7.5.3.2.2); and

- Providing sufficient bypass conveyance capacities to minimize the potential for upstream flooding impacts associated with the installation of the flow barrier.

It is currently anticipated that such bypass pumping systems can be implemented at the four culvert locations. However, overland bypass pumping may be difficult at Culvert #2 (which runs beneath Merrill Road) and Culvert #4 (which runs beneath the railroad tracks on the rail siding portion of Parcel L11-4-12). Potential options for managing the water flow in Culverts #2 and #4 could involve: (a) suspending bypass piping within the culvert subject to cleaning (subject to the dimensions of the bypass piping); (b) routing the bypass pumping through one of the two culverts at Culvert #2; or (c) performance of the culvert cleaning activities during a period of low flow. The last of these options would involve installation of a temporary water flow barrier (e.g., temporary dam structure) upstream of the culvert during cleaning and allowing any surface waters to temporarily accumulate upstream during the cleaning activities. Under such a scenario, the water flow barrier would be removed after completion of the culvert cleaning activities.

The last of these approaches (i.e., use of water flow barriers and/or working during periods of low flow) may also be implemented at the culvert under Dalton Avenue until such time as the portion of the brook immediately downstream of the culvert has been remediated. Upon remediation of the section of the brook adjacent to the outlet for the Dalton Avenue culvert, a water diversion structure and bypass pumping equipment will be constructed to allow for the remediation of the remaining portions of the brook channel north of Merrill Road.

Specific details related to the identification of the segments and progression for the sediment remediation and culvert cleaning activities at Unkamet Brook, as well as the selected water flow barriers and bypass conveyance system(s), will be provided by the Remediation Contractor in its Operations Plan. Additional information regarding water diversion, bypass pumping, dewatering, and contingency planning for the remediation activities is provided in the following subsections.

7.5.2.3.1 Water Flow Barriers

As previously indicated, the Remediation Contractor will select the locations and elevations for the water flow barriers as necessary to protect the sediment removal area and facilitate sediment removal in the dry. The elevation of the water flow barriers will be presented in the Remediation Contractor's Operations Plan. The elevations of the barriers will be selected based on the time of the year when the sediment-related remediation action will be conducted and the hydraulic effects associated with retaining the water behind the barrier for an extended period. It is anticipated that the elevations will be, at a minimum, equal to or higher than the approximate top-of-bank elevation at each respective barrier location. The selection and final design of the barriers will depend on the type of structure used, which will be developed by the Remediation Contractor in consultation with GE.

7.5.2.3.2 Bypass Conveyance Capacity

In addition to supporting the assessment of potential design needs for the water flow barriers, an estimate of flows/modeling data associated with Unkamet Brook will be provided to the Remediation Contractor to facilitate the selection of the required capacities for the bypass conveyance system. As with the water flow barriers, the Remediation Contractor will be responsible for determining the specific means and methods associated with the bypass conveyance system. GE will provide the Remediation Contractor with the relevant flood flow frequencies, so that the Contractor may provide adequate pumping capacity to accommodate the variability in flows in Unkamet Brook. GE will require that, in making final design decisions related to these components, the Remediation Contractor must provide adequate pumping/bypass capacity equal to a two-year flow event (i.e., 57 cubic feet per second) to protect the removal area(s) downstream of Dalton Avenue. Such capacity will take account of the presence and capacity of any storm water outfalls located within the segment of the brook subject to remediation (as discussed in Section 7.5.2.1).

As previously indicated, the details of the bypass conveyance components will be included in the Remediation Contractor's Operations Plan.

7.5.2.3.3 Initial Dewatering

Following construction of the water flow barriers and bypass conveyance system and prior to commencing sediment removal activities, any surface water initially trapped between the barriers will be pumped over the downstream wall to facilitate removal in the dry. Such pumping will be performed using an auxiliary bypass pump. The seepage water bypass pump is anticipated to be located near the downstream end of the individual brook removal segments and will be suspended a minimum of six inches above the brook bottom. The exact location of the pump will ultimately be determined by the Remediation Contractor based on field conditions and the type of backflow prevention dam selected for installation.

7.5.2.3.4 Water Management/Dewatering During Excavations

Groundwater flow in Unkamet Brook is not anticipated to be a major source of water in the excavation areas. At this time, it is anticipated that the water flow barriers combined with sumps equipped with pumps will be sufficient to keep the active excavation areas largely dry in most conditions. Accumulated water will be pumped over the downstream water flow barrier until the total depth is six inches. The remaining waters will be collected for transportation to the Building 64G WTF for treatment and discharge. Water that accumulates in portions of the channel that have been restored or have yet to be excavated will be pumped over the downstream water flow barrier on an event-specific basis.

7.5.2.3.5 Contingency Plan for Potential Overtopping

As indicated in Section 7.5.2.3.1, the Remediation Contractor will select the configuration and elevation of the flow barriers as necessary to protect the work area for the performance of removal activities in the dry. As also previously indicated, sediment removal will progress from upstream to downstream, to the extent practicable, in order to minimize the potential for mixing of potentially clean and impacted materials in the event that a flood event were to occur. Further, if significant precipitation is anticipated or forecasted, the length of the brook segment under active excavation will be limited to that which the Remediation Contractor anticipates can be performed in one day's time, thereby leaving no open unprotected excavation areas overnight.

To further reduce potential impacts during flooding events, GE and the Remediation Contractor will closely monitor the weather forecast throughout the performance of removal activities to plan the sequence of the construction activities accordingly. Precautions will be taken in advance of anticipated inclement weather, and the schedule for specific work

activities will be adjusted. In the event that overtopping of a water flow barrier is anticipated due to rising water levels or forecasted rainfall, the Remediation Contractor will implement the precautions specified for that situation in GE's Contingency Plan provided as Appendix J.

As also presented in that Contingency Plan, following an overtopping event, after any water retained within the channel has receded below the level of the upstream flow barrier, and the bypass pump has sufficiently conveyed the upstream water around the removal area, any impounded water within the removal area will be allowed to collect at the downstream end of the removal area (i.e., at the backflow water flow barrier) and pumped into the brook downstream of the removal area, using a pump suspended a minimum of six inches above the bottom of the brook. Any remaining waters will then be collected for transportation to the Building 64G WTF for treatment and discharge. Sediment removal activities will then be continued.

7.5.2.4 Sediment Removal

As previously indicated, sediment removal activities will proceed in an upstream to downstream direction (i.e., Dalton Avenue toward the confluence of Unkamet Brook with the Housatonic River). After each removal area is dewatered, and the appropriate materials staging and dewatering areas have been identified and constructed, sediments will be removed from Unkamet Brook in segments to the limits shown on Technical Drawings 4 (north of Merrill Road) and 23 (south of Merrill Road), with any field modifications approved by EPA. The sediment removal approach is described in Section 5.3.3.

Once removed, sediments will be moved out of the dewatered channel and transferred to staging and dewatering areas (e.g., the parking lot portion of the former interior landfill following the removal of the vegetated island and installation of pavement shims, as described in Sections 5.3.5 and 5.9.1, or other staging areas to be identified) for additional dewatering, if necessary. Such dewatering could involve combining excavated materials with high water content with drier soils from adjacent excavation areas. In addition, such dewatering would be performed in lined, contained areas that drain to one or more sumps so that the dewatered liquids can be collected for transportation to GE's Building 64G WTF for treatment and discharge. The subsequent loading and off-site transportation of the excavated sediments will be handled in the same manner as the soils subject to excavation, as described in Section 7.5.5.

As previously indicated, sediment removal activities will be performed in the dry to the extent possible through the use of water diversion/flow barriers and bypass pumping. However, in certain instances, infiltration water may enter and collect within the active excavation areas. It is anticipated that sumps equipped with pumps will be sufficient for keeping standing water out of the excavations; however, based on field conditions, certain sediment materials may need to be removed through the water. In this event, excavated

materials will be allowed to temporarily dewater over the active excavation area, before being transported to a temporary dewatering stockpile. Any dewatered liquids will be collected, pumped to a tanker truck (or possibly temporary water storage tanks), and subsequently transported to GE's Building 64G WTF for treatment and discharge.

7.5.2.5 Culvert Cleaning

As discussed in Section 5.3.4, four culverts have been identified within the boundaries of the sediment removal areas – Culverts #1 through #4, as shown on Technical Drawings 4 (Culverts #1 and #2) and 23 (Culverts #2 through #4). In August 2013, in preparation for the culvert cleaning activities, GE performed video inspections of Culverts #1, #2, and #3 to gauge the quantity of sediment present, verify the materials of construction, and provide an understanding of each culvert's condition. The results of those culvert inspections are summarized in Section 5.3.4. The video inspection of Culvert #4 was not completed at that time due to high water levels.[22] The table provided on Technical Drawing 30 summarizes the location, invert elevations, material, dimensions, and geometry of each culvert.

GE will provide all data, including the results of the culvert video inspections, to the Remediation Contractor for the purpose of developing the proposed culvert cleaning procedures. The proposed procedures will be included in the Contractor's Operations Plan that will be submitted to EPA for approval as part of the SIP (Section 7.3.1). It is currently anticipated that, at a minimum, the culvert cleaning activities will involve the following procedures/activities:

- Culvert cleaning will proceed in an upstream to downstream direction (i.e., from Culvert #1 to Culvert #4). These activities will be performed following the sediment removal in the adjacent upstream portion of the brook channel and prior to the sediment removal activities in the adjacent downstream portion of the brook channel to prevent impacts to remediated segments of Unkamet Brook.

- Sediment removal activities within the culverts will be performed in the dry – i.e., when brook flows are either being diverted around the work areas with a bypass pumping system or prevented from entering the work area.

[22] As noted above, in the event that the Remediation Contractor believes that a video inspection of Culvert #4 would be helpful to assist in determining proposed methods for culvert cleaning and sediment removal, such an inspection can be conducted at an appropriate time when water levels allow.

- Prior to the initiation of culvert cleaning activities, the downstream opening of each culvert will be lined with sand bags or another flow prevention device to allow collection of the sediment and wash waters associated with culvert cleaning. In addition, a floating silt curtain will be installed downstream of the bypass pumping system outlet as shown on Detail 1 of Technical Drawing 30 to minimize downstream impacts from: (1) the culvert cleaning activities; and (2) turbulence and erosion caused by the reintroduction of brook flows.

- Culvert cleaning activities are anticipated to be performed using hydraulic pressure washing to remove accumulated sediment/debris and restore the hydraulic conveyance/capacity of each culvert. No detergents or chemicals will be used in the wash water.

- During hydraulic pressure washing of the culvert piping, a vacuum truck is anticipated to be used to collect water and sediment/debris which have been removed from the interior surfaces of the culverts. Typically, the vacuum truck will be positioned at the downstream end of the culvert to collect the wash waters. Sediments collected as part of the culvert cleaning activities will be managed in the same manner as excavated sediments and soils. In addition, waters collected as part of the culvert cleaning activities will be taken by vacuum truck to GE's Building 64G WTF for treatment and discharge.

- Following completion of the cleaning, the culverts will be inspected again with video equipment to confirm that the sediments proposed for removal have been removed. If the inspection shows that an appreciable amount of the sediment proposed for removal remains in one or more of these culverts, GE will make a proposal to EPA for review and approval regarding steps to address that remaining sediment.

7.5.2.6 Contingency Plan for Potential Observations of NAPL

During the course of sediment removal activities, visual observations will be made for the presence of NAPL in the form of free product, sheens on surface water, or NAPL-stained soils or sediments. In the event that NAPL is observed, GE and the Remediation Contractor will implement the provisions specified for NAPL observations in the Contingency Plan provided as Appendix J.

7.5.2.7 Resuspension Controls

To reduce turbidity and minimize the potential for migration of suspended material within Unkamet Brook due to the performance of the remediation activities within or affecting the brook, silt curtains will be installed in the brook. Silt curtains allow water to pass through the fabric material, while any associated site-related or off-site materials that may be suspended in the water are captured/retained by the fabric material. As a result, these

curtains are effective in reducing turbidity (i.e., the amount of suspended material in the water) and mitigating the potential for off-site transport to the Housatonic River.

Prior to initiating any in-channel remediation work, two full-depth silt curtains (one behind the other) will be deployed in Unkamet Brook just upstream of the confluence with the Housatonic River. Additional silt curtains will be deployed in Unkamet Brook downstream of the bypass conveyance for each active remediation area. Efforts will also be made to install silt curtains in locations which will maximize their effects, such as areas of the brook with lower flows and a flat bottom. As necessary to control turbidity, additional silt curtains will be installed between the bypass discharge curtains and the full-depth silt curtains at the confluence with the Housatonic River. In addition, all silt curtains will have an oil-sorbent boom installed on the upstream side of the curtain as a NAPL control measure. Details related to typical silt curtain installation are included on Detail 1 of Technical Drawing 30. The Remediation Contractor's Operations Plan will identify the proposed installation locations and maintenance procedures (developed in conjunction with GE) for the installed silt curtains.

In addition, water column monitoring will be conducted in the brook during sediment removal, culvert cleaning, and restoration activities performed in the brook. This monitoring is described in Section 7.6.1.

7.5.3 Unkamet Brook Re-Routing

As indicated in Section 5.7, GE will re-route an approximate 600-foot section of Unkamet Brook currently located within the former interior landfill to generally flow via its former channel, which makes a gradual meander to the east beyond the eastern edge of the former landfill. Excavation of the re-routed channel will extend approximately one foot below final grade to facilitate restoration activities. (Design calculations for the re-routed brook channel are included in Appendix G.)

The location of the re-routed brook channel is shown on Technical Drawings 2 through 5. As indicated therein, the alignment of the re-routed channel passes through several areas requiring the removal of one foot of soil/sediment that is subject to TSCA or non-TSCA handling and disposal requirements. The soil/sediment removal activities in these areas will be performed first, followed by the excavation of additional materials to construct the re-routed brook channel. Those additional materials could potentially be used as subsurface backfill materials in soil removal areas if they meet the criteria for such reuse in the Soil Cover and Backfill Characterization Plan, or may be placed as fill materials beneath the vegetative engineered barrier/cap for the former interior landfill if they meet the criteria specified in Section 5.9.1.

Temporary earthen (or other material) dams will be constructed at each end of the re-routed brook to minimize sediment runoff into the active reach of Unkamet Brook during channel excavation activities. These dams will be removed when channel excavation/restoration is complete and the connections to the existing brook are made at each end.

The restoration of the re-routed brook is discussed in Section 7.5.8.

7.5.4 Handling of Excavated Materials

This section describes the handling of all materials to be excavated, including the soils removed to meet soil Performance Standards (and any associated soils removed for constructability), the soils/sediments removed from the inundated wetlands, the sediments removed from the existing channel of Unkamet Brook, the soils and phragmites removed from the phragmites areas, the soils removed to facilitate the re-routing of a section of Unkamet Brook, the soils generated by the removal of the vegetated islands in the paved portion of the former interior landfill, and miscellaneous other soils removed as part of the performance of the remediation activities (e.g., excavation of anchor trenches and drainage swales for the engineered barrier/cap for the former interior landfill, removal of the temporary road cover on Parcel L11-4-11, etc.).

As discussed above, some of the materials removed as part of the re-routing of Unkamet Brook, the removal of the vegetated islands in the paved portion of the former interior landfill, the construction of barrier anchor trenches outside soil removal areas, and/or the removal of the temporary road cover materials on Parcel L11-4-11 may be sampled and reused either: (a) as subsurface backfill in soil removal areas, if they meet the criteria for such reuse in the Soil Cover and Backfill Characterization Plan (Appendix B of the POP); or (b) as fill material beneath the vegetative engineered barrier/cap to be constructed over the former interior landfill, if they meet the criteria specified for such use in Section 5.9.1. These materials (if any) will be segregated and stockpiled separately from the other excavated materials.

The remaining excavated materials will be subject to off-site transport and disposal. As these materials are excavated, and prior to their transport to an appropriate off-site disposal facility, a number of intermediate on-site handling activities may be necessary. During these activities, materials determined *in situ* to have PCB concentrations of 50 ppm or greater and thus subject to disposal under TSCA requirements (TSCA materials) will be segregated and handled separately from materials that have PCB concentrations less than 50 ppm and thus are considered non-TSCA materials.

In preparation for the remediation activities, GE performed an evaluation of the existing non-PCB soil/sediment sample data to determine whether the excavated materials would constitute characteristic hazardous waste under RCRA. This review included an initial screening evaluation to determine whether further waste characterization sampling would

be necessary. Specifically, the non-PCB total sample results for the soils and sediments subject to remediation (where available) were divided by 20 and compared to the allowable TCLP concentration limits specified in the RCRA regulations. Based on that comparison, where GE determined that additional TCLP waste characterization sampling activities would be appropriate for certain soils or sediments subject to excavation, waste characterization sampling was performed. Specifically, such sampling was performed in January 2014 for certain soils or sediments where: (1) no Appendix IX+3 data existed to perform a screening comparison for soils subject to excavation; or (2) the results of the comparison described above indicated the potential presence of materials subject to RCRA hazardous waste disposal requirements. The results of this waste characterization sampling are summarized in Table 7-2. As indicated in that table, samples TCLP-S-4 (located on Parcel L12-1-5) and TCLP-S-20 (located on Parcel L11-4-11) contained lead at concentrations greater than the TCLP regulatory limit of 5 mg/L (i.e., 15.1 mg/L and 13.6 [with a duplicate of 0.82] mg/L, respectively). Based on those results, certain additional sampling will be conducted to further delineate the areas and volumes of soil that will be handled as hazardous waste under RCRA. The results of that delineation sampling and any appropriate revisions to the Technical Drawings included herein will be provided in the SIP.

Excavated materials will be segregated into appropriate stockpiles upon removal, based upon the TSCA, non-TSCA, and/or RCRA characteristics of the excavated materials. The specific method(s) of handling these removed materials will be based on, but not limited to, the following considerations:

- The characteristics of the excavated materials and corresponding disposal requirements under TSCA and/or RCRA;

- The locations from which the materials are removed and their proximity to the loading area(s); and

- The overall sequence and schedule of the remediation activities.

To reduce the potential for the release of PCBs or other Appendix IX+3 constituents to the environment during removal and handling activities, the number of times that the excavated material is handled will be kept to a minimum. To accomplish this, the Remediation Contractor will, to the extent practical, conduct direct loading to trucks for transport to the off-site disposal facility(ies). However, temporary stockpiling of excavated materials may be performed prior to such transport where appropriate. As discussed in Section 5.3.5, there are four types of potential locations for such temporary stockpiles: (1) inside Building 14, Building 65, or another existing building at the GE facility or a temporary structure to be constructed within the Unkamet Brook Area; (2) in the paved parking lot portion of the former interior landfill that will be subject to the asphalt-covered engineered barrier; (3) in outdoor areas subject to future excavation; and (4) in outdoor areas not subject to future excavation or engineered barrier placement. The precautions and controls to be

implemented at each of these types of areas (e.g., dumping/loading ramps or stone tracking areas, liners, berms, water collection measures, temporary covers, dust control measures) are described in Section 5.3.5.

If excavated materials are to be transferred within the GE facility, they will be transferred by truck. If such materials have not been dewatered sufficiently to pass the Paint Filter Test, water-tight trucks will be used to transport the materials to the temporary stockpiles at the GE facility. If these materials will be transferred to Buildings 14 and/or 65, they will be transported over the route(s) shown on Figure 7-2. If such materials will be transferred to another existing building or temporary structure at the Unkamet Brook Area, the route(s) will be identified on a figure included in the SIP. In any case, such transport to other locations at the GE facility will be considered to occur "onsite" within the meaning of Paragraph 9.a of the CD and Section 121(e) of the Comprehensive Environmental Response, Compensation, and Liability Act. For such on-site transport, the Remediation Contractor will be required to implement the following procedures:

- Employ qualified personnel trained per U.S. Department of Transportation (DOT) requirements for handling and shipping hazardous materials, with such training to include general safety, emergency response, exposure protection, accident prevention, preparation of shipping papers, and securing loads;

- Employ drivers that have a Commercial Driver's License (CDL) with a Hazardous Materials Endorsement;

- Utilize trucks that are DOT-inspected;

- Include in its HASP, Operations Plan, and Contingency Plan detailed provisions for responding to transportation emergencies such as spills, releases, or other incidents;

- Maintain records of the number of loads of materials sent to the temporary stockpiles on a daily basis; and

- Confirm that the materials are suitable for on-site transport (i.e., pass the Paint Filter Test or are contained in water-tight trucks).

The on-site transport of excavated materials will also be conducted in accordance with the following guidelines:

- After a safety check of the truck, the truck bed will be lined with polyethylene.

- Excavated non-liquid materials will be placed in the truck and the load will be covered.

- An appropriate materials Bill of Lading will be prepared and signed by the truck driver, with the following DOT shipping description:

  "UN 3432, Polychlorinated Biphenyls, Solid, Mixture, 9, III, RQ"

- The exterior of the truck will be inspected after loading, and any excavated materials that are observed to have been deposited on the outside of the truck will be removed prior to transport.

- After another safety check of the vehicle and placarding, the truck will proceed to the destination using the designated route.

- Upon arrival of the truck at the destination, receipt of the load will be documented and the material will be off-loaded and placed in an appropriate temporary stockpile.

Prior to any transport of excavated materials to an off-site disposal facility (either directly from the excavation area or from the temporary on-site stockpiles) using over-the-road vehicles, the materials will be sufficiently dewatered by gravity so that they are able to pass the Paint Filter Test. Any water collected at material dewatering locations will be placed inside tanker trucks for transportation to GE's Building 64G WTF for treatment and discharge.

For non-TSCA materials, if these dewatering procedures do not yield material that will pass the Paint Filter Test, drier excavated materials (if available in sufficient quantities) or drying agents (e.g., Portland cement, cement kiln dust, lime, fly ash, or other suitable and locally available material) will be mixed with the stockpiled material (as necessary) to condition the material such that it is suitable for off-site transport (i.e., contains no free liquids and passes the Paint Filter Test).

For TSCA-regulated materials, GE will take other actions (including, but not limited to, combining excavated TSCA-regulated materials that have a high moisture content with excavated TSCA-regulated materials from the Unkamet Brook Area with a lower moisture content) as necessary to allow the materials to pass the Paint Filter Test prior to adding drying agents. After the material passes the Paint Filter Test, GE may add drying agents to further "dry" the materials so as to facilitate transport to off-site disposal facilities. By following these procedures, a risk-based approval pursuant to 40 CFR 761.61(c) will not be necessary. However, in the event that, after implementation of all practical actions, the material still does not pass the Paint Filter Test, GE may request that EPA determine, pursuant to 40 CFR 761.61(c), that the transport and disposal of materials using drying materials to satisfy the Paint Filter Test under those limited circumstances would not present an unreasonable risk of injury to health or the environment.

7.5.5 Off-Site Transport and Disposal of Excavated Materials and Remediation-Derived Waste

As discussed above, it is anticipated that all excavated materials – with the potential exception of certain soils that are removed as part of the re-routing of Unkamet Brook, the removal of the vegetated islands in the paved portion of the former interior landfill, the construction of anchor trenches outside soil removal areas, and/or the temporary road cover materials on Parcel L11-4-11, if they meet the criteria for on-site reuse – will be transported to off-site disposal facilities. For such purposes, the excavated materials will be segregated based on their status under TSCA and RCRA. The off-site disposal facilities to be used for TSCA- and RCRA-regulated materials and for non-TSCA, non-RCRA materials will be identified in the SIP.

All such excavated materials (once they pass the Paint Filter Test), as well as remediation-related residual wastes, will be loaded into vehicles for transportation to the appropriate off-site disposal facilities. Over-the-road transport of the waste materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Dump trailers leaving the work area will be lined to prevent spillage during transportation (as necessary), manifested (as necessary), and placarded in accordance with federal and state requirements using Hazardous Waste Manifests (for TSCA or RCRA material) or Bills of Lading forms (for non-TSCA/non-RCRA material). The Remediation Contractor will be required to comply with all off-site transportation and disposal requirements, including use of qualified personnel trained per DOT requirements for handling and shipping hazardous materials, use of drivers that have a CDL with a Hazardous Materials Endorsement, and use of trucks that are DOT-inspected. The Remediation Contractor will also confirm that the materials are suitable for transport and will maintain records of the number of loads of materials sent to the disposal facilities on a daily basis.

The transport of excavated materials from the Unkamet Brook Area to the appropriate off-site disposal facilities will be conducted in accordance with the following guidelines:

- The Remediation Contractor will construct material loading ramps or tracking areas constructed of gravel or polyethylene sheeting to remove, and prevent the potential spread of, soil material from truck tires as they depart the work areas.

- After a safety check of the truck, the truck bed will be lined with polyethylene.

- Excavated soil and sediment will be placed in the truck and the load will be covered.

- An appropriate Waste Manifest (for TSCA or RCRA material) or Bill of Lading (for non-TSCA/non-RCRA material) will be prepared and signed by the truck driver and the appropriate disposal facility.

- The exterior of the truck will be inspected after loading, and any excavated materials that are observed to have been deposited on the outside of the truck will be removed prior to transport.

- A final safety check of each transportation vehicle will be performed, which will include verification that the vehicle has been properly decontaminated and that appropriate measures were taken to mitigate unintended releases of excavated materials during transportation of the materials to the appropriate off-site disposal facility. After this final safety check of the vehicle and placarding, the truck will leave the site and proceed to the appropriate off-site disposal facility.

7.5.6 Backfilling and Restoration of Soil Removal Areas

This section provides additional details regarding the backfilling and restoration of soil removal areas (excluding areas associated with the remediation and re-routing of Unkamet Brook, the culverts, and areas subject to installation of engineered barriers – all of which are discussed in later sections).

7.5.6.1 Backfilling

Backfilling operations for soil removal areas (including the inundated wetlands, but excluding the majority of the phragmites removal areas, which will not be backfilled) will be initiated as soon as practicable after completion and proper documentation of excavation activities (i.e., survey control). As discussed in Section 5.5, backfill material will consist of clean fill material from off-site sources, which may be supplemented, for subsurface placement, by certain limited amounts of excavated material (generated as part of the re-routing of Unkamet Brook, the removal of the vegetated islands in the paved portion of the former interior landfill, the excavation of certain items [listed in Section 5.5] outside of soil removal areas, and/or the temporary road cover materials on Parcel L11-4-11) that meet the criteria for such reuse in the Soil Cover and Backfill Characterization Plan. The off-site backfill may also be supplemented by backfill and/or access road materials left over from the recently completed Silver Lake Area Removal Action that satisfy the reuse criteria. The equipment to be used for backfilling will be identified in the Remediation Contractor's Operations Plan. If such equipment was used during the material excavation activities, it will be cleaned, using the procedures described in Section 7.7, prior to handling clean backfill materials. The Remediation Contractor will be responsible for adequately controlling groundwater to facilitate proper backfilling activities. If necessary, gravel backfill materials may be used to facilitate excavation backfilling activities greater than one foot in depth, where water is present in the excavation.

Backfill materials will be placed in 12-inch thick lifts in a loose state and compacted in accordance with the applicable Technical Specifications prior to additional fill being placed within the excavation. Each excavation will be brought up to the predetermined subgrade elevation prior to installing the final surface layer (e.g., topsoil and vegetative cover, asphalt, etc.). One-foot soil excavations subject to vegetative surface restoration will be backfilled with topsoil only, as opposed to a combination of general fill and topsoil. All backfill materials will consist of clean, natural material, no greater than gravel in size to ensure proper settlement, permeability, and compactability. The specific off-site fill sources to be used for this project will be identified by the Remediation Contractor and documented in the forthcoming SIP. A description of the process for identifying such sources and, if necessary, submitting the analytical data is included in Section 5.5.

7.5.6.2 Surface Restoration

In general, the restoration of the surfaces of the backfilled soil removal areas described above will be completed as vegetative restoration or asphalt pavement. Additional details regarding the anticipated activities associated with these types of surface restoration are provided below. However, for affected areas owned by parties other than GE, GE will conduct discussions with the property owners regarding the restoration on their properties, and will take those discussions into account in developing restoration plans (or modifications to previous plans) for those properties.

Vegetative Restoration

As discussed in Section 5.11 and shown on Technical Drawing 7, the inundated wetlands will be restored, to the extent practicable, by placing a minimum of one foot of clean topsoil in an uncompacted state. Affected portions of these wetlands that are periodically inundated will be restored with a wetland seed mix (i.e., the New England Wetmix), while permanently inundated portions of these wetlands will be restored with plugs or live mats of native wetland species.

As indicated in Section 7.5.6.1, one-foot soil excavations subject to vegetative surface restoration will be backfilled with topsoil only, as opposed to a combination of general fill and topsoil. As shown on Technical Drawings 7 (north of Merrill Road) and 24 (south of Merrill Road), excavation areas extending beyond one foot in depth that are subject to vegetative restoration will first be backfilled to the specified subgrade elevations (i.e., to within six inches of final grade) utilizing compacted gravel materials (if necessary, based on the potential presence of water in the base of the completed excavations) and/or compacted soil fill materials. The remainder of the excavated areas will then be restored with a six-inch layer of topsoil followed by the placement of a standard grass seed and mulch, as illustrated in Detail 5 on Technical Drawing 40, in accordance with the applicable

Technical Specifications.[23] In addition, erosion control matting will be installed over certain restored areas shown on Technical Drawings 7, 24, and 27. These areas were selected based on a review of the post-construction contours to identify drainage pathways where surface water runoff could be concentrated during precipitation events, preventing the potential establishment of vegetative cover.

In addition, as indicated in Section 7.3.2, prior to the initiation of the remediation actions, GE will inspect the areas subject to the performance of those actions and develop an inventory of all trees and shrubs that will be removed to facilitate the soil/sediment removal or engineered barrier placement activities. The results of this inventory will then be used to create a restoration planting plan, which will be submitted to EPA for approval. As part of the vegetative restoration activities, any replacement trees and shrubs will be planted in accordance with the restoration planting plan. In the vicinity of the engineered barriers, any new tree or shrub plantings will be performed at least ten feet outside the limits of the engineered barriers to ensure that the barrier components are not impacted at some future time by the root structures of such restored vegetation.

Asphalt/Pavement Restoration

As indicated on Technical Drawing 24, bituminous asphalt pavement will be restored in currently paved remedial excavation areas. Following the placement of backfill to within one foot of final surface grade (for excavations greater than one foot in depth), the top foot will be restored by installing compacted gravel subbase material to within three inches of the original surface grade and then restoring the upper three inches with a two-inch base course and a one-inch wearing course of bituminous asphalt, as illustrated in Detail 4 on Technical Drawing 40.

7.5.7 Backfilling and Restoration of Sediment Removal Areas

As previously discussed in Section 5.5, following the completion and documentation (through survey) of sediment removal activities, a layer of silty sand will be placed to within six inches of the pre-existing grade and covered with six inches of stone riprap to restore each area to approximately pre-existing and/or design grades. Such stone has been sufficiently sized to withstand transport and/or erosion as a result of normally anticipated or average current velocities associated with flow events ranging from the one-year up to the

[23] These procedures do not apply in the phragmites removal areas. As discussed in Section 5.10.1, GE will allow for the re-development of the wetlands community in those areas through natural succession, unless GE and EPA agree that an alternative approach, such as installation of "plugs" or "live mats" of native wetlands species, is likely to be more effective. If GE and EPA agree on installation of such plugs or mats, their placement will not require an offset for flood storage compensation.

100-year flow event, as shown in Appendix G. Additional details regarding the backfilling and restoration of the excavated portions of Unkamet Brook are described below:

- The excavated channel will be restored with a six-inch silty sand layer. As noted in Section 5.5, this material will have a TOC content of 0.5% as measured in a stockpile prior to placement (at a frequency of one sample for every 500 cy), but post-placement monitoring will not be required to confirm that level of TOC.

- Next, a six-inch layer of Type I riprap (defined in Technical Specification Section 02222 – Fill Materials), will be placed on top of the silty-sand layer, as shown on Detail 1 on Technical Drawing 31.

- As requested by EPA, the silty-sand mixture and a wetland/conservation seed mix will be used to fill the voids in the Type I riprap, but only within the top third to top half of the banks in portions of the brook with a flat bottom, so as to avoid unduly restricting flow. As agreed with EPA, no monitoring or maintenance will be required for the material placed within the riprap or any resulting vegetation.

Additional details regarding performance standards related to backfill materials for sediment excavation areas are provided in the Technical Specifications. In addition, as specified in Section 7.3.1, the Remediation Contractor's Operations Plan will provide additional details regarding the timing/sequencing of the backfilling and restoration of the sediment removal areas and adjacent/abutting soil removal areas; and the Remediation Contractor's Contingency Plan will include a requirement that all in-stream excavations must be backfilled or temporarily protected at the end of each day when significant precipitation is anticipated or forecasted, as provided in Section 7.5.3.2.5 and in the Contingency Plan in Appendix J.

7.5.8 Backfilling and Restoration of Re-routed Brook Channel

Similar to the remediated portions of Unkamet Brook, the re-routed approximate 600-foot long section of the Unkamet Brook channel will be restored to the design grade with a layer of silty sand that will be placed to within six inches of the design finish grade and covered with six inches of stone riprap. Such stone has been sufficiently sized to withstand transport and/or erosion as a result of normally anticipated or average current velocities associated with flow events ranging from the one-year up to the 100-year flow event, as shown in Appendix G. Additional details regarding the restoration of the re-routed brook channel are provided below.

- For the portions of the re-routed brook that pass through TSCA removal areas (i.e., at the northern and southern ends of the realigned portion of the brook), a geotextile fabric will be placed on top of any remaining TSCA soils prior to the placement of the brook restoration materials.

- The re-routed channel will be restored with a six-inch silty-sand layer. As noted in Section 5.7, this material will have a TOC content of 0.5% as measured in a stockpile prior to placement (at a frequency of one sample for every 500 cy), but post-placement monitoring will not be required to confirm that level of TOC.

- Next, a six-inch layer of Type I riprap (defined in Technical Specification Section 02222 – Fill Materials), will be placed on top of the silty-sand layer, as shown on Detail 1 on Technical Drawing 31. Here again, in response to a request by EPA, the silty-sand mixture will be used to fill the voids within the Type I riprap within the top third to top half of the banks, and a wetland/conservation seed mix (but no trees or shrubs) will be placed in those areas. As agreed with EPA, no monitoring or maintenance will be required for the material placed within the riprap or any resulting vegetation.

- In addition to the above, Type II riprap material will be placed at the three locations shown on Technical Drawing 7 to minimize the potential for soil erosion along the re-routed brook channel (see Detail 2 on Technical Drawing 31).

- Finally, as discussed in Section 5.10.2, as part of NRR/E activities, GE will plant an herbaceous native vegetative community along the western bank of the new channel and along the areas east of the channel that are disturbed by the re-routing activities. In addition, native tree and shrub plantings will be placed east of the re-routed brook (i.e., not within the Type I riprap). An estimate of the number of trees and shrubs to be planted in this area will be included as part of the Tree/Shrub Planting Plan to be included as part of the SIP. As agreed with EPA, these tree/shrub plantings will not be subject to monitoring or maintenance.

As specified in Section 7.3.1, details regarding the anticipated timing and sequencing of backfilling/restoration of the re-routed brook area and adjacent banks will be included in the Remediation Contractor's Operations Plan.[24]

7.5.9 Culvert Protective and Restoration Measures

This section provides information regarding the installation of erosion and scour protection adjacent to the culverts conveying Unkamet Brook waters, as well as the slip-lining and the beaver deterrent and debris structures that will be installed for Culvert #1.

[24] In addition, as noted several times above, the Remediation Contractor's Contingency Plan will include a requirement that if, during the course of these activities, significant precipitation is anticipated or forecasted, all in-stream excavation activities will be backfilled and/or temporarily protected at the end of the day,

7.5.9.1 Erosion/Scour Protection

As previously indicated, there are four culverts conveying Unkamet Brook waters under roads or rail lines at the locations shown on Technical Drawings 4 (north of Merrill Road) and 23 (south of Merrill Road). The table provided on Technical Drawing 30 summarizes the location, invert elevations, material, dimensions, and geometry of each culvert. These four culverts will be subject to the cleaning activities described in Section 7.5.2.5, with additional details to be provided in the Remediation Contractor's Operations Plan. Following the culvert cleaning activities and as part of the brook restoration, protective measures (e.g., aprons, armor stone) will be installed to protect the restored channel backfill materials from potential scour associated with high velocity flow at the culvert inverts. In addition, although the culvert under Dalton Avenue and the other outfalls into Unkamet Brook (as described in Section 7.5.2.1) are not subject to cleaning, similar measures will also be installed on the downstream ends of those culverts.

Descriptions of the design calculations for the culvert protective measures for each location are provided in Appendix G. The design calculations associated with each culvert have used guidance provided in the New York State Standards and Specifications for Erosion and Sediment Control, a widely accepted industry standard for the selection of outfall protection measures.

The calculations for the culverts conveying Unkamet Brook flow were based on the modeled flow rates presented in Appendix F. For each modeled flow, the contribution of the respective culverts to that flow (i.e., the flow actually passing through the culvert) was estimated. For each culvert, the maximum estimated flow from the culvert was selected, regardless of the actual total flow in the channel. With one exception (Culvert #2), the two-year flow rate predicted by EPA's HSPF hydrologic model was used to estimate the flow exiting the culverts in designing the scour protection apron. For Culvert #2 (under Merrill Road), the 10-year FEMA flow rate was used for design, as this flow simulation produced a higher estimated flow through this culvert. For the culverts that discharge to Unkamet Brook, the aprons were conservatively designed assuming the full conveyance capacities of the outfalls, as indicated in Section 7.5.2.1. Details related to the protective measures selected for each of the outfalls, including a summary of culvert and outlet apron specifications, are included on Technical Drawing 30.

7.5.9.2 Additional Restoration and Protective Measures for Culvert #1

As noted in Section 5.3.4, one of the two culverts comprising Culvert #1 (namely, the 48-inch eastern culvert) has a joint displacement approximately 8 feet from the upstream end. Therefore, since this culvert is on GE property, GE has elected to slip-line that culvert (after the sediment removal) with a 42-inch HDPE pipe to repair the joint displacement, as noted on Technical Drawing 9. GE has modeled the slip-lining of this culvert and determined that the use of the slightly smaller 42-inch HDPE pipe will not adversely impact the flow through

this culvert or the water elevation upstream of the culvert, as indicated in Appendix G, due to the improved Manning's coefficient associated with the proposed use of an HDPE pipe rather than the current corrugated metal pipe culvert.

In addition, as also indicated on Technical Drawing 9, beaver deterrent structures will be installed on the upstream end of the both culverts comprising Culvert #1, due to historical beaver activity in the vicinity of that culvert. These structures will consist of wire cages designed to prevent beavers from accessing and damming the culverts. Product information for the beaver deterrent structures is provided in Appendix L.

GE will also install a debris diversion structure upstream of these culverts to prevent miscellaneous floating debris from entering and becoming lodged in the culverts, thereby restricting flow. The debris diversion structure will consist of a floating boom installed upstream of the culverts, across the channel for Unkamet Brook and at an angle to the direction of flow (as indicated on Technical Drawing 7) so that floating debris that encounters the boom will be guided toward the bank of the channel. Accumulated materials will be periodically removed to maintain the function of the debris diversion structure.

7.5.10 Sanitary Sewer Realignment

As discussed in Section 5.8, GE has elected to realign an approximate 825-foot section of the existing 30-inch reinforced concrete sanitary sewer line that runs parallel to Unkamet Brook from a point just north of the former interior landfill to the manhole located north of Building 120W. The sanitary sewer realignment activities will be performed following the re-routing of Unkamet Brook, as described in Section 7.5.3. As indicated on Technical Drawings 14, 15, 32, and 33, the sanitary sewer realignment will consist of the following activities: (1) construction, testing, and operation of a bypass pumping system to convey the sanitary sewer flow around the section of pipeline to be bypassed; (2) re-grading and conditioning the soils in the former brook channel as necessary to accommodate installation of the realigned sanitary sewer components; (3) installation of helical piles and concrete foundation supports for the realigned sanitary sewer; (4) installation of approximately 850 feet of new 30-inch diameter polyvinyl chloride sewer pipe and five new precast concrete manholes following placement of the synthetic engineered barrier components (for the portion located within the former interior landfill, see Section 7.5.11) and pipe bedding materials; and (5) construction of the vegetated landfill cap (for the portion located within the former interior landfill, as described in Section 7.5.11) or pipe cover materials (for the portions located outside the limits of the former interior landfill. Prior to disconnecting the bypassed portion of the sanitary sewer and connecting the realigned sewer pipe to make it operational, the bypassed section of the sewer pipe will be flushed in an upstream to downstream (north to south) direction, supplemented if necessary with a vacuum truck, to remove any accumulated fluids or solids to the extent practicable. Once the bypassed section of pipeline has been cleaned, it will be abandoned in place using mechanical plugs

and grout. Upon connection of the realigned portion of the sanitary sewer, the bypass pumping operations will be discontinued.

7.5.11 Placement of Engineered Barriers

As noted in Section 5.9.1, there will be two types of engineered barriers that will be installed over the former interior landfill. As shown on Technical Drawings 14 and 16, the western portion of the former interior landfill will be covered with a one-foot-thick above-grade asphalt-covered engineered barrier that will be installed in two phases (to accommodate SABIC employee parking throughout construction and the potential use of a portion of the parking lot as a material staging and/or dewatering area), and the eastern portion of the former interior landfill will be covered with a two-foot-thick above-grade vegetative engineered barrier/landfill cap. The subgrade and final grade configurations are provided on Technical Drawings 14 and 16, respectively. Construction details and associated notes for the engineered barrier/landfill cap (e.g., cross-sections, material types, etc.) are provided on Technical Drawings 17, 18, and 34 through 39.

In addition, a combination vegetative and asphalt-covered engineered barrier will be installed at Parcel L12-1-5, as shown on Technical Drawing 27. In accordance with Condition No. 7 of EPA's December 16, 2009 letter conditionally approving the Remainder Conceptual Work Plan, the limits of the engineered barrier, as previously presented on Figure 4-2 of the Remainder Conceptual Work Plan, have been revised such that a portion of Unkamet Brook will not be flowing across the engineered barrier. The subgrade and final grade configurations are shown on Technical Drawing 28. Construction details and associated notes for this engineered barrier (e.g., cross-sections, material types, etc.) are provided on Technical Drawings 29, 34, and 39.

It is anticipated that the geomembrane liner and geosynthetic drainage composite will be placed by hand and light duty equipment with rubber tires. Geosynthetic materials that are not immediately covered with soil fill material will be anchored with sand bags or, at the termination of the vegetative landfill cap, Type II riprap until the remaining cover materials have been placed. For the vegetative landfill cap, the riprap will be placed using bucket-type equipment (e.g., excavator grading bucket, skid steer loader, etc.) to avoid the need for pushing of such materials and potential damage to the liner components. This riprap will serve as an anchor for the geosynthetic liner components. It is anticipated that low ground pressure construction equipment will be used to spread and compact the soil cover materials that are placed over the geosynthetic barrier components. In addition, for the remaining, uppermost portion of the vegetative landfill cap side slope (i.e., above the riprap materials), the cover soils will be placed from above the plateau/side-slope grade break using an excavator grading bucket or similar piece of equipment to further minimize the potential for the movement of the geosynthetic liner components. During the placement of the engineered barriers, the Remediation Contractor will exercise appropriate care when covering the geomembrane liner and geosynthetic drainage composite with the soil cover

materials such that construction equipment does not damage the liner components. Finally, the engineered barrier components will be installed under the oversight of construction quality assurance personnel. Additional details regarding the specific materials to be used and procedures to be followed when installing the various components of the engineered barrier are provided in detail in the Technical Drawings and Technical Specifications.

As discussed in Sections 5.9.1 and 5.10.3, the surface cover for the engineered barrier/cap over the former interior landfill will consist of either asphalt or topsoil and NRR/E plantings. As also discussed in those sections, the asphalt-covered portion of this barrier will be installed in two phases to accommodate SABIC employee parking and potential construction of a material staging and/or dewatering area. Following removal of the vegetated islands, the placement of the asphalt shims (as discussed in Section 7.4.7), and cleaning of the asphalt pavement (if the area was used to stockpile and dewater excavated soils/sediments), GE will construct a bituminous asphalt cap over the currently paved portion of the former interior landfill. This will involve the placement of the synthetic barrier components described above, followed by the placement of an 8.5-inch subbase layer, a 2.5-inch base course of bituminous asphalt, and a 1-inch wearing course of bituminous asphalt, as illustrated in Detail 1 of Technical Drawing 34. For the vegetative engineered barrier/landfill cap, the surface will be restored with six inches of topsoil and a seed mix consisting of warm-season grasses and wild flowers, as described in Section 5.10.3 and as the required NRR/E measure for this area.

The surface cover for the engineered barrier on Parcel L12-1-5 will consist of both asphalt and vegetative portions. For the asphalt-covered portion of this barrier, GE will construct a bituminous cap consisting of an 8.5-inch subbase layer, 2.5-inch base course, and a 1-inch wearing course. For the vegetative portion of this barrier, the surface will be restored with six inches of topsoil, followed by the placement of grass seed and mulch in accordance with the Technical Specifications for planting of a grass cover.

Additional details regarding the specific materials to be used and procedures to be followed in installing the surface covers for the engineered barriers are provided in the Technical Drawings and Technical Specifications.

7.6 Surface Water and Ambient Air Monitoring

This section describes the surface water and ambient air monitoring to be performed during construction activities.

7.6.1 Surface Water Monitoring

During sediment removal, culvert cleaning, and restoration activities performed in Unkamet Brook, water column monitoring will be implemented to evaluate turbidity conditions and potential PCB transport impacts in Unkamet Brook that may be the result of those activities.

This program will use procedures consistent with the monitoring programs previously performed for the Building 68 Area Removal Action and the Upper ½ Mile Reach Removal Action in the Housatonic River, as well as the sediment remediation activities in the West Branch of the Housatonic River. Additional details are provided below.

Monitoring Programs and Action Levels

During the course of these construction activities, surface water samples will be collected on a weekly basis at two locations within Unkamet Brook – one just upstream of the Dalton Avenue culvert and one just downstream of the silt curtains installed near the confluence of Unkamet Brook with the Housatonic River. The surface water samples will be collected beginning two weeks prior to initiation of sediment removal activities and continuing throughout the sediment removal and restoration activities. In addition, during the first week of active brook remediation (i.e., beginning with the initiation of brook bypassing activities), surface water samples will be collected on the first, third, and fifth days of this week, provided that active remediation is ongoing on those days. In the event that active remediation is not ongoing on those days, the samples will be collected on other days when active remediation is ongoing.

The water samples of equal volume will be collected at each location from depths approximately equal to 0.2-, 0.5-, and 0.8-times the total water depth at that location (i.e., at the 20%, 50%, and 80% levels of the water column), and will be combined into one composite sample for the given location. These water samples will be sent to an approved laboratory for analysis of total PCBs (not dissolved PCBs) and total suspended solids (TSS), with a turn-around time of no more than four days during the first two weeks of active remediation, and no more than seven days thereafter. These sampling data will provide information both on baseline conditions (i.e., prior to construction) and on upstream and downstream PCB and TSS levels during construction, for use in evaluating potential impacts of the remediation work on the water column. The collection and analysis of such weekly water samples will continue for one week following the completion of construction activities.

The PCB sampling data will be reviewed during construction to assess potential impacts to the water column. The downstream PCB action level to be used during this project will be the same as previously approved by EPA for the Building 68 Area and Upper ½-Mile Reach Removal Actions. This action level is as follows:

$$PCBs_{Downstream} \geq PCBs_{Upstream} + 5 \text{ ug/l}$$

In addition, during the course of these activities, the water column will be monitored for turbidity at the same two locations within Unkamet Brook. Such monitoring will be initiated two weeks prior to commencement of sediment removal activities and will continue for the duration of the removal and replacement activities. Continuous turbidity measurements will

be made and recorded using a turbidity probe suspended at the approximate mid-depth elevation at each of the upstream and downstream locations, along with a submersible battery-powered data logger (which will record a turbidity reading every 15 minutes).

The turbidity data will be reviewed on a daily basis during construction activities to assess potential changes in water column turbidity. The downstream turbidity action level to be used during this project will be the same as previously approved by EPA for the Building 68 Area and the Upper ½-Mile Reach Removal Actions (and also used by GE with MDEP approval for the West Branch remediation). This action level is as follows:

$$Turbidity_{Downstream} \geq Turbidity_{Upstream} + 50\ NTU$$

During sediment removal and restoration activities, evaluations of the turbidity data will be made at least once per day.

Response to Exceedance of Action Levels

In the event that any of the 15-minute readings recorded at the downstream location exceeds the turbidity action level or that any of the PCB results from the downstream station exceeds the PCB action level, a number of site assessment activities will be initiated, including, but not limited to, the following:

- Review of the ongoing removal and replacement activities and the potential need for modification of the condition or performance of the existing erosion and sedimentation control measures;

- Continued or additional monitoring at the downstream location to determine if the prior sampling result was an anomaly or if the elevated reading was possibly a short duration event; and/or

- Collection of additional samples from various locations within or adjacent to the removal area to possibly identify the potential source(s) of the elevated reading.

Additionally, if the downstream turbidity or PCB action level is exceeded on a given day, water column samples will be collected daily at both the upstream and downstream locations for analysis of total PCBs and TSS, using the same collection protocol described above for the weekly water column sampling and with a laboratory turn-around time of no more than four days. The resulting data will be compared to the upstream and downstream turbidity data to assess whether the elevated downstream turbidity reading is also reflected in the PCB and TSS data. The data will also be compared to the PCB action level described above. This daily sampling will be continued until the data show that the turbidity and PCB action levels have been achieved.

If these assessment activities indicate that the elevated downstream turbidity or PCB reading reflects a water quality impact that could persist or recur and that can reasonably be attributed to the ongoing removal and replacement activities, the construction activities will be modified to the extent feasible, or additional controls will be implemented. GE will modify activities to the extent feasible and/or implement additional controls until compliance with action level(s) is achieved and GE demonstrates to EPA that such measures are no longer necessary.

In the event that GE receives any monitoring result that exceeds either of the action levels described above, GE will notify EPA as soon as possible but no later than 24 hours after receipt of the data, and discuss with EPA the need for work stoppage. In addition, GE will submit a proposal regarding a response to such an exceedance, including proposed corrective measures (if needed), for EPA approval within 48 hours of receipt of any monitoring data exceeding action levels. GE will submit written results of all water quality monitoring data on a monthly basis.

7.6.2 Ambient Air Monitoring

Ambient air monitoring for PCBs and particulate matter will be performed during all on-site construction activities. A revised scope of the ambient air monitoring program is provided in Appendix M. That revised air monitoring scope of work applies to the entire anticipated Removal Action to be conducted at the Unkamet Brook Area (West and Remainder combined).

In overview, ambient air monitoring for PCBs will include collection of ambient air samples using “high volume” samplers equipped with glass fiber filters and polyurethane foam (PUF) cartridges. The samples will be collected, analyzed, and evaluated using the procedures specified in EPA Compendium Method TO-4A. To obtain representative data on ambient levels of PCBs around the construction site before and during construction activities, two PCB air sampling events will be performed prior to the start of construction activities, and additional events will be performed once per week during the first four weeks of construction. If there are no exceedances of the notification level during that time, the frequency of PCB air sampling events will be reduced to once per month for the remainder of the construction work. In addition, ambient air monitoring for particulates will be performed on a continuous basis during all active construction activities using real-time particulate air monitors.

The revised ambient air monitoring scope of work in Appendix M identifies on Figure M-1 the proposed air monitoring locations, subject to change based on the location of construction activities and weather conditions. As indicated in that scope of work, monitoring locations will be rotated among several locations (depending on weather conditions and the work being performed) for both PCB and particulate monitoring. However, whenever intrusive activities are being performed in areas west of the railroad

tracks on the rail siding portion of Parcel L11-4-12, the monitoring locations for PCBs will include the monitoring station located on GE property at the corner of Plastics Avenue and Dalton Avenue, as shown on Figure M-1. In addition, a background monitoring location will be established during the response actions for comparison to the data from the locations with the RAA.

7.7 Equipment Cleaning

Equipment and materials that have come into contact with existing soils or sediments at the Unkamet Brook Area during the construction activities will be cleaned prior to relocation to an area outside the work zone (i.e., the excavation and loading areas), prior to handling backfill materials, and prior to departure from the site. In addition, equipment and materials that have come into contact with TSCA- and/or RCRA-regulated materials will be cleaned prior to handling non-TSCA, non-RCRA materials. Equipment cleaning will be conducted as specified in Section 3.5 of the Site Management Plan within the POP.

8. Post-Construction Activities

8.1 General

This section describes the activities to be performed by GE following the completion of the remediation and restoration actions at the entire Unkamet Brook Area (i.e., both Unkamet Brook Area-West and Unkamet Brook Area-Remainder). It replaces and supersedes Section 8 of the West Revised Final Work Plan. These post-construction activities include: (a) execution and recordation of the remaining EREs for properties where EREs will be implemented (along with associated activities); (b) notification of Conditional Solutions at other properties that do not meet residential Performance Standards; (c) project closeout activities (including performance of a Completion of Installation of Restoration Work inspection, performance of a Pre-Certification Inspection for this Removal Action, and preparation and submittal of a Final Completion Report); and (d) Post-Removal Site Control activities, as well as monitoring and maintenance activities for the NRR/E measures. Each of these topics is further discussed below.

8.2 Execution and Recordation of Grants of Environmental Restrictions and Easements

As discussed above, the CD requires GE to execute EREs on its properties at the Site (CD ¶ 54). It also requires the City of Pittsfield to execute EREs on its properties at the Site (CD ¶ 66); and it provides that, for properties owned by the Commonwealth of Massachusetts at the Site, the Commonwealth will execute EREs or (for properties subject to Article 97 of the State Constitution, for which standard EREs could not be executed without specific legislative authorization) Notice EREs, subject to certain conditions (CD ¶ 62.b). Further, the CD requires GE to make "best efforts" to obtain EREs for other properties at which residential Performance Standards are not met (CD ¶¶ 56, 57, 60).

The GE-owned properties at the Unkamet Brook Area are the portion of Parcel K11-7-2 within Unkamet Brook Area-West and Parcel K12-9-1 (which is situated within both the West and the Remainder Areas). For the former, at which no remediation is required, GE has prepared an ERE and associated Plans of Property and Restricted Area, which have been reviewed by EPA and MDEP, and has obtained the required subordination agreements for that ERE from the holders of encumbrances on the property, with one exception (U.S. Navy). The need for that remaining subordination agreement is under review by EPA and MDEP. Following resolution of that issue, GE will execute the ERE, submit it to EPA for formal approval and MDEP for acceptance, and record it following formal MDEP acceptance. For Parcel K12-9-1, an ERE for the entire property will be executed following the completion of all remediation and restoration work at this RAA. That executed ERE will then be submitted to EPA for formal approval and to MDEP for acceptance, and will be recorded following MDEP acceptance.

The only City-owned property at this RAA is Parcel K11-7-9, a small property in Unkamet Brook Area-West at which no remediation is required. The City has already executed an ERE for this property on May 23, 2013; and following MDEP acceptance, that ERE was recorded in the Berkshire Middle District Registry of Deeds on August 16, 2013 in Book 5249, Page 277. Thus, no further actions will be necessary relating to the execution or recording of that ERE.

The only property owned by the Commonwealth at this RAA is Parcel L12-2-1 in Unkamet Brook Area-Remainder, which is specifically owned by the Massachusetts Board of Regional Community Colleges for the use of BCC. As discussed in Section 3.2.1, it appears that this property may have been subject to Article 97 of the State Constitution at the time of entry of the CD, but is not currently subject to that article. However, it also appears, based on discussions with MassDCAMM, that, similar to the situation for Article 97 property, a standard ERE could not be executed for this property without specific legislative authorization. In these circumstances, GE anticipates that a Notice ERE will be executed by or on behalf of BCC for this property following completion of the remediation and restoration activities at this RAA. Following execution, the Notice ERE will be submitted to EPA for formal approval, and will be recorded thereafter.

For the private properties at this RAA, as also discussed in Section 3.2.1, the owners of three parcels within Unkamet Brook Area-Remainder – Parcels L12-1-4, L12-1-5, and L12-1-101 – have already executed EREs on their properties.[25] However, for each of these properties, in accordance with the CD and the applicable ERE, GE will record a Notice of Completion (and, if necessary, a revised Plan of Restricted Area) following completion of the remediation actions at the property. The owner of Parcel L12-2-2 in Unkamet Brook Area-West (the U.S. Navy) and the owner of Parcels L11-4-11 and L11-4-12 (CSX) have declined to execute EREs on their properties; and thus the portions of those properties within the Unkamet Brook Area will be subject to Conditional Solutions, as discussed in Section 8.3.[26]

8.3 Notification of Conditional Solutions

Following completion of the remediation and restoration activities at the Unkamet Brook Area, GE will provide notifications to the owners of Parcel L12-2-2 (the U.S. Navy) and Parcels L11-4-11 and L11-4-12 (CSX) that a Conditional Solution has been implemented on the portions of those properties within this RAA. Those notifications will describe the terms of the Conditional Solution, including the requirements applicable to GE and the owner

[25] The recording information for these EREs is provided in a footnote in Section 3.2.1.

[26] It should be noted that Parcel K11-7-8 at Unkamet Brook Area-West meets the Performance Standards for residential properties (as shown in the West Conceptual Work Plan) and thus does not require either an ERE or a Conditional Solution.

regarding future remediation activities at the property(ies) in question, and will describe the levels of residual contamination at the property(ies). In addition, GE will provide such notifications to the holders of easements or other encumbrances on these properties.

8.4 Project Closeout – Inspections and Completion Report

Once GE has determined that the remediation and restoration actions for the entire Unkamet Brook Area (i.e., both the West and the Remainder Areas) are complete (including recordation of the EREs, but excluding Post-Removal Site Control and NRR/E monitoring and maintenance activities) and that the applicable Performance Standards have been attained, GE will schedule and conduct certain completion inspections and submit certain completion reports.

First, in accordance with Paragraph 120 of the CD, GE will prepare and submit to the Natural Resource Trustees a Completion of Installation of Restoration Work Report, which will describe the NRR/E measures installed or constructed by GE at this RAA and will show that the Performance Standards for the installation or construction of those measures have been achieved. GE will then schedule with the Trustees and EPA an on-site inspection and meeting to review the NRR/E measures that have been installed or constructed. GE will request from the Trustees a Certification of Completion of Restoration Work stating that the NRR/E measures have been installed or constructed in accordance with the requirements of the CD and that the Performance Standards for the installation or construction of those measures have been achieved.

In addition, in accordance with Paragraph 88.a of the CD, GE will schedule and conduct a Pre-Certification Inspection with EPA and MDEP. Representatives of the City of Pittsfield will also be invited to attend this inspection. The purpose of this inspection will be to confirm that the Unkamet Brook Area Removal Action (excluding Post-Removal Site Control activities) has been completed in accordance with the requirements of the CD and that the Performance Standards for that Removal Action have been attained.

GE will also proceed with the development of a Final Completion Report for the entire Unkamet Brook Area Removal Action to summarize and document the scope of the completed Removal Action. That Final Completion Report will be submitted to EPA after the Pre-Certification Inspection at a time to be agreed upon by GE and EPA. At a minimum, the Final Completion Report will include the following:

- A description of the remediation and NRR/E activities performed;
- Identification of any deviations from the design submittals approved by EPA;
- A listing of remediation quantities, including soil and sediment volumes removed and areas subject to installation of engineered barriers;

- Results of quality assurance/quality control (QA/QC) testing performed during remediation actions;
- Survey data to document the post-remediation grades and final surface contours;
- Copies of Record Drawings to document the as-built conditions;
- Representative project photographs;
- Copies of all EREs, subordination agreements, and title insurance policies;
- Copies of all Conditional Solution notification letters to property owners and to holders of encumbrances on properties subject to Conditional Solutions;
- Documentation regarding the off-site disposition of materials excavated in conjunction with the construction activities, including copies of all BOLs and manifests;
- Comparison of the completed remediation actions and installation of NRR/E measures to the applicable Performance Standards (with any modifications) and demonstration that those Performance Standards have been achieved; and
- A final plan for Post-Removal Site Control activities and NRR/E monitoring and maintenance activities at the Unkamet Brook Area, including a schedule for such activities.

8.5 Post-Removal Site Control/Restoration Project Monitoring and Maintenance Activities

Based on discussions with EPA, a Post-Removal Site Control Plan/Restoration Project Monitoring and Maintenance Plan (PRSCP/RPMMP) for the entire Unkamet Brook Area will be prepared and submitted following EPA's approval of this Revised Remainder Final Work Plan. That plan will describe the future inspection, maintenance, and repair activities (I/M activities) to be conducted at Unkamet Brook Area–West and Unkamet Brook Area-Remainder, including the monitoring and maintenance activities for the NRR/E measures to be implemented at Unkamet Brook Area-Remainder. That plan will be prepared in accordance with: (a) Technical Attachment J of the SOW, which includes requirements for future I/M activities at areas where soil or sediment removal and replacement activities are performed and at areas subject to the installation of an engineered barrier or landfill cap; (b) Paragraph 119 of the CD and Technical Attachment I of the SOW, which require development of a Restoration Project Monitoring and Maintenance Plan for NRR/E measures and specify requirements for monitoring and maintenance for those measures; and (c) the provisions of the CD that specify requirements for future inspections of non-GE-

owned properties with EREs (CD ¶ 57.o and Appendix Q) and properties subject to Conditional Solutions (CD ¶¶ 36, 38, and Appendix Q).

This PRSCP/RPMMP will cover the following Post-Removal Site Control activities for non-NRR/E areas:

- I/M activities for areas subject to soil removal and backfilling/restoration (including the inundated wetlands and other soil removal areas);

- I/M activities for the backfilled/restored sediment removal areas within the portions of Unkamet Brook that were not re-routed, including monitoring for evidence of erosion;

- I/M activities for the restored culverts on GE-owned property, including monitoring for beaver activity and inspection/maintenance of the beaver deterrent structures and debris diversion structure upstream of Culvert #1;

- I/M activities for the re-routed portion of Unkamet Brook, including monitoring for evidence of erosion;

- I/M activities for the vegetation installed in non-NRR/E areas, including the vegetation installed in the inundated wetlands, the herbaceous vegetation installed in other non-NRR/E areas, and the trees and shrubs planted in non-NRR/E areas, to assess the establishment, coverage, survival, and condition of the vegetation (including any evidence of stressed or bare cover and stressed or dead trees or shrubs) and to ensure that the plantings are surviving and growing as anticipated;

- I/M activities for the vegetative engineered barrier/landfill cap and asphalt-covered engineered barrier installed over the former interior landfill and the combination vegetative/asphalt-covered engineered barrier installed at Parcel L12-1-5; and

- Although not required by the SOW, I/M activities for paved areas, located at GE-owned properties, that were not subject to remediation but that GE has agreed to maintain as paved – i.e., areas identified as part of the Other Ground-Covering Feature Areas in the ERE for the portion of Parcel K11-7-2 within Unkamet Brook Area-West and in the future ERE for Parcel K12-9-1.[27]

[27] These activities will be consistent with the I/M activities described for Parcel K11-7-2 in Appendix E to the West Revised Final Work Plan. That appendix contained a figure (Figure E-1) showing the areas that were then anticipated to constitute the Other Ground-Covering Feature Area in the ERE for the relevant portion of Parcel K11-7-2. Since that time, as discussed above, the ERE and associated Plan of Restricted Area for that area have been prepared and reviewed by EPA and MDEP. In the

In addition to these Post-Removal Site Control Activities, the PRSCP/RPMMP will include the following monitoring and maintenance activities for the NRR/E measures at the Unkamet Brook Area:

- Monitoring and maintenance activities for the phragmites removal areas, including monitoring for the return of phragmites and associated control efforts, as discussed in Section 5.10.1;

- Monitoring and maintenance activities for the herbaceous native grassland community planted along the western side of the re-routed Unkamet Brook, as well as the similar vegetation planted in areas east of the re-routed brook that are disturbed by re-routing activities;[28]

- Monitoring and maintenance activities for the native herbaceous grassland community planted on top of the vegetative engineered barrier/landfill cap over the former interior landfill; and

- Monitoring and maintenance activities for the bluebird boxes installed along the edges of the engineered barrier/landfill cap at the former interior landfill adjacent to the wetlands.

Finally, the PRSCP/RPMMP will include the requirements for future inspections of: (1) the non-GE, non-State-owned properties with EREs (i.e., Parcels K11-7-9, L12-1-4, L12-1-5, and the portion of L12-1-101 within this RAA);[29] and (2) the properties subject to Conditional Solutions (i.e., Navy-owned Parcel L12-2-2 and CSX-owned Parcels L11-4-11 and L11-4-12). These requirements will include property record reviews and visual site inspections in accordance with Appendix Q to the CD.

PRSCP/RPMMP, the relevant figure will be revised so that the Other Ground-Covering Feature Area shown thereon is consistent with the Other Ground-Covering Feature Area in the final Plan of Restricted Area for this property.

[28] As discussed in Section 5.10.2 and as EPA has agreed, the trees and shrubs planted along the eastern side of the re-routed brook will not be subject to any post-installation monitoring or maintenance.

[29] In fact, the ERE inspections of these properties have already begun. Such inspections of Parcels L12-1-4, L12-1-5, and L12-1-101 were conducted in December 2012 and November 2013, and the initial ERE inspection of Parcel K11-7-9 was conducted in November 2013. Reports on those inspections were submitted to MDEP and EPA on January 2, 2013 and December 18, 2013, respectively.

Reports on all of these inspections will be submitted to EPA, the Trustees, and/or MDEP, as appropriate, typically within 30 days of the inspection (although Attachment I of the SOW allows 90 days for the submission of reports on the inspections of NRR/E measures). More details regarding these reports will be provided in the PRSCP/RPMMP.

Ultimately, this PRSCP/RPMMP will be replaced and superseded by the PRSCP/RPMMP that is included in the Final Completion Report, as described in Section 8.4.

9. Schedule

This section presents GE's proposed schedule for future activities at the Unkamet Brook Area. It replaces and supersedes Section 9 of the Revised West Final Work Plan.

As described in Section 6, following EPA's approval of this Revised Remainder Final Work Plan, GE will develop and submit a Request for Proposal to potential Remediation Contractors and will thereafter select a Remediation Contractor.

Within approximately 120 days of EPA's approval of this Revised Remainder Final Work Plan, GE will submit a SIP for the work in both Unkamet Brook Area-West and Unkamet Brook Area-Remainder. This SIP is anticipated to include the following:

- Identification of and contact information for the selected Remediation Contractor;
- Copies of the Remediation Contractor's pre-mobilization submittals – i.e., its Operations Plan (providing further implementation details for the activities described herein, as well as a project schedule for the work to be performed), HASP, and Contingency Plan;
- Identification of backfill sources and locations and analytical data for samples collected from the backfill sources (unless the backfill sources have already been approved based on previously submitted analytical data);
- Revised or new technical drawings relating to the monitoring well decommissioning activities (if any), along with the monitoring well protection and/or replacement activities, that will be performed in connection with the remediation activities in the Unkamet Brook Area;
- Revisions to the remediation proposal and technical drawings for Parcel L12-1-5 if determined to be necessary based on discussions with the selected Remediation Contractor;
- Results of any additional TCLP waste characterization sampling conducted between the submittal of this Revised Remainder Final Work Plan and the SIP, and any resulting modifications to the RCRA designation of materials to be excavated;
- A map showing proposed access roads within the Unkamet Brook Area;
- A map showing the route(s) for transport of excavated materials to any existing building or structure at the GE facility (in addition to Buildings 14 and 65) to be used for temporary stockpiling of such materials; and
- Identification of the off-site disposal facilities to be used for this project.

In addition to the SIP, as discussed in Section 7.3.2, the results of the tree and shrub inventory and a restoration planting plan will be submitted to EPA for approval prior to the commencement of work. Further, as discussed in Section 8.5, GE will submit a separate PRSCP/RPMMP for the entire Unkamet Brook Area on a timetable to be agreed upon by GE and EPA.

Following EPA's approval of the SIP, site preparation activities will be initiated. The specific schedule for the implementation and completion of the remediation and restoration actions will depend on several factors, including EPA approval of the above documents, receipt of the necessary access permission from non-GE property owners to conduct the necessary remediation/restoration actions at their properties, and potential weather conditions. A proposed schedule, including an estimate of the duration of the entire project in working weeks, will be provided in the Remediation Contractor's Operations Plan, which will be part of the SIP.

Following completion of the Removal Action for the entire Unkamet Brook Area (including recordation of all EREs), GE will submit a Completion of Installation of Restoration Work Report, will schedule and conduct an on-site inspection and meeting with the Trustees and EPA to review the NRR/E measures installed, and will schedule and conduct a Pre-Certification Inspection with EPA and MDEP (with the City also invited) – all as described in Section 8.4, on dates to be agreed upon by the parties. Thereafter, at a time to be agreed upon by EPA and GE, GE will submit a Final Completion Report for the Unkamet Brook Area Removal Action. That report will contain a final version of the PRSCP/RPMMP, which will include a schedule for the performance of the future inspection and maintenance activities.

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Tables

TABLE 7-1
SUMMARY OF UNKAMET BROOK OUTFALL INVENTORY

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Outfall ID	Material	Dimensions	Invert		
			Northing	Easting	Elevation
YD10	Concrete	18-inch (4 pipes)	538204.5	138186.0	983.7
YD11[5]	Concrete	24-inch	537591.1	138708.7	982.5
YD12	CMP	32-inch	537466.6	138817.5	983.8
009	Concrete	30-inch	537113.6	138946.8	984.6
09C	Concrete	40-inch	537135.6	138971.6	984.8
SM-1	Concrete	15-inch	537065.4	139073.9	984.2
SM-2	CMP	10-inch	536886.6	139075.6	988.1
SM-3	CMP	6-inch	536887.7	139076.3	987.9
SM-4	Concrete	12-inch	536888.1	139076.4	985.9
SM-5	Steel	24-inch	536240.8	138989.1	985.0

Notes:
1. Outfall inventory performed in August 2013, January 2014, and April 2014 by ARCADIS.
2. Coordinates are based on the North American Datum of 1927, Massachusetts Mainland Zone, U.S. Survey Foot and elevations are based on the National Geodetic Vertical Datum of 1927.
3. See Figure 7-1 for outfall locations in the Unkamet Brook Area.
4. Outfalls YD10, YD11, YD12, and 009 are regulated under GE's National Pollutant Discharge Elimination System (NPDES) Permit No. MA0003891.
5. As indicated in the Revised Final RD/ RA Work Plan for Unkamet Brook Area-West, the YD-11 and associated piping are subject to decommissioning during the Unkamet Brook Area Removal Action.

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	RAA10-N-I16 0-2 1/8/2014	TCLP-N-1 0-2 1/8/2014	TCLP-N-2 0-2 1/8/2014	TCLP-N-3 0-2 1/8/2014
Volatile Organics					
1,1-Dichloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	NA	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	NA	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	NA	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	NA	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	NA	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	NA	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	NA	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	NA	0.0110	0.00390 B	0.00300 B
Barium	100	NA	0.440 B	0.180 B	0.260 B
Cadmium	1	NA	0.0150	0.000700 B	ND(0.00400)
Chromium	5	NA	ND(0.0100)	ND(0.0100)	ND(0.0100)
Lead	5	0.00390 B	0.890	0.00550 B	0.00240 B
Mercury	0.2	NA	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	NA	ND(0.0250)	ND(0.0250)	ND(0.0250)
Silver	5	NA	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-N-4 0-2 1/8/2014	TCLP-N-5 0-2 1/8/2014	TCLP-N-6 0-2 1/8/2014	TCLP-N-7 0-2 1/8/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	0.00360 B	0.00590 B	ND(0.0100)	ND(0.0100)
Barium	100	0.260 B	0.150 B	0.260 B	0.270 B
Cadmium	1	0.000700 B	0.00110 B	0.000900 B	0.00180 B
Chromium	5	0.00150 B	ND(0.0100)	0.00190 B	0.00170 B
Lead	5	0.00540 B	0.00710 B	0.00420 B	0.00640 B
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	ND(0.0250)	ND(0.0250)	ND(0.0250)	ND(0.0250)
Silver	5	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-N-8 0-2 1/8/2014	TCLP-N-9 0-1 1/7/2014	TCLP-N-10 0-1 1/7/2014	RAA10-N-L12 0-2 1/7/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	NA
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20)	NA
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20)	NA
2-Butanone	200	ND(1.0)	ND(1.0)	ND(1.0)	NA
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10)	NA
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20)	NA
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20)	NA
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20)	NA
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	NA
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20)	NA
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20)	NA
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	0.0025 J	ND(0.050)	NA
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10)	NA
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10)	NA
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10)	NA
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	NA
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	NA
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050)	NA
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	NA
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050)	NA
Nitrobenzene	2	ND(0.050)	ND(0.050)	0.0027 J	NA
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10)	NA
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10)	NA
Inorganics					
Arsenic	5	ND(0.0100)	0.0170	0.0130	NA
Barium	100	0.300 B	0.870	0.440 B	NA
Cadmium	1	0.00120 B	0.00470	0.00820	NA
Chromium	5	ND(0.0100)	0.00970 B	ND(0.0100)	NA
Lead	5	ND(0.0100)	0.130	0.300	0.0250
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	NA
Selenium	1	ND(0.0250)	ND(0.0250)	ND(0.0250)	NA
Silver	5	ND(0.00500)	ND(0.00500)	ND(0.00500)	NA

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-N-11 0-1 1/7/2014	TCLP-N-12 0-1 1/7/2014	RAA10-N-S20 0-1 1/6/2014	TCLP-N-13 0-1 1/6/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	NA	NA	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	NA	NA	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	NA	NA	ND(0.20)
2-Butanone	200	ND(1.0)	NA	NA	ND(1.0)
Benzene	0.5	ND(0.10)	NA	NA	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	NA	NA	ND(0.20)
Chlorobenzene	100	ND(0.20)	NA	NA	ND(0.20)
Chloroform	6	ND(0.20)	NA	NA	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	NA	NA	ND(0.20)
Trichloroethene	0.5	ND(0.20)	NA	NA	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	NA	NA	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	NA	NA	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	NA	NA	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	NA	NA	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	NA	NA	ND(0.10)
2-Methylphenol	200	ND(0.10)	NA	NA	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	NA	NA	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	NA	NA	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	NA	NA	ND(0.050)
Hexachloroethane	3	ND(0.050)	NA	NA	ND(0.050)
Nitrobenzene	2	ND(0.050)	NA	NA	ND(0.050)
Pentachlorophenol	100	ND(0.10)	NA	NA	ND(0.10)
Pyridine	5	ND(0.10)	NA	NA	ND(0.10)
Inorganics					
Arsenic	5	0.0160	0.0150	NA	0.0320
Barium	100	0.230 B	0.140 B	NA	0.280 B
Cadmium	1	ND(0.00400)	0.000900 B	NA	0.00380 B
Chromium	5	ND(0.0100)	ND(0.0100)	NA	0.00210 B
Lead	5	0.00780 B	0.0310	0.0230	0.0490
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	ND(0.0250)	ND(0.0250)	NA	ND(0.0250)
Silver	5	ND(0.00500)	ND(0.00500)	NA	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	RAA10-N-W20 0-1 1/6/2014	TCLP-N-14 0-1 1/6/2014	TCLP-N-15 0-1 1/6/2014	TCLP-N-16 0-1 1/6/2014
Volatile Organics					
1,1-Dichloroethene	0.7	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
2-Butanone	200	NA	ND(1.0) [ND(1.0)]	ND(1.0)	ND(1.0)
Benzene	0.5	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
Chlorobenzene	100	NA	ND(0.20) [ND(0.20)]	0.63	ND(0.20)
Chloroform	6	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
Trichloroethene	0.5	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	NA	ND(0.20) [ND(0.20)]	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	NA	ND(0.050) [ND(0.050)]	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
2-Methylphenol	200	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	NA	ND(0.050) [ND(0.050)]	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	NA	ND(0.050) [ND(0.050)]	ND(0.050)	ND(0.050)
Hexachloroethane	3	NA	ND(0.050) [ND(0.050)]	ND(0.050)	ND(0.050)
Nitrobenzene	2	NA	ND(0.050) [ND(0.050)]	ND(0.050)	ND(0.050)
Pentachlorophenol	100	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
Pyridine	5	NA	ND(0.10) [ND(0.10)]	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	NA	0.00820 B [0.0110]	0.00490 B	0.00490 B
Barium	100	NA	0.650 [0.730]	0.840	0.190 B
Cadmium	1	NA	0.00740 [0.00710]	0.00720	0.00200 B
Chromium	5	NA	0.00240 B [0.00240 B]	0.00540 B	0.00160 B
Lead	5	0.110	0.350 [0.400]	0.0190	0.0480
Mercury	0.2	ND(0.000200)	ND(0.000200) [ND(0.000200)]	ND(0.000200)	ND(0.000200)
Selenium	1	NA	ND(0.0250) [ND(0.0250)]	ND(0.0250)	ND(0.0250)
Silver	5	NA	ND(0.00500) [ND(0.00500)]	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Sample ID: Sample Depth(Feet): Parameter Date Collected:	TCLP Regulatory Limits	BA-1 0-1 1/6/2014	TCLP-N-17 0-1 1/6/2014	TCLP-N-18 0-1 1/9/2014	TCLP-N-19 0-1 1/9/2014
Volatile Organics					
1,1-Dichloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	NA	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	NA	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	NA	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	NA	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	NA	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	NA	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	NA	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	0.00370 B	0.0140	0.00590 B	ND(0.0100)
Barium	100	1.20	0.230 B	0.390 B	0.560
Cadmium	1	0.00810	0.000500 B	0.00820	0.00120 B
Chromium	5	0.00150 B	ND(0.0100)	ND(0.0100)	0.00180 B
Lead	5	0.0710	0.00390 B	0.140	0.0240
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	ND(0.0250)	ND(0.0250)	ND(0.0250)	ND(0.0250)
Silver	5	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-N-20 0-1 1/9/2014	TCLP-N-22 0-2 1/8/2014	TCLP-N-23 0-2 1/8/2014
Volatile Organics				
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
2-Butanone	200	ND(1.0)	ND(1.0)	ND(1.0) [ND(1.0)]
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Semivolatile Organics				
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Nitrobenzene	2	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Inorganics				
Arsenic	5	ND(0.0100)	0.00310 B	ND(0.0100) [ND(0.0100)]
Barium	100	0.220 B	0.310 B	0.300 B [0.270 B]
Cadmium	1	0.000700 B	0.000600 B	0.00110 B [0.00110 B]
Chromium	5	ND(0.0100)	0.00150 B	0.00180 B [0.00160 B]
Lead	5	ND(0.0100)	0.0140	0.00380 B [0.00550 B]
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200) [ND(0.000200)]
Selenium	1	0.00530 B	ND(0.0250)	ND(0.0250) [ND(0.0250)]
Silver	5	ND(0.00500)	ND(0.00500)	ND(0.00500) [ND(0.00500)]

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-S-1 1-4 1/15/2014	TCLP-S-2 0-4.5 1/15/2014	TCLP-S-3 1-3 1/13/2014	TCLP-S-4 3-6 1/13/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	1.4	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	ND(0.0100)	ND(0.0100)	0.00560 B	ND(0.0100)
Barium	100	0.680	0.350 B	0.360 B	3.10
Cadmium	1	0.00350 B	0.00360 B	0.00290 B	0.140
Chromium	5	ND(0.0100)	0.00200 B	0.00150 B	0.0100
Lead	5	0.0220	0.0970	0.0620	15.1
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	0.00500 B	ND(0.0250)	0.00540 B	0.00500 B
Silver	5	0.00100 B	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	RAA10-E-T14 0-1 1/15/2014	TCLP-S-5 0-1 1/13/2014	TCLP-S-6 0-3 1/13/2014	TCLP-S-7 1-3 1/13/2014
Volatile Organics					
1,1-Dichloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	NA	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	NA	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	NA	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	NA	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	NA	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	NA	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	NA	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	NA	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	NA	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	NA	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	NA	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	NA	ND(0.0100)	ND(0.0100)	ND(0.0100)
Barium	100	NA	0.110 B	0.270 B	0.780
Cadmium	1	NA	0.000800 B	0.00150 B	0.0100
Chromium	5	NA	ND(0.0100)	ND(0.0100)	ND(0.0100)
Lead	5	0.0720	0.00480 B	0.0210	0.270
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	NA	0.00510 B	0.00700 B	0.00860 B
Silver	5	NA	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-S-8 3-6 1/13/2014	TCLP-S-9 0-6 1/13/2014	RAA10-E-X10 0-1 1/13/2014	RAA10-E-T13 0-1 1/15/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	NA	NA
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	NA	NA
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	NA	NA
2-Butanone	200	ND(1.0)	ND(1.0)	NA	NA
Benzene	0.5	ND(0.10)	ND(0.10)	NA	NA
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	NA	NA
Chlorobenzene	100	ND(0.20)	ND(0.20)	NA	NA
Chloroform	6	ND(0.20)	ND(0.20)	NA	NA
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	NA	NA
Trichloroethene	0.5	ND(0.20)	ND(0.20)	NA	NA
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	NA	NA
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	NA	NA
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	NA	NA
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	NA	NA
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	NA	NA
2-Methylphenol	200	ND(0.10)	ND(0.10)	NA	NA
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	NA	NA
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	NA	NA
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	NA	NA
Hexachloroethane	3	ND(0.050)	ND(0.050)	NA	NA
Nitrobenzene	2	ND(0.050)	ND(0.050)	NA	NA
Pentachlorophenol	100	ND(0.10)	ND(0.10)	NA	NA
Pyridine	5	ND(0.10)	ND(0.10)	NA	NA
Inorganics					
Arsenic	5	ND(0.0100)	0.00610 B	NA	NA
Barium	100	0.690	1.80	NA	NA
Cadmium	1	0.00440	0.0200	NA	NA
Chromium	5	ND(0.0100)	0.00230 B	NA	NA
Lead	5	0.110	2.00	1.40	0.0210
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	NA
Selenium	1	0.00820 B	0.00820 B	NA	NA
Silver	5	ND(0.00500)	ND(0.00500)	NA	NA

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Sample ID: Sample Depth(Feet): Parameter Date Collected:	TCLP Regulatory Limits	TCLP-S-10 1-5 1/15/2014	TCLP-S-11 0-4 1/15/2014	TCLP-S-12 0-1 1/9/2014	TCLP-S-13 0-1 1/9/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	ND(1.0)	ND(1.0)	5.3	ND(1.0)
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	ND(0.0100)	0.00400 B	ND(0.0100)	ND(0.0100)
Barium	100	0.430 B	0.310 B	0.140 B	0.260 B
Cadmium	1	0.00270 B	0.00150 B	ND(0.00400)	0.00640
Chromium	5	0.00240 B	ND(0.0100)	ND(0.0100)	ND(0.0100)
Lead	5	0.0110	0.0110	ND(0.0100)	0.0290
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	ND(0.0250)	ND(0.0250)	0.00650 B	ND(0.0250)
Silver	5	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-S-14 0-1 1/15/2014	TCLP-S-15 0-1 1/13/2014	TCLP-S-16 0-3 1/15/2014	TCLP-S-17 0-1 1/9/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Butanone	200	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	0.5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	100	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform	6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichloroethene	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
2-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Hexachloroethane	3	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Nitrobenzene	2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Pentachlorophenol	100	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Pyridine	5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Inorganics					
Arsenic	5	0.00650 B	ND(0.0100)	ND(0.0100)	ND(0.0100)
Barium	100	0.420 B	0.210 B	0.210 B	0.240 B
Cadmium	1	0.000500 B	ND(0.00400)	ND(0.00400)	0.00410
Chromium	5	0.00390 B	ND(0.0100)	ND(0.0100)	ND(0.0100)
Lead	5	0.00380 B	0.00170 B	0.00530 B	0.0170
Mercury	0.2	ND(0.000200)	ND(0.000200)	ND(0.000200)	ND(0.000200)
Selenium	1	ND(0.0250)	0.00870 B	ND(0.0250)	ND(0.0250)
Silver	5	0.00110 B	ND(0.00500)	ND(0.00500)	ND(0.00500)

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Sample ID: Sample Depth(Feet): Parameter Date Collected:	TCLP Regulatory Limits	TCLP-S-18 0-1 1/9/2014	TCLP-S-19 0-1 1/14/2014	RAA10-E-LL14 0-1 1/14/2014	RAA10-E-MM13 0-1 1/14/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20)	ND(0.20)	NA	NA
1,2-Dichloroethane	0.5	ND(0.20)	ND(0.20)	NA	NA
1,4-Dichlorobenzene	7.5	ND(0.20)	ND(0.20)	NA	NA
2-Butanone	200	ND(1.0)	ND(1.0)	NA	NA
Benzene	0.5	ND(0.10)	ND(0.10)	NA	NA
Carbon Tetrachloride	0.5	ND(0.20)	ND(0.20)	NA	NA
Chlorobenzene	100	ND(0.20)	ND(0.20)	NA	NA
Chloroform	6	ND(0.20)	ND(0.20)	NA	NA
Tetrachloroethene	0.7	ND(0.20)	ND(0.20)	NA	NA
Trichloroethene	0.5	ND(0.20)	ND(0.20)	NA	NA
Vinyl Chloride	0.2	ND(0.20)	ND(0.20)	NA	NA
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050)	ND(0.050)	NA	NA
2,4,5-Trichlorophenol	400	ND(0.10)	ND(0.10)	NA	NA
2,4,6-Trichlorophenol	2	ND(0.10)	ND(0.10)	NA	NA
2,4-Dinitrotoluene	0.13	ND(0.10)	ND(0.10)	NA	NA
2-Methylphenol	200	ND(0.10)	ND(0.10)	NA	NA
3&4-Methylphenol	200	ND(0.10)	ND(0.10)	NA	NA
Hexachlorobenzene	0.13	ND(0.050)	ND(0.050)	NA	NA
Hexachlorobutadiene	0.5	ND(0.050)	ND(0.050)	NA	NA
Hexachloroethane	3	ND(0.050)	ND(0.050)	NA	NA
Nitrobenzene	2	ND(0.050)	ND(0.050)	NA	NA
Pentachlorophenol	100	ND(0.10)	ND(0.10)	NA	NA
Pyridine	5	ND(0.10)	ND(0.10)	NA	NA
Inorganics					
Arsenic	5	ND(0.0100)	0.00390 B	NA	NA
Barium	100	0.360 B	0.290 B	NA	NA
Cadmium	1	0.00410	0.00260 B	NA	NA
Chromium	5	0.00210 B	ND(0.0100)	0.00180 B	NA
Lead	5	0.0240	0.0360	0.200	0.0580
Mercury	0.2	ND(0.000200)	ND(0.000200)	NA	NA
Selenium	1	ND(0.0250)	0.00780 B	NA	NA
Silver	5	ND(0.00500)	ND(0.00500)	NA	NA

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-S-20 1-3.5 1/14/2014	RAA10-E-OO18 0-1 1/14/2014	UFP2-L3 0-1 1/14/2014	RAA10-E-LL16 0-1 1/9/2014
Volatile Organics					
1,1-Dichloroethene	0.7	ND(0.20) [ND(0.20)]	NA	NA	NA
1,2-Dichloroethane	0.5	ND(0.20) [ND(0.20)]	NA	NA	NA
1,4-Dichlorobenzene	7.5	ND(0.20) [ND(0.20)]	NA	NA	NA
2-Butanone	200	ND(1.0) [ND(1.0)]	NA	NA	NA
Benzene	0.5	ND(0.10) [ND(0.10)]	NA	NA	NA
Carbon Tetrachloride	0.5	ND(0.20) [ND(0.20)]	NA	NA	NA
Chlorobenzene	100	ND(0.20) [ND(0.20)]	NA	NA	NA
Chloroform	6	ND(0.20) [ND(0.20)]	NA	NA	NA
Tetrachloroethene	0.7	ND(0.20) [ND(0.20)]	NA	NA	NA
Trichloroethene	0.5	ND(0.20) [ND(0.20)]	NA	NA	NA
Vinyl Chloride	0.2	ND(0.20) [ND(0.20)]	NA	NA	NA
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	ND(0.050) [ND(0.050)]	NA	NA	NA
2,4,5-Trichlorophenol	400	ND(0.10) [ND(0.10)]	NA	NA	NA
2,4,6-Trichlorophenol	2	ND(0.10) [ND(0.10)]	NA	NA	NA
2,4-Dinitrotoluene	0.13	ND(0.10) [ND(0.10)]	NA	NA	NA
2-Methylphenol	200	ND(0.10) [ND(0.10)]	NA	NA	NA
3&4-Methylphenol	200	ND(0.10) [ND(0.10)]	NA	NA	NA
Hexachlorobenzene	0.13	ND(0.050) [ND(0.050)]	NA	NA	NA
Hexachlorobutadiene	0.5	ND(0.050) [ND(0.050)]	NA	NA	NA
Hexachloroethane	3	ND(0.050) [0.12]	NA	NA	NA
Nitrobenzene	2	ND(0.050) [ND(0.050)]	NA	NA	NA
Pentachlorophenol	100	ND(0.10) [ND(0.10)]	NA	NA	NA
Pyridine	5	ND(0.10) [ND(0.10)]	NA	NA	NA
Inorganics					
Arsenic	5	0.00320 B [ND(0.0100)]	NA	NA	ND(0.0100)
Barium	100	1.80 [1.50]	NA	NA	0.470 B
Cadmium	1	0.0420 [0.0320]	NA	NA	0.0110
Chromium	5	0.00140 B [0.00270 B]	NA	NA	0.0110
Lead	5	13.6 [0.820]	0.0550	0.0480	0.0510
Mercury	0.2	ND(0.000200) [ND(0.000200)]	NA	NA	ND(0.000200)
Selenium	1	0.00760 B [0.00860 B]	NA	NA	ND(0.0250)
Silver	5	ND(0.00500) [ND(0.00500)]	NA	NA	0.00180 B

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Sample ID: Sample Depth(Feet): Parameter Date Collected:	TCLP Regulatory Limits	UFP2-R1 0-1 1/9/2014	TCLP-S-22 0-1 1/9/2014	TCLP-S-23 0-1 1/14/2014	TCLP-S-24 0-1 1/9/2014
Volatile Organics					
1,1-Dichloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
1,2-Dichloroethane	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
1,4-Dichlorobenzene	7.5	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
2-Butanone	200	NA	ND(1.0)	ND(1.0)	ND(1.0) [ND(1.0)]
Benzene	0.5	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Carbon Tetrachloride	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Chlorobenzene	100	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Chloroform	6	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Tetrachloroethene	0.7	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Trichloroethene	0.5	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Vinyl Chloride	0.2	NA	ND(0.20)	ND(0.20)	ND(0.20) [ND(0.20)]
Semivolatile Organics					
1,4-Dichlorobenzene	7.5	NA	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
2,4,5-Trichlorophenol	400	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2,4,6-Trichlorophenol	2	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2,4-Dinitrotoluene	0.13	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
2-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
3&4-Methylphenol	200	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Hexachlorobenzene	0.13	NA	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Hexachlorobutadiene	0.5	NA	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Hexachloroethane	3	NA	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Nitrobenzene	2	NA	ND(0.050)	ND(0.050)	ND(0.050) [ND(0.050)]
Pentachlorophenol	100	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Pyridine	5	NA	ND(0.10)	ND(0.10)	ND(0.10) [ND(0.10)]
Inorganics					
Arsenic	5	NA	ND(0.0100)	ND(0.0100)	ND(0.0100) [ND(0.0100)]
Barium	100	NA	0.220 B	0.280 B	0.340 B [0.380 B]
Cadmium	1	NA	0.00130 B	0.00680	0.00860 [0.00900]
Chromium	5	0.00410 B	0.00420 B	0.00320 B	0.00410 B [0.00360 B]
Lead	5	0.0520	0.00860 B	0.0360	0.0240 [0.0250]
Mercury	0.2	NA	ND(0.000200)	ND(0.000200)	ND(0.000200) [ND(0.000200)]
Selenium	1	NA	ND(0.0250)	0.00580 B	ND(0.0250) [ND(0.0250)]
Silver	5	NA	ND(0.00500)	ND(0.00500)	ND(0.00500) [ND(0.00500)]

See notes on page 16

TABLE 7-2
SUMMARY OF TCLP SOIL SAMPLING DATA

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	TCLP Regulatory Limits	TCLP-S-25 0-1 1/9/2014	TCLP-S-26 0-1 1/9/2014	TCLP-S-27 0-1 1/14/2014
Volatile Organics				
1,1-Dichloroethene	0.7	ND(0.20)	NA	ND(0.20)
1,2-Dichloroethane	0.5	ND(0.20)	NA	ND(0.20)
1,4-Dichlorobenzene	7.5	ND(0.20)	NA	ND(0.20)
2-Butanone	200	ND(1.0)	NA	ND(1.0)
Benzene	0.5	ND(0.10)	NA	ND(0.10)
Carbon Tetrachloride	0.5	ND(0.20)	NA	ND(0.20)
Chlorobenzene	100	ND(0.20)	NA	ND(0.20)
Chloroform	6	ND(0.20)	NA	ND(0.20)
Tetrachloroethene	0.7	ND(0.20)	NA	ND(0.20)
Trichloroethene	0.5	ND(0.20)	NA	ND(0.20)
Vinyl Chloride	0.2	ND(0.20)	NA	ND(0.20)
Semivolatile Organics				
1,4-Dichlorobenzene	7.5	ND(0.050)	NA	ND(0.050)
2,4,5-Trichlorophenol	400	ND(0.10)	NA	ND(0.10)
2,4,6-Trichlorophenol	2	ND(0.10)	NA	ND(0.10)
2,4-Dinitrotoluene	0.13	ND(0.10)	NA	ND(0.10)
2-Methylphenol	200	ND(0.10)	NA	ND(0.10)
3&4-Methylphenol	200	ND(0.10)	NA	ND(0.10)
Hexachlorobenzene	0.13	ND(0.050)	NA	ND(0.050)
Hexachlorobutadiene	0.5	ND(0.050)	NA	ND(0.050)
Hexachloroethane	3	ND(0.050)	NA	ND(0.050)
Nitrobenzene	2	ND(0.050)	NA	ND(0.050)
Pentachlorophenol	100	ND(0.10)	NA	ND(0.10)
Pyridine	5	ND(0.10)	NA	ND(0.10)
Inorganics				
Arsenic	5	ND(0.0100)	NA	0.00470 B
Barium	100	0.220 B	NA	0.110 B
Cadmium	1	0.00100 B	NA	0.00110 B
Chromium	5	ND(0.0100)	0.00370 B	ND(0.0100)
Lead	5	ND(0.0100)	0.00180 B	0.00640 B
Mercury	0.2	ND(0.000200)	NA	ND(0.000200)
Selenium	1	ND(0.0250)	NA	0.00580 B
Silver	5	ND(0.00500)	NA	ND(0.00500)

Notes:
1. Samples were collected by ARCADIS and submitted to Accutest Laboratories for analysis of TCLP constituents.
2. NA = Not Analyzed.
3. ND = Not Detected. The number in parentheses is the associated reporting limit.
4. Field duplicate sample results are presented in brackets.
5. Shading indicates that value exceeds the TCLP Regulatory Limits.

Data Qualifiers:
Organics (volatiles, semivolatiles)
J - Indicates an estimated value.
Inorganics
B - Indicates an estimated value between the method detection limit (MDL) and reporting limit (RL).

ARCADIS

Figures



LEGEND:

- APPROXIMATE REMOVAL ACTION AREA BOUNDARY
- UNKAMET BROOK AREA – WEST
- UNKAMET BROOK AREA – REMAINDER
- BUILDING/STRUCTURE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES ARE APPROXIMATE.

0 1000' 2000'

APPROXIMATE SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

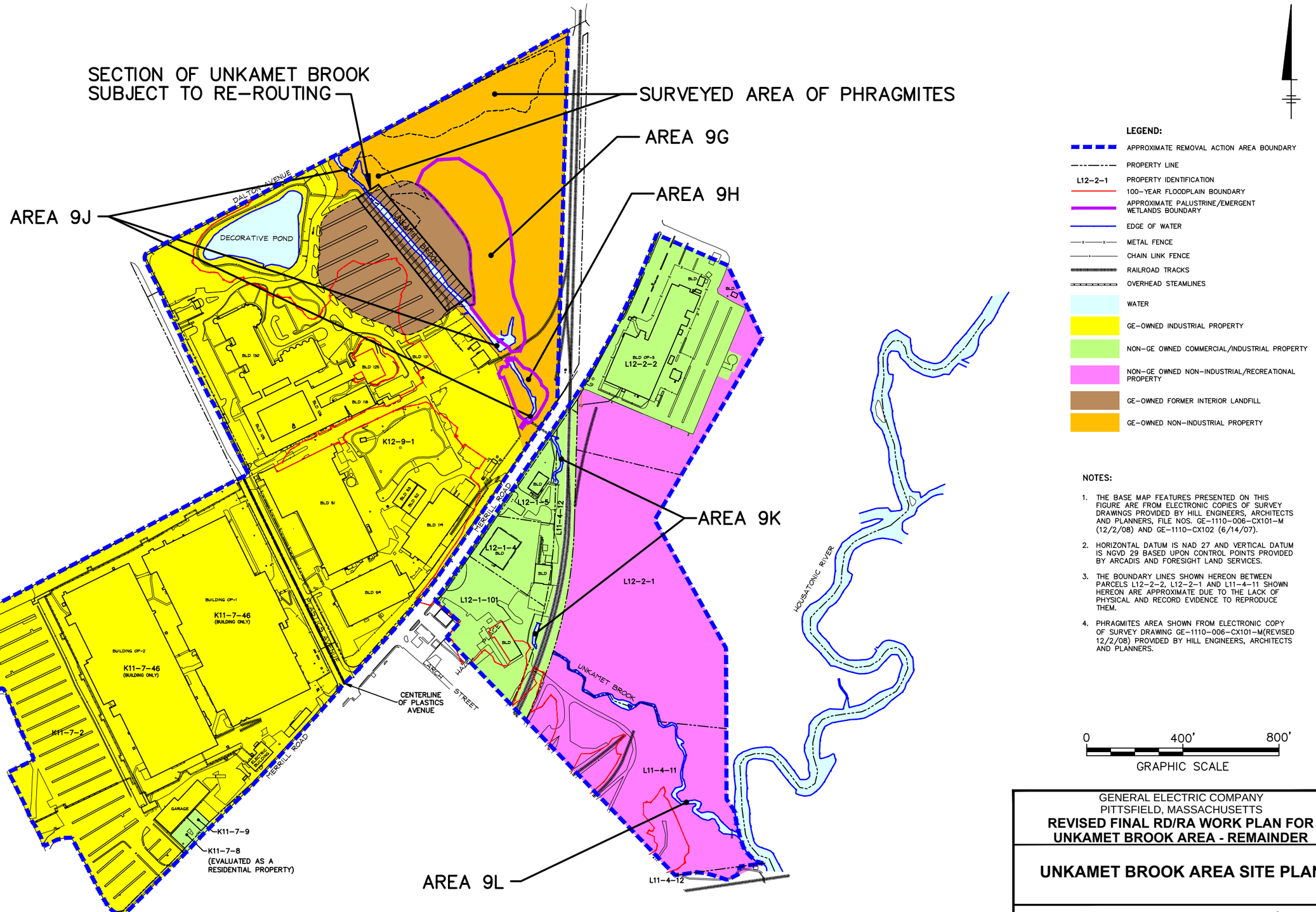
REMOVAL ACTION AREA

ARCADIS

FIGURE
1-1

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW; A.Schilling, K.SARTORI PM:C.AVERILL TM:MDALEY LYR:(Opt)ON=*;OFF=*REF*
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XREFS: PROJECTNAME: ----
40190XBL IMAGES:

CITY:SYRACUSE, NY DIV/GROUP:ENV/CAD DB: DMW KEW, K.SARTORI PM:C.AVERILL TM:M.DALEY LYR: ON=*;OFF=*REF*
V:\ENV\CAD\SYRACUSE\ACTIVE\B0040190\00020000\061\DWG\FINAL-REMAINDER\40190612.DWG LAYOUT: 1-2 SAVED: 4/2/2014 5:29 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/2/2014 5:29 PM BY: SARTORI, KATHERINE
XREFS:
40190X12
40190X11
40190XBL
IMAGES:



LEGEND:

- APPROXIMATE REMOVAL ACTION AREA BOUNDARY
- PROPERTY LINE
- L12-2-1 PROPERTY IDENTIFICATION
- 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- EDGE OF WATER
- METAL FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- OVERHEAD STEAMLINES
- WATER
- GE-OWNED INDUSTRIAL PROPERTY
- NON-GE OWNED COMMERCIAL/INDUSTRIAL PROPERTY
- NON-GE OWNED NON-INDUSTRIAL/RECREATIONAL PROPERTY
- GE-OWNED FORMER INTERIOR LANDFILL
- GE-OWNED NON-INDUSTRIAL PROPERTY

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPIES OF SURVEY DRAWINGS PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS, FILE NOS. GE-1110-006-CX101-M (12/2/08) AND GE-1110-CX102 (6/14/07).
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES SHOWN HEREON BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. PHRAGMITES AREA SHOWN FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REVISED 12/2/08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.

0 400' 800'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

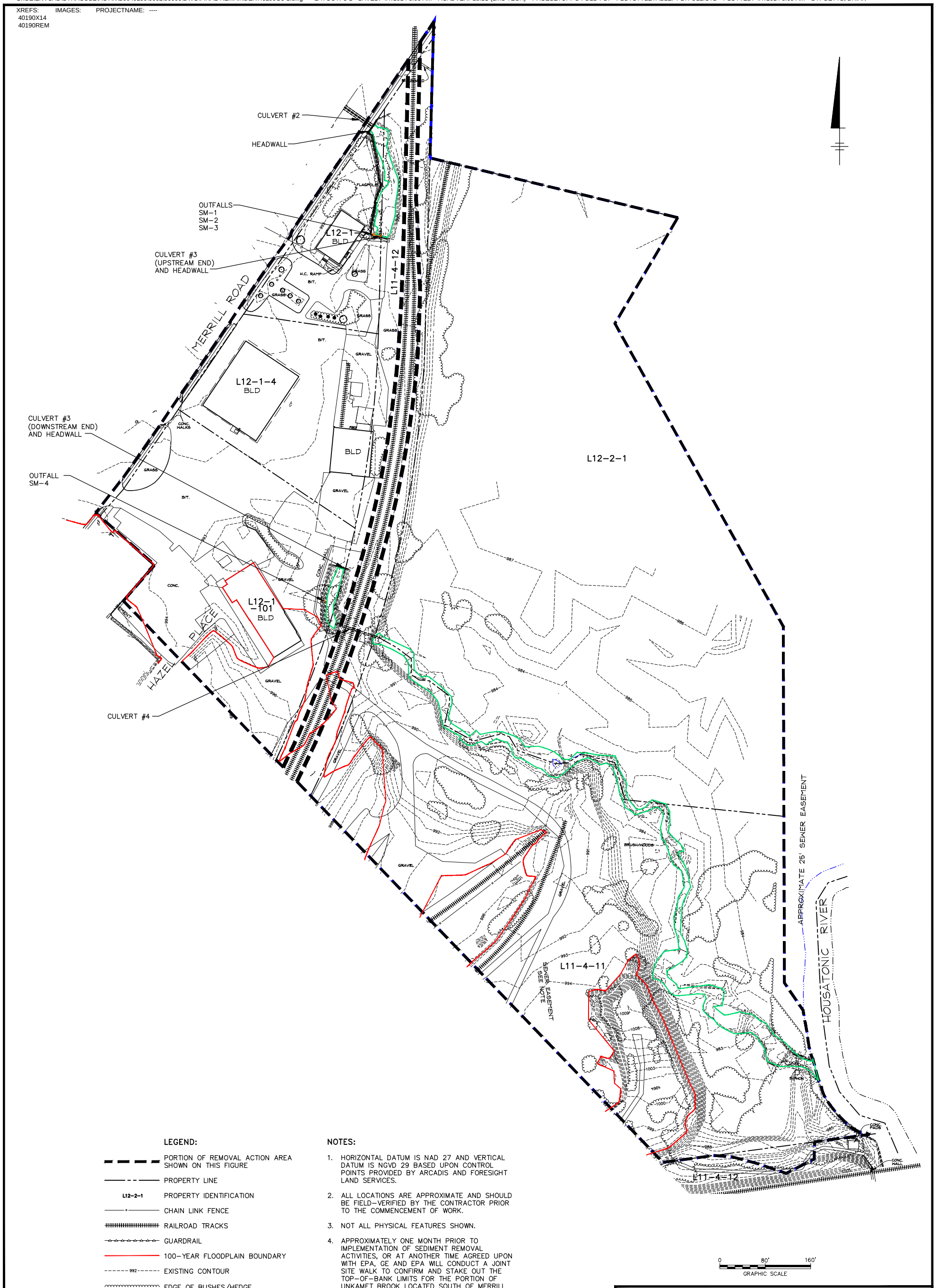
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

UNKAMET BROOK AREA SITE PLAN

ARCADIS

FIGURE
1-2

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: K.WOOD, B.GETTS, K.SARTORI LD: B.GETTS PIC: PM:C.AVERILL TM: M.DALEY LYR:ON=*;OFF=*REF*
G:\GE\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190G3-1.dwg LAYOUT: 3-1 SAVED: 4/7/2014 8:08 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/7/2014 8:09 AM BY: GETTS, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
40190X14
40190REM



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- L12-2-1 PROPERTY IDENTIFICATION
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- 100-YEAR FLOODPLAIN BOUNDARY
- 992 EXISTING CONTOUR
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- PROPOSED TOP-OF-BANK LIMITS
- OUTFALLS
- STONE RETAINING WALL

NOTES:

1. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
2. ALL LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. APPROXIMATELY ONE MONTH PRIOR TO IMPLEMENTATION OF SEDIMENT REMOVAL ACTIVITIES, OR AT ANOTHER TIME AGREED UPON WITH EPA, GE AND EPA WILL CONDUCT A JOINT SITE WALK TO CONFIRM AND STAKE OUT THE TOP-OF-BANK LIMITS FOR THE PORTION OF UNKAMET BROOK LOCATED SOUTH OF MERRILL ROAD. THE REMEDIATION CONTRACTOR WILL SUBSEQUENTLY ESTABLISH SURVEY CONTROL FOR THE REQUIRED SEDIMENT REMOVAL ACTIVITIES BY SURVEYING THE AGREED-UPON TOP OF BANK LIMITS (AS WELL AS ANY NECESSARY TRANSECTS AND ADDITIONAL SURVEY CONTROL POINTS) THAT WILL BE USED TO DOCUMENT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES.

0 80' 160'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

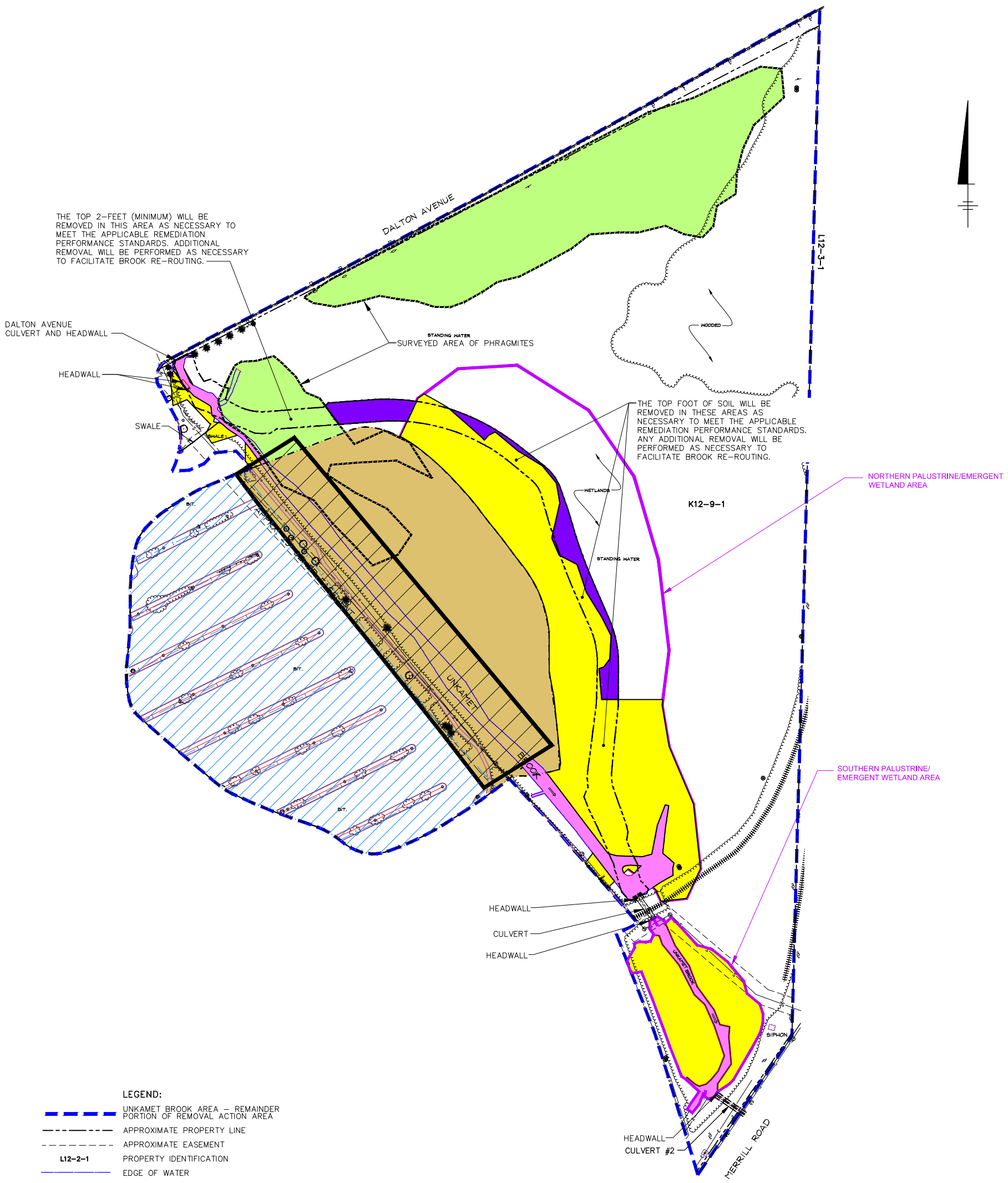
REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

TOP OF BANK LIMITS FOR SEDIMENT REMOVAL ACTIVITIES SOUTH OF MERRILL ROAD

ARCADIS

FIGURE
3-1

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B. DECLERCQ PM: C. AVERILL TM: M. DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190G4-1.DWG LAYOUT: 4-1 SAVED: 4/4/2014 9:11 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/4/2014 9:11 AM BY: POSENAUER, LISA
XREFS: IMAGES: PROJECTNAME: ----
40190X14
40190X00



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-006-CX101-M(REV 12-2-08) AND GW-1110-009-CX101-M(REV 1-8-09) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.

0 80' 160'
GRAPHIC SCALE

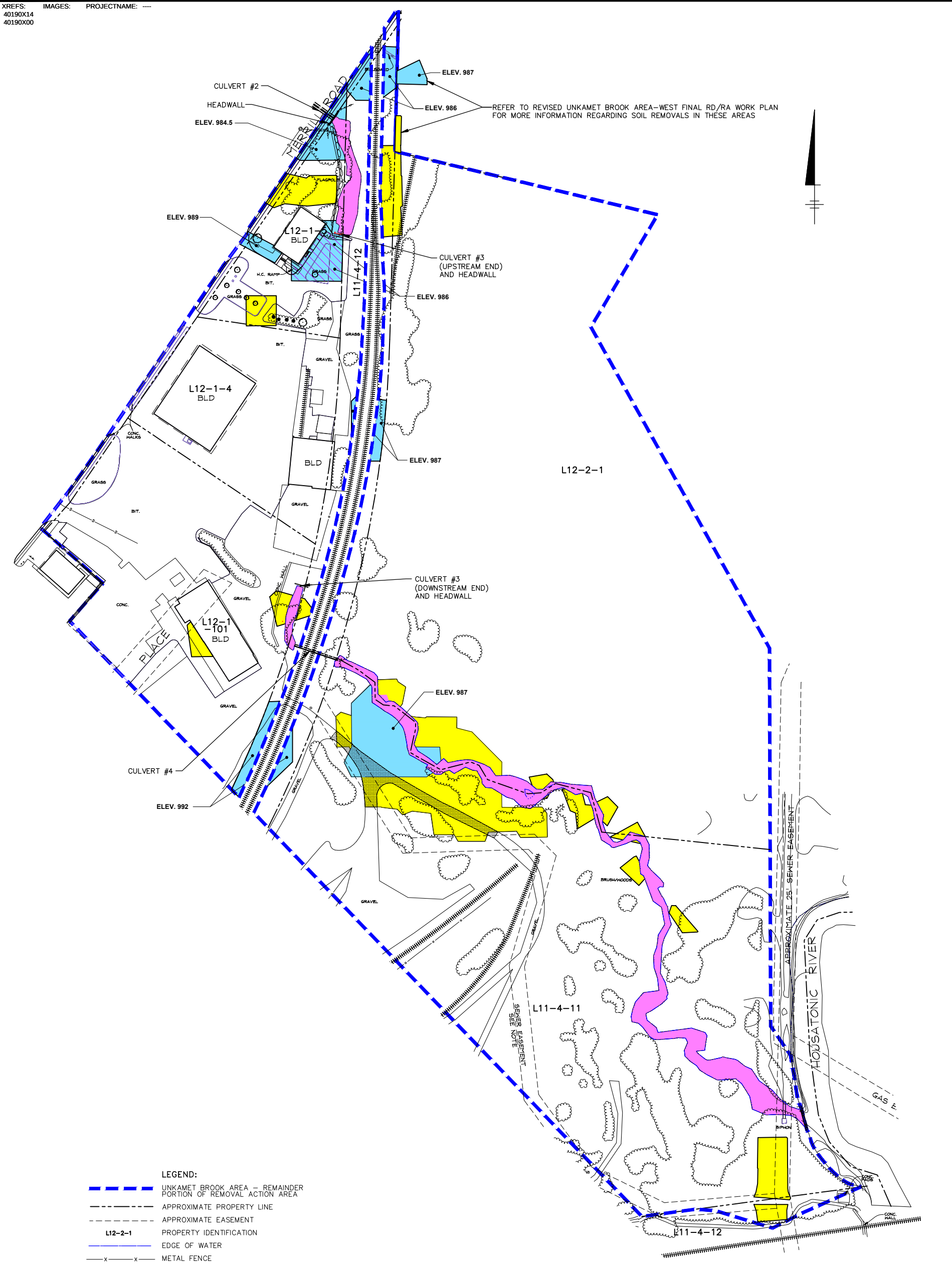
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER

LIMITS OF SOIL/SEDIMENT REMOVAL AND ENGINEERED BARRIER INSTALLATION (PROPERTIES NORTH OF MERRILL ROAD)

ARCADIS

FIGURE
4-1

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B. DECLERCQ PM: C. AVERILL TM: M. DALEY
G:\GE\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190G4-2.DWG LAYOUT: 4-2 SAVED: 4/9/2014 11:33 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/9/2014 11:34 AM BY: GETTS, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
40190X14
40190X00



LEGEND:

- UNKAMET BROOK AREA – REMAINDER PORTION OF REMOVAL ACTION AREA
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- METAL FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- LANDFILL
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- BUILDING/STRUCTURE
- TEMPORARY GRAVEL COVER MATERIALS PLACED IN 2013 (TO BE REMOVED PRIOR TO SOIL EXCAVATION AND STOCKPILED/ SAMPLED FOR POTENTIAL REUSE)
- 1-FOOT SOIL REMOVAL
- 1-FOOT BROOK SEDIMENT REMOVAL
- SOIL REMOVAL TO ELEVATION
- ELEV. 987 BOTTOM ELEVATION OF EXCAVATION
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER
- STONE RETAINING WALL

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-006-CX101-M(REV 12-2-08) AND GW-1110-009-CX101-M(REV 1-8-09) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.

0 80' 160'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER

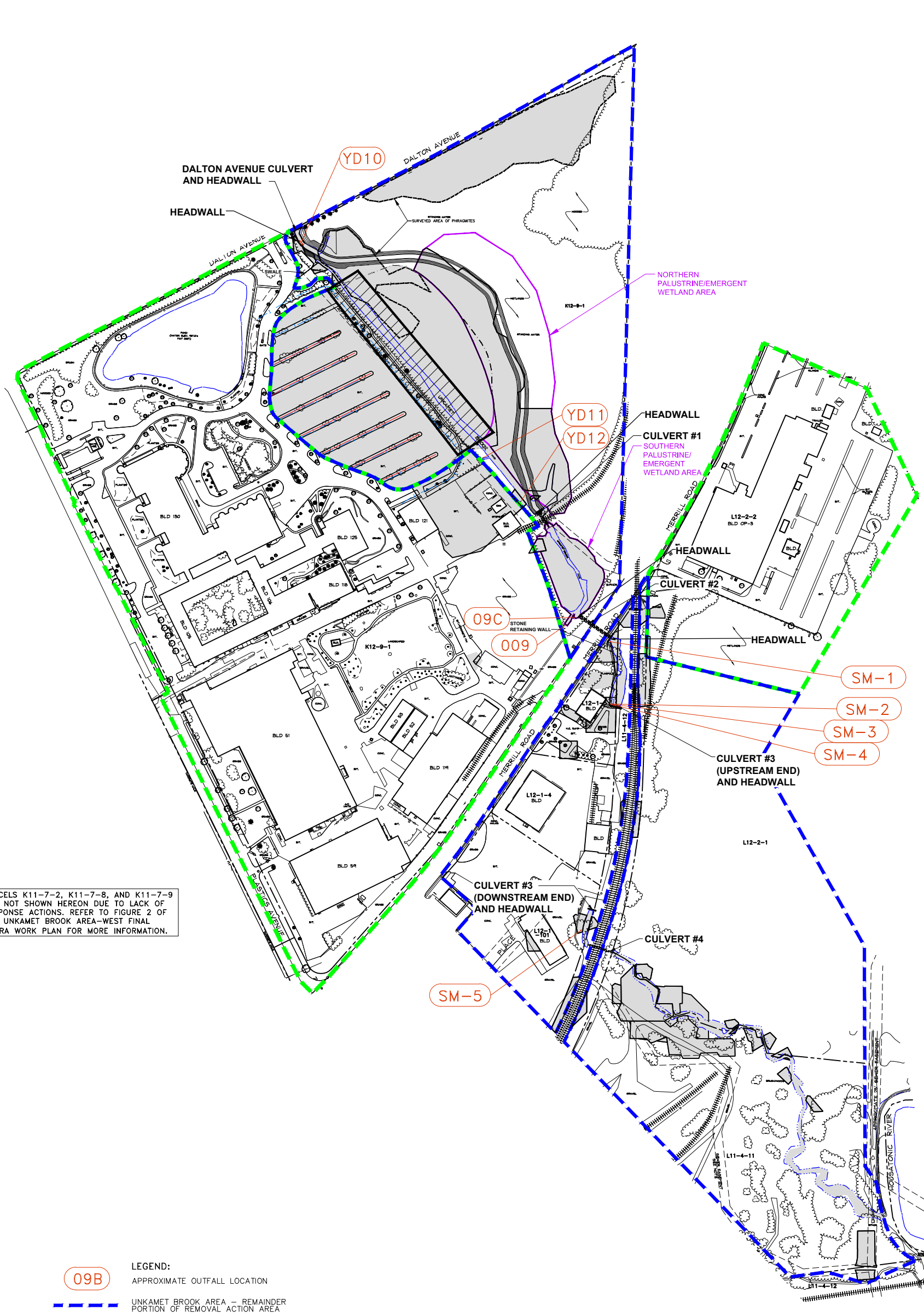
LIMITS OF SOIL/SEDIMENT REMOVAL AND ENGINEERED BARRIER INSTALLATION (PROPERTIES SOUTH OF MERRILL ROAD)

ARCADIS

FIGURE
4-2

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B. DECLERCQ PM: C. AVERILL TM: M. DALEY
G:\GE\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190G7-1.DWG LAYOUT: 7-1 SAVED: 4/8/2014 7:45 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/8/2014 7:46 AM BY: GETTS, BRIAN

XREFS: IMAGES: PROJECTNAME: ----
40190X14
40190X00



PARCELS K11-7-2, K11-7-8, AND K11-7-9 ARE NOT SHOWN HEREON DUE TO LACK OF RESPONSE ACTIONS. REFER TO FIGURE 2 OF THE UNKAMET BROOK AREA-WEST FINAL RD/RA WORK PLAN FOR MORE INFORMATION.

LEGEND:

- 09B — APPROXIMATE OUTFALL LOCATION
- UNKAMET BROOK AREA – REMAINDER PORTION OF REMOVAL ACTION AREA
- UNKAMET BROOK AREA – WEST PORTION OF REMOVAL ACTION AREA
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- METAL FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- LANDFILL
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- BUILDING/STRUCTURE
- LIMITS OF REMEDIATION ACTIVITIES (SEE FIGURES 4-1 AND 4-2)
- SECTION OF UNKAMET BROOK SUBJECT TO RE-ROUTING
- PROPOSED RE-ROUTED UNKAMET BROOK ALIGNMENT

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-006-CX101-M(REV 12-2-08) AND GW-1110-009-CX101-M(REV 1-8-09) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

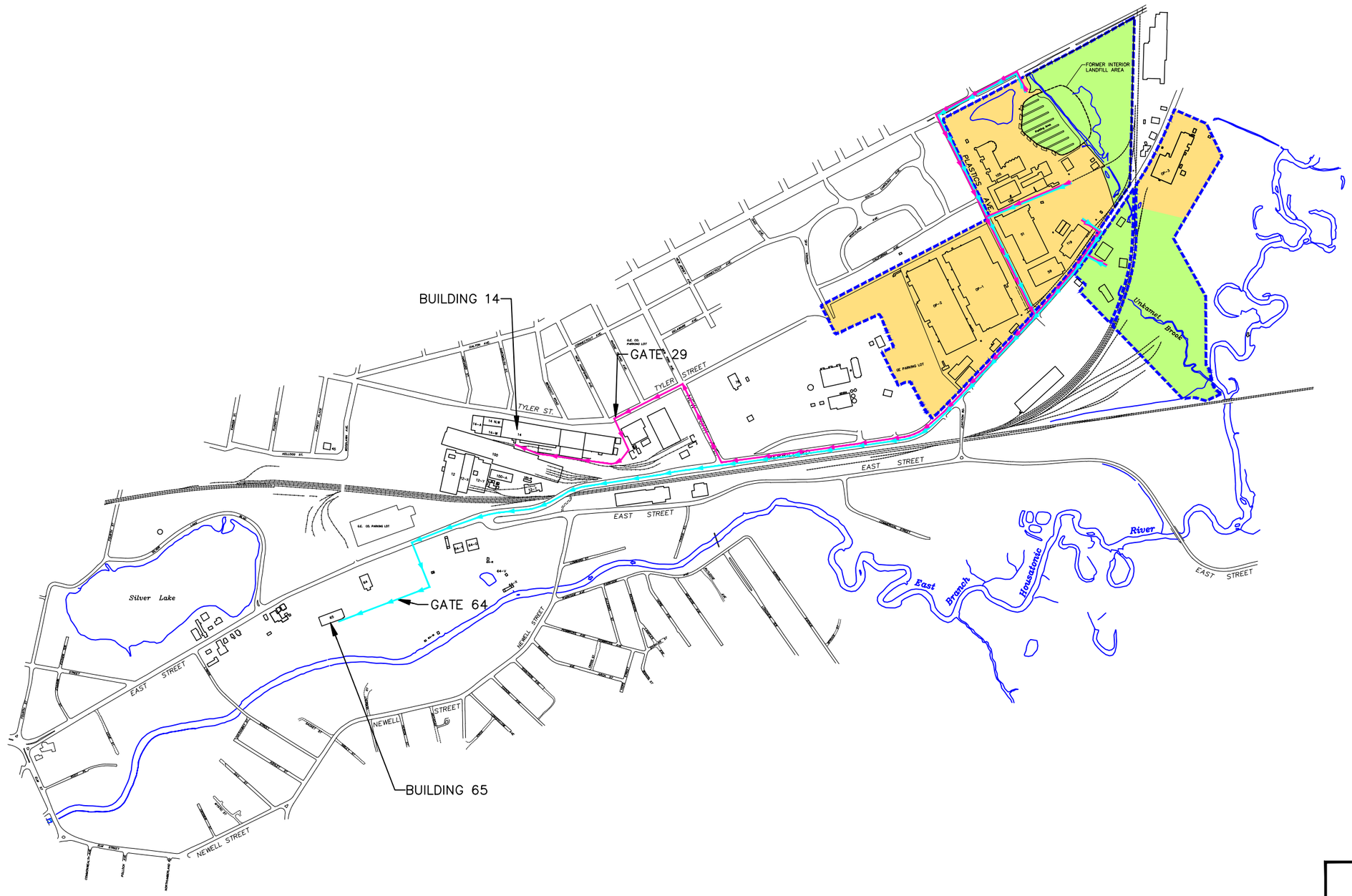
0 150' 300'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER

OUTFALL LOCATIONS ALONG UNKAMET BROOK

ARCADIS

FIGURE
7-1



LEGEND:

- APPROXIMATE REMOVAL ACTION AREA BOUNDARY
- UNKAMET BROOK AREA – WEST
- UNKAMET BROOK AREA – REMAINDER
- TRAFFIC ROUTE TO/FROM BUILDING 14 TEMPORARY STORAGE AREA
- TRAFFIC ROUTE TO/FROM BUILDING 65 TEMPORARY STORAGE AREA

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES ARE APPROXIMATE.

0 1000' 2000'

APPROXIMATE SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPOSED TRUCK ROUTES TO BUILDINGS 14 AND 65

ARCADIS

FIGURE
7-2

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD DB: DMW; A.Schilling, K.SARTORI PIC:(Opt) PM:C.AVERILL TM: M.DALEY LYR:(Opt)ON=*;OFF=*REF*
V:\ENVCAD\SYRACUSE\ACTIVN\B004019\0002\000061\DWG\FINAL-REMAINDER\40190G7-2.DWG LAYOUT: 7-2 SAVED: 4/2/2014 5:23 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/2/2014 5:23 PM BY: SARTORI, KATHERINE
XREFS: IMAGES: PROJECTNAME: ----
40190XBL

ARCADIS
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General Electric Company
Pittsfield, Massachusetts

Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder

Volume II of II

April 2014

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Appendix A

Revised Evaluations for
Parcel L12-1-5

TABLE A-1
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 1-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P13	528,528A,1737,1737A	47	0 - 0.5	0.176	0.87	0.18	0.15
RAA10-E-Q13	532,1752,1753	360	0 - 0.5	2.28	6.67	2.28	15.20
RAA10-E-R12	388,389,1397,1398	1,023	0 - 0.5	60.5	18.94	60.50	1,145.88
RAA10-E-R13	1769,1770	83	0 - 0.5	13.3	1.54	13.30	20.48
RAA10-E-S11	537,537A,1784,1784A,1785,1785A	1,277	0 - 0.5	16	23.64	16.00	378.30
RAA10-E-S12	1405, 1405A	1,979	0 - 0.5	15	36.65	15.00	549.76
RAA10-E-S13	538,1786,1787,1787A	144	0 - 0.5	7.9	2.67	7.90	21.12
RAA10-E-T10	539,1803,1804	868	0 - 0.5	140	16.08	140.00	2,251.30
RAA10-E-T11	283,1132,1133	1,744	0 - 0.5	730	32.29	730.00	23,574.54
RAA10-E-T12	540,1805	2,397	0 - 0.5	250	44.39	250.00	11,097.64
RAA10-E-T13	391,1413,1414	358	0 - 0.5	89	6.63	89.00	590.48
RAA10-E-U10	247,247A,1039,1039A,1040,1040A	1,738	0 - 0.5	84	32.19	84.00	2,704.29
RAA10-E-U11	1821	1,481	0 - 0.5	9.3	27.43	9.30	255.10
RAA10-E-U12	393,393A,1424,1424A,1425,1425A	1,322	0 - 0.5	4	24.47	4.00	97.89
RAA10-E-U13	1822,1822A,1823	42	0 - 0.5	12.6	0.78	12.60	9.81
RAA10-E-V9	315,315A,1232,1233	1,190	0 - 0.5	8	22.03	8.00	176.27
RAA10-E-V10	284,284A,1136,1136A,1136B	2,400	0 - 0.5	5.3	44.44	5.30	235.54
RAA10-E-V11	541,542,543,1836,1836A,1837,1837A	1,355	0 - 0.5	7.5	25.10	7.50	188.26
RAA10-E-V12	394,395,1431,1432,1433	2,080	0 - 0.5	18.7	38.52	18.70	720.41
RAA10-E-V13	544	360	0 - 0.5	2.5	6.67	2.50	16.68
RAA10-E-W9	316,316A,317,318,318A,319,319A,1237,1237A,1238,1238A	2,406	0 - 0.5	4.3	44.56	4.30	191.59
RAA10-E-W10	264,264A,1085,1086	2,375	0 - 0.5	0.277	43.99	0.28	12.18
RAA10-E-W11	546,546A,546B,1849,1850,1851,1851A	2,094	0 - 0.5	1	38.77	1.00	38.77
RAA10-E-W12	396,397,397A,397B,1439,1440,1440A	2,524	0 - 0.5	14	46.75	14.00	654.47
RAA10-E-W13	547,547A	436	0 - 0.5	0.54	8.07	0.54	4.36
RAA10-E-X8	266,266A,1087,1088	1,417	0 - 0.5	65	26.25	65.00	1,706.19
RAA10-E-X9	553,1869	2,160	0 - 0.5	4	40.00	4.00	160.02
RAA10-E-X10	550,550A,1862,1863	2,471	0 - 0.5	162	45.76	162.00	7,413.51
RAA10-E-X11	285,286,1139	2,477	0 - 0.5	34	45.88	34.00	1,559.82
RAA10-E-X12	551,1864	2,506	0 - 0.5	10.9	46.41	10.90	505.82
RAA10-E-X13	398,1446	373	0 - 0.5	58	6.90	58.00	400.26
RAA10-E-Y10	555	79	0 - 0.5	1.44	1.47	1.44	2.12
RAA10-E-Y11	401,1453	409	0 - 0.5	96	7.58	96.00	727.35
RAA10-E-Y12	1876	767	0 - 0.5	13.7	14.20	13.70	194.50
RAA10-E-Y13	1055	128	0 - 0.5	41	2.38	41.00	97.51
UE2060	1932,1934	8	0 - 0.5	56	0.15	56.00	8.30
UE2272	411,568,1501,1502,1503	666	0 - 0.5	20	12.33	20.00	246.64
UW2060	576,577,2012,2012A	864	0 - 0.5	13	16.00	13.00	207.98
UW2110	414,1529	160	0 - 0.5	15	2.97	15.00	44.53
UW2160	578,1805A,2013,2014	360	0 - 0.5	65	6.66	65.00	433.17
UW2210	323,323A,1279,1279A,1280,1280A	822	0 - 0.5	11	15.23	11.00	167.53
UW2272	579,580,581,1939,2016,2017	520	0 - 0.5	23	9.63	23.00	221.57
Totals:	--	48,274	--	--	893.96	--	59,047.27
					Volume Weighted Average:		**66.05**

0.5- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P13	518,518A,1640,1640A	47	0.5 - 1	0.176	0.87	0.18	0.15
RAA10-E-Q13	522,523,1656,1657	772	0.5 - 1	2.28	14.29	2.28	32.59
RAA10-E-R12	374,375,376,1334,1335	1,740	0.5 - 1	60.5	32.22	60.50	1,949.35
RAA10-E-R13	1673,1674,1675	394	0.5 - 1	13.3	7.29	13.30	96.97
RAA10-E-S11	529,529A,1690,1690A,1691,1691A	1,277	0.5 - 1	16	23.64	16.00	378.30
RAA10-E-S12	378,1343,1343A	2,216	0.5 - 1	15	41.04	15.00	615.61
RAA10-E-S13	530,530A,1692,1692A,1693,1693A	711	0.5 - 1	7.9	13.17	7.90	104.03
RAA10-E-T10	531,1709,1710	868	0.5 - 1	140	16.08	140.00	2,251.30
RAA10-E-T11	269,1094,1095	1,744	0.5 - 1	730	32.29	730.00	23,574.54
RAA10-E-T12	532,1712	2,435	0.5 - 1	250	45.09	250.00	11,272.72
RAA10-E-T13	379,1351,1352	599	0.5 - 1	89	11.10	89.00	987.82
RAA10-E-U10	238,238A,1014,1014A,1015,1015A	1,738	0.5 - 1	84	32.19	84.00	2,704.29
RAA10-E-U11	1728	1,481	0.5 - 1	9.3	27.43	9.30	255.10
RAA10-E-U12	380,382,383,383A,1362,1362A,1362B	1,743	0.5 - 1	4	32.28	4.00	129.13
RAA10-E-U13	1729,1730,1730A,1731	120	0.5 - 1	12.6	2.21	12.60	27.89
RAA10-E-V9	302,302A,1189,1190	1,190	0.5 - 1	8	22.03	8.00	176.28
RAA10-E-V10	270,270A,1098,1098A,1098B	2,400	0.5 - 1	5.3	44.44	5.30	235.54

TABLE A-1
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 1-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0.5- TO 1-FOOT DEPTH INCREMENT (continued)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V11	534,535,536,1745,1745A,1746,1746A	1,355	0.5 - 1	7.5	25.10	7.50	188.26
RAA10-E-V12	384,386,1368,1369,1370,1371,1372	2,340	0.5 - 1	18.7	43.33	18.70	810.28
RAA10-E-V13	537,1747	479	0.5 - 1	2.5	8.88	2.50	22.19
RAA10-E-W9	303,303A,304,305,305A,306,306A,1195,1195A,1196,1196A	2,406	0.5 - 1	4.3	44.56	4.30	191.59
RAA10-E-W10	253,253A,1053,1054	2,375	0.5 - 1	0.277	43.99	0.28	12.18
RAA10-E-W11	540,540A,540B,1762,1763,1764,1764A	2,094	0.5 - 1	1	38.77	1.00	38.77
RAA10-E-W12	387,388,388A,388B,1378,1379,1379A	2,524	0.5 - 1	14	46.75	14.00	654.47
RAA10-E-W13	541,541A	436	0.5 - 1	0.54	8.07	0.54	4.36
RAA10-E-X8	255,255A,1055,1056	1,417	0.5 - 1	65	26.25	65.00	1,706.19
RAA10-E-X9	547,1783	2,160	0.5 - 1	4	40.00	4.00	160.02
RAA10-E-X10	544,544A,1776,1777	2,471	0.5 - 1	162	45.76	162.00	7,413.44
RAA10-E-X11	271,272,1101	2,477	0.5 - 1	34	45.88	34.00	1,559.82
RAA10-E-X12	545,1778	2,506	0.5 - 1	10.9	46.41	10.90	505.82
RAA10-E-X13	389,1386	373	0.5 - 1	58	6.90	58.00	400.25
RAA10-E-Y10	550	79	0.5 - 1	1.44	1.47	1.44	2.12
RAA10-E-Y11	392,1394	409	0.5 - 1	96	7.58	96.00	727.35
RAA10-E-Y12	1790	767	0.5 - 1	13.7	14.20	13.70	194.54
RAA10-E-Y13	1027	128	0.5 - 1	41	2.38	41.00	97.50
Totals:	--	48,274	--	--	893.95	--	59,480.75
					Volume Weighted Average:		**66.54**

SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	48,274	--	--	1,787.92	--	118,528.02
					Volume Weighted Average:		**66.29**

Notes:

1. Polygon ID and area based on information shown on Figures A-1 and A-2.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE A-2
EXISTING CONDITIONS
PARCEL L12-1-5: 1- TO 6-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	228	24	1 - 2	1,300	0.90	1,300.00	1,165.63
RAA10-E-R12	243	5,271	1 - 2	230	195.21	230.00	44,897.79
RAA10-E-T10	254	4,215	1 - 2	185	156.12	185.00	28,882.68
RAA10-E-T12	67	6,942	1 - 2	161	257.10	161.00	41,393.58
RAA10-E-V10	265,265A,265B	8,239	1 - 2	1,080	305.15	1,080.00	329,562.00
RAA10-E-V12	138	5,976	1 - 2	30.3	221.35	30.30	6,706.79
RAA10-E-X8	147	3,555	1 - 2	6.65	131.68	6.65	875.64
RAA10-E-X10	274	7,577	1 - 2	48.4	280.62	48.40	13,582.17
RAA10-E-X12	144	7,350	1 - 2	42	272.22	42.00	11,433.15
Totals:	--	49,149	--	--	1,820.34	--	478,499.43
					Volume Weighted Average:		**262.86**

2- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	233	24	2 - 3	1,300	0.90	1,300.00	1,165.63
RAA10-E-R12	248	5,271	2 - 3	230	195.21	230.00	44,897.79
RAA10-E-T10	260	4,215	2 - 3	185	156.12	185.00	28,882.68
RAA10-E-T12	72	6,942	2 - 3	161	257.10	161.00	41,393.58
RAA10-E-V10	271,271A,271B	8,239	2 - 3	1,080	305.15	1,080.00	329,562.00
RAA10-E-V12	142	5,976	2 - 3	30.3	221.35	30.30	6,706.79
RAA10-E-X8	151	3,555	2 - 3	6.65	131.68	6.65	875.64
RAA10-E-X10	280	7,577	2 - 3	48.4	280.62	48.40	13,582.17
RAA10-E-X12	148	7,350	2 - 3	42	272.22	42.00	11,433.15
Totals:	--	49,149	--	--	1,820.34	--	478,499.43
					Volume Weighted Average:		**262.86**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	34	24	3 - 4	640	0.90	640.00	573.85
RAA10-E-R12	123	5,271	3 - 4	1,800	195.21	1,800.00	351,374.00
RAA10-E-T10	68	4,215	3 - 4	3.8	156.12	3.80	593.27
RAA10-E-T12	247	6,942	3 - 4	500	257.10	500.00	128,551.48
RAA10-E-V10	135	8,239	3 - 4	115	305.15	115.00	35,092.25
RAA10-E-V12	261	5,976	3 - 4	2,100	221.35	2,100.00	464,827.22
RAA10-E-X8	274	3,555	3 - 4	0.021	131.68	0.02	2.77
RAA10-E-X10	139	7,577	3 - 4	0.43	280.62	0.43	120.67
RAA10-E-X12	270	7,350	3 - 4	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	983,966.57
					Volume Weighted Average:		**540.54**

TABLE A-2
EXISTING CONDITIONS
PARCEL L12-1-5: 1- TO 6-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	4 - 5	640	0.90	640.00	573.85
RAA10-E-R12	242	5,271	4 - 5	1,800	195.21	1,800.00	351,374.00
RAA10-E-T10	254	4,215	4 - 5	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	4 - 5	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	4 - 5	115	305.15	115.00	35,092.25
RAA10-E-V12	131	5,976	4 - 5	2,100	221.35	2,100.00	464,827.22
RAA10-E-X8	140	3,555	4 - 5	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	4 - 5	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	4 - 5	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	983,966.57
					Volume Weighted Average:		**540.54**

5- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	5 - 6	640	0.90	640.00	573.85
RAA10-E-R12	242	5,271	5 - 6	1,800	195.21	1,800.00	351,374.00
RAA10-E-T10	254	4,215	5 - 6	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	5 - 6	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	5 - 6	115	305.15	115.00	35,092.25
RAA10-E-V12	131	5,976	5 - 6	2,100	221.35	2,100.00	464,827.22
RAA10-E-X8	140	3,555	5 - 6	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	5 - 6	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	5 - 6	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	983,966.57
					Volume Weighted Average:		**540.54**

SUMMARY - 1- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	49,149	--	--	9,101.72	--	3,908,898.57
					Volume Weighted Average:		**429.47**

Notes:

1. Polygon ID and area based on information shown on Figures A-3 to A-6.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE A-3
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT (TABLE A-1)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	48,274	--	--	1,787.92	--	118,528.02
					Volume Weighted Average:		**66.29**

SUMMARY - 1- TO 6-FOOT DEPTH INCREMENT (TABLE A-2)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	49,149	--	--	9,101.72	--	3,908,898.57
					Volume Weighted Average:		**429.47**

6- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	228	24	6 - 7	4.9	0.90	4.90	4.39
RAA10-E-R12	243	5,271	6 - 7	21.0	195.21	21.00	4,099.36
RAA10-E-T10	254	4,215	6 - 7	0.255	156.12	0.26	39.81
RAA10-E-T12	67	6,942	6 - 7	342	257.10	342.00	87,929.21
RAA10-E-V10	265	8,239	6 - 7	1.38	305.15	1.38	421.11
RAA10-E-V12	138, 138A	5,976	6 - 7	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	147	3,555	6 - 7	**0.021**	131.68	0.02	2.77
RAA10-E-X10	274	7,577	6 - 7	4.6	280.62	4.60	1,290.87
RAA10-E-X12	144	7,350	6 - 7	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

7- TO 8-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	64	24	7 - 8	4.9	0.90	4.90	4.39
RAA10-E-R12	121	5,271	7 - 8	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	7 - 8	0.255	156.12	0.26	39.81
RAA10-E-T12	242	6,942	7 - 8	342	257.10	342.00	87,929.21
RAA10-E-V10	133	8,239	7 - 8	1.38	305.15	1.38	421.11
RAA10-E-V12	256,256A	5,976	7 - 8	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	269	3,555	7 - 8	**0.021**	131.68	0.02	2.77
RAA10-E-X10	137	7,577	7 - 8	4.6	280.62	4.60	1,290.87
RAA10-E-X12	265	7,350	7 - 8	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

TABLE A-3
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

8- TO 9-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	63	24	8 - 9	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	8 - 9	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	8 - 9	0.255	156.12	0.26	39.81
RAA10-E-T12	244	6,942	8 - 9	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	8 - 9	1.38	305.15	1.38	421.11
RAA10-E-V12	258,258A	5,976	8 - 9	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	138	3,555	8 - 9	**0.021**	131.67	0.02	2.77
RAA10-E-X10	266	7,577	8 - 9	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	8 - 9	10.19	272.20	10.19	2,773.76
Totals:	--	49,149	--	--	1,820.33	--	450,716.09
					Volume Weighted Average:		**247.60**

9- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	63	24	9 - 10	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	9 - 10	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	9 - 10	0.255	156.12	0.26	39.81
RAA10-E-T12	244	6,942	9 - 10	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	9 - 10	1.38	305.15	1.38	421.11
RAA10-E-V12	258,258A	5,976	9 - 10	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	138	3,555	9 - 10	**0.021**	131.68	0.02	2.77
RAA10-E-X10	266	7,577	9 - 10	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	9 - 10	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

10- TO 11-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	62	24	10 - 11	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	10 - 11	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	10 - 11	0.255	156.12	0.26	39.81
RAA10-E-T12	241	6,942	10 - 11	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	10 - 11	1.38	305.15	1.38	421.11
RAA10-E-V12	255,255A	5,976	10 - 11	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	138	3,555	10 - 11	**0.021**	131.68	0.02	2.77
RAA10-E-X10	263	7,577	10 - 11	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	10 - 11	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

TABLE A-3
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

11- TO 12-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	62	24	11 - 12	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	11 - 12	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	11 - 12	0.255	156.12	0.26	39.81
RAA10-E-T12	241	6,942	11 - 12	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	11 - 12	1.38	305.15	1.38	421.11
RAA10-E-V12	255,255A	5,976	11 - 12	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	138	3,555	11 - 12	**0.021**	131.68	0.02	2.77
RAA10-E-X10	263	7,577	11 - 12	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	11 - 12	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

12- TO 13-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	12 - 13	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	12 - 13	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	12 - 13	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	12 - 13	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	12 - 13	1.38	305.15	1.38	421.11
RAA10-E-V12	127,127A	5,976	12 - 13	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	264	3,555	12 - 13	**0.021**	131.68	0.02	2.77
RAA10-E-X10	40	7,577	12 - 13	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	12 - 13	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

13- TO 14-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	13 - 14	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	13 - 14	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	13 - 14	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	13 - 14	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	13 - 14	1.38	305.15	1.38	421.11
RAA10-E-V12	127,127A	5,976	13 - 14	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	264	3,555	13 - 14	**0.021**	131.68	0.02	2.77
RAA10-E-X10	40	7,577	13 - 14	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	13 - 14	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

TABLE A-3
EXISTING CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

14- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	14 - 15	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	14 - 15	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	14 - 15	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	14 - 15	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	14 - 15	1.38	305.15	1.38	421.11
RAA10-E-V12	127,127A	5,976	14 - 15	1,600	221.35	1,600.00	354,154.81
RAA10-E-X8	264	3,555	14 - 15	**0.021**	131.68	0.02	2.77
RAA10-E-X10	39	7,577	14 - 15	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	14 - 15	10.19	272.22	10.19	2,773.90
Totals:	--	49,149	--	--	1,820.34	--	450,716.23
					Volume Weighted Average:		**247.60**

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	49,070	--	--	27,272.71	--	8,083,872.56
					Volume Weighted Average:		**296.41**

Notes:

1. Polygon ID and area based on information shown on Figures A-7 to A-11.
2. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
3. For instances where a duplicate sample was available, the average of the samples was included in table.
4. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-T12 4-6 10/06/04	RAA10-E-T12 6-15 10/06/04	RAA10-E-T12 8-10 10/06/04
Volatile Organics							
1,1,1,2-Tetrachloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,1,1-Trichloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,1,2,2-Tetrachloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,1,2-Trichloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,1-Dichloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,1-Dichloroethene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,2,3-Trichloropropane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,2-Dibromo-3-chloropropane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,2-Dibromoethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,2-Dichloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,2-Dichloropropane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
1,4-Dioxane		ND(0.12) J	ND(0.11) J	NA	ND(0.12) J	NA	ND(0.13) J
2-Butanone		ND(0.012)	ND(0.011)	NA	ND(0.012)	NA	ND(0.013)
2-Chloro-1,3-butadiene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
2-Chloroethylvinylether		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
2-Hexanone		ND(0.012)	ND(0.011)	NA	ND(0.012)	NA	ND(0.013)
3-Chloropropene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
4-Methyl-2-pentanone		ND(0.012)	ND(0.011)	NA	ND(0.012)	NA	ND(0.013)
Acetone		0.022 J	0.011 J	NA	0.013 J	NA	0.016 J
Acetonitrile		ND(0.12)	ND(0.11) J	NA	ND(0.12) J	NA	ND(0.13) J
Acrolein		ND(0.12) J	ND(0.11) J	NA	ND(0.12) J	NA	ND(0.13) J
Acrylonitrile		ND(0.0058) J	ND(0.0056) J	NA	ND(0.0058) J	NA	ND(0.0066) J
Benzene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Bromodichloromethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Bromoform		ND(0.0058)	ND(0.0056)	NA	ND(0.0058) J	NA	ND(0.0066) J
Bromomethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Carbon Disulfide		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Carbon Tetrachloride		ND(0.0058) J	ND(0.0056) J	NA	ND(0.0058) J	NA	ND(0.0066) J
Chlorobenzene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	0.0084
Chloroethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Chloroform		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Chloromethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
cis-1,3-Dichloropropene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Dibromochloromethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Dibromomethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Dichlorodifluoromethane		ND(0.0058) J	ND(0.0056) J	NA	ND(0.0058) J	NA	ND(0.0066) J
Ethyl Methacrylate		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Ethylbenzene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Iodomethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Isobutanol		ND(0.12) J	ND(0.11) J	NA	ND(0.12) J	NA	ND(0.13) J
Methacrylonitrile		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Methyl Methacrylate		ND(0.0058) J	ND(0.0056) J	NA	ND(0.0058) J	NA	ND(0.0066) J
Methylene Chloride		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Propionitrile		ND(0.012)	ND(0.011)	NA	ND(0.012)	NA	ND(0.013)
Styrene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Tetrachloroethene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Toluene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
trans-1,2-Dichloroethene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
trans-1,3-Dichloropropene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058) J	NA	ND(0.0066) J
trans-1,4-Dichloro-2-butene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Trichloroethene		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Trichlorofluoromethane		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Vinyl Acetate		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Vinyl Chloride		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)
Xylenes (total)		ND(0.0058)	ND(0.0056)	NA	ND(0.0058)	NA	ND(0.0066)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-T12 4-6 10/06/04	RAA10-E-T12 6-15 10/06/04	RAA10-E-T12 8-10 10/06/04
Semivolatile Organics							
1,2,4,5-Tetrachlorobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
1,2,4-Trichlorobenzene		ND(0.38)	0.28 J	1.2	NA	3.9	NA
1,2-Dichlorobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
1,2-Diphenylhydrazine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
1,3,5-Trinitrobenzene		ND(0.38)	ND(0.37) J	ND(0.38) J	NA	ND(0.42)	NA
1,3-Dichlorobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	1.0	NA
1,3-Dinitrobenzene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
1,4-Dichlorobenzene		ND(0.38)	ND(0.37)	0.12 J	NA	5.1	NA
1,4-Naphthoquinone		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
1-Naphthylamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
2,3,4,6-Tetrachlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,4,5-Trichlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,4,6-Trichlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,4-Dichlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,4-Dimethylphenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,4-Dinitrophenol		ND(2.0)	ND(1.9)	ND(2.0)	NA	ND(2.1)	NA
2,4-Dinitrotoluene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,6-Dichlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2,6-Dinitrotoluene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2-Acetylaminofluorene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
2-Chloronaphthalene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2-Chlorophenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2-Methylnaphthalene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2-Methylphenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
2-Naphthylamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
2-Nitroaniline		ND(2.0)	ND(1.9)	ND(2.0)	NA	ND(2.1)	NA
2-Nitrophenol		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
2-Picoline		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
3&4-Methylphenol		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
3,3'-Dichlorobenzidine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84) J	NA
3,3'-Dimethylbenzidine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
3-Methylcholanthrene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
3-Nitroaniline		ND(2.0)	ND(1.9)	ND(2.0)	NA	ND(2.1)	NA
4,6-Dinitro-2-methylphenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
4-Aminobiphenyl		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
4-Bromophenyl-phenylether		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
4-Chloro-3-Methylphenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
4-Chloroaniline		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
4-Chlorobenzilate		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
4-Chlorophenyl-phenylether		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
4-Nitroaniline		ND(2.0)	ND(1.9)	ND(2.0)	NA	ND(2.1)	NA
4-Nitrophenol		ND(2.0) J	ND(1.9) J	ND(2.0) J	NA	ND(2.1) J	NA
4-Nitroquinoline-1-oxide		ND(0.77) J	ND(0.75) J	ND(0.77) J	NA	ND(0.84) J	NA
4-Phenylenediamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
5-Nitro-o-toluidine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
7,12-Dimethylbenz(a)anthracene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
a,a'-Dimethylphenethylamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84) J	NA
Acenaphthene		0.082 J	ND(0.37)	0.31 J	NA	5.4	NA
Acenaphthylene		ND(0.38)	0.11 J	0.11 J	NA	0.13 J	NA
Acetophenone		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Aniline		ND(0.38)	0.13 J	ND(0.38)	NA	1.5	NA
Anthracene		0.12 J	0.19 J	0.79	NA	ND(0.42)	NA
Aramite		ND(0.77)	ND(0.75) J	ND(0.77) J	NA	ND(0.84)	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-T12 4-6 10/06/04	RAA10-E-T12 6-15 10/06/04	RAA10-E-T12 8-10 10/06/04
Semivolatile Organics (continued)							
Benzidine		ND(0.77) J	ND(0.75) J	ND(0.77) J	NA	ND(0.84) J	NA
Benzo(a)anthracene		0.28 J	0.36 J	0.99	NA	0.41 J	NA
Benzo(a)pyrene		0.20 J	0.28 J	0.56	NA	0.25 J	NA
Benzo(b)fluoranthene		0.14 J	0.17 J	0.35 J	NA	0.14 J	NA
Benzo(g,h,i)perylene		0.11 J	0.21 J	0.34 J	NA	0.16 J	NA
Benzo(k)fluoranthene		0.22 J	0.34 J	0.65	NA	0.40 J	NA
Benzyl Alcohol		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
bis(2-Chloroethoxy)methane		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
bis(2-Chloroethyl)ether		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
bis(2-Chloroisopropyl)ether		ND(0.38) J	ND(0.37) J	ND(0.38) J	NA	ND(0.42) J	NA
bis(2-Ethylhexyl)phthalate		ND(0.38)	ND(0.37)	0.22 J	NA	0.28 J	NA
Butylbenzylphthalate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Chrysene		0.34 J	0.46	1.0	NA	0.57	NA
Diallate		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Dibenzo(a,h)anthracene		ND(0.38)	ND(0.37)	0.10 J	NA	ND(0.42)	NA
Dibenzofuran		ND(0.38)	ND(0.37)	0.17 J	NA	ND(0.42)	NA
Diethylphthalate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Dimethylphthalate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Di-n-Butylphthalate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Di-n-Octylphthalate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Diphenylamine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Ethyl Methanesulfonate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Fluoranthene		0.76	0.86	2.5	NA	0.52	NA
Fluorene		ND(0.38)	ND(0.37)	0.31 J	NA	ND(0.42)	NA
Hexachlorobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Hexachlorobutadiene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Hexachlorocyclopentadiene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Hexachloroethane		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Hexachlorophene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Hexachloropropene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Indeno(1,2,3-cd)pyrene		0.091 J	0.14 J	0.30 J	NA	0.14 J	NA
Isodrin		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Isophorone		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Isosafrole		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Methapyrilene		ND(0.77) J	ND(0.75) J	ND(0.77) J	NA	ND(0.84)	NA
Methyl Methanesulfonate		ND(0.38)	ND(0.37) J	ND(0.38) J	NA	ND(0.42) J	NA
Naphthalene		ND(0.38)	ND(0.37)	0.11 J	NA	0.13 J	NA
Nitrobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosodiethylamine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosodimethylamine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitroso-di-n-butylamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
N-Nitroso-di-n-propylamine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosodiphenylamine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosomethylethylamine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
N-Nitrosomorpholine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosopiperidine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
N-Nitrosopyrrolidine		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
o,o,o-Triethylphosphorothioate		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42) J	NA
o-Toluidine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
p-Dimethylaminoazobenzene		ND(0.77) J	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Pentachlorobenzene		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Pentachloroethane		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Pentachloronitrobenzene		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Pentachlorophenol		ND(2.0)	ND(1.9)	ND(2.0)	NA	ND(2.1)	NA
Phenacetin		ND(0.77)	ND(0.75)	ND(0.77)	NA	ND(0.84)	NA
Phenanthrene		0.50	0.45	2.2	NA	0.18 J	NA
Phenol		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Pronamide		ND(0.38) J	ND(0.37) J	ND(0.38) J	NA	ND(0.42) J	NA
Pyrene		0.61	0.72	1.9	NA	0.89	NA
Pyridine		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Safrole		ND(0.38) J	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA
Thionazin		ND(0.38)	ND(0.37)	ND(0.38)	NA	ND(0.42)	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-T12 4-6 10/06/04	RAA10-E-T12 6-15 10/06/04	RAA10-E-T12 8-10 10/06/04
Furans						
2,3,7,8-TCDF	0.00020 Y	0.0014 EJ	0.0032 EJ	NA	0.0020 EJ	NA
TCDFs (total)	0.0022 I	0.012 I	0.028 QI	NA	0.022 I	NA
1,2,3,7,8-PeCDF	0.00017	0.00094	0.0025 EJ	NA	0.00095	NA
2,3,4,7,8-PeCDF	0.00026	0.0016	0.0033 EJ	NA	0.0018	NA
PeCDFs (total)	0.0025 I	0.015	0.030	NA	0.020 QI	NA
1,2,3,4,7,8-HxCDF	0.00054	0.0026 EJ	0.0069 EJ	NA	0.0037 EJ	NA
1,2,3,6,7,8-HxCDF	0.00033	0.0017	0.0038 EJ	NA	0.0020	NA
1,2,3,7,8,9-HxCDF	0.000072	0.00035	0.0011	NA	0.00062	NA
2,3,4,6,7,8-HxCDF	0.00017	0.0013	0.0022	NA	0.0011	NA
HxCDFs (total)	0.0026	0.018	0.031	NA	0.017 Q	NA
1,2,3,4,6,7,8-HpCDF	0.00054	0.0034 EJ	0.0067 EJ	NA	0.0042 EJ	NA
1,2,3,4,7,8,9-HpCDF	0.00015	0.00084	0.0022	NA	0.0013	NA
HpCDFs (total)	0.00096	0.0066	0.013	NA	0.0078	NA
OCDF	0.00040	0.0029	0.0072 EJ	NA	0.0037	NA
Dioxins						
2,3,7,8-TCDD	0.0000012 J	0.000010	0.000019	NA	0.000018	NA
TCDDs (total)	0.000030	0.00030	0.00068	NA	0.00054	NA
1,2,3,7,8-PeCDD	0.0000050 J	0.000056	0.00012	NA	0.000060	NA
PeCDDs (total)	0.000073	0.00067	0.0017 Q	NA	0.0011 Q	NA
1,2,3,4,7,8-HxCDD	0.0000046 J	0.000063	0.000082	NA	0.000060	NA
1,2,3,6,7,8-HxCDD	0.0000083	0.000088	0.00016	NA	0.000088	NA
1,2,3,7,8,9-HxCDD	ND(0.0000072) X	0.000073	0.00014	NA	0.000079	NA
HxCDDs (total)	0.000099	0.0012	0.0021	NA	0.0014	NA
1,2,3,4,6,7,8-HpCDD	0.000054	0.00087	0.00074	NA	0.00056	NA
HpCDDs (total)	0.00012	0.0023	0.0017	NA	0.0012	NA
OCDD	0.00027	0.0084 EJ	0.0021	NA	0.0018	NA
Total TEQs (WHO TEFs)	0.00029	0.0017	0.0038	NA	0.0021	NA
Inorganics						
Antimony	ND(6.00)	5.90 B	8.80	NA	9.00	NA
Arsenic	3.90	6.20	5.80	NA	11.0	NA
Barium	24.0	53.0	78.0	NA	71.0	NA
Beryllium	0.160 B	0.170 B	0.170 B	NA	0.140 B	NA
Cadmium	0.230 B	0.820	1.20	NA	1.40	NA
Chromium	5.80	12.0	19.0	NA	22.0	NA
Cobalt	5.40	7.30	7.10	NA	7.40	NA
Copper	28.0	290	460	NA	350	NA
Lead	24.0	230	320	NA	330	NA
Mercury	0.0560 B	4.00	4.20	NA	5.40	NA
Nickel	8.80	16.0	22.0	NA	20.0	NA
Selenium	1.00 J	1.50 J	1.10 J	NA	1.10 J	NA
Silver	0.140 B	0.340 B	0.140 B	NA	3.00	NA
Thallium	ND(1.20) J	ND(1.10) J	1.50 J	NA	ND(1.20) J	NA
Tin	ND(10)	24.0	30.0	NA	30.0	NA
Vanadium	6.60	7.80	9.30	NA	9.00	NA
Zinc	43.0	240	410	NA	410	NA
Cyanide	0.0990 B	0.110 B	0.200	NA	0.170	NA
Sulfide	ND(5.80)	27.0	18.0	NA	62.0	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04
Volatile Organics						
1,1,1,2-Tetrachloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,1,1-Trichloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,1,2,2-Tetrachloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,1,2-Trichloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,1-Dichloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,1-Dichloroethene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,2,3-Trichloropropane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,2-Dibromo-3-chloropropane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,2-Dibromoethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,2-Dichloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,2-Dichloropropane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
1,4-Dioxane		ND(0.12)	ND(0.11) J	ND(0.12)	0.076 J	ND(0.11) J
2-Butanone		ND(0.012)	ND(0.011)	ND(0.012)	ND(0.010)	ND(0.011)
2-Chloro-1,3-butadiene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
2-Chloroethylvinylether		ND(0.0058) J	ND(0.0055)	ND(0.0060) J	ND(0.0052) J	ND(0.0056)
2-Hexanone		ND(0.012)	ND(0.011)	ND(0.012)	ND(0.010)	ND(0.011)
3-Chloropropene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
4-Methyl-2-pentanone		ND(0.012)	ND(0.011)	ND(0.012)	ND(0.010)	ND(0.011)
Acetone		ND(0.023)	0.018 J	ND(0.024) J	ND(0.021) J	ND(0.022)
Acetonitrile		ND(0.12)	ND(0.11)	ND(0.12)	ND(0.10)	ND(0.11)
Acrolein		ND(0.12) J	ND(0.11) J	ND(0.12) J	ND(0.10) J	ND(0.11) J
Acrylonitrile		ND(0.0058)	ND(0.0055) J	ND(0.0060)	ND(0.0052)	ND(0.0056)
Benzene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Bromodichloromethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Bromoform		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056) J
Bromomethane		ND(0.0058)	ND(0.0055)	ND(0.0060) J	ND(0.0052) J	ND(0.0056)
Carbon Disulfide		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Carbon Tetrachloride		ND(0.0058)	ND(0.0055) J	ND(0.0060)	ND(0.0052)	ND(0.0056) J
Chlorobenzene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Chloroethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Chloroform		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Chloromethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
cis-1,3-Dichloropropene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Dibromochloromethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Dibromomethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Dichlorodifluoromethane		ND(0.0058)	ND(0.0055) J	ND(0.0060)	ND(0.0052)	ND(0.0056)
Ethyl Methacrylate		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Ethylbenzene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Iodomethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Isobutanol		ND(0.12) J	ND(0.11) J	ND(0.12) J	ND(0.10) J	ND(0.11) J
Methacrylonitrile		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Methyl Methacrylate		ND(0.0058)	ND(0.0055) J	ND(0.0060)	ND(0.0052)	ND(0.0056)
Methylene Chloride		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Propionitrile		ND(0.012)	ND(0.011)	ND(0.012)	ND(0.010)	ND(0.011)
Styrene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Tetrachloroethene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Toluene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
trans-1,2-Dichloroethene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
trans-1,3-Dichloropropene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
trans-1,4-Dichloro-2-butene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Trichloroethene		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Trichlorofluoromethane		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Vinyl Acetate		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Vinyl Chloride		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)
Xylenes (total)		ND(0.0058)	ND(0.0055)	ND(0.0060)	ND(0.0052)	ND(0.0056)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04
Semivolatile Organics						
1,2,4,5-Tetrachlorobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
1,2,4-Trichlorobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	4.7
1,2-Dichlorobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
1,2-Diphenylhydrazine		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
1,3,5-Trinitrobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37) J
1,3-Dichlorobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
1,3-Dinitrobenzene		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
1,4-Dichlorobenzene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
1,4-Naphthoquinone		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74) J
1-Naphthylamine		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
2,3,4,6-Tetrachlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37) J
2,4,5-Trichlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2,4,6-Trichlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2,4-Dichlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2,4-Dimethylphenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2,4-Dinitrophenol		ND(2.0)	ND(1.8)	ND(2.0)	ND(1.8)	ND(1.9)
2,4-Dinitrotoluene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2,6-Dichlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37) J
2,6-Dinitrotoluene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2-Acetylaminofluorene		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
2-Chloronaphthalene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2-Chlorophenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2-Methylnaphthalene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2-Methylphenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
2-Naphthylamine		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
2-Nitroaniline		ND(2.0)	ND(1.8)	ND(2.0)	ND(1.8)	ND(1.9)
2-Nitrophenol		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
2-Picoline		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
3&4-Methylphenol		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
3,3'-Dichlorobenzidine		ND(0.77) J	ND(0.73)	ND(0.80) J	ND(0.70) J	ND(0.74)
3,3'-Dimethylbenzidine		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
3-Methylcholanthrene		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
3-Nitroaniline		ND(2.0)	ND(1.8)	ND(2.0)	ND(1.8)	ND(1.9)
4,6-Dinitro-2-methylphenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
4-Aminobiphenyl		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
4-Bromophenyl-phenylether		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
4-Chloro-3-Methylphenol		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
4-Chloroaniline		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
4-Chlorobenzilate		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
4-Chlorophenyl-phenylether		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
4-Nitroaniline		ND(2.0)	ND(1.8)	ND(2.0)	ND(1.8)	ND(1.9)
4-Nitrophenol		ND(2.0) J	ND(1.8) J	ND(2.0) J	ND(1.8) J	ND(1.9) J
4-Nitroquinoline-1-oxide		ND(0.77) J	ND(0.73) J	ND(0.80) J	ND(0.70) J	ND(0.74) J
4-Phenylenediamine		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
5-Nitro-o-toluidine		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
7,12-Dimethylbenz(a)anthracene		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
a,a'-Dimethylphenethylamine		ND(0.77) J	ND(0.73)	ND(0.80) J	ND(0.70) J	ND(0.74)
Acenaphthene		ND(0.38)	0.23 J	ND(0.40)	ND(0.35)	ND(0.37)
Acenaphthylene		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Acetophenone		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Aniline		ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	1.1
Anthracene		ND(0.38)	0.60	ND(0.40)	ND(0.35)	0.099 J
Aramite		ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:				
	RAA10-E-U10 / 0-1 / 10/11/04	RAA10-E-U12 / 0-1 / 10/07/04	RAA10-E-W9 / 0-1 / 10/11/04	RAA10-E-W11 / 0-1 / 10/11/04	RAA10-E-X10 / 0-1 / 09/30/04
Semivolatile Organics (continued)					
Benzidine	ND(0.77) J	ND(0.73) J	ND(0.80) J	ND(0.70) J	ND(0.74)
Benzo(a)anthracene	0.13 J	0.63	ND(0.40)	ND(0.35)	0.20 J
Benzo(a)pyrene	0.13 J	0.36 J	ND(0.40)	ND(0.35)	0.16 J
Benzo(b)fluoranthene	ND(0.38)	0.27 J	ND(0.40)	ND(0.35)	0.12 J
Benzo(g,h,i)perylene	ND(0.38)	0.18 J	ND(0.40)	ND(0.35)	0.14 J
Benzo(k)fluoranthene	0.17 J	0.39	ND(0.40)	ND(0.35)	0.19 J
Benzyl Alcohol	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
bis(2-Chloroethoxy)methane	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
bis(2-Chloroethyl)ether	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
bis(2-Chloroisopropyl)ether	ND(0.38) J	ND(0.36) J	ND(0.40) J	ND(0.35) J	ND(0.37) J
bis(2-Ethylhexyl)phthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.34)	ND(0.37)
Butylbenzylphthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Chrysene	0.20 J	0.66	0.10 J	ND(0.35)	0.27 J
Diallate	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
Dibenzo(a,h)anthracene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Dibenzofuran	ND(0.38)	0.14 J	ND(0.40)	ND(0.35)	ND(0.37)
Diethylphthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Dimethylphthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Di-n-Butylphthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Di-n-Octylphthalate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Diphenylamine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Ethyl Methanesulfonate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Fluoranthene	0.26 J	1.8	0.24 J	ND(0.35)	0.40
Fluorene	ND(0.38)	0.25 J	ND(0.40)	ND(0.35)	ND(0.37)
Hexachlorobenzene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Hexachlorobutadiene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Hexachlorocyclopentadiene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Hexachloroethane	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Hexachlorophene	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
Hexachloropropene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Indeno(1,2,3-cd)pyrene	ND(0.38)	0.16 J	ND(0.40)	ND(0.35)	0.10 J
Isodrin	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Isophorone	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Isosafrole	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
Methapyrilene	ND(0.77)	ND(0.73) J	ND(0.80)	ND(0.70)	ND(0.74)
Methyl Methanesulfonate	ND(0.38) J	ND(0.36)	ND(0.40) J	ND(0.35) J	ND(0.37)
Naphthalene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Nitrobenzene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosodiethylamine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosodimethylamine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitroso-di-n-butylamine	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
N-Nitroso-di-n-propylamine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosodiphenylamine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosomethylethylamine	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74) J
N-Nitrosomorpholine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosopiperidine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
N-Nitrosopyrrolidine	ND(0.77) J	ND(0.73)	ND(0.80) J	ND(0.70) J	ND(0.74)
o,o,o-Triethylphosphorothioate	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
o-Toluidine	ND(0.38) J	ND(0.36)	ND(0.40) J	ND(0.35) J	ND(0.37)
p-Dimethylaminoazobenzene	ND(0.77)	ND(0.73) J	ND(0.80)	ND(0.70)	ND(0.74)
Pentachlorobenzene	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Pentachloroethane	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Pentachloronitrobenzene	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
Pentachlorophenol	ND(2.0)	ND(1.8)	ND(2.0)	ND(1.8)	ND(1.9)
Phenacetin	ND(0.77)	ND(0.73)	ND(0.80)	ND(0.70)	ND(0.74)
Phenanthrene	0.10 J	1.8	0.14 J	ND(0.35)	0.26 J
Phenol	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	0.10 J
Pronamide	ND(0.38) J	ND(0.36) J	ND(0.40) J	ND(0.35) J	ND(0.37) J
Pyrene	0.24 J	1.3	0.21 J	ND(0.35)	0.36 J
Pyridine	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)
Safrole	ND(0.38) J	ND(0.36) J	ND(0.40) J	ND(0.35) J	ND(0.37)
Thionazin	ND(0.38)	ND(0.36)	ND(0.40)	ND(0.35)	ND(0.37)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04
Furans						
2,3,7,8-TCDF		0.00044 Y	0.000034 Y	0.000013 Y	0.0000057 Y	0.0016 YE
TCDFs (total)		0.0053 I	0.00034	0.00013	0.000058	0.015 I
1,2,3,7,8-PeCDF		0.00037	0.000031	0.000016	0.0000039 J	0.0010
2,3,4,7,8-PeCDF		0.00066	0.000046	0.000015	0.0000068	0.0016
PeCDFs (total)		0.0062	0.00044	0.00026	0.000062	0.015 Q
1,2,3,4,7,8-HxCDF		0.0012	0.000088	ND(0.000016) X	0.000012	0.0030 E
1,2,3,6,7,8-HxCDF		0.00073	0.000058	0.000010	0.0000073	0.0016
1,2,3,7,8,9-HxCDF		0.00014	0.000011	0.0000040 J	0.0000013 J	0.00033
2,3,4,6,7,8-HxCDF		0.00034	0.000023	0.000010	0.0000033 J	0.00089
HxCDFs (total)		0.0057	0.00040	0.00016	0.000052	0.014
1,2,3,4,6,7,8-HpCDF		0.0010	0.000076	0.000036	0.000016	0.0034 E
1,2,3,4,7,8,9-HpCDF		0.00030	0.000020	0.0000046 J	0.0000023 J	0.00076
HpCDFs (total)		0.0019	0.00014	0.000073	0.000023	0.0056
OCDF		0.00096	0.000066	0.000041	0.0000094 J	0.0029
Dioxins						
2,3,7,8-TCDD		0.0000025	ND(0.00000054) X	ND(0.00000047)	ND(0.00000060)	0.000011
TCDDs (total)		0.000077	0.0000013 J	ND(0.00000069)	ND(0.00000060)	0.00026
1,2,3,7,8-PeCDD		ND(0.000010) X	ND(0.00000063)	ND(0.0000014)	ND(0.00000055)	ND(0.000051) X
PeCDDs (total)		0.00012	0.0000064 Q	0.0000022 J	ND(0.00000055)	0.00046
1,2,3,4,7,8-HxCDD		0.0000091	0.00000077 J	ND(0.0000016)	ND(0.00000094)	0.000043
1,2,3,6,7,8-HxCDD		0.000018	0.0000021 J	ND(0.0000030) X	ND(0.00000083)	0.000071
1,2,3,7,8,9-HxCDD		0.000015	0.0000016 J	ND(0.0000016)	ND(0.00000091)	0.000062
HxCDDs (total)		0.00024	0.000024	0.0000070	0.0000033 J	0.0010
1,2,3,4,6,7,8-HpCDD		0.00011	0.000019	0.000019	0.0000018 J	0.00034
HpCDDs (total)		0.00025	0.000058	0.000037	0.0000038 J	0.00071
OCDD		0.00048	0.00013	0.00018	0.000010	0.00096
Total TEQs (WHO TEFs)		0.00066	0.000048	0.000015	0.0000075	0.0017
Inorganics						
Antimony		1.50 B	ND(6.00)	ND(6.00)	ND(6.00)	85.0 J
Arsenic		3.10	3.70	4.40	1.60 J	6.20
Barium		36.0	23.0	32.0	8.80 B	74.0
Beryllium		0.210 B	0.180 B	0.220 B	0.0760 B	0.190 B
Cadmium		0.430 B	0.160 B	0.140 B	ND(0.500)	1.30
Chromium		12.0	5.20	8.30	2.60	11.0
Cobalt		5.50	5.00	4.50 B	3.20 B	7.10
Copper		120	36.0	14.0	7.10	1100
Lead		100	20.0	38.0	2.70	290
Mercury		0.160	0.0560 B	0.250	ND(0.100)	16.0
Nickel		11.0	9.80	7.80	5.30	17.0
Selenium		1.10 J	1.20 J	0.700 J	ND(1.00)	ND(1.00) J
Silver		ND(1.0)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)
Thallium		1.00 B	ND(1.10) J	ND(1.20)	ND(1.00)	ND(1.10) J
Tin		ND(10)	ND(10)	ND(10)	ND(10)	870
Vanadium		8.30	7.60	8.50	2.60 B	9.40
Zinc		140	35.0	49.0	15.0	350 J
Cyanide		0.270	0.120	0.130	ND(0.210)	ND(0.11)
Sulfide		7.40	7.00	5.70 B	5.00 B	ND(5.60) J

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-X10 3-6 09/30/04	RAA10-E-X10 4-6 09/30/04	RAA10-E-X10 6-15 09/30/04	RAA10-E-X10 10-12 09/30/04	RAA10-E-X12 0-1 09/30/04
Volatile Organics					
1,1,1,2-Tetrachloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,1,1-Trichloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,1,2,2-Tetrachloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,1,2-Trichloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,1-Dichloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,1-Dichloroethene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,2,3-Trichloropropane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,2-Dibromo-3-chloropropane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,2-Dibromoethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,2-Dichloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,2-Dichloropropane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
1,4-Dioxane	NA	ND(0.11) J	NA	ND(0.12) J	ND(0.11) J
2-Butanone	NA	ND(0.011)	NA	ND(0.012)	ND(0.011)
2-Chloro-1,3-butadiene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
2-Chloroethylvinylether	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
2-Hexanone	NA	ND(0.011)	NA	ND(0.012)	ND(0.011)
3-Chloropropene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
4-Methyl-2-pentanone	NA	ND(0.011)	NA	ND(0.012)	ND(0.011)
Acetone	NA	ND(0.022)	NA	ND(0.024)	ND(0.022)
Acetonitrile	NA	ND(0.11)	NA	ND(0.12)	ND(0.11)
Acrolein	NA	ND(0.11) J	NA	ND(0.12) J	ND(0.11) J
Acrylonitrile	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Benzene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Bromodichloromethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Bromoform	NA	ND(0.0056) J	NA	ND(0.0060) J	ND(0.0055) J
Bromomethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Carbon Disulfide	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Carbon Tetrachloride	NA	ND(0.0056) J	NA	ND(0.0060) J	ND(0.0055) J
Chlorobenzene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Chloroethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Chloroform	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Chloromethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
cis-1,3-Dichloropropene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Dibromochloromethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Dibromomethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Dichlorodifluoromethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Ethyl Methacrylate	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Ethylbenzene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Iodomethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Isobutanol	NA	ND(0.11) J	NA	ND(0.12) J	ND(0.11) J
Methacrylonitrile	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Methyl Methacrylate	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Methylene Chloride	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Propionitrile	NA	ND(0.011)	NA	ND(0.012)	ND(0.011)
Styrene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Tetrachloroethene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Toluene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
trans-1,2-Dichloroethene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
trans-1,3-Dichloropropene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
trans-1,4-Dichloro-2-butene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Trichloroethene	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Trichlorofluoromethane	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Vinyl Acetate	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Vinyl Chloride	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)
Xylenes (total)	NA	ND(0.0056)	NA	ND(0.0060)	ND(0.0055)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-X10 3-6 09/30/04	RAA10-E-X10 4-6 09/30/04	RAA10-E-X10 6-15 09/30/04	RAA10-E-X10 10-12 09/30/04	RAA10-E-X12 0-1 09/30/04
Semivolatile Organics						
1,2,4,5-Tetrachlorobenzene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
1,2,4-Trichlorobenzene		ND(0.37)	NA	R	NA	ND(0.37)
1,2-Dichlorobenzene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
1,2-Diphenylhydrazine		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
1,3,5-Trinitrobenzene		ND(0.37)	NA	ND(0.46) J	NA	ND(0.37) J
1,3-Dichlorobenzene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
1,3-Dinitrobenzene		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
1,4-Dichlorobenzene		ND(0.37)	NA	R	NA	ND(0.37)
1,4-Naphthoquinone		ND(0.75)	NA	ND(0.93) J	NA	ND(0.74) J
1-Naphthylamine		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
2,3,4,6-Tetrachlorophenol		ND(0.37)	NA	ND(0.46) J	NA	ND(0.37) J
2,4,5-Trichlorophenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2,4,6-Trichlorophenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2,4-Dichlorophenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2,4-Dimethylphenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2,4-Dinitrophenol		ND(1.9)	NA	ND(2.4)	NA	ND(1.9)
2,4-Dinitrotoluene		ND(0.37)	NA	R	NA	ND(0.37)
2,6-Dichlorophenol		ND(0.37)	NA	ND(0.46) J	NA	ND(0.37) J
2,6-Dinitrotoluene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2-Acetylaminofluorene		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
2-Chloronaphthalene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2-Chlorophenol		ND(0.37)	NA	ND(0.46) J	NA	ND(0.37)
2-Methylnaphthalene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2-Methylphenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
2-Naphthylamine		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
2-Nitroaniline		ND(1.9)	NA	ND(2.4)	NA	ND(1.9)
2-Nitrophenol		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
2-Picoline		ND(0.37) J	NA	ND(0.46)	NA	ND(0.37)
3&4-Methylphenol		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
3,3'-Dichlorobenzidine		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
3,3'-Dimethylbenzidine		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
3-Methylcholanthrene		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
3-Nitroaniline		ND(1.9)	NA	ND(2.4)	NA	ND(1.9)
4,6-Dinitro-2-methylphenol		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
4-Aminobiphenyl		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
4-Bromophenyl-phenylether		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
4-Chloro-3-Methylphenol		ND(0.37)	NA	ND(0.46) J	NA	ND(0.37)
4-Chloroaniline		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
4-Chlorobenzilate		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
4-Chlorophenyl-phenylether		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
4-Nitroaniline		ND(1.9)	NA	ND(2.4)	NA	ND(1.9)
4-Nitrophenol		ND(1.9) J	NA	R	NA	ND(1.9) J
4-Nitroquinoline-1-oxide		ND(0.75) J	NA	ND(0.93) J	NA	ND(0.74) J
4-Phenylenediamine		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
5-Nitro-o-toluidine		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
7,12-Dimethylbenz(a)anthracene		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
a,a'-Dimethylphenethylamine		ND(0.75) J	NA	ND(0.93)	NA	ND(0.74)
Acenaphthene		ND(0.37)	NA	R	NA	ND(0.37)
Acenaphthylene		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Acetophenone		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Aniline		ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Anthracene		0.083 J	NA	ND(0.46)	NA	0.12 J
Aramite		ND(0.75)	NA	ND(0.93)	NA	ND(0.74)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-X10 3-6 09/30/04	RAA10-E-X10 4-6 09/30/04	RAA10-E-X10 6-15 09/30/04	RAA10-E-X10 10-12 09/30/04	RAA10-E-X12 0-1 09/30/04
Semivolatile Organics (continued)					
Benzidine	ND(0.75) J	NA	ND(0.93)	NA	ND(0.74)
Benzo(a)anthracene	0.16 J	NA	ND(0.46)	NA	0.092 J
Benzo(a)pyrene	0.12 J	NA	ND(0.46)	NA	ND(0.37)
Benzo(b)fluoranthene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Benzo(g,h,i)perylene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Benzo(k)fluoranthene	ND(0.37)	NA	ND(0.46)	NA	0.090 J
Benzyl Alcohol	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
bis(2-Chloroethoxy)methane	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
bis(2-Chloroethyl)ether	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
bis(2-Chloroisopropyl)ether	ND(0.37)	NA	ND(0.46) J	NA	ND(0.37) J
bis(2-Ethylhexyl)phthalate	0.30 J	NA	ND(0.46)	NA	ND(0.36)
Butylbenzylphthalate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Chrysene	0.17 J	NA	ND(0.46)	NA	0.11 J
Diallate	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Dibenzo(a,h)anthracene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Dibenzofuran	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Diethylphthalate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Dimethylphthalate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Di-n-Butylphthalate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Di-n-Octylphthalate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Diphenylamine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Ethyl Methanesulfonate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Fluoranthene	0.42	NA	0.12 J	NA	0.19 J
Fluorene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Hexachlorobenzene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Hexachlorobutadiene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Hexachlorocyclopentadiene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Hexachloroethane	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Hexachlorophene	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Hexachloropropene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Indeno(1,2,3-cd)pyrene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Isodrin	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Isophorone	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Isosafrole	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Methapyrilene	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Methyl Methanesulfonate	ND(0.37) J	NA	ND(0.46)	NA	ND(0.37)
Naphthalene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Nitrobenzene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitrosodiethylamine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitrosodimethylamine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitroso-di-n-butylamine	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
N-Nitroso-di-n-propylamine	ND(0.37)	NA	R	NA	ND(0.37)
N-Nitrosodiphenylamine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitrosomethylethylamine	ND(0.75)	NA	ND(0.93) J	NA	ND(0.74) J
N-Nitrosomorpholine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitrosopiperidine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
N-Nitrosopyrrolidine	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
o,o,o-Triethylphosphorothioate	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
o-Toluidine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
p-Dimethylaminoazobenzene	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Pentachlorobenzene	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Pentachloroethane	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Pentachloronitrobenzene	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Pentachlorophenol	ND(1.9)	NA	ND(2.4) J	NA	ND(1.9)
Phenacetin	ND(0.75)	NA	ND(0.93)	NA	ND(0.74)
Phenanthrene	0.27 J	NA	ND(0.46)	NA	0.11 J
Phenol	ND(0.37)	NA	ND(0.46) J	NA	ND(0.37)
Pronamide	ND(0.37) J	NA	ND(0.46) J	NA	ND(0.37) J
Pyrene	0.34 J	NA	0.13 J	NA	0.16 J
Pyridine	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Safrole	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)
Thionazin	ND(0.37)	NA	ND(0.46)	NA	ND(0.37)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-X10 3-6 09/30/04	RAA10-E-X10 4-6 09/30/04	RAA10-E-X10 6-15 09/30/04	RAA10-E-X10 10-12 09/30/04	RAA10-E-X12 0-1 09/30/04
Furans						
2,3,7,8-TCDF		0.000023 Y	NA	0.000032 Y	NA	0.000013 Y
TCDFs (total)		0.00020 QI	NA	0.00029	NA	0.00011
1,2,3,7,8-PeCDF		0.000012	NA	0.000019	NA	0.000011
2,3,4,7,8-PeCDF		0.000022	NA	0.000044	NA	0.000019
PeCDFs (total)		0.00020	NA	0.00040	NA	0.00023
1,2,3,4,7,8-HxCDF		0.000042	NA	0.000072	NA	0.000025
1,2,3,6,7,8-HxCDF		0.000023	NA	0.000043	NA	0.000011
1,2,3,7,8,9-HxCDF		0.0000050 J	NA	0.000010	NA	0.0000045 J
2,3,4,6,7,8-HxCDF		0.000014	NA	0.000047	NA	0.000010
HxCDFs (total)		0.00019	NA	0.00067	NA	0.00016
1,2,3,4,6,7,8-HpCDF		0.000045	NA	0.00013	NA	0.000027
1,2,3,4,7,8,9-HpCDF		0.000013	NA	0.000030	NA	0.000011
HpCDFs (total)		0.000082	NA	0.00028	NA	0.000059
OCDF		0.000042	NA	0.00014	NA	0.000039
Dioxins						
2,3,7,8-TCDD		ND(0.00000062)	NA	ND(0.00000096)	NA	ND(0.00000087)
TCDDs (total)		0.0000015 J	NA	ND(0.00000096)	NA	ND(0.00000087)
1,2,3,7,8-PeCDD		0.0000013 J	NA	ND(0.0000017) X	NA	ND(0.0000013)
PeCDDs (total)		0.000014	NA	0.000014	NA	ND(0.0000013)
1,2,3,4,7,8-HxCDD		ND(0.0000025)	NA	ND(0.0000029)	NA	ND(0.0000019)
1,2,3,6,7,8-HxCDD		ND(0.0000022)	NA	0.0000028 J	NA	ND(0.0000017)
1,2,3,7,8,9-HxCDD		ND(0.0000024)	NA	ND(0.0000027)	NA	ND(0.0000019)
HxCDDs (total)		0.000012	NA	0.000030	NA	0.0000038 J
1,2,3,4,6,7,8-HpCDD		0.0000065	NA	0.000034	NA	0.0000061
HpCDDs (total)		0.000013	NA	0.000074	NA	0.000012
OCDD		0.000038	NA	0.00042	NA	0.000049
Total TEQs (WHO TEFs)		0.000025	NA	0.000047	NA	0.000018
Inorganics						
Antimony		ND(1.8) J	NA	ND(1.8) J	NA	ND(1.8) J
Arsenic		3.40	NA	3.70	NA	4.00
Barium		18.0 B	NA	32.0	NA	22.0
Beryllium		0.160 B	NA	0.310 B	NA	0.190 B
Cadmium		0.230 B	NA	0.320 B	NA	0.460 B
Chromium		4.50	NA	11.0	NA	7.70
Cobalt		5.20	NA	8.80	NA	6.80
Copper		100	NA	18.0	NA	16.0
Lead		14.0	NA	11.0	NA	25.0
Mercury		ND(0.110)	NA	ND(0.140)	NA	ND(0.110)
Nickel		8.70	NA	15.0	NA	12.0
Selenium		ND(1.00) J	NA	ND(1.00) J	NA	ND(1.00) J
Silver		ND(1.00)	NA	ND(1.00)	NA	ND(1.00)
Thallium		ND(1.10) J	NA	ND(1.40) J	NA	ND(1.10) J
Tin		ND(10)	NA	ND(10)	NA	ND(10)
Vanadium		4.30 B	NA	9.80	NA	5.70
Zinc		31.0 J	NA	77.0 J	NA	47.0 J
Cyanide		ND(0.220)	NA	ND(0.11)	NA	ND(0.220)
Sulfide		72.0 J	NA	73.0 J	NA	7.00 J

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-X12 1-3 09/30/04	RAA10-E-X12 6-15 09/30/04	RAA10-E-X12 8-10 09/30/04
Volatile Organics			
1,1,1,2-Tetrachloroethane	ND(0.0057)	NA	ND(0.031)
1,1,1-Trichloroethane	ND(0.0057)	NA	ND(0.031)
1,1,2,2-Tetrachloroethane	ND(0.0057)	NA	ND(0.031)
1,1,2-Trichloroethane	ND(0.0057)	NA	ND(0.031)
1,1-Dichloroethane	ND(0.0057)	NA	ND(0.031)
1,1-Dichloroethene	ND(0.0057)	NA	ND(0.031)
1,2,3-Trichloropropane	ND(0.0057)	NA	ND(0.031)
1,2-Dibromo-3-chloropropane	ND(0.0057)	NA	ND(0.031)
1,2-Dibromoethane	ND(0.0057)	NA	ND(0.031)
1,2-Dichloroethane	ND(0.0057)	NA	ND(0.031)
1,2-Dichloropropane	ND(0.0057)	NA	ND(0.031)
1,4-Dioxane	ND(0.11) J	NA	ND(0.31) J
2-Butanone	ND(0.011)	NA	ND(0.031)
2-Chloro-1,3-butadiene	ND(0.0057)	NA	ND(0.031)
2-Chloroethylvinylether	ND(0.0057)	NA	ND(0.031)
2-Hexanone	ND(0.011)	NA	ND(0.063)
3-Chloropropene	ND(0.0057)	NA	ND(0.031)
4-Methyl-2-pentanone	ND(0.011)	NA	ND(0.063)
Acetone	ND(0.023)	NA	ND(0.063)
Acetonitrile	ND(0.11)	NA	ND(0.63)
Acrolein	ND(0.11) J	NA	ND(0.63) J
Acrylonitrile	ND(0.0057)	NA	ND(0.031)
Benzene	ND(0.0057)	NA	0.097
Bromodichloromethane	ND(0.0057)	NA	ND(0.031)
Bromoform	ND(0.0057) J	NA	ND(0.031) J
Bromomethane	ND(0.0057)	NA	ND(0.031)
Carbon Disulfide	ND(0.0057)	NA	ND(0.031)
Carbon Tetrachloride	ND(0.0057) J	NA	ND(0.031) J
Chlorobenzene	ND(0.0057)	NA	0.20
Chloroethane	ND(0.0057)	NA	ND(0.031)
Chloroform	ND(0.0057)	NA	ND(0.031)
Chloromethane	ND(0.0057)	NA	ND(0.031)
cis-1,3-Dichloropropene	ND(0.0057)	NA	ND(0.031)
Dibromochloromethane	ND(0.0057)	NA	ND(0.031)
Dibromomethane	ND(0.0057)	NA	ND(0.031)
Dichlorodifluoromethane	ND(0.0057)	NA	ND(0.031)
Ethyl Methacrylate	ND(0.0057)	NA	ND(0.031)
Ethylbenzene	ND(0.0057)	NA	ND(0.031)
Iodomethane	ND(0.0057)	NA	ND(0.031)
Isobutanol	ND(0.11) J	NA	ND(0.63) J
Methacrylonitrile	ND(0.0057)	NA	ND(0.031)
Methyl Methacrylate	ND(0.0057)	NA	ND(0.031)
Methylene Chloride	ND(0.0057)	NA	ND(0.031)
Propionitrile	ND(0.011)	NA	ND(0.031)
Styrene	ND(0.0057)	NA	ND(0.031)
Tetrachloroethene	ND(0.0057)	NA	ND(0.031)
Toluene	ND(0.0057)	NA	ND(0.031)
trans-1,2-Dichloroethene	ND(0.0057)	NA	ND(0.031)
trans-1,3-Dichloropropene	ND(0.0057)	NA	ND(0.031)
trans-1,4-Dichloro-2-butene	ND(0.0057)	NA	ND(0.031)
Trichloroethene	ND(0.0057)	NA	ND(0.031)
Trichlorofluoromethane	ND(0.0057)	NA	ND(0.031)
Vinyl Acetate	ND(0.0057)	NA	ND(0.031)
Vinyl Chloride	ND(0.0057)	NA	ND(0.031)
Xylenes (total)	ND(0.0057)	NA	ND(0.031)

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-X12 1-3 09/30/04	RAA10-E-X12 6-15 09/30/04	RAA10-E-X12 8-10 09/30/04
Semivolatile Organics				
1,2,4,5-Tetrachlorobenzene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
1,2,4-Trichlorobenzene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
1,2-Dichlorobenzene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
1,2-Diphenylhydrazine		ND(0.38)	ND(0.45) [ND(0.48)]	NA
1,3,5-Trinitrobenzene		ND(0.38) J	ND(0.45) J [ND(0.48) J]	NA
1,3-Dichlorobenzene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
1,3-Dinitrobenzene		ND(0.76)	ND(0.90) [ND(0.97)]	NA
1,4-Dichlorobenzene		ND(0.38)	0.13 J [0.28 J]	NA
1,4-Naphthoquinone		ND(0.76) J	ND(0.90) J [ND(0.97) J]	NA
1-Naphthylamine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
2,3,4,6-Tetrachlorophenol		ND(0.38) J	ND(0.45) J [ND(0.48) J]	NA
2,4,5-Trichlorophenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2,4,6-Trichlorophenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2,4-Dichlorophenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2,4-Dimethylphenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2,4-Dinitrophenol		ND(1.9)	ND(2.3) [ND(2.5)]	NA
2,4-Dinitrotoluene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2,6-Dichlorophenol		ND(0.38) J	ND(0.45) J [ND(0.48) J]	NA
2,6-Dinitrotoluene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2-Acetylaminofluorene		ND(0.76)	ND(0.90) [ND(0.97)]	NA
2-Chloronaphthalene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2-Chlorophenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2-Methylnaphthalene		ND(0.38)	0.33 J [0.17 J]	NA
2-Methylphenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
2-Naphthylamine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
2-Nitroaniline		ND(1.9)	ND(2.3) [ND(2.5)]	NA
2-Nitrophenol		ND(0.76)	ND(0.90) [ND(0.97)]	NA
2-Picoline		ND(0.38)	ND(0.45) [ND(0.48)]	NA
3&4-Methylphenol		ND(0.76)	ND(0.90) [ND(0.97)]	NA
3,3'-Dichlorobenzidine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
3,3'-Dimethylbenzidine		ND(0.38)	ND(0.45) [ND(0.48)]	NA
3-Methylcholanthrene		ND(0.76)	ND(0.90) [ND(0.97)]	NA
3-Nitroaniline		ND(1.9)	ND(2.3) [ND(2.5)]	NA
4,6-Dinitro-2-methylphenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
4-Aminobiphenyl		ND(0.76)	ND(0.90) [ND(0.97)]	NA
4-Bromophenyl-phenylether		ND(0.38)	ND(0.45) [ND(0.48)]	NA
4-Chloro-3-Methylphenol		ND(0.38)	ND(0.45) [ND(0.48)]	NA
4-Chloroaniline		ND(0.38)	ND(0.45) [ND(0.48)]	NA
4-Chlorobenzilate		ND(0.76)	ND(0.90) [ND(0.97)]	NA
4-Chlorophenyl-phenylether		ND(0.38)	ND(0.45) [ND(0.48)]	NA
4-Nitroaniline		ND(1.9)	ND(2.3) [ND(2.5)]	NA
4-Nitrophenol		ND(1.9) J	ND(2.3) J [ND(2.5) J]	NA
4-Nitroquinoline-1-oxide		ND(0.76) J	ND(0.90) J [ND(0.97) J]	NA
4-Phenylenediamine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
5-Nitro-o-toluidine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
7,12-Dimethylbenz(a)anthracene		ND(0.76)	ND(0.90) [ND(0.97)]	NA
a,a'-Dimethylphenethylamine		ND(0.76)	ND(0.90) [ND(0.97)]	NA
Acenaphthene		ND(0.38)	ND(0.45) [ND(0.48)]	NA
Acenaphthylene		0.74	ND(0.45) [ND(0.48)]	NA
Acetophenone		ND(0.38)	ND(0.45) [ND(0.48)]	NA
Aniline		0.10 J	ND(0.45) [ND(0.48)]	NA
Anthracene		0.80	ND(0.45) [ND(0.48)]	NA
Aramite		ND(0.76)	ND(0.90) [ND(0.97)]	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: RAA10-E-X12 Sample Depth(Feet): 1-3 Date Collected: 09/30/04	RAA10-E-X12 6-15 09/30/04	RAA10-E-X12 8-10 09/30/04
Semivolatile Organics (continued)			
Benzidine	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Benzo(a)anthracene	1.8	0.11 J [0.10 J]	NA
Benzo(a)pyrene	1.5	0.15 J [ND(0.48)]	NA
Benzo(b)fluoranthene	1.6	ND(0.45) [ND(0.48)]	NA
Benzo(g,h,i)perylene	0.80	ND(0.45) [ND(0.48)]	NA
Benzo(k)fluoranthene	2.4	ND(0.45) [ND(0.48)]	NA
Benzyl Alcohol	ND(0.76)	ND(0.90) [ND(0.97)]	NA
bis(2-Chloroethoxy)methane	ND(0.38)	ND(0.45) [ND(0.48)]	NA
bis(2-Chloroethyl)ether	ND(0.38)	ND(0.45) [ND(0.48)]	NA
bis(2-Chloroisopropyl)ether	ND(0.38) J	ND(0.45) J [ND(0.48) J]	NA
bis(2-Ethylhexyl)phthalate	ND(0.38)	ND(0.44) [ND(0.48)]	NA
Butylbenzylphthalate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Chrysene	2.8	0.13 J [0.13 J]	NA
Diallate	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Dibenzo(a,h)anthracene	0.29 J	ND(0.45) [ND(0.48)]	NA
Dibenzofuran	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Diethylphthalate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Dimethylphthalate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Di-n-Butylphthalate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Di-n-Octylphthalate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Diphenylamine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Ethyl Methanesulfonate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Fluoranthene	2.2	0.18 J [0.24 J]	NA
Fluorene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Hexachlorobenzene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Hexachlorobutadiene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Hexachlorocyclopentadiene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Hexachloroethane	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Hexachlorophene	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Hexachloropropene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Indeno(1,2,3-cd)pyrene	0.75	ND(0.45) [ND(0.48)]	NA
Isodrin	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Isophorone	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Isosafrole	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Methapyrilene	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Methyl Methanesulfonate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Naphthalene	ND(0.38)	0.80 [0.36 J]	NA
Nitrobenzene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosodiethylamine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosodimethylamine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitroso-di-n-butylamine	ND(0.76)	ND(0.90) [ND(0.97)]	NA
N-Nitroso-di-n-propylamine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosodiphenylamine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosomethylethylamine	ND(0.76) J	ND(0.90) J [ND(0.97) J]	NA
N-Nitrosomorpholine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosopiperidine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
N-Nitrosopyrrolidine	ND(0.76)	ND(0.90) [ND(0.97)]	NA
o,o,o-Triethylphosphorothioate	ND(0.38)	ND(0.45) [ND(0.48)]	NA
o-Toluidine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
p-Dimethylaminoazobenzene	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Pentachlorobenzene	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Pentachloroethane	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Pentachloronitrobenzene	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Pentachlorophenol	ND(1.9)	ND(2.3) [ND(2.5)]	NA
Phenacetin	ND(0.76)	ND(0.90) [ND(0.97)]	NA
Phenanthrene	0.48	0.091 J [0.14 J]	NA
Phenol	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Pronamide	ND(0.38) J	ND(0.45) J [ND(0.48) J]	NA
Pyrene	2.6	0.15 J [0.19 J]	NA
Pyridine	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Safrole	ND(0.38)	ND(0.45) [ND(0.48)]	NA
Thionazin	ND(0.38)	ND(0.45) [ND(0.48)]	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-X12 1-3 09/30/04	RAA10-E-X12 6-15 09/30/04	RAA10-E-X12 8-10 09/30/04
Furans				
2,3,7,8-TCDF		0.000094 Y	0.0000042 Y [0.0000059 Y]	NA
TCDFs (total)		0.0011 QI	0.000024 [0.000031]	NA
1,2,3,7,8-PeCDF		0.000057	0.0000018 J [0.0000026 J]	NA
2,3,4,7,8-PeCDF		0.00020	0.0000047 J [0.0000055 J]	NA
PeCDFs (total)		0.0022 QI	0.000042 [0.000051]	NA
1,2,3,4,7,8-HxCDF		0.00019	0.0000078 [0.0000099]	NA
1,2,3,6,7,8-HxCDF		0.00011	0.0000030 J [0.0000048 J]	NA
1,2,3,7,8,9-HxCDF		0.000032	ND(0.0000022) [ND(0.0000047)]	NA
2,3,4,6,7,8-HxCDF		0.00013	0.0000030 J [ND(0.0000039)]	NA
HxCDFs (total)		0.0019	0.000044 [0.000049]	NA
1,2,3,4,6,7,8-HpCDF		0.00028	0.0000096 [0.000012]	NA
1,2,3,4,7,8,9-HpCDF		0.000064	0.0000032 J [ND(0.0000030)]	NA
HpCDFs (total)		0.00057	0.000022 [0.000023]	NA
OCDF		0.00026	0.000013 [0.000014]	NA
Dioxins				
2,3,7,8-TCDD		ND(0.0000013)	ND(0.0000014) [ND(0.0000012)]	NA
TCDDs (total)		0.000019	ND(0.0000014) [ND(0.0000012)]	NA
1,2,3,7,8-PeCDD		0.0000086	ND(0.0000012) [ND(0.0000013)]	NA
PeCDDs (total)		0.000092 Q	ND(0.0000012) [0.0000019 J]	NA
1,2,3,4,7,8-HxCDD		0.0000053 J	ND(0.0000016) [ND(0.0000050)]	NA
1,2,3,6,7,8-HxCDD		0.000013	ND(0.0000014) [ND(0.0000044)]	NA
1,2,3,7,8,9-HxCDD		0.0000090	ND(0.0000015) [ND(0.0000048)]	NA
HxCDDs (total)		0.00015	ND(0.0000015) [ND(0.0000047)]	NA
1,2,3,4,6,7,8-HpCDD		0.000066	0.0000019 J [ND(0.0000030)]	NA
HpCDDs (total)		0.00013	0.0000019 J [ND(0.0000030)]	NA
OCDD		0.00040	0.000020 [0.000017]	NA
Total TEQs (WHO TEFs)		0.00017	0.0000060 [0.0000075]	NA
Inorganics				
Antimony		ND(1.8) J	ND(1.8) J [ND(1.8) J]	NA
Arsenic		4.60	2.20 [3.20]	NA
Barium		50.0	31.0 [51.0]	NA
Beryllium		0.190 B	0.250 B [0.300 B]	NA
Cadmium		0.930	0.400 B [0.550]	NA
Chromium		8.50	20.0 [17.0]	NA
Cobalt		5.90	6.80 [10.0]	NA
Copper		35.0	18.0 [22.0]	NA
Lead		47.0	18.0 [18.0]	NA
Mercury		0.100 B	0.0180 B [ND(0.140)]	NA
Nickel		13.0	12.0 [17.0]	NA
Selenium		ND(1.00) J	ND(1.00) J [ND(1.10) J]	NA
Silver		0.530 B	ND(1.00) [0.230 B]	NA
Thallium		ND(1.10) J	ND(1.30) J [ND(1.40) J]	NA
Tin		ND(10)	ND(10) [ND(10)]	NA
Vanadium		7.80	9.60 [11.0]	NA
Zinc		100 J	59.0 J [70.0 J]	NA
Cyanide		ND(0.12)	ND(0.270) [ND(0.290)]	NA
Sulfide		5.50 J	73.0 J [100 J]	NA

TABLE A-4
SUMMARY OF APPENDIX IX+3 SOIL SAMPLE DATA
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Notes:

1. Samples were collected by ARCADIS and submitted to SGS Environmental Services, Inc. for analysis of Appendix IX+3 constituents.
2. Samples have been validated as per GE's EPA-approved FSP/QAPP, General Electric Company, Pittsfield, Massachusetts.
3. NA - Not Analyzed - Laboratory did not report results for this analyte.
4. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
5. Total 2,3,7,8-TCDD toxicity equivalents (TEQs) were calculated using Toxicity Equivalency Factors (TEFs) derived by the World Health Organization (WHO) and published by Van den Berg et al. in Environmental Health Perspectives 106(2), December 1998.
6. Field duplicate sample results are presented in brackets.

Data Qualifiers:

Organics (volatiles, semivolatiles, dioxin/furans)

E - Analyte exceeded calibration range.
J - Indicates that the associated numerical value is an estimated concentration.
I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
R - Data was rejected due to a deficiency in the data generation process.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

Inorganics

B - Indicates an estimated value between the instrument detection limit (IDL) and practical quantitation limit (PQL).
J - Indicates that the associated numerical value is an estimated concentration.

TABLE A-5
COMPARISON OF DETECTED APPENDIX IX+3 CONSTITUENTS TO INDUSTRIAL SCREENING PRGs
PARCEL L12-1-5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY-PITTSFIELD, MASSACHUSETTS
(Results in ppm, dry weight)

Analytical Parameter	Maximum Detect	USEPA Region 9 Industrial PRGs (See Note 3)	Constituent Retained for Further Evaluation? (See Note 5)
Volatile Organics			
1,4-Dioxane	0.076	270	No
Acetone	0.022	6,100	No
Benzene	0.097	1.4	No
Chlorobenzene	0.2	180	No
Semivolatile Organics			
1,2,4-Trichlorobenzene	4.7	1,700	No
1,3-Dichlorobenzene	1	140	No
1,4-Dichlorobenzene	5.1	7.3	No
2-Methylnaphthalene	0.33	190*	No
Acenaphthene	5.4	28,000	No
Acenaphthylene	0.74	190*	No
Aniline	1.5	530	No
Anthracene	0.8	220,000	No
Benzo(a)anthracene	1.8	3.6	No
Benzo(a)pyrene	1.5	0.36	**Yes**
Benzo(b)fluoranthene	1.6	3.6	No
Benzo(g,h,i)perylene	0.8	190*	No
Benzo(k)fluoranthene	2.4	36	No
bis(2-Ethylhexyl)phthalate	0.3	210	No
Chrysene	2.8	360	No
Dibenzo(a,h)anthracene	0.29	0.36	No
Dibenzofuran	0.17	3,200	No
Fluoranthene	2.5	37,000	No
Fluorene	0.31	22,000	No
Indeno(1,2,3-cd)pyrene	0.75	3.6	No
Naphthalene	0.8	190	No
Phenanthrene	2.2	190*	No
Phenol	0.1	100,000	No
Pyrene	2.6	26,000	No
Inorganics			
Antimony	85	750	No
Arsenic	11	3	**Yes**
Barium	78	100,000	No
Beryllium	0.31	3,400	No
Cadmium	1.4	930	No
Chromium	22	450	No
Cobalt	10	29,000	No
Copper	1,100	70,000	No
Cyanide	0.27	35*	No
Lead	330	1,000	No
Mercury	16	560	No
Nickel	22	37,000	No
Selenium	1.5	9,400	No
Silver	3	9,400	No
Sulfide	100	1,200*	No
Thallium	1.5	150	No
Tin	870	100,000	No
Vanadium	11	13,000	No
Zinc	410	100,000	No

Notes:

1. PRG = Preliminary Remediation Goal.
2. Per Attachment F to *Statement of Work for Removal Actions Outside the River* (SOW), comparison to PRGs is required for all detected Appendix IX+3 constituents except PCBs, dioxins and furans.
3. The PRGs listed in this column consist of EPA Region 9 industrial soil PRGs for the constituents listed or, for certain constituents, surrogate Region 9 PRGs previously approved by EPA as identified in Section 3.3.3 of this Revised Work Plan. The PRGs listed are those set forth in Exhibit F-1 to Attachment F to the SOW.
4. * = No EPA Region 9 PRG exists for certain noncarcinogenic PAHs (i.e., 2-methylnaphthalene, acenaphthylene, benzo(g,h,i)perylene, and phenanthrene), cyanide, or sulfide. The PRGs for naphthalene, hydrogen cyanide, and carbon disulfide, respectively, were used as surrogates.
5. Constituent is retained for further evaluation if its maximum detected concentration exceeds its corresponding PRG.

TABLE A-6
EXISTING CONDITIONS - COMPARISON TO METHOD 1 SOIL STANDARDS
PARCEL L12-1-5 (0- TO 1-FOOT DEPTH INCREMENT)

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results in ppm, dry weight)

Parameter / Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04
Semivolatile Organics						
Benzo(a)pyrene	0.20	0.13	0.36	**0.20**	**0.18**	0.16
Dioxins/Furans						
Total TEQs (WHO TEFs)	2.90E-04	6.60E-04	4.80E-05	1.50E-05	7.50E-06	1.70E-03
Inorganics						
Arsenic	3.90	3.10	3.70	4.40	1.60	6.20

Parameter / Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-X12 0-1 09/30/04	Maximum Sample Result	Arithmetic Average Concentration (See Note 3)	MCP Method 1 S-2 GW-2/GW-3 Soil Standard (See Note 4)	Constituent Exceeds Initial Comparison Criteria? (See Note 5)
Semivolatile Organics					
Benzo(a)pyrene	**0.19**	N/A (See Note 5)	0.20	4	No
Dioxins/Furans					
Total TEQs (WHO TEFs)	1.80E-05	1.70E-03	N/A (See Note 5)	5.00E-03	No
Inorganics					
Arsenic	4.00	N/A (See Note 5)	3.84	20	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using World Health Organization (WHO) Toxicity Equivalency Factors (TEFs) for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. With the exception of Total TEQs, constituents evaluated above have a maximum sample result that exceeds their respective EPA Region 9 Industrial PRGs or surrogate PRGs.
3. Non-detect sample results included as one-half the detection limit in the calculation of arithmetic average concentrations and presented in bold.
4. The Method 1 S-2 soil standards (MCP; revised December 14, 2007) listed are those associated with GW-2 or GW-3 groundwater (whichever is more stringent), except for Dioxin/Furan Total TEQs. Total TEQs are compared to the EPA PRGs for such TEQs set out in Attachment F of the *Statement of Work for Removal Actions Outside the River* (SOW) or other TEQ comparison criteria utilized during previous evaluations.
5. Arithmetic average concentrations of all constituents, except Total TEQs, are compared to Method 1 Soil Standards. For TEQs, the maximum concentration is compared to the appropriate EPA PRG (or other comparison criterion).

TABLE A-7
EXISTING CONDITIONS - COMPARISON TO METHOD 1 SOIL STANDARDS
PARCEL L12-1-5 (1- TO 6-FOOT DEPTH INCREMENT)

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results in ppm, dry weight)

Parameter / Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-T12 1-3 10/06/04	RAA10-E-X12 1-3 09/30/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-X10 3-6 09/30/04
Semivolatile Organics				
Benzo(a)pyrene	0.28	1.5	0.56	0.12
Inorganics				
Arsenic	6.20	4.60	5.80	3.40

Parameter / Sample ID: / Sample Depth (Feet): / Date Collected:	Arithmetic Average Concentration	MCP Method 1 S-2 GW-2/GW-3 Soil Standard (See Note 2)	Constituent Exceeds Initial Comparison Criteria? (See Note 3)
Semivolatile Organics			
Benzo(a)pyrene	0.62	4	No
Inorganics			
Arsenic	5.00	20	No

Notes:
1. Constituents evaluated above have a maximum sample result that exceeds their respective EPA Region 9 Industrial PRGs or surrogate PRGs.
2. The Method 1 S-2 soil standards (MCP; revised December 14, 2007) listed are those associated with GW-2 or GW-3 groundwater (whichever is more stringent).
3. Arithmetic average concentrations of all constituents are compared to Method 1 Soil Standards.

TABLE A-8
EXISTING CONDITIONS - COMPARISON TO METHOD 1 SOIL STANDARDS
PARCEL L12-1-5 (0- TO 15-FOOT DEPTH INCREMENT)

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results in ppm, dry weight)

Parameter	Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04
Semivolatile Organics							
Benzo(a)pyrene		0.20	0.13	0.36	**0.20**	**0.18**	0.16
Dioxins/Furans							
Total TEQs (WHO TEFs)		See Note 6	See Note 6	See Note 6	See Note 6	See Note 6	See Note 6
Inorganics							
Arsenic		3.90	3.10	3.70	4.40	1.60	6.20

Parameter	Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-X12 0-1 09/30/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-X12 1-3 09/30/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-X10 3-6 09/30/04	RAA10-E-T12 6-15 10/06/04
Semivolatile Organics							
Benzo(a)pyrene		**0.19**	0.28	1.5	0.56	0.12	0.25
Dioxins/Furans							
Total TEQs (WHO TEFs)		See Note 6	1.70E-03	1.70E-04	3.80E-03	2.50E-05	2.10E-03
Inorganics							
Arsenic		4.00	6.20	4.60	5.80	3.40	11.0

Parameter	Sample ID: / Sample Depth (Feet): / Date Collected:	RAA10-E-X10 6-15 09/30/04	RAA10-E-X12 6-15 09/30/04	Maximum Sample Result	Arithmetic Average Concentration (See Note 3)	MCP Method 1 S-3 GW-2/GW-3 Soil Standard (See Note 4)	Constituent Exceeds Initial Comparison Criteria? (See Note 5)
Semivolatile Organics							
Benzo(a)pyrene		**0.23**	0.20	N/A (See Note 5)	0.33	30	No
Dioxins/Furans							
Total TEQs (WHO TEFs)		4.70E-05	*7.50E-06*	3.80E-03	N/A (See Note 5)	2.00E-02	No
Inorganics							
Arsenic		3.70	2.70	N/A (See Note 5)	4.59	20	No

See notes on page 2.

TABLE A-8
EXISTING CONDITIONS - COMPARISON TO METHOD 1 SOIL STANDARDS
PARCEL L12-1-5 (0- TO 15-FOOT DEPTH INCREMENT)

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results in ppm, dry weight)

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using World Health Organization (WHO) Toxicity Equivalency Factors (TEFs) for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. With the exception of Total TEQs, constituents evaluated above have a maximum sample result that exceeds their respective EPA Region 9 Industrial PRGs or surrogate PRGs.
3. Non-detect sample results included as one-half the detection limit in the calculation of arithmetic average concentrations and presented in bold.
4. The Method 1 S-3 soil standards (MCP; revised December 14, 2007) listed are those associated with GW-2 or GW-3 groundwater (whichever is more stringent), except for Dioxin/Furan Total TEQs. Total TEQs are compared to the EPA PRGs for such TEQs set out in Attachment F of the *Statement of Work for Removal Actions Outside the River* (SOW) or other TEQ comparison criteria utilized during previous evaluations.
5. Arithmetic average concentrations of all constituents, except Total TEQs, are compared to Method 1 Soil Standards. For TEQs, the maximum concentration is compared to the appropriate EPA PRG (or other comparison criterion).
6. Total TEQs were evaluated for the 1- to 15-foot depth increment only.
7. Total TEQ concentrations in italics represent the maximum value for the sample location/depth in question.

TABLE A-9
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 1-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P13	528,528A,1737,1737A	47	0 - 0.5	***0.021***	0.87	0.02	0.02
RAA10-E-Q13	532,1752,1753	360	0 - 0.5	***0.021***	6.67	0.02	0.14
RAA10-E-R12	388,389,1397,1398	1,023	0 - 0.5	***0.021***	18.94	0.02	0.40
RAA10-E-R13	1769,1770	83	0 - 0.5	***0.021***	1.54	0.02	0.03
RAA10-E-S11	537,1784,1785	409	0 - 0.5	***0.021***	7.57	0.02	0.16
RAA10-E-S11	537A,1784A,1785A	868	0 - 0.5	16	16.07	16.00	257.14
RAA10-E-S12	1405	894	0 - 0.5	***0.021***	16.56	0.02	0.35
RAA10-E-S12	1405A	1,085	0 - 0.5	15	20.09	15.00	301.35
RAA10-E-S13	538,1786,1787	131	0 - 0.5	7.9	2.43	7.90	19.18
RAA10-E-S13	1787A	13	0 - 0.5	***0.021***	0.25	0.02	0.01
RAA10-E-T10	539,1803,1804	868	0 - 0.5	***0.021***	16.08	0.02	0.34
RAA10-E-T11	283,1132,1133	1,744	0 - 0.5	***0.021***	32.29	0.02	0.68
RAA10-E-T12	540,1805	2,397	0 - 0.5	***0.021***	44.39	0.02	0.93
RAA10-E-T13	391,1413,1414	358	0 - 0.5	89	6.63	89.00	590.48
RAA10-E-U10	247,1039,1040	1,685	0 - 0.5	84	31.21	84.00	2,621.38
RAA10-E-U10	247A,1039A,1040A	53	0 - 0.5	***0.021***	0.99	0.02	0.02
RAA10-E-U11	1821	1,481	0 - 0.5	9.3	27.43	9.30	255.10
RAA10-E-U12	393,1424,1425	1,169	0 - 0.5	4	21.65	4.00	86.60
RAA10-E-U12	393A,1424A,1425A	152	0 - 0.5	***0.021***	2.82	0.02	0.06
RAA10-E-U13	1822,1823	41	0 - 0.5	12.6	0.76	12.60	9.59
RAA10-E-U13	1822A	1	0 - 0.5	***0.021***	0.02	0.02	0.00
RAA10-E-V9	315,1232,1233	1,140	0 - 0.5	8	21.12	8.00	168.93
RAA10-E-V9	315A	49	0 - 0.5	***0.021***	0.92	0.02	0.02
RAA10-E-V10	284,1136A,1136B	1,081	0 - 0.5	5.3	20.03	5.30	106.14
RAA10-E-V10	284A,1136	1,318	0 - 0.5	***0.021***	24.42	0.02	0.51
RAA10-E-V11	543,1836, 1837A	873	0 - 0.5	7.5	16.17	7.50	121.28
RAA10-E-V11	541,542,1836A,1837	482	0 - 0.5	***0.021***	8.93	0.02	0.19
RAA10-E-V12	394,395,1431,1432,1433	2,080	0 - 0.5	***0.021***	38.52	0.02	0.81
RAA10-E-V13	544	360	0 - 0.5	***0.021***	6.67	0.02	0.14
RAA10-E-W9	316,316A,317,318,318A,319,319A,1237,1237A,1238,1238A	2,406	0 - 0.5	4.3	44.56	4.30	191.59
RAA10-E-W10	264,264A,1085,1086	2,375	0 - 0.5	0.277	43.99	0.28	12.18
RAA10-E-W11	546A,546B,1849,1851A	1,564	0 - 0.5	1	28.97	1.00	28.97
RAA10-E-W11	546,1850,1851	529	0 - 0.5	***0.021***	9.81	0.02	0.21
RAA10-E-W12	397B,1439,1440,1440A	1,250	0 - 0.5	14	23.15	14.00	324.11
RAA10-E-W12	396,397,397A,1440	1,274	0 - 0.5	***0.021***	23.60	0.02	0.50
RAA10-E-W13	547	204	0 - 0.5	0.54	3.77	0.54	2.04
RAA10-E-W13	547A	232	0 - 0.5	***0.021***	4.30	0.02	0.09
RAA10-E-X8	266,266A,1087,1088	1,417	0 - 0.5	65	26.25	65.00	1,706.19
RAA10-E-X9	553,1869	2,160	0 - 0.5	4	40.00	4.00	160.02
RAA10-E-X10	550,550A,1862,1863	2,471	0 - 0.5	***0.021***	45.76	0.02	0.96
RAA10-E-X11	285,286,1139	2,477	0 - 0.5	34	45.88	34.00	1,559.82
RAA10-E-X12	551,1864	2,506	0 - 0.5	10.9	46.41	10.90	505.82
RAA10-E-X13	398,1446	373	0 - 0.5	58	6.90	58.00	400.26
RAA10-E-Y10	555	79	0 - 0.5	1.44	1.47	1.44	2.12
RAA10-E-Y11	401,1453	409	0 - 0.5	96	7.58	96.00	727.35
RAA10-E-Y12	1876	767	0 - 0.5	13.7	14.20	13.70	194.50
RAA10-E-Y13	1055	128	0 - 0.5	41	2.38	41.00	97.51
UE2060	1932,1934	8	0 - 0.5	***0.021***	0.15	0.02	0.00
UE2272	411,568,1501,1502,1503	666	0 - 0.5	***0.021***	12.33	0.02	0.26
UW2060	576,577,2012	859	0 - 0.5	***0.021***	15.91	0.02	0.33
UW2060	2012A	5	0 - 0.5	13	0.09	13.00	1.20
UW2110	414,1529	160	0 - 0.5	15	2.97	15.00	44.53
UW2160	578,2013,2014	341	0 - 0.5	65	6.32	65.00	411.01
UW2160	1805A	18	0 - 0.5	***0.021***	0.34	0.02	0.01
UW2210	323,1279,1280	791	0 - 0.5	***0.021***	14.64	0.02	0.31
UW2210	323A,1279A,1280A	32	0 - 0.5	11	0.59	11.00	6.46
UW2272	579,580,581,1939,2016,2017	520	0 - 0.5	***0.021***	9.63	0.02	0.20
Totals:	--	48,274	--	--	893.97	--	10,920.48
					Volume Weighted Average:		**12.22**

TABLE A-9
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 1-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0.5- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P13	518,518A,1640,1640A	47	0.5 - 1	***0.021***	0.87	0.02	0.02
RAA10-E-Q13	522,523,1656,1657	772	0.5 - 1	***0.021***	14.29	0.02	0.30
RAA10-E-R12	374,375,376,1334,1335	1,740	0.5 - 1	***0.021***	32.22	0.02	0.68
RAA10-E-R13	1673,1674,1675	394	0.5 - 1	***0.021***	7.29	0.02	0.15
RAA10-E-S11	529,1690,1691	409	0.5 - 1	***0.021***	7.57	0.02	0.16
RAA10-E-S11	529A,1690A,1691A	868	0.5 - 1	16	16.07	16.00	257.14
RAA10-E-S12	378,1343	1,097	0.5 - 1	***0.021***	20.31	0.02	0.43
RAA10-E-S12	1343A	1,120	0.5 - 1	15	20.73	15.00	310.98
RAA10-E-S13	530,1692,1693A	363	0.5 - 1	7.9	6.73	7.90	53.14
RAA10-E-S13	530A,1692A,1693	348	0.5 - 1	***0.021***	6.44	0.02	0.14
RAA10-E-T10	531,1709,1710	868	0.5 - 1	***0.021***	16.08	0.02	0.34
RAA10-E-T11	269,1094,1095	1,744	0.5 - 1	***0.021***	32.29	0.02	0.68
RAA10-E-T12	532,1712	2,435	0.5 - 1	***0.021***	45.09	0.02	0.95
RAA10-E-T13	379,1351,1352	599	0.5 - 1	89	11.10	89.00	987.82
RAA10-E-U10	238,1014,1015	1,685	0.5 - 1	84	31.21	84.00	2,621.38
RAA10-E-U10	238A,1014A,1015A	53	0.5 - 1	***0.021***	0.99	0.02	0.02
RAA10-E-U11	1728	1,481	0.5 - 1	9.3	27.43	9.30	255.10
RAA10-E-U12	380,382,383A,1362A	566	0.5 - 1	***0.021***	10.48	0.02	0.22
RAA10-E-U12	383,1362,1362B	1,177	0.5 - 1	4	21.80	4.00	87.20
RAA10-E-U13	1729,1730A	76	0.5 - 1	***0.021***	1.40	0.02	0.03
RAA10-E-U13	1730,1731	44	0.5 - 1	12.6	0.81	12.60	10.21
RAA10-E-V9	302,1189,1190	1,140	0.5 - 1	8	21.12	8.00	168.94
RAA10-E-V9	302A	49	0.5 - 1	***0.021***	0.92	0.02	0.02
RAA10-E-V10	270,1098A,1098B	1,081	0.5 - 1	5.3	20.03	5.30	106.14
RAA10-E-V10	270A,1098	1,318	0.5 - 1	***0.021***	24.42	0.02	0.51

0.5- TO 1-FOOT DEPTH INCREMENT (continued)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V11	534,535,1745A,1746	482	0.5 - 1	***0.021***	8.93	0.02	0.19
RAA10-E-V11	536,1745,1746A	873	0.5 - 1	7.5	16.17	7.50	121.27
RAA10-E-V12	384,386,1368,1369,1370,1371,1372	2,340	0.5 - 1	***0.021***	43.33	0.02	0.91
RAA10-E-V13	537,1747	479	0.5 - 1	***0.021***	8.88	0.02	0.19
RAA10-E-W9	303,303A,304,305A,306,306A,1195,1195A,1196,1196A	2,409	0.5 - 1	4.3	44.61	4.30	191.83
RAA10-E-W10	253,253A,1053,1054	2,375	0.5 - 1	0.277	43.99	0.28	12.18
RAA10-E-W11	540B,1763,1764	529	0.5 - 1	***0.021***	9.80	0.02	0.21
RAA10-E-W11	540,540A,1762,1764A	1,564	0.5 - 1	1	28.97	1.00	28.97
RAA10-E-W12	387,388,388A,1379	1,274	0.5 - 1	***0.021***	23.60	0.02	0.50
RAA10-E-W12	388B,1378,1379A	1,250	0.5 - 1	14	23.15	14.00	324.11
RAA10-E-W13	541A	232	0.5 - 1	***0.021***	4.30	0.02	0.09
RAA10-E-W13	541	204	0.5 - 1	0.54	3.77	0.54	2.04
RAA10-E-X8	255,255A,1055,1056	1,417	0.5 - 1	65	26.25	65.00	1,706.19
RAA10-E-X9	547,1783	2,160	0.5 - 1	4	40.00	4.00	160.02
RAA10-E-X10	544,544A,1776,1777	2,471	0.5 - 1	***0.021***	45.76	0.02	0.96
RAA10-E-X11	271,272,1101	2,477	0.5 - 1	34	45.88	34.00	1,559.82
RAA10-E-X12	545,1778	2,506	0.5 - 1	10.9	46.41	10.90	505.82
RAA10-E-X13	389,1386	373	0.5 - 1	58	6.90	58.00	400.25
RAA10-E-Y10	550	79	0.5 - 1	1.44	1.45	1.44	2.09
RAA10-E-Y11	392,1394	409	0.5 - 1	96	7.57	96.00	727.17
RAA10-E-Y12	1790	767	0.5 - 1	13.7	14.19	13.70	194.47
RAA10-E-Y13	1027	128	0.5 - 1	41	2.36	41.00	96.90
Totals:	--	48,274	--	--	893.97	--	10,898.83
					Volume Weighted Average:		**12.19**

TABLE A-9
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 1-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	48,274	--	--	1,787.93	--	21,819.31
					Volume Weighted Average:		**12.20**

Notes:

1. Polygon ID and area based on information shown on Figures A-1 and A-2.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE A-10
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 1- TO 6-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	228	24	1 - 2	***0.021***	0.90	0.02	0.02
RAA10-E-R12	243	5,271	1 - 2	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	1 - 2	185	156.12	185.00	28,882.68
RAA10-E-T12	67	6,942	1 - 2	161	257.10	161.00	41,393.58
RAA10-E-V10	265A	1,606	1 - 2	***0.021***	59.49	0.02	1.25
RAA10-E-V10	265,265B	6,633	1 - 2	1,080	245.66	1,080.00	265,311.20
RAA10-E-V12	138	5,976	1 - 2	***0.021***	221.35	0.02	4.65
RAA10-E-X8	147	3,555	1 - 2	6.65	131.68	6.65	875.64
RAA10-E-X10	274	7,577	1 - 2	48.4	280.62	48.40	13,582.17
RAA10-E-X12	144	7,350	1 - 2	42	272.22	42.00	11,433.15
Totals:	--	49,149	--	--	1,820.34	--	361,488.43
					Volume Weighted Average:		**198.58**

2- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	233	24	2 - 3	***0.021***	0.90	0.02	0.02
RAA10-E-R12	248	5,271	2 - 3	***0.021***	195.21	0.02	4.10
RAA10-E-T10	260	4,215	2 - 3	185	156.12	185.00	28,882.68
RAA10-E-T12	72	6,942	2 - 3	161	257.10	161.00	41,393.58
RAA10-E-V10	271A	1,606	2 - 3	***0.021***	59.49	0.02	1.25
RAA10-E-V10	271,271B	6,633	2 - 3	1,080	245.66	1,080.00	265,311.20
RAA10-E-V12	142	5,976	2 - 3	***0.021***	221.35	0.02	4.65
RAA10-E-X8	151	3,555	2 - 3	6.65	131.68	6.65	875.64
RAA10-E-X10	280	7,577	2 - 3	48.4	280.62	48.40	13,582.17
RAA10-E-X12	148	7,350	2 - 3	42	272.22	42.00	11,433.15
Totals:	--	49,149	--	--	1,820.34	--	361,488.43
					Volume Weighted Average:		**198.58**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	34	24	3 - 4	***0.021***	0.90	0.02	0.02
RAA10-E-R12	123	5,271	3 - 4	***0.021***	195.21	0.02	4.10
RAA10-E-T10	68	4,215	3 - 4	3.8	156.12	3.80	593.27
RAA10-E-T12	247	6,942	3 - 4	500	257.10	500.00	128,551.48
RAA10-E-V10	135	8,239	3 - 4	115	305.15	115.00	35,092.25
RAA10-E-V12	261	5,976	3 - 4	***0.021***	221.35	0.02	4.65
RAA10-E-X8	274	3,555	3 - 4	0.021	131.68	0.02	2.77
RAA10-E-X10	139	7,577	3 - 4	0.43	280.62	0.43	120.67
RAA10-E-X12	270	7,350	3 - 4	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	167,200.26
					Volume Weighted Average:		**91.85**

TABLE A-10
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 1- TO 6-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	4 - 5	***0.021***	0.90	0.02	0.02
RAA10-E-R12	242	5,271	4 - 5	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	4 - 5	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	4 - 5	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	4 - 5	115	305.15	115.00	35,092.25
RAA10-E-V12	131	5,976	4 - 5	***0.021***	221.35	0.02	4.65
RAA10-E-X8	140	3,555	4 - 5	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	4 - 5	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	4 - 5	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	167,200.26
					Volume Weighted Average:		**91.85**

5- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	5 - 6	***0.021***	0.90	0.02	0.02
RAA10-E-R12	242	5,271	5 - 6	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	5 - 6	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	5 - 6	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	5 - 6	115	305.15	115.00	35,092.25
RAA10-E-V12	131	5,976	5 - 6	***0.021***	221.35	0.02	4.65
RAA10-E-X8	140	3,555	5 - 6	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	5 - 6	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	5 - 6	10.4	272.22	10.40	2,831.06
Totals:	--	49,149	--	--	1,820.34	--	167,200.26
					Volume Weighted Average:		**91.85**

SUMMARY - 1- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	49,149	--	--	9,101.72	--	1,224,577.65
					Volume Weighted Average:		**134.54**

Notes:

1. Polygon ID and area based on information shown on Figures A-3 to A-6.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE A-11
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT (TABLE A-9)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	48,274	--	--	1,787.93	--	21,819.31
					Volume Weighted Average:		**12.20**

1- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	228	24	1 - 2	***0.021***	0.90	0.02	0.02
RAA10-E-R12	243	5,271	1 - 2	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	1 - 2	185	156.12	185.00	28,882.68
RAA10-E-T12	67	6,942	1 - 2	161	257.10	161.00	41,393.58
RAA10-E-V10	265A	1,606	1 - 2	***0.021***	59.49	0.02	1.25
RAA10-E-V10	265,265B	6,633	1 - 2	1,080	245.66	1,080.00	265,311.20
RAA10-E-V12	138A	585	1 - 2	***0.021***	21.65	0.02	0.45
RAA10-E-V12	138	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	147	3,555	1 - 2	6.65	131.68	6.65	875.64
RAA10-E-X10	274	7,577	1 - 2	48.4	280.62	48.40	13,582.17
RAA10-E-X12	144	7,350	1 - 2	42	272.22	42.00	11,433.15
Totals:	--	43,757	--	--	1,620.65	--	361,484.24
					Volume Weighted Average:		**223.05**

2- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	233	24	2 - 3	***0.021***	0.90	0.02	0.02
RAA10-E-R12	248	5,271	2 - 3	***0.021***	195.21	0.02	4.10
RAA10-E-T10	260	4,215	2 - 3	185	156.12	185.00	28,882.68
RAA10-E-T12	72	6,942	2 - 3	161	257.10	161.00	41,393.58
RAA10-E-V10	271A	1,606	2 - 3	***0.021***	59.49	0.02	1.25
RAA10-E-V10	271,271B	6,633	2 - 3	1,080	245.66	1,080.00	265,311.20
RAA10-E-V12	142A	585	2 - 3	***0.021***	21.65	0.02	0.45
RAA10-E-V12	142	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	151	3,555	2 - 3	6.65	131.68	6.65	875.64
RAA10-E-X10	280	7,577	2 - 3	48.4	280.62	48.40	13,582.17
RAA10-E-X12	148	7,350	2 - 3	42	272.22	42.00	11,433.15
Totals:	--	43,757	--	--	1,620.65	--	361,484.24
					Volume Weighted Average:		**223.05**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	34	24	3 - 4	***0.021***	0.90	0.02	0.02
RAA10-E-R12	123	5,271	3 - 4	***0.021***	195.21	0.02	4.10
RAA10-E-T10	68	4,215	3 - 4	3.8	156.12	3.80	593.27
RAA10-E-T12	247	6,942	3 - 4	500	257.10	500.00	128,551.48
RAA10-E-V10	135	8,239	3 - 4	115	305.15	115.00	35,092.25
RAA10-E-V12	261A	585	3 - 4	***0.021***	21.65	0.02	0.45
RAA10-E-V12	261	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	274	3,555	3 - 4	0.021	131.68	0.02	2.77
RAA10-E-X10	139	7,577	3 - 4	0.43	280.62	0.43	120.67
RAA10-E-X12	270	7,350	3 - 4	10.4	272.22	10.40	2,831.06
Totals:	--	43,757	--	--	1,620.65	--	167,196.07
					Volume Weighted Average:		**103.17**

TABLE A-11
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	4 - 5	***0.021***	0.90	0.02	0.02
RAA10-E-R12	242	5,271	4 - 5	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	4 - 5	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	4 - 5	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	4 - 5	115	305.15	115.00	35,092.25
RAA10-E-V12	131A	585	4 - 5	***0.021***	21.65	0.02	0.45
RAA10-E-V12	131	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	140	3,555	4 - 5	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	4 - 5	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	4 - 5	10.4	272.22	10.40	2,831.06
Totals:	--	43,757	--	--	1,620.65	--	167,196.07
					Volume Weighted Average:		**103.17**

5- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	227	24	5 - 6	***0.021***	0.90	0.02	0.02
RAA10-E-R12	242	5,271	5 - 6	***0.021***	195.21	0.02	4.10
RAA10-E-T10	254	4,215	5 - 6	3.8	156.12	3.80	593.27
RAA10-E-T12	68	6,942	5 - 6	500	257.10	500.00	128,551.48
RAA10-E-V10	265	8,239	5 - 6	115	305.15	115.00	35,092.25
RAA10-E-V12	131A	585	5 - 6	***0.021***	21.65	0.02	0.45
RAA10-E-V12	131	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	140	3,555	5 - 6	0.021	131.68	0.02	2.77
RAA10-E-X10	274	7,577	5 - 6	0.43	280.62	0.43	120.67
RAA10-E-X12	137	7,350	5 - 6	10.4	272.22	10.40	2,831.06
Totals:	--	43,757	--	--	1,620.65	--	167,196.07
					Volume Weighted Average:		**103.17**

6- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	228	24	6 - 7	4.9	0.90	4.90	4.39
RAA10-E-R12	243	5,271	6 - 7	21.0	195.21	21.00	4,099.36
RAA10-E-T10	254	4,215	6 - 7	0.255	156.12	0.26	39.81
RAA10-E-T12	67	6,942	6 - 7	342	257.10	342.00	87,929.21
RAA10-E-V10	265	8,239	6 - 7	1.38	305.15	1.38	421.11
RAA10-E-V12	138A	585	6 - 7	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	138	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	147	3,555	6 - 7	**0.021**	131.68	0.02	2.77
RAA10-E-X10	274	7,577	6 - 7	4.6	280.62	4.60	1,290.87
RAA10-E-X12	144	7,350	6 - 7	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

TABLE A-11
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

7- TO 8-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	64	24	7 - 8	4.9	0.90	4.90	4.39
RAA10-E-R12	121	5,271	7 - 8	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	7 - 8	0.255	156.12	0.26	39.81
RAA10-E-T12	242	6,942	7 - 8	342	257.10	342.00	87,929.21
RAA10-E-V10	133	8,239	7 - 8	1.38	305.15	1.38	421.11
RAA10-E-V12	256A	585	7 - 8	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	256	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	269	3,555	7 - 8	**0.021**	131.68	0.02	2.77
RAA10-E-X10	137	7,577	7 - 8	4.6	280.62	4.60	1,290.87
RAA10-E-X12	265	7,350	7 - 8	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

8- TO 9-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	63	24	8 - 9	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	8 - 9	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	8 - 9	0.255	156.12	0.26	39.81
RAA10-E-T12	244	6,942	8 - 9	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	8 - 9	1.38	305.15	1.38	421.11
RAA10-E-V12	258A	585	8 - 9	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	258	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	138	3,555	8 - 9	**0.021**	131.68	0.02	2.77
RAA10-E-X10	266	7,577	8 - 9	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	8 - 9	10.19	272.20	10.19	2,773.76
Totals:	--	43,757	--	--	1,620.63	--	131,201.43
					Volume Weighted Average:		**80.96**

9- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	63	24	9 - 10	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	9 - 10	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	9 - 10	0.255	156.12	0.26	39.81
RAA10-E-T12	244	6,942	9 - 10	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	9 - 10	1.38	305.15	1.38	421.11
RAA10-E-V12	258A	585	9 - 10	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	258	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	138	3,555	9 - 10	**0.021**	131.68	0.02	2.77
RAA10-E-X10	266	7,577	9 - 10	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	9 - 10	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

TABLE A-11
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

10- TO 11-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	62	24	10 - 11	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	10 - 11	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	10 - 11	0.255	156.12	0.26	39.81
RAA10-E-T12	241	6,942	10 - 11	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	10 - 11	1.38	305.15	1.38	421.11
RAA10-E-V12	255A	585	10 - 11	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	255	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	138	3,555	10 - 11	**0.021**	131.68	0.02	2.77
RAA10-E-X10	263	7,577	10 - 11	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	10 - 11	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

11- TO 12-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	62	24	11 - 12	4.9	0.90	4.90	4.39
RAA10-E-R12	118	5,271	11 - 12	21	195.21	21.00	4,099.36
RAA10-E-T10	9	4,215	11 - 12	0.255	156.12	0.26	39.81
RAA10-E-T12	241	6,942	11 - 12	342	257.10	342.00	87,929.21
RAA10-E-V10	130	8,239	11 - 12	1.38	305.15	1.38	421.11
RAA10-E-V12	255A	585	11 - 12	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	255	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	138	3,555	11 - 12	**0.021**	131.68	0.02	2.77
RAA10-E-X10	263	7,577	11 - 12	4.6	280.62	4.60	1,290.87
RAA10-E-X12	135	7,350	11 - 12	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

12- TO 13-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	12 - 13	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	12 - 13	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	12 - 13	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	12 - 13	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	12 - 13	1.38	305.15	1.38	421.11
RAA10-E-V12	127A	585	12 - 13	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	127	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	264	3,555	12 - 13	**0.021**	131.68	0.02	2.77
RAA10-E-X10	40	7,577	12 - 13	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	12 - 13	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

TABLE A-11
POST-REMEDIATION CONDITIONS
PARCEL L12-1-5: 0- TO 15-FOOT DEPTH INCREMENT

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

13- TO 14-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	13 - 14	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	13 - 14	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	13 - 14	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	13 - 14	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	13 - 14	1.38	305.15	1.38	421.11
RAA10-E-V12	127A	585	13 - 14	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	127	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	264	3,555	13 - 14	**0.021**	131.68	0.02	2.77
RAA10-E-X10	40	7,577	13 - 14	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	13 - 14	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

14- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-P14	213	24	14 - 15	4.9	0.90	4.90	4.39
RAA10-E-R12	228	5,271	14 - 15	21	195.21	21.00	4,099.36
RAA10-E-T10	240	4,215	14 - 15	0.255	156.12	0.26	39.81
RAA10-E-T12	10	6,942	14 - 15	342	257.10	342.00	87,929.21
RAA10-E-V10	251	8,239	14 - 15	1.38	305.15	1.38	421.11
RAA10-E-V12	127A	585	14 - 15	1,600	21.65	1,600.00	34,640.15
RAA10-E-V12	127	Polygon(s) removed from further evaluation to represent the placement of an engineered barrier.					
RAA10-E-X8	264	3,555	14 - 15	**0.021**	131.68	0.02	2.77
RAA10-E-X10	39	7,577	14 - 15	4.6	280.62	4.60	1,290.87
RAA10-E-X12	260	7,350	14 - 15	10.19	272.22	10.19	2,773.90
Totals:	--	43,757	--	--	1,620.65	--	131,201.57
					Volume Weighted Average:		**80.96**

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	44,059	--	--	24,476.98	--	2,427,189.97
					Volume Weighted Average:		**99.16**

Notes:

1. Polygon ID and area based on information shown on Figures A-7 to A-11.
2. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
3. For instances where a duplicate sample was available, the average of the samples was included in table.
4. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
5. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

LEGEND:

PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE

APPROXIMATE PROPERTY LINE

L12–1–5 PROPERTY IDENTIFICATION

EDGE OF WATER

BUILDING/STRUCTURE

WATER

PAVED AREA

UNPAVED AREA

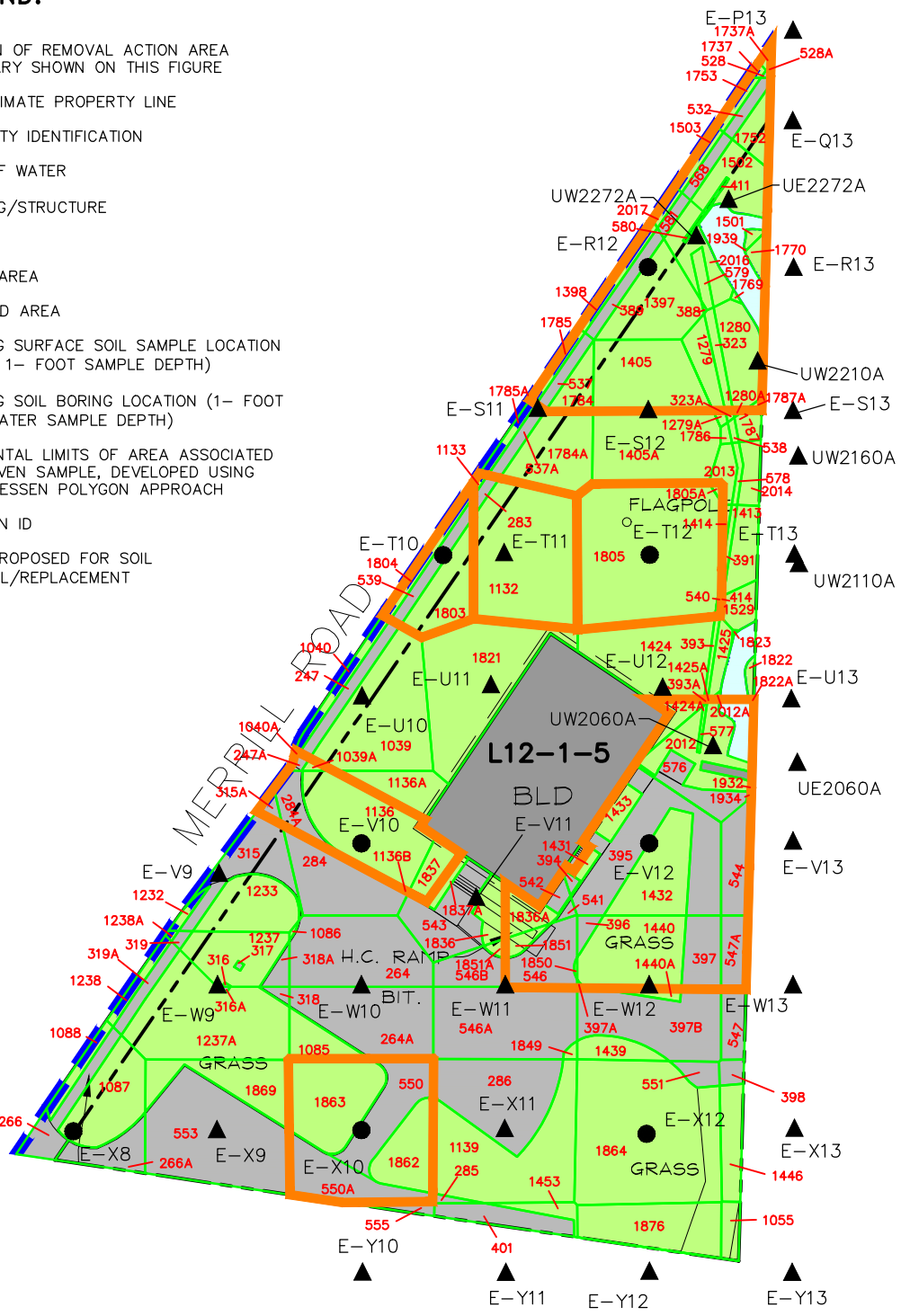
▲ E–U14 EXISTING SURFACE SOIL SAMPLE LOCATION (0– TO 1– FOOT SAMPLE DEPTH)

● E–T12 EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)

HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH

254 POLYGON ID

AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. PAVED AREAS SHOWN TO REFLECT EXISTING SITE CONDITIONS. AS DISCUSSED IN THE UNKAMET BROOK AREA–REMAINDER CONCEPTUAL WORK PLAN ADDENDUM, PAVED AREAS SHOWN ON THIS FIGURE WERE EVALUATED AS UNPAVED AREAS DURING PCB EVALUATIONS.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 0- TO 0.5-FOOT DEPTH INCREMENT

ARCADIS

FIGURE A-1

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE

APPROXIMATE PROPERTY LINE

L12–1–5 PROPERTY IDENTIFICATION

EDGE OF WATER

BUILDING/STRUCTURE

WATER

PAVED AREA

UNPAVED AREA

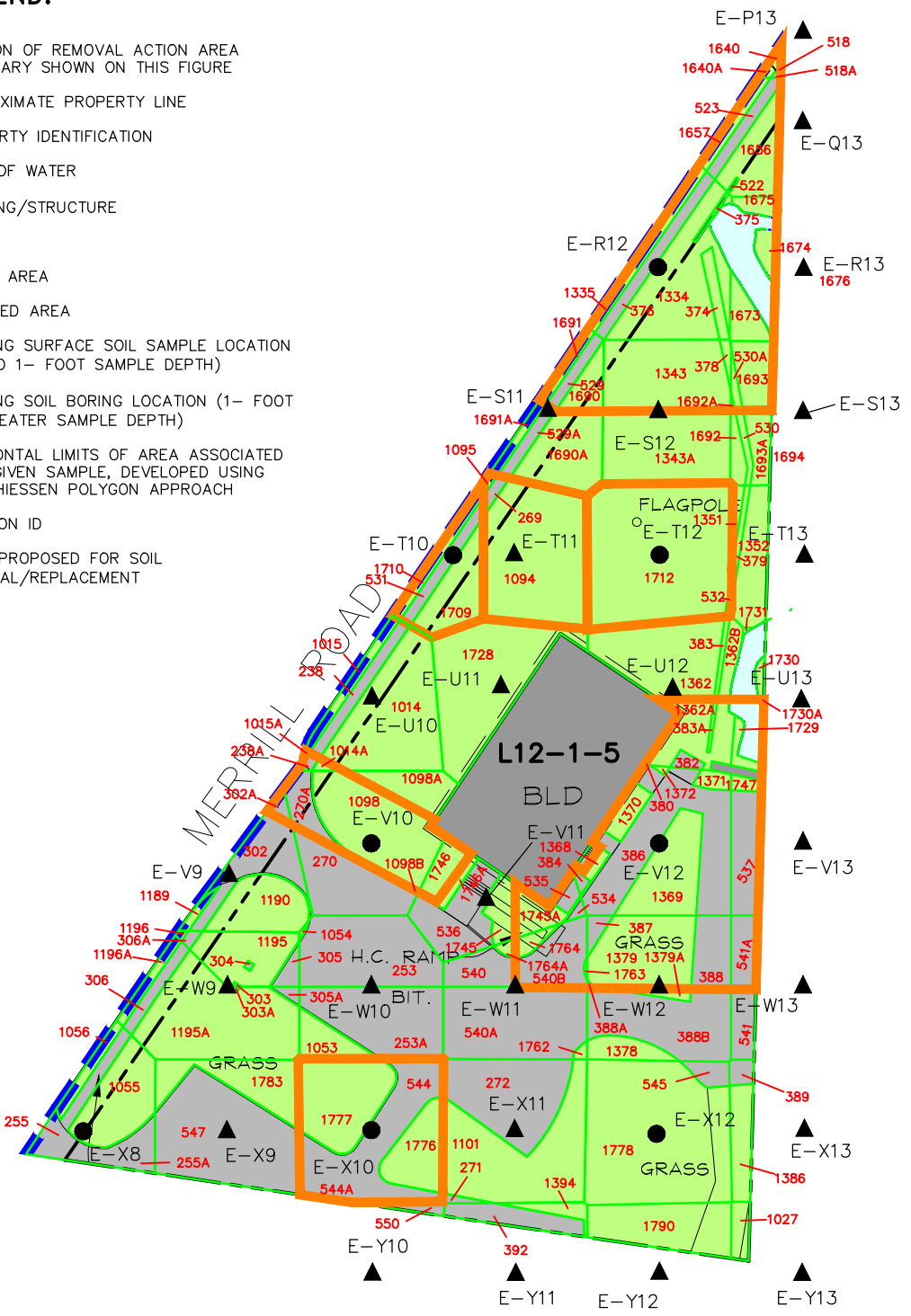
▲ E–U14 EXISTING SURFACE SOIL SAMPLE LOCATION (0– TO 1– FOOT SAMPLE DEPTH)

● E–T12 EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)

HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH

254 POLYGON ID

AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. PAVED AREAS SHOWN TO REFLECT EXISTING SITE CONDITIONS. AS DISCUSSED IN THE UNKAMET BROOK AREA–REMAINDER CONCEPTUAL WORK PLAN ADDENDUM, PAVED AREAS SHOWN ON THIS FIGURE WERE EVALUATED AS UNPAVED AREAS DURING PCB EVALUATIONS.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 0.5- TO 1-FOOT DEPTH INCREMENT

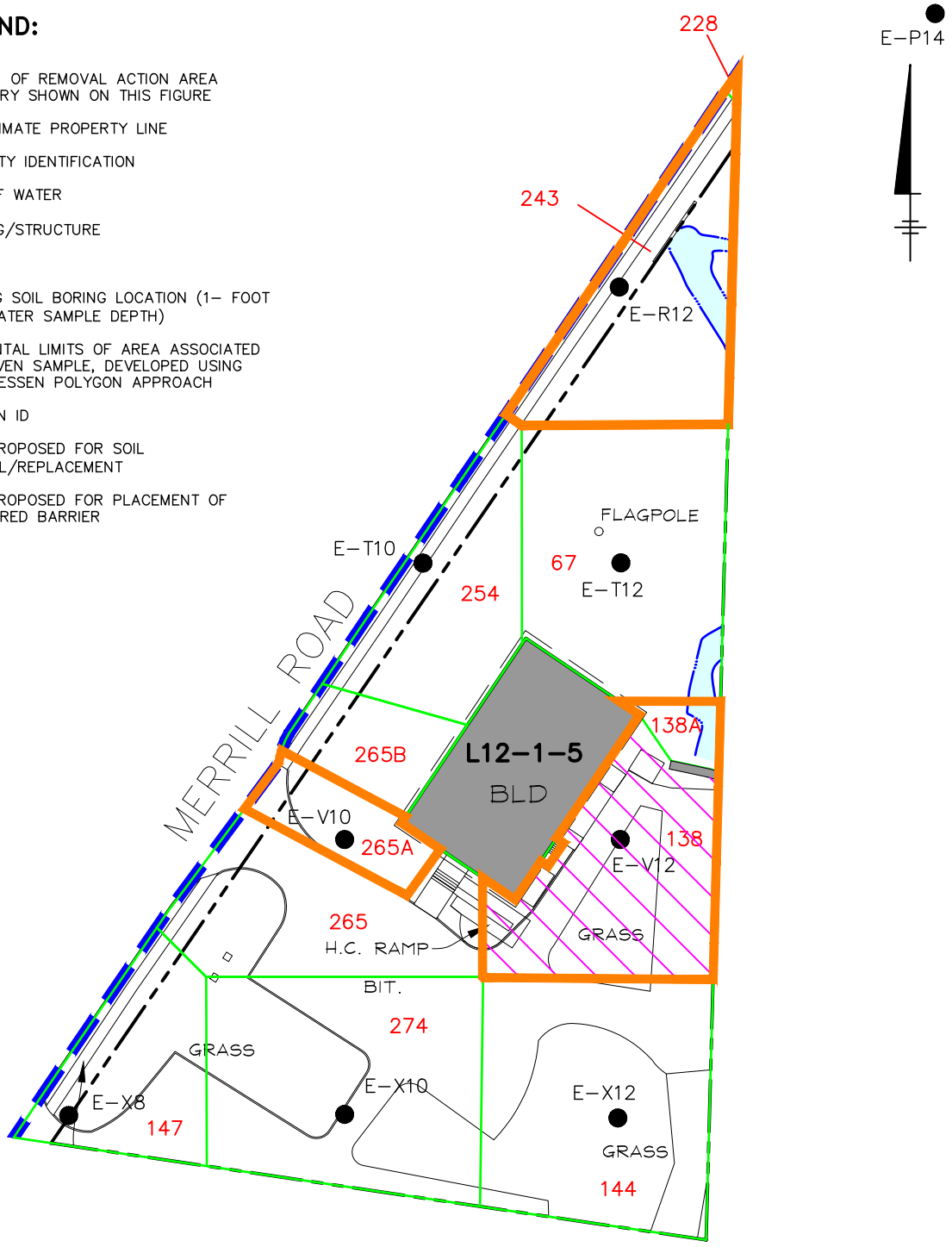
ARCADIS

FIGURE **A-2**

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 1- TO 2-FOOT DEPTH INCREMENT

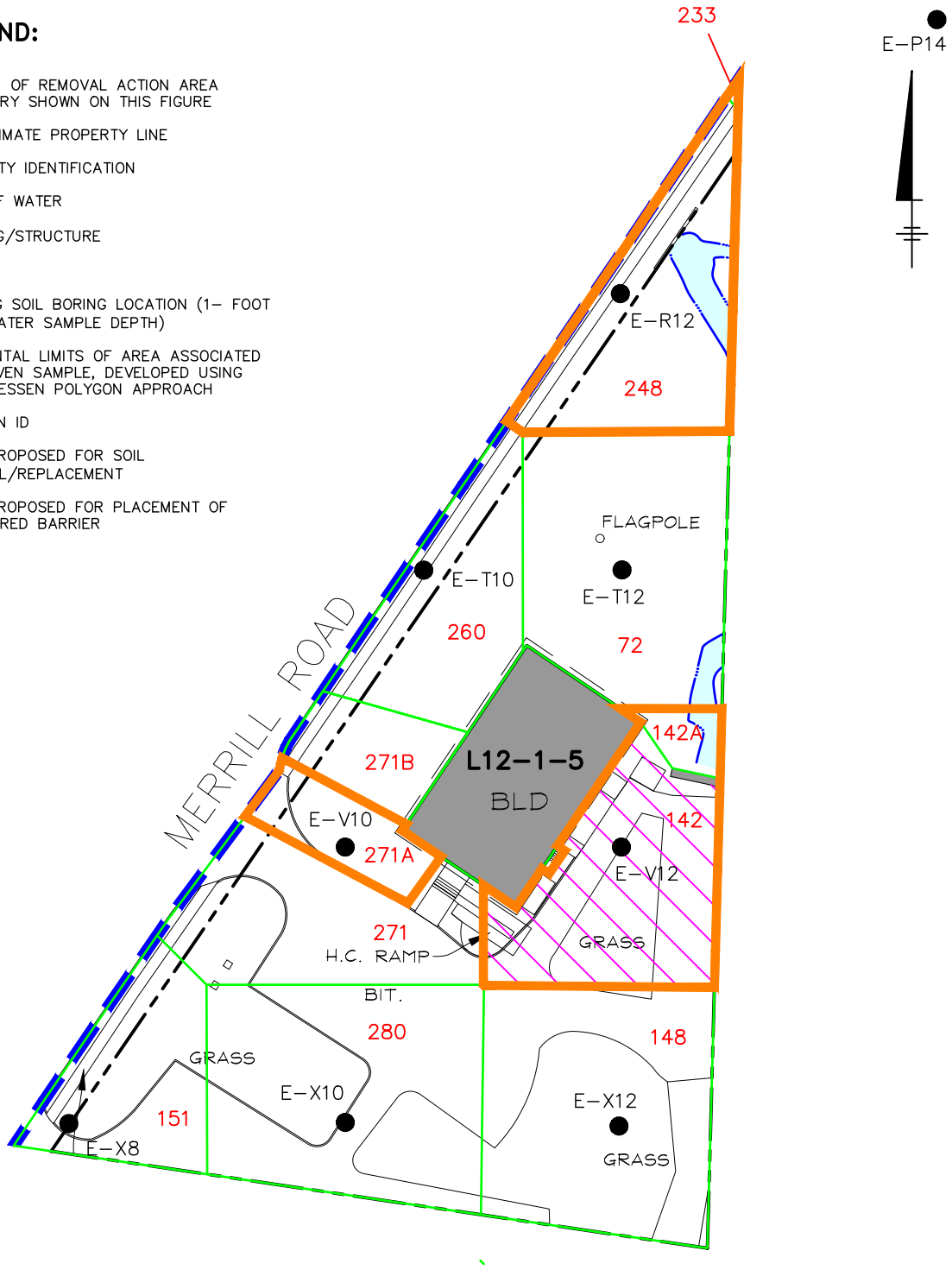
ARCADIS

FIGURE
A-3

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
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40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 2- TO 3-FOOT DEPTH INCREMENT

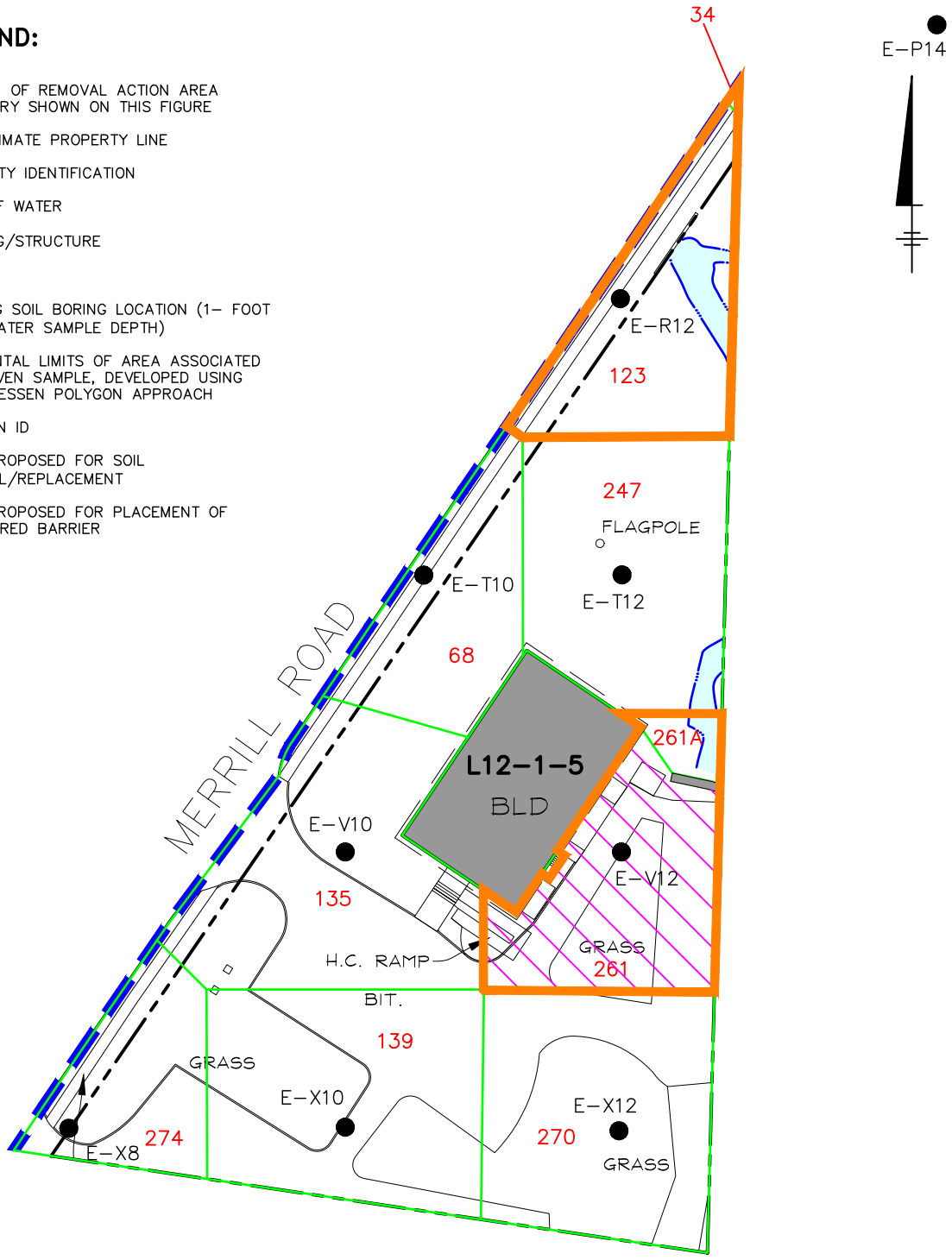
ARCADIS

FIGURE
A-4

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 3- TO 4-FOOT DEPTH INCREMENT

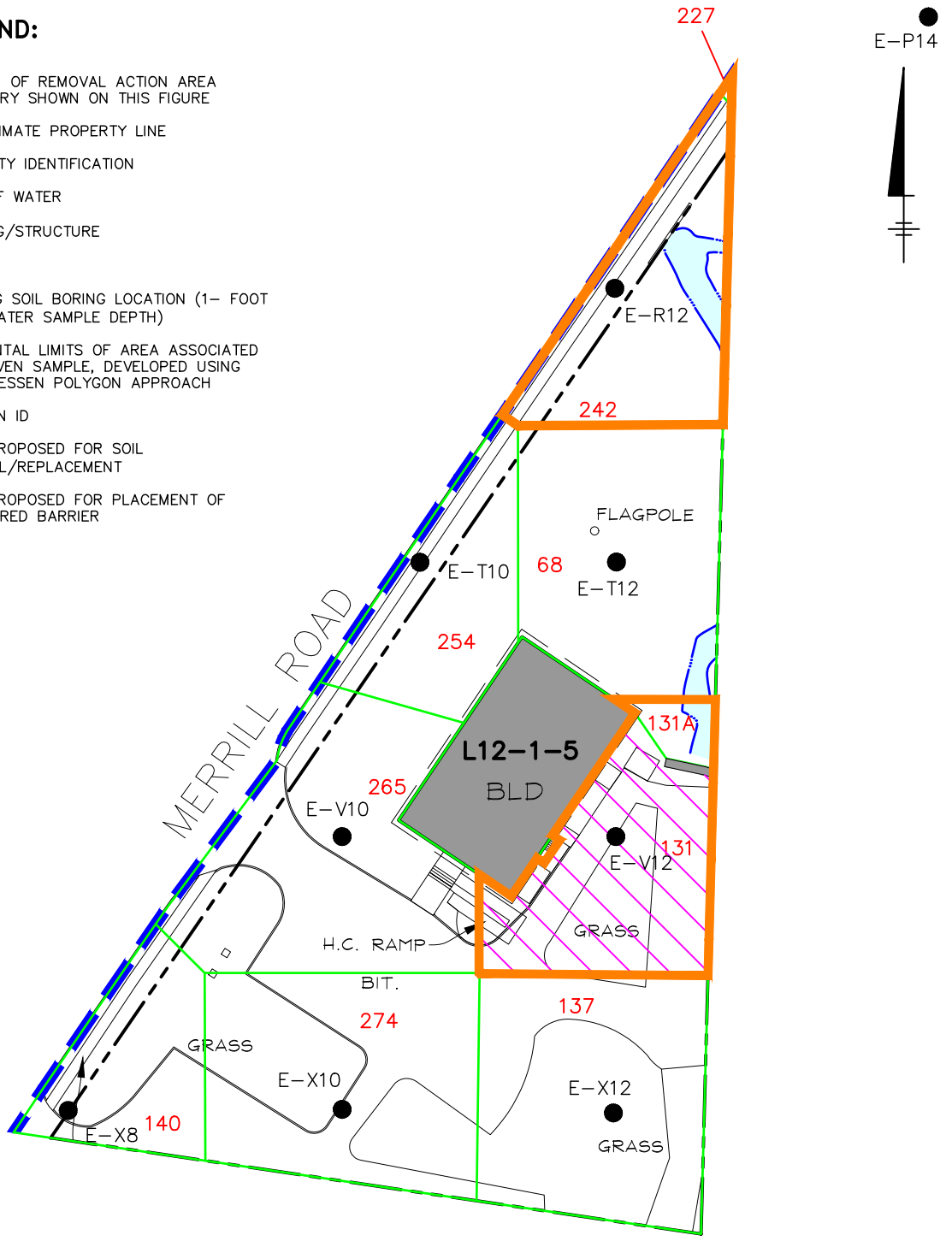
ARCADIS

FIGURE
A-5

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 4- TO 6-FOOT DEPTH INCREMENT

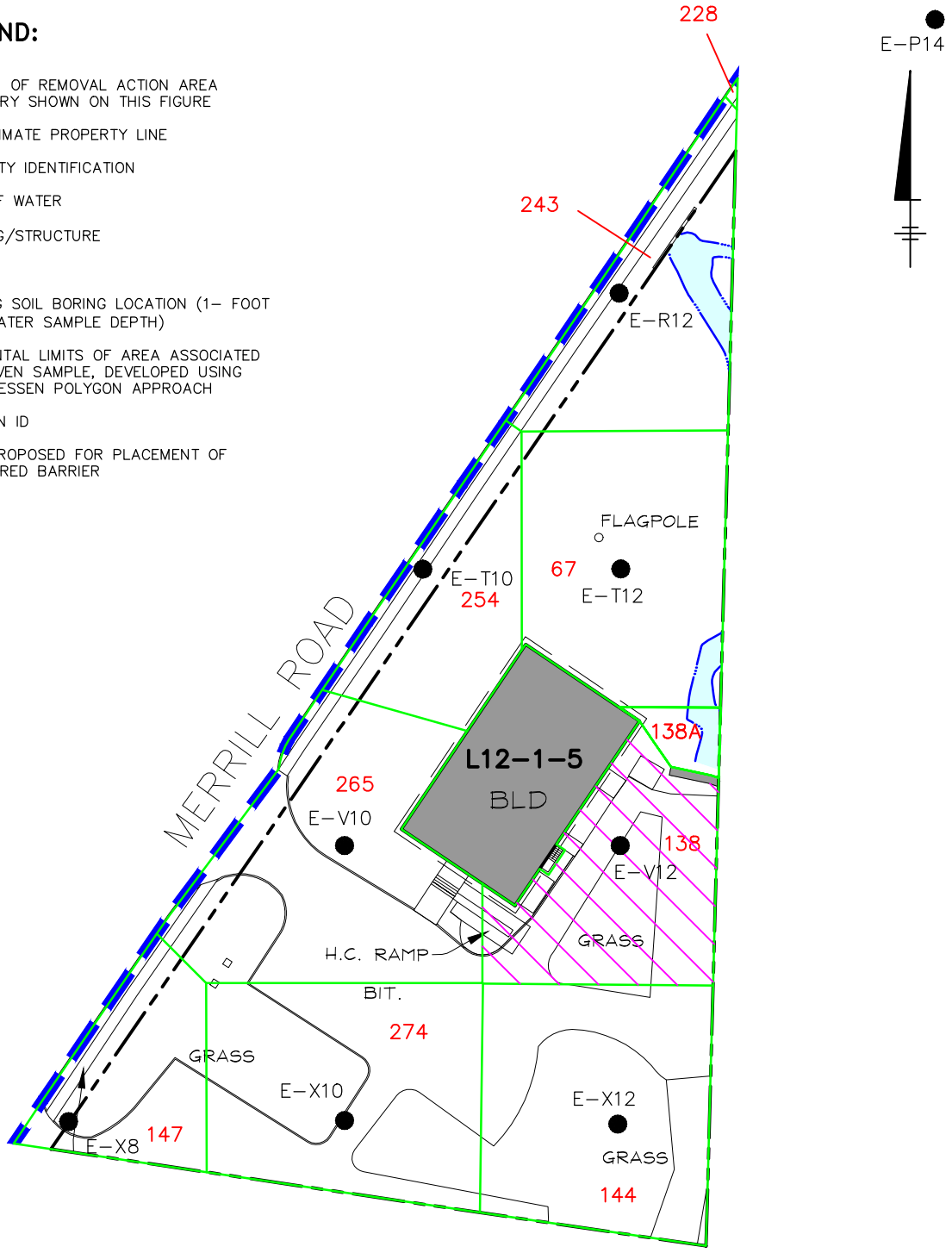
ARCADIS

FIGURE
A-6

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
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40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 6- TO 7-FOOT DEPTH INCREMENT

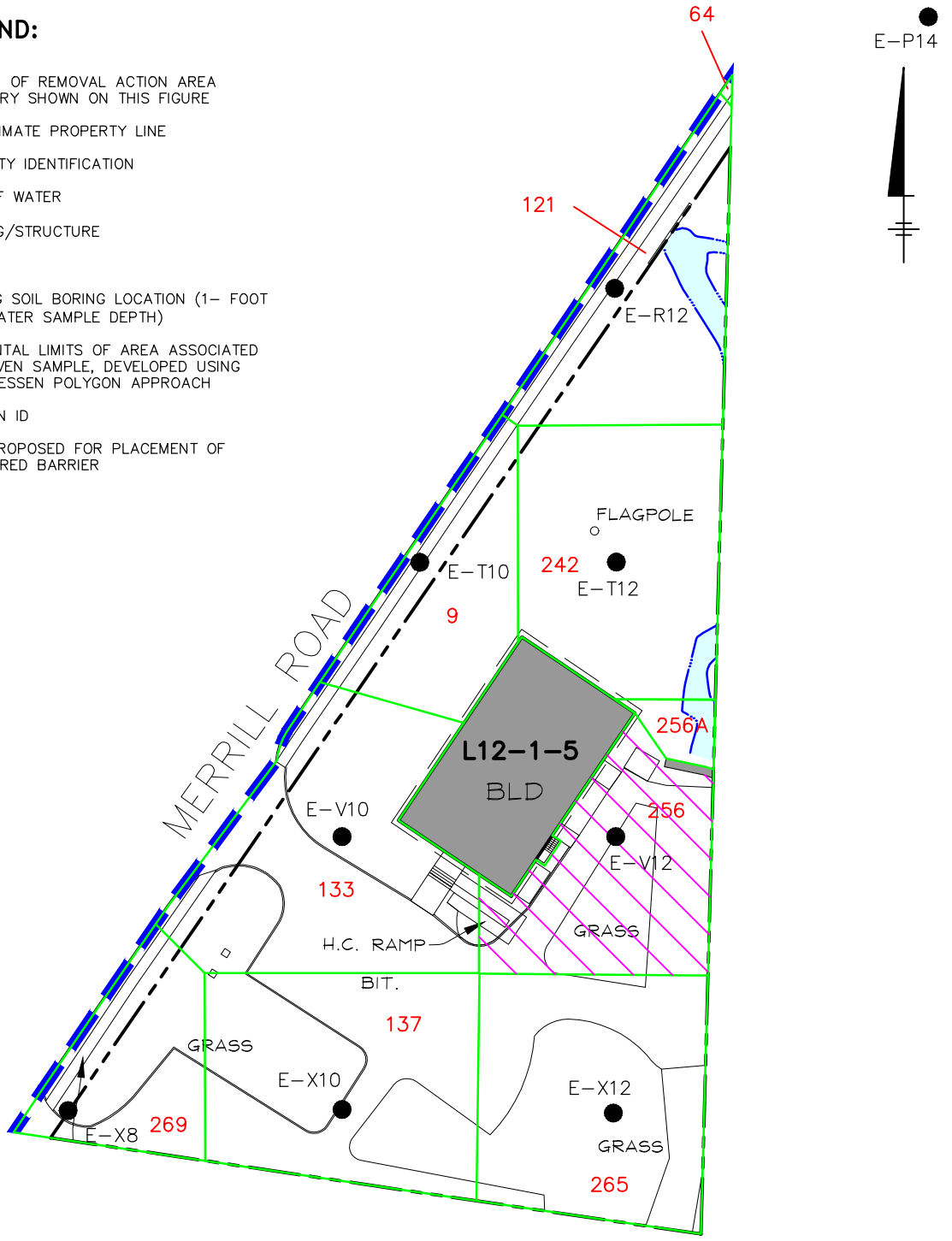
ARCADIS

FIGURE
A-7

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
G:\GE\ENVCAD\SYRACUSE\ACTIVE\B004019\0002\10006\DWG\RDRA\L12-1-5\REVISED-20144019006-38.DWG LAYOUT: A-7 SAVED: 3/28/2014 10:02 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-PA-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/28/2014 10:02 AM BY: SAMIOS, ALEX
XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 7- TO 8-FOOT DEPTH INCREMENT

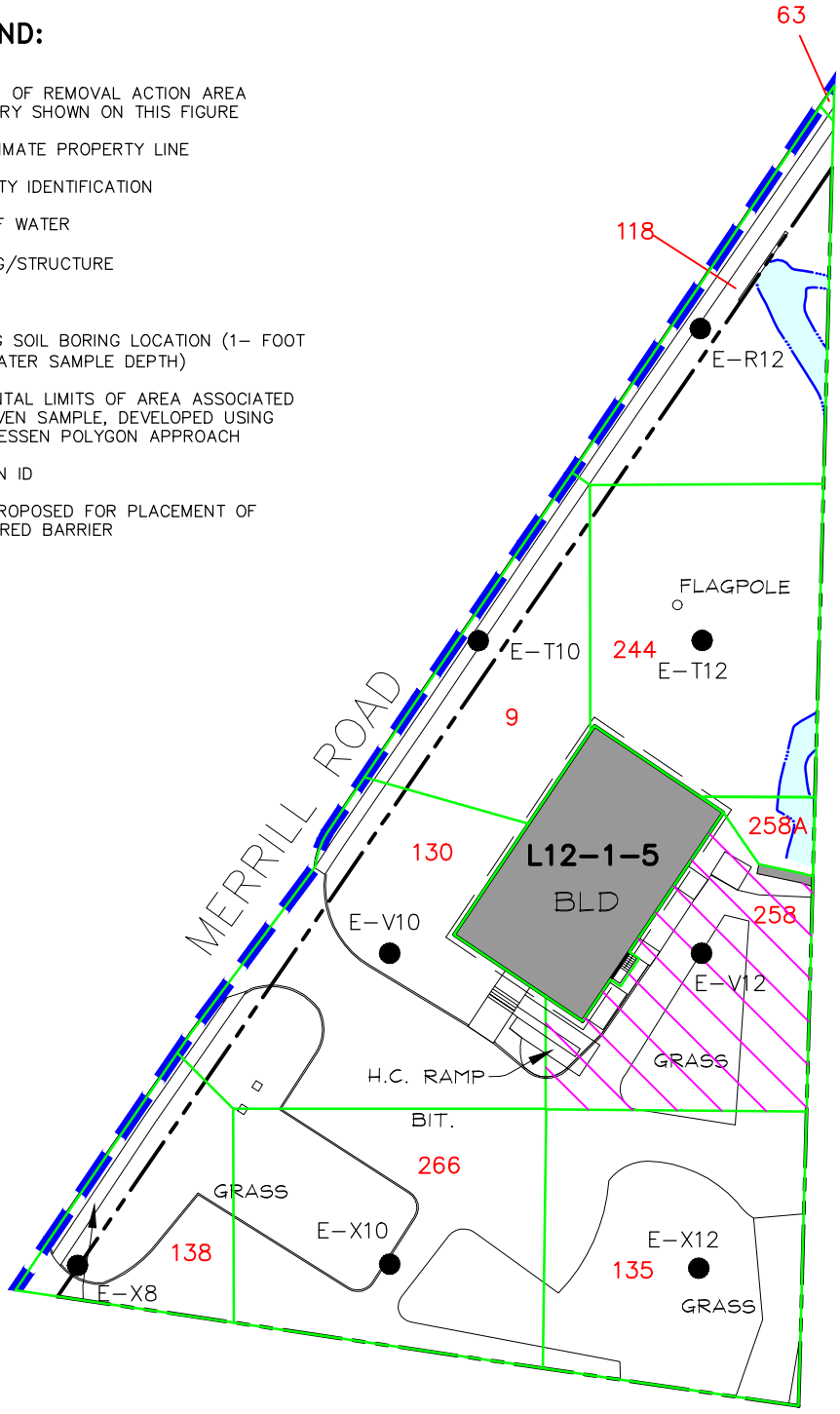
ARCADIS

FIGURE
A-8

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 8- TO 10-FOOT DEPTH INCREMENT

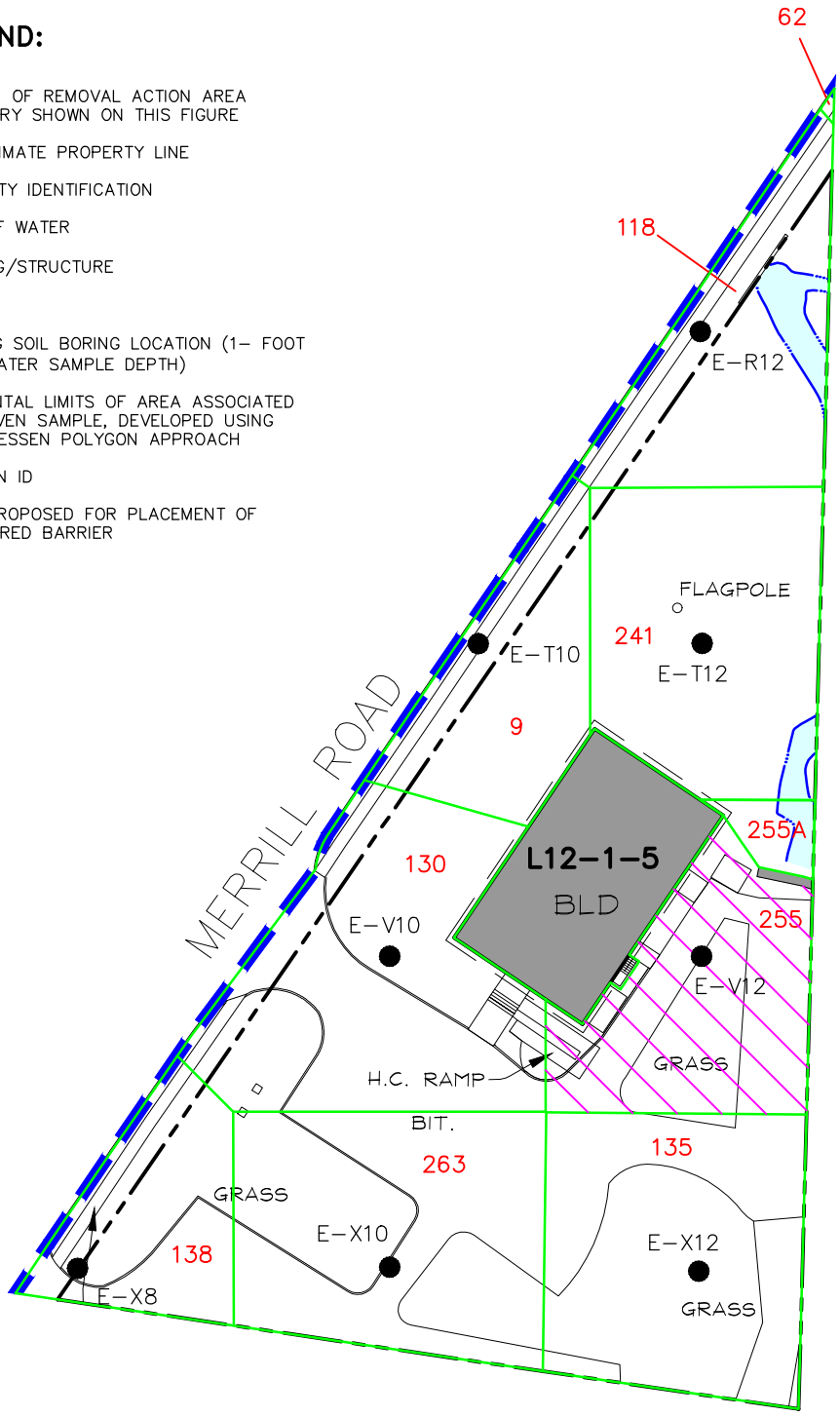
ARCADIS

FIGURE
A-9

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(On)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 10- TO 12-FOOT DEPTH INCREMENT

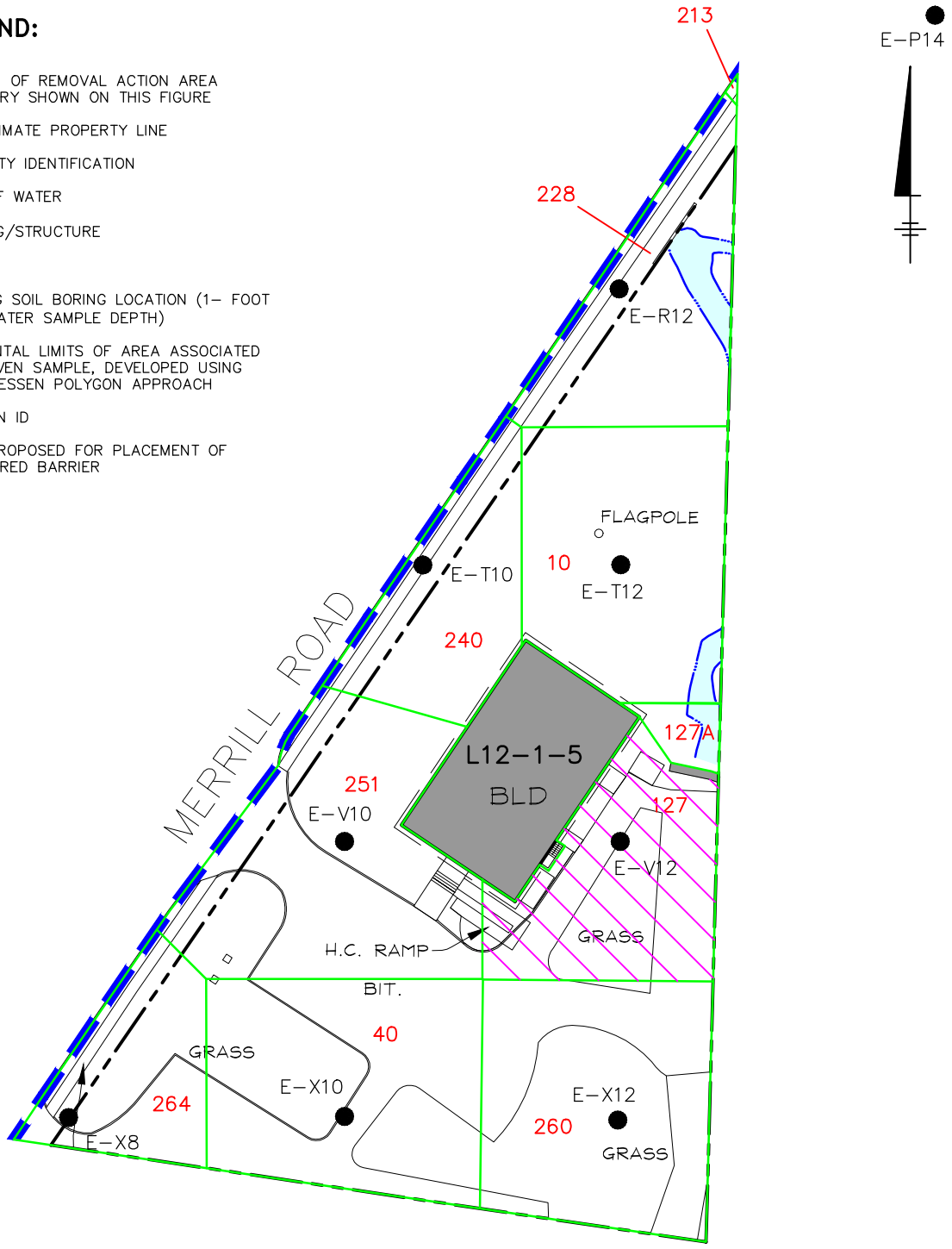
ARCADIS

FIGURE
A-10

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–1–5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–T12 — EXISTING SOIL BORING LOCATION (1– FOOT OR GREATER SAMPLE DEPTH)
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 254 — POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF ENGINEERED BARRIER



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - THIESSEN POLYGON MAP 12- TO 15-FOOT DEPTH INCREMENT

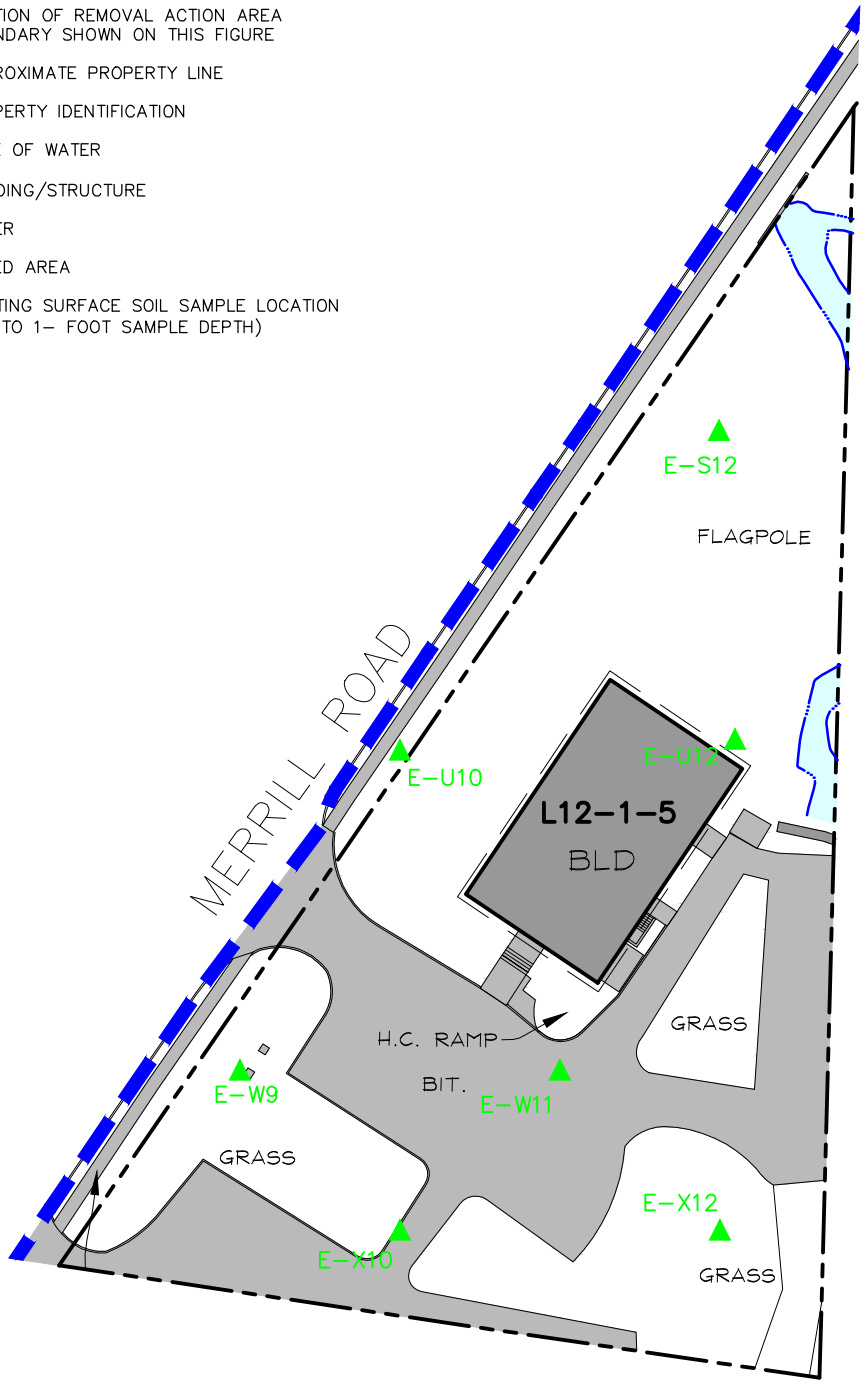
ARCADIS

FIGURE
A-11

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X00
40190X12

LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12-2-1 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- PAVED AREA
- ▲ E-S12 — EXISTING SURFACE SOIL SAMPLE LOCATION (0- TO 1- FOOT SAMPLE DEPTH)



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - APPENDIX IX+3 SOIL SAMPLING LOCATIONS (0- TO 1-FOOT DEPTH INTERVAL)

ARCADIS

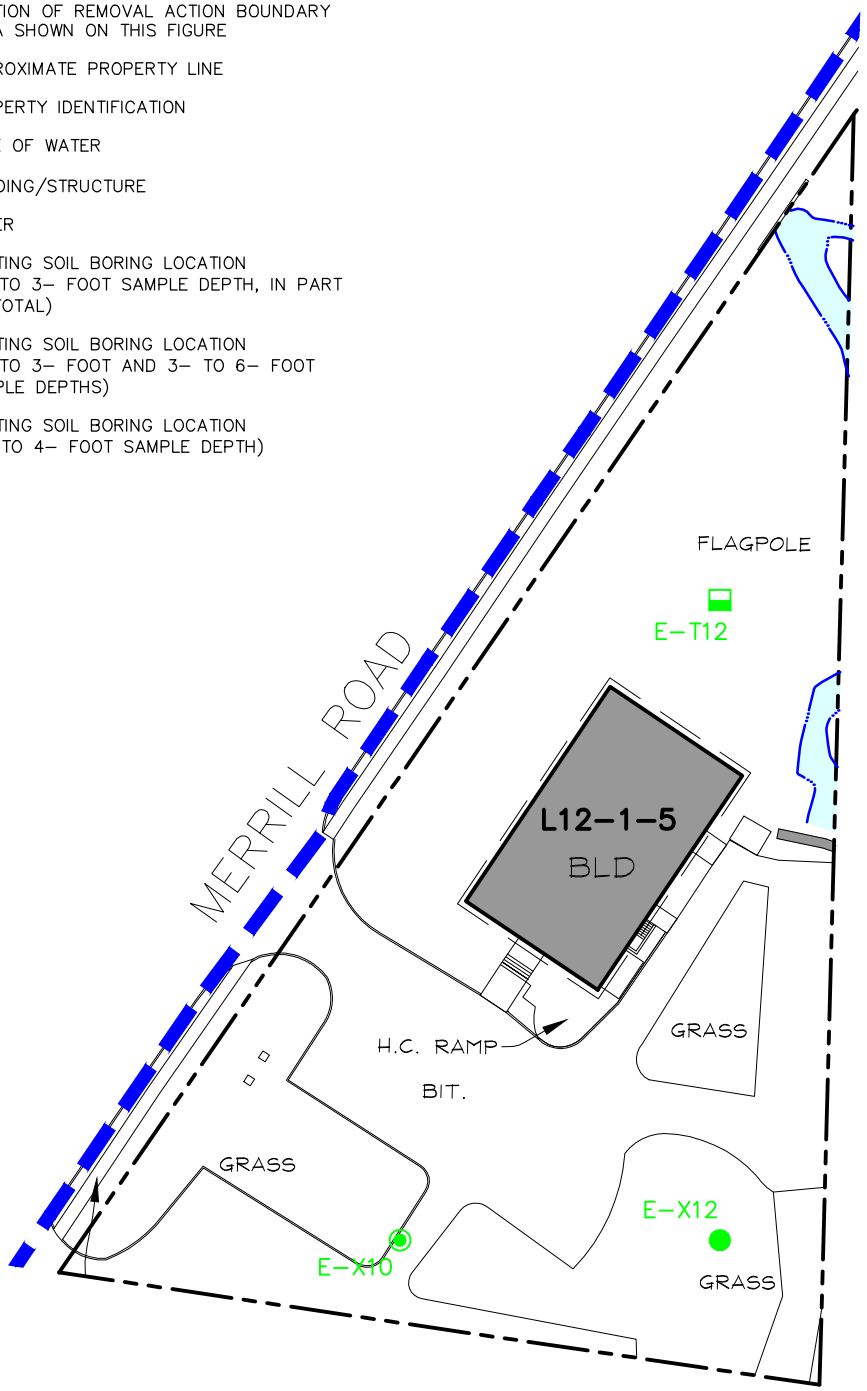
FIGURE
A-12

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190X00

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
G:\GE\ENVCAD\SYRACUSE\ACTIVE\B0040190\0002\0006\DWG\RDRA\L12-1-5\REVISED-20144019OG59.DWG LAYOUT: A-13 SAVED: 3/28/2014 10:27 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-PA-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/28/2014 10:27 AM BY: SAMIOS, ALEX
XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION BOUNDARY AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–2–1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- E–X12 EXISTING SOIL BORING LOCATION (1– TO 3– FOOT SAMPLE DEPTH, IN PART OR TOTAL)
- E–T12 EXISTING SOIL BORING LOCATION (1– TO 3– FOOT AND 3– TO 6– FOOT SAMPLE DEPTHS)
- E–X10 EXISTING SOIL BORING LOCATION (2– TO 4– FOOT SAMPLE DEPTH)



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - APPENDIX IX+3 SOIL SAMPLING LOCATIONS (1- TO 6-FOOT DEPTH INTERVAL)

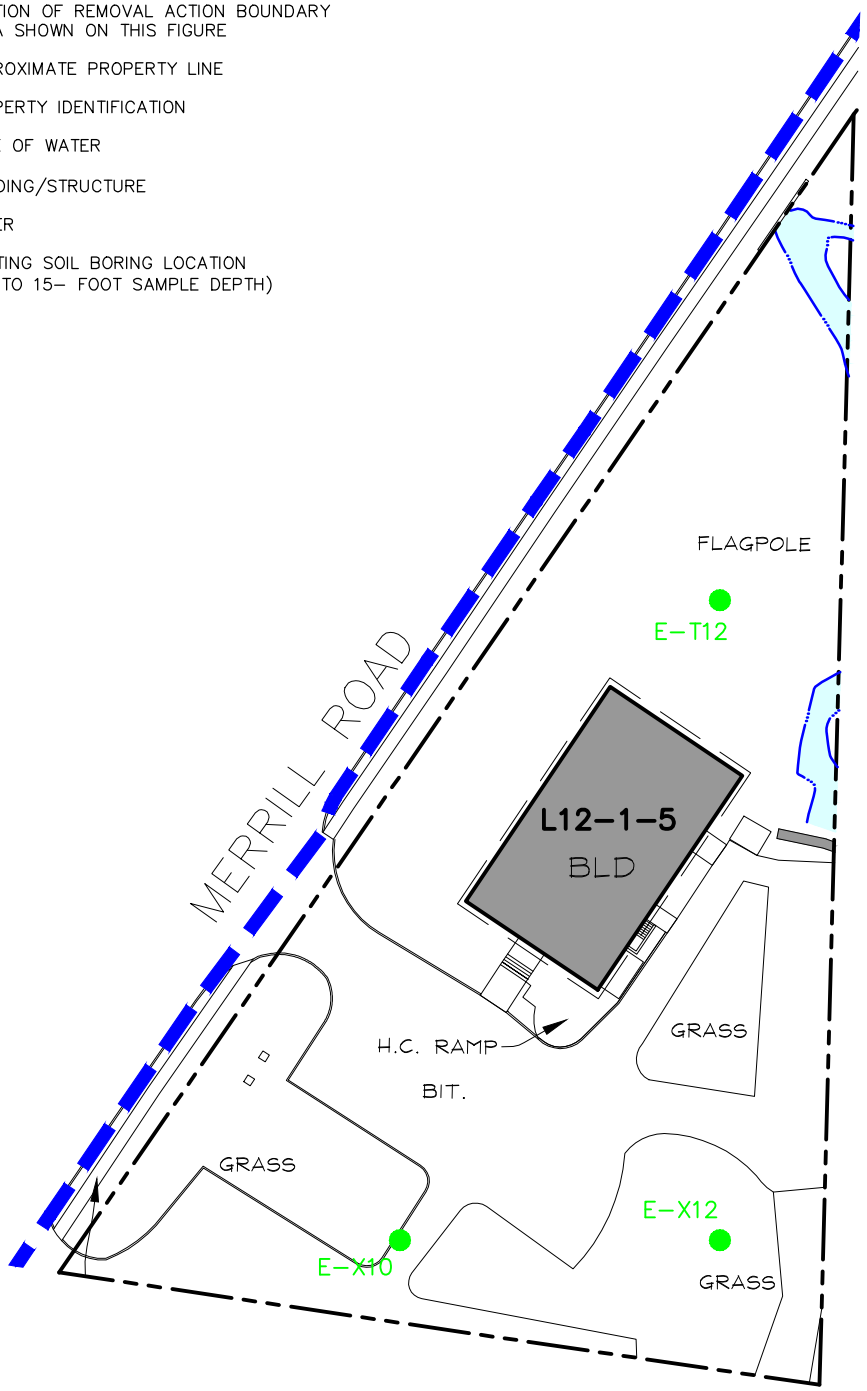
ARCADIS

FIGURE
A-13

CITY: SYRACUSE DIV/GROUP: ENV-141 DB: G.STOWELL L. FORAKER LD: PIC: P. KEANEY PM: A.CORBIN TM: T.LEEMHUIS LYR:(Opt)ON=*;OFF=*REF*
G:\GE\ENVCAD\SYRACUSE\ACTIVE\B0040190\00021\0006\DWG\RDRA\L12-1-5\REVISED-20144019OG60.DWG LAYOUT: A-14 SAVED: 3/28/2014 10:33 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-PA-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/28/2014 10:34 AM BY: SAMIOS, ALEX
XREFS: IMAGES:
40190X12
40190X00

LEGEND:

- PORTION OF REMOVAL ACTION BOUNDARY AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12–2–1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- WATER
- ▲ E–S12 EXISTING SOIL BORING LOCATION (6– TO 15– FOOT SAMPLE DEPTH)



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M(REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

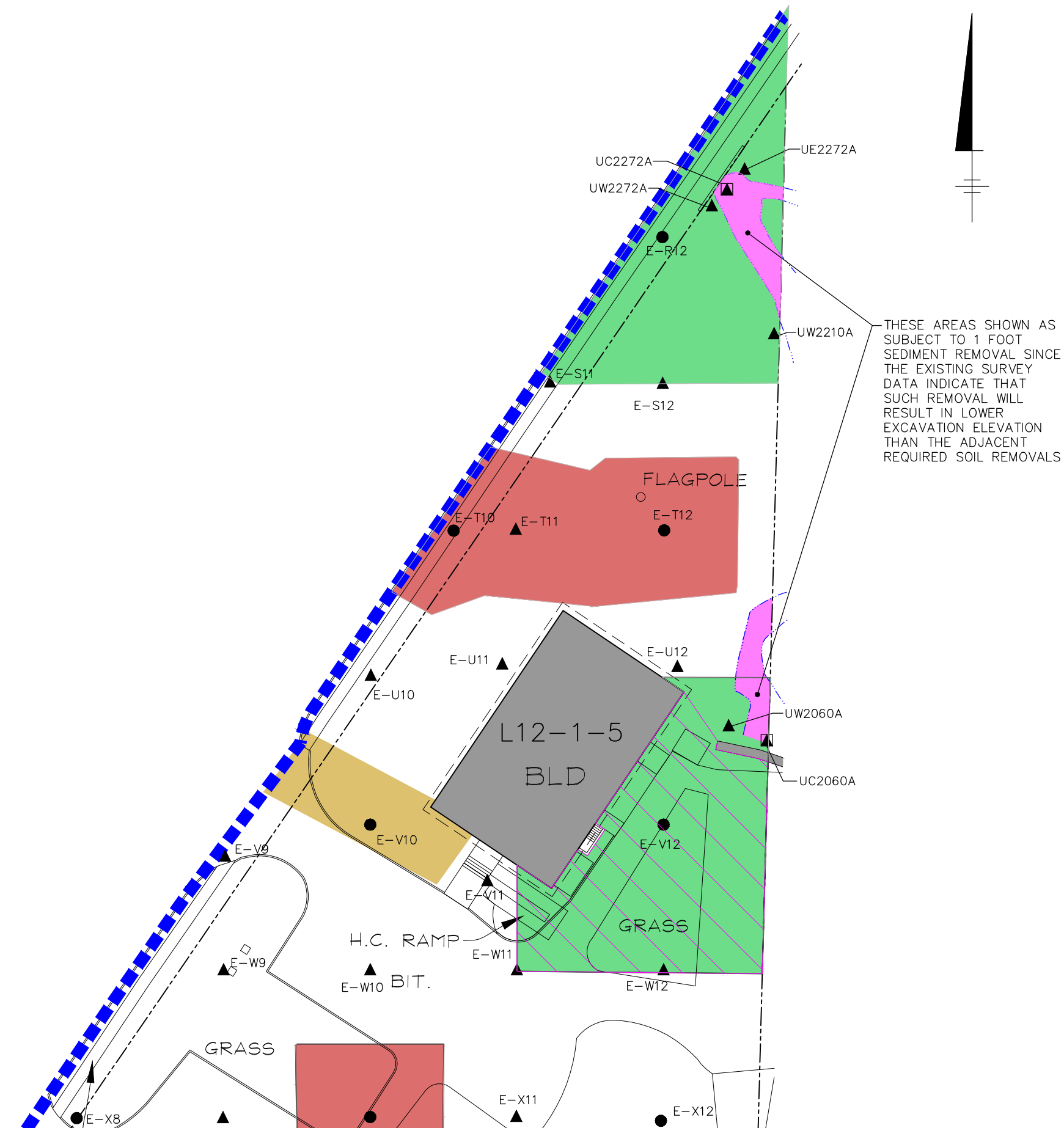
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - APPENDIX IX+3 SOIL SAMPLING LOCATIONS (6- TO 15-FOOT DEPTH INTERVAL)

ARCADIS

FIGURE
A-14

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES:
40190X12
40190XDP



LEGEND:

- PORTION OF REMOVAL ACTION AREA BOUNDARY SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- L12-1-5 — PROPERTY IDENTIFICATION
- EDGE OF WATER
- BUILDING/STRUCTURE
- 1-FOOT SOIL REMOVAL/REPLACEMENT
- 3-FOOT SOIL REMOVAL/REPLACEMENT
- 6-FOOT SOIL REMOVAL/REPLACEMENT
- AREA SUBJECT TO INSTALLATION OF ENGINEERED BARRIER
- 1-FOOT SEDIMENT REMOVAL
- ▲ E-X9 — EXISTING SURFACE SOIL SAMPLE LOCATION (0- TO 1- FOOT SAMPLE DEPTH)
- ● E-X12 — EXISTING SOIL BORING LOCATION (1- FOOT OR GREATER SAMPLE DEPTH)
- UC2060A — EXISTING SEDIMENT SAMPLE LOCATION

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M (REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

0 20' 40'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN
FOR UNKAMET BROOK AREA- REMAINDER

SOIL- AND SEDIMENT- RELATED RESPONSE ACTIONS - PARCEL L12-1-5

ARCADIS

FIGURE
A-15

ARCADIS

Appendix B

Revised Utility Corridor Evaluations

TABLE B-1
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #3

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-R12	279	557	0 - 0.5	***0.021***	10.31	0.02	0.22
UW2272	279A	302	0 - 0.5	***0.021***	5.60	0.02	0.12
Totals:	--	859	--	--	15.91	--	0.33
					Volume Weighted Average:		**0.02**

0.5- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-R12	279	859	0.5 - 1	***0.021***	15.91	0.02	0.33
Totals:	--	859	--	--	15.91	--	0.33
					Volume Weighted Average:		**0.02**

1- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-R12	133	859	1 - 3	***0.021***	63.64	0.02	1.34
Totals:	--	859	--	--	63.64	--	1.34
					Volume Weighted Average:		**0.02**

3- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-R12	133	859	3 - 6	***0.021***	95.46	0.02	2.00
Totals:	--	859	--	--	95.46	--	2.00
					Volume Weighted Average:		**0.02**

TABLE B-1
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #3

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

6- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-R12	133	859	6 - 7	21.0	31.82	21.00	668.24
Totals:	--	859	--	--	31.82	--	668.24
					Volume Weighted Average:		**21.00**

SUMMARY: 0- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	859	--	--	222.75	--	672.24
					Volume Weighted Average:		**3.02**

Notes:

1. Polygon ID and area based on information shown on Figures B-2 to B-5.
2. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
3. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE B-2
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #4

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V10	236,237A	1,421	0 - 0.5	***0.021***	26.32	0.02	0.55
RAA10-E-V11	281	185	0 - 0.5	***0.021***	3.43	0.02	0.07
Totals:	--	1,606	--	--	29.75	--	0.62
					Volume Weighted Average:		**0.02**

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V10	236,223A	1,421	0.5 - 1	***0.021***	26.32	0.02	0.55
RAA10-E-V11	264	185	0.5 - 1	***0.021***	3.43	0.02	0.07
Totals:	--	1,606	--	--	29.75	--	0.62
					Volume Weighted Average:		**0.02**

1- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V10	103	1,606	1 - 3	***0.021***	118.98	0.02	2.50
Totals:	--	1,606	--	--	118.98	--	2.50
					Volume Weighted Average:		**0.02**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-V10	103	1,606	3 - 4	115	59.49	115.00	6,841.48
Totals:	--	1,606	--	--	59.49	--	6,841.48
					Volume Weighted Average:		**115.00**

TABLE B-2
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #4

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)
SUMMARY: 0- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	1,606	--	--	237.96	--	6,845.23
					Volume Weighted Average:		**28.77**

Notes:

1. Polygon ID and area based on information shown on Figures B-2 to B-4.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE B-3
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

0- TO 0.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-AA6	201	942	0 - 0.5	25.0	17.45	25.00	436.20
RAA10-E-BB5	200	932	0 - 0.5	0.298	17.27	0.30	5.15
RAA10-E-CC4	199	693	0 - 0.5	21.1	12.84	21.10	270.90
RAA10-E-CC5	286	171	0 - 0.5	4.7	3.18	4.70	14.92
RAA10-E-DD4	287	755	0 - 0.5	2.61	13.98	2.61	36.50
RAA10-E-EE3	198	741	0 - 0.5	1.37	13.73	1.37	18.80
RAA10-E-V10	237	310	0 - 0.5	5.3	5.74	5.30	30.41
RAA10-E-V10	237A	243	0 - 0.5	***0.021***	4.51	0.02	0.09
RAA10-E-V11	281	185	0 - 0.5	***0.021***	3.43	0.02	0.07
RAA10-E-V11	281A	229	0 - 0.5	7.5	4.24	7.50	31.83
RAA10-E-W9	283	1,144	0 - 0.5	4.3	21.18	4.30	91.06
RAA10-E-W10	282	847	0 - 0.5	0.277	15.68	0.28	4.34
RAA10-E-X8	210	1,546	0 - 0.5	65.0	28.63	65.00	1,860.78
RAA10-E-X9	284	458	0 - 0.5	4.0	8.47	4.00	33.90
RAA10-E-Y7	202	1,004	0 - 0.5	0.2	18.59	0.20	3.72
RAA10-E-Z6	209	716	0 - 0.5	0.083	13.26	0.08	1.10
RAA10-E-Z7	285	207	0 - 0.5	9.4	3.84	9.40	36.08
Totals:	--	11,124	--	--	206.01	--	2,875.85
					Volume Weighted Average:		**13.96**

0.5- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-AA6	187	942	0.5 - 1	25.0	17.45	25.00	436.20
RAA10-E-BB5	186	932	0.5 - 1	0.298	17.27	0.30	5.15
RAA10-E-CC4	185	693	0.5 - 1	21.1	12.84	21.10	270.90
RAA10-E-CC5	269	171	0.5 - 1	4.7	3.18	4.70	14.92
RAA10-E-DD4	270	755	0.5 - 1	2.61	13.98	2.61	36.50
RAA10-E-EE3	184	741	0.5 - 1	1.37	13.73	1.37	18.80
RAA10-E-V10	223	310	0.5 - 1	5.3	5.74	5.30	30.41
RAA10-E-V10	223A	243	0.5 - 1	***0.021***	4.51	0.02	0.09
RAA10-E-V11	264	185	0.5 - 1	***0.021***	3.43	0.02	0.07
RAA10-E-V11	264A	229	0.5 - 1	7.5	4.24	7.50	31.83
RAA10-E-W9	266	1,144	0.5 - 1	4.3	21.18	4.30	91.06
RAA10-E-W10	265	847	0.5 - 1	0.277	15.68	0.28	4.34
RAA10-E-X8	196	1,546	0.5 - 1	65.0	28.63	65.00	1,860.78
RAA10-E-X9	267	458	0.5 - 1	4.0	8.47	4.00	33.90
RAA10-E-Y7	188	1,004	0.5 - 1	0.2	18.59	0.20	3.72
RAA10-E-Z6	195	716	0.5 - 1	0.083	13.26	0.08	1.10
RAA10-E-Z7	268	207	0.5 - 1	9.4	3.84	9.40	36.08
Totals:	--	11,124	--	--	206.01	--	2,875.85
					Volume Weighted Average:		**13.96**

TABLE B-3
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

1- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-DD4	135	1,934	1 - 3	1.35	143.23	1.35	193.36
RAA10-E-V10	104	1,893	1 - 3	1,080	140.22	1,080.00	151,439.20
RAA10-E-V10	104A	428	1 - 3	***0.021***	31.73	0.02	0.67
RAA10-E-X8	97	3,081	1 - 3	6.65	228.24	6.65	1,517.80
RAA10-E-Z6	96	2,017	1 - 3	0.12	149.41	0.12	17.93
UB-UTL-4	134	1,771	1 - 3	17.7	131.20	17.70	2,322.27
Totals:	--	11,124	--	--	824.03	--	155,491.22
					Volume Weighted Average:		**188.70**

3- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-DD4	135	1,934	3 - 6	0.42	214.85	0.42	90.24
RAA10-E-V10	104	2,321	3 - 6	115	257.92	115.00	29,660.80
RAA10-E-X8	97	3,081	3 - 6	0.021	342.36	0.02	7.19
RAA10-E-Z6	96	2,017	3 - 6	20.8	224.11	20.80	4,661.46
UB-UTL-4	134	1,771	3 - 6	4.2	196.80	4.20	826.57
Totals:	--	11,124	--	--	1,236.04	--	35,246.26
					Volume Weighted Average:		**28.52**

6- TO 8-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-DD4	135	1,934	6 - 8	**0.02**	143.23	0.02	2.86
RAA10-E-V10	104	2,321	6 - 8	1.38	171.95	1.38	237.29
RAA10-E-X8	97	3,081	6 - 8	**0.021**	228.24	0.02	4.79
RAA10-E-Z6	96	2,017	6 - 8	0.51	149.41	0.51	76.20
UB-UTL-4	134	1,771	6 - 8	**0.0185**	131.20	0.02	2.43
Totals:	--	11,124	--	--	824.03	--	323.57
					Volume Weighted Average:		**0.39**

TABLE B-3
POST-REMEDIATION CONDITIONS
UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

8- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
RAA10-E-DD4	135	1,934	8 - 10	**0.02**	143.23	0.02	2.86
RAA10-E-V10	104	2,321	8 - 10	1.38	171.95	1.38	237.29
RAA10-E-X8	97	3,081	8 - 10	**0.021**	228.24	0.02	4.79
RAA10-E-Z6	96	2,017	8 - 10	0.51	149.41	0.51	76.20
UB-UTL-4	134	1,771	8 - 10	**0.0185**	131.20	0.02	2.43
Totals:	--	11,124	--	--	824.03	--	323.57
					Volume Weighted Average:		**0.39**

SUMMARY: 0- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	11,124	--	--	4,120.13	--	197,136.32
					Volume Weighted Average:		**47.85**

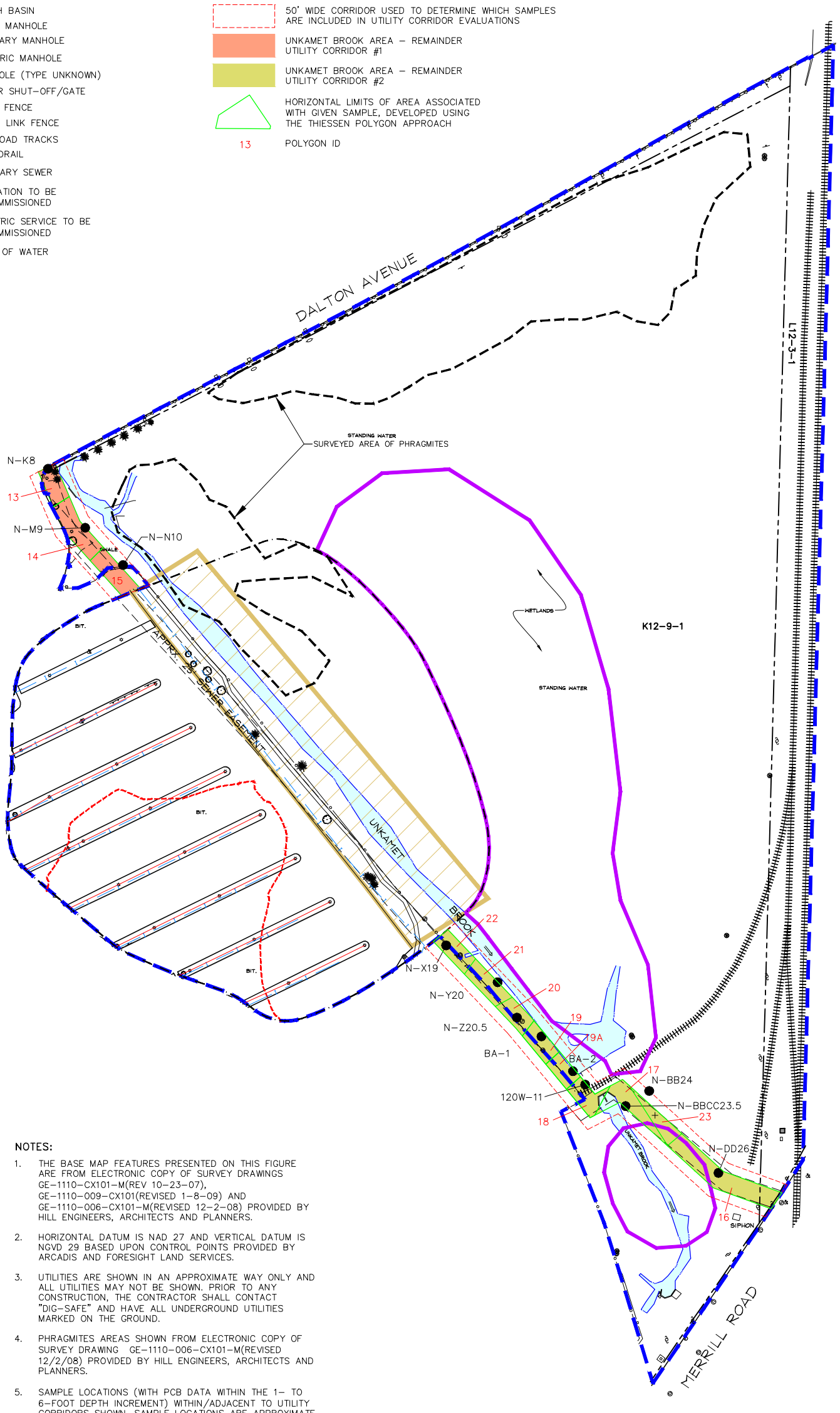
Notes:

1. Polygon ID and area based on information shown on Figures B-2 to B-8.
2. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
3. For instances where a duplicate sample was available, the average of the samples was included in table.
4. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
5. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
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XREFS: IMAGES: PROJECTNAME: ----
40190X112
40190XDP

LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- K12-9-1 PROPERTY IDENTIFICATION
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- WOOD FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- SANITARY SEWER
- IRRIGATION TO BE DECOMMISSIONED
- ELECTRIC SERVICE TO BE DECOMMISSIONED
- EDGE OF WATER
- LANDFILL
- BUILDING/STRUCTURE
- WATER
- SECTION OF UNKAMET BROOK SUBJECT TO REROUTING
- N-K8 EXISTING SOIL BORING LOCATION (1-FOOT OR GREATER SAMPLE DEPTH)
- EXISTING MONITORING WELL
- 50' WIDE CORRIDOR USED TO DETERMINE WHICH SAMPLES ARE INCLUDED IN UTILITY CORRIDOR EVALUATIONS
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #1
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #2
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 13 POLYGON ID



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-CX101-M(REV 10-23-07), GE-1110-009-CX101(REVISED 1-8-09) AND GE-1110-006-CX101-M(REVISED 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.
4. PHRAGMITES AREAS SHOWN FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REVISED 12/2/08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
5. SAMPLE LOCATIONS (WITH PCB DATA WITHIN THE 1- TO 6-FOOT DEPTH INCREMENT) WITHIN/ADJACENT TO UTILITY CORRIDORS SHOWN. SAMPLE LOCATIONS ARE APPROXIMATE.

0 80' 160'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

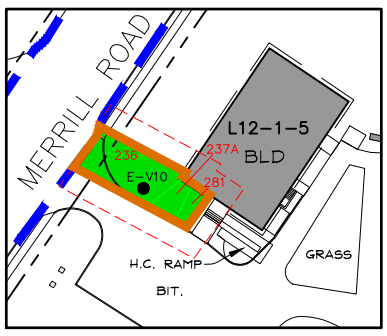
PROPERTIES LOCATED NORTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 1- TO 6-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-1

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\RDRA\L12-1-5\REVISED-2014\40190G50.DWG LAYOUT: B-2 SAVED: 4/1/2014 12:04 PM PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 12:04 PM BY: SARTORI, KATHERINE

XREFS: IMAGES: PROJECTNAME: ----
40190X12
40190XDP
40190x13



DETAIL A

SCALE: 1" = 100'

CORRIDOR #4
SEE DETAIL A

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHOULD CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.
5. SAMPLE LOCATIONS (WITH PCB DATA WITHIN THE 0- TO 19-FOOT DEPTH INCREMENT) WITHIN/ADJACENT TO UTILITY CORRIDORS SHOWN. ALL OTHER SAMPLE LOCATIONS HAVE BEEN REMOVED. SAMPLE LOCATIONS ARE APPROXIMATE.
6. SEWER EASEMENT AND SANITARY SEWER LINE/MANHOLES SHOWN (FROM PARCEL K11-4-2 ACROSS L11-4-11) BASED ON CITY OF PITTSFIELD SEWER MAP #650 (DATED 1960) AND ELECTRONIC COPY OF SURVEY DRAWING GE-1110-CX101-M(REV 8-27-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS. THE SEWER EASEMENT, LINES AND SOME MANHOLES) SHOULD BE CONSIDERED APPROXIMATE.

L12-2-1

L11-4-11

L11-4-12

L12-1-4 BLD

L12-1-101 BLD

BLD

MERRILL ROAD

HAZEL PLACE

FLAGPOLE

SEWER EASEMENT

SEE NOTE

APPROXIMATE 25' SEWER EASEMENT

HOUSATONIC RIVER

LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING/STRUCTURE
- WATER
- ▲E-AA6 EXISTING SURFACE SOIL SAMPLE LOCATION (0- TO 1- FOOT SAMPLE DEPTH)
- ●E-AAA22 EXISTING SOIL BORING LOCATION (1- FOOT OR GREATER SAMPLE DEPTH)
- 50' WIDE CORRIDOR USED TO DETERMINE WHICH SAMPLES ARE INCLUDED IN UTILITY CORRIDOR EVALUATIONS
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #3
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #4
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #6
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #7
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 269 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT

0 80' 160'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

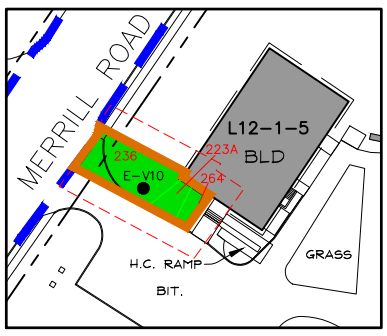
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 0- TO 0.5-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-2

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\RDRA\L12-1-5\REVISED-2014\40190G51.DWG LAYOUT: B-3 SAVED: 4/1/2014 12:03 PM PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 12:03 PM BY: SARTORI, KATHERINE

XREFS: IMAGES: PROJECTNAME: ----
40190X12
40190XDP
40190x13



DETAIL A

SCALE: 1" = 100'

CORRIDOR #4
SEE DETAIL A

L12-2-1

L11-4-11

L11-4-12

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHOULD CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.
5. SAMPLE LOCATIONS (WITH PCB DATA WITHIN THE 0- TO 19-FOOT DEPTH INCREMENT) WITHIN/ADJACENT TO UTILITY CORRIDORS SHOWN. ALL OTHER SAMPLE LOCATIONS HAVE BEEN REMOVED. SAMPLE LOCATIONS ARE APPROXIMATE.
6. SEWER EASEMENT AND SANITARY SEWER LINE/MANHOLES SHOWN (FROM PARCEL K11-4-2 ACROSS L11-4-11) BASED ON CITY OF PITTSFIELD SEWER MAP #650 (DATED 1960) AND ELECTRONIC COPY OF SURVEY DRAWING GE-1110-CX101-M(REV 8-27-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS. THE SEWER EASEMENT, LINES AND SOME MANHOLES) SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING/STRUCTURE
- WATER
- ▲E-AA6 EXISTING SURFACE SOIL SAMPLE LOCATION (0- TO 1- FOOT SAMPLE DEPTH)
- ●E-AAA22 EXISTING SOIL BORING LOCATION (1- FOOT OR GREATER SAMPLE DEPTH)
- 50' WIDE CORRIDOR USED TO DETERMINE WHICH SAMPLES ARE INCLUDED IN UTILITY CORRIDOR EVALUATIONS
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #3
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #4
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #6
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #7
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 269 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT

0 80' 160'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

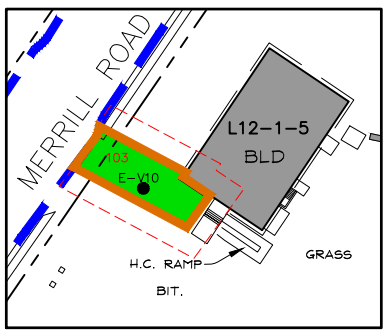
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 0.5- TO 1.0-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-3

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ, K.SARTORI PM: C.AVERILL TM: M.DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\RDRA\L12-1-5\REVISED-2014\40190G52.DWG LAYOUT: B-4 SAVED: 4/1/2014 1:01 PM PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 1:02 PM BY: SARTORI, KATHERINE

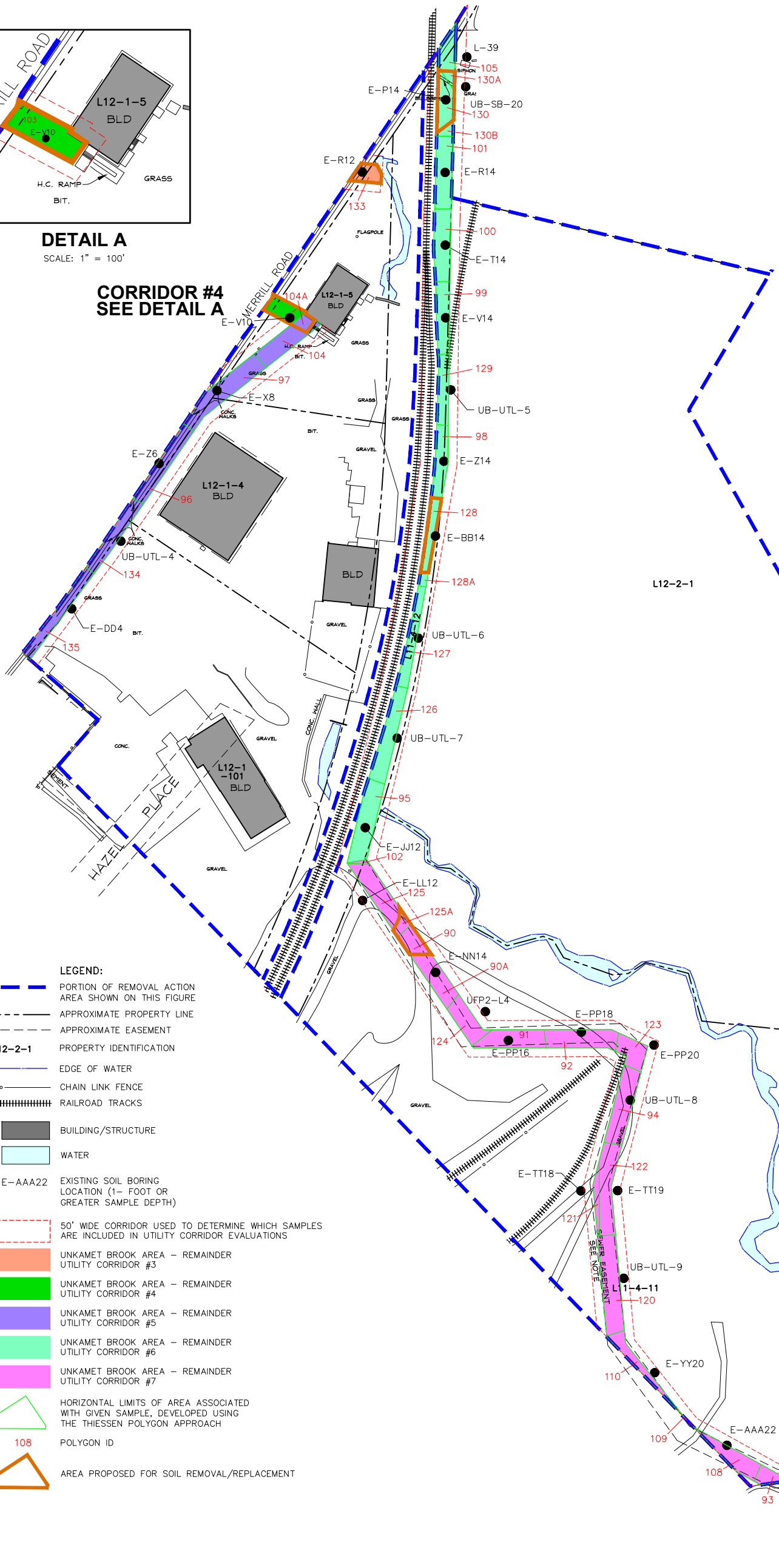
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40190X12
40190XDP
40190x13



DETAIL A

SCALE: 1" = 100'

CORRIDOR #4
SEE DETAIL A



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
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LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING/STRUCTURE
- WATER
- E-AAA22 EXISTING SOIL BORING LOCATION (1- FOOT OR GREATER SAMPLE DEPTH)
- 50' WIDE CORRIDOR USED TO DETERMINE WHICH SAMPLES ARE INCLUDED IN UTILITY CORRIDOR EVALUATIONS
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- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #4
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- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #6
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- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 108 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

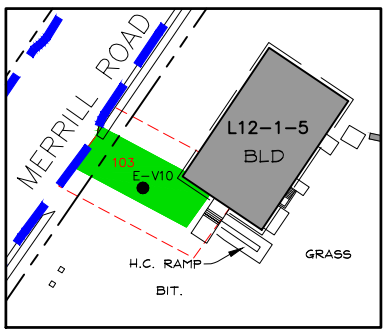
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 1- TO 3-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-4

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ, K.SARTORI PM: C.AVERILL TM: M.DALEY
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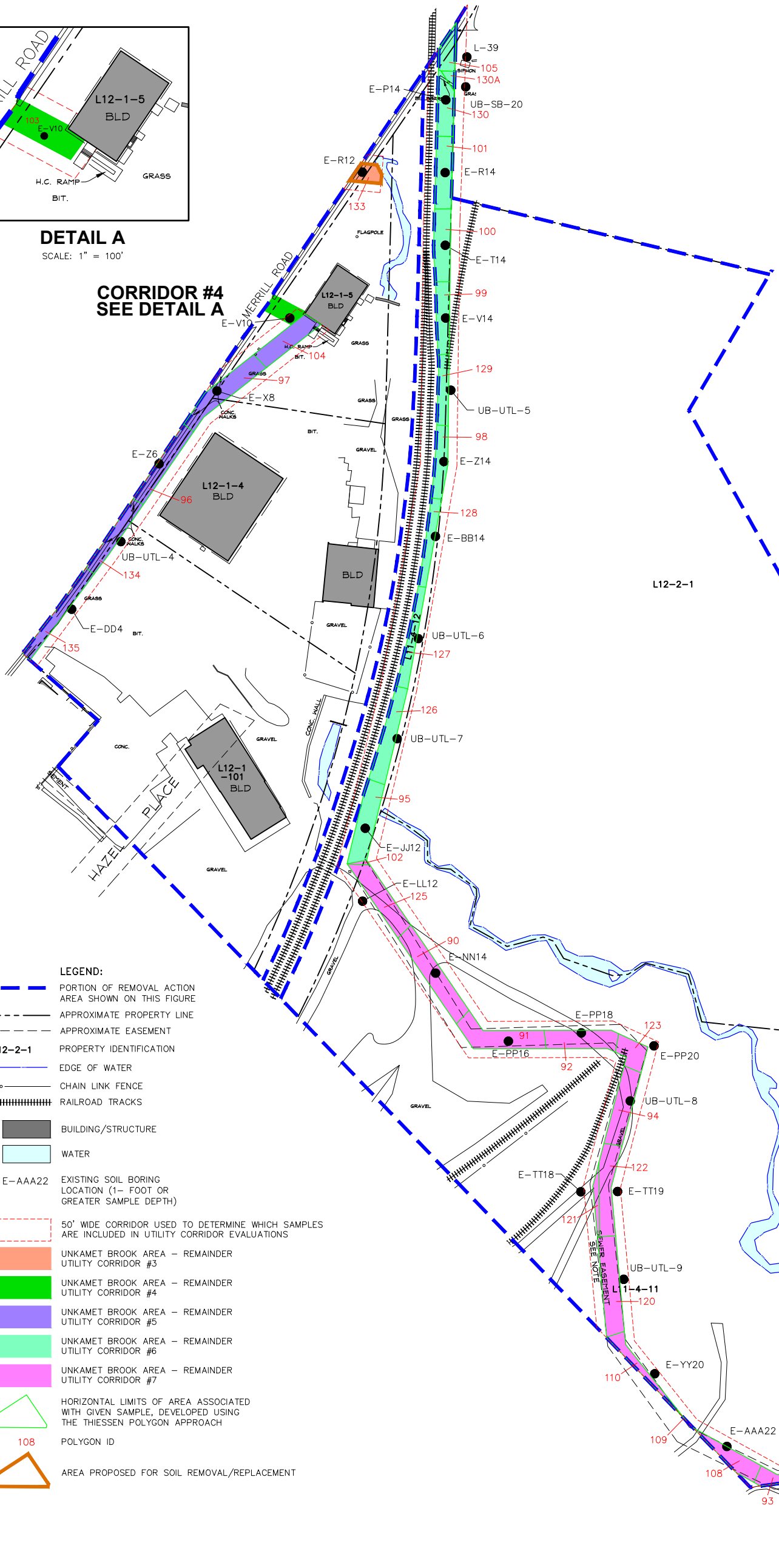
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40190X12
40190XDP
40190x13



DETAIL A

SCALE: 1" = 100'

CORRIDOR #4
SEE DETAIL A



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
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6. SEWER EASEMENT AND SANITARY SEWER LINE/MANHOLES SHOWN (FROM PARCEL K11-4-2 ACROSS L11-4-11) BASED ON CITY OF PITTSFIELD SEWER MAP #650 (DATED 1960) AND ELECTRONIC COPY OF SURVEY DRAWING GE-1110-CX101-M(REV 8-27-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS. THE SEWER EASEMENT, LINES AND SOME MANHOLES) SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

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- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING/STRUCTURE
- WATER
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- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #6
- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #7
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- 108 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

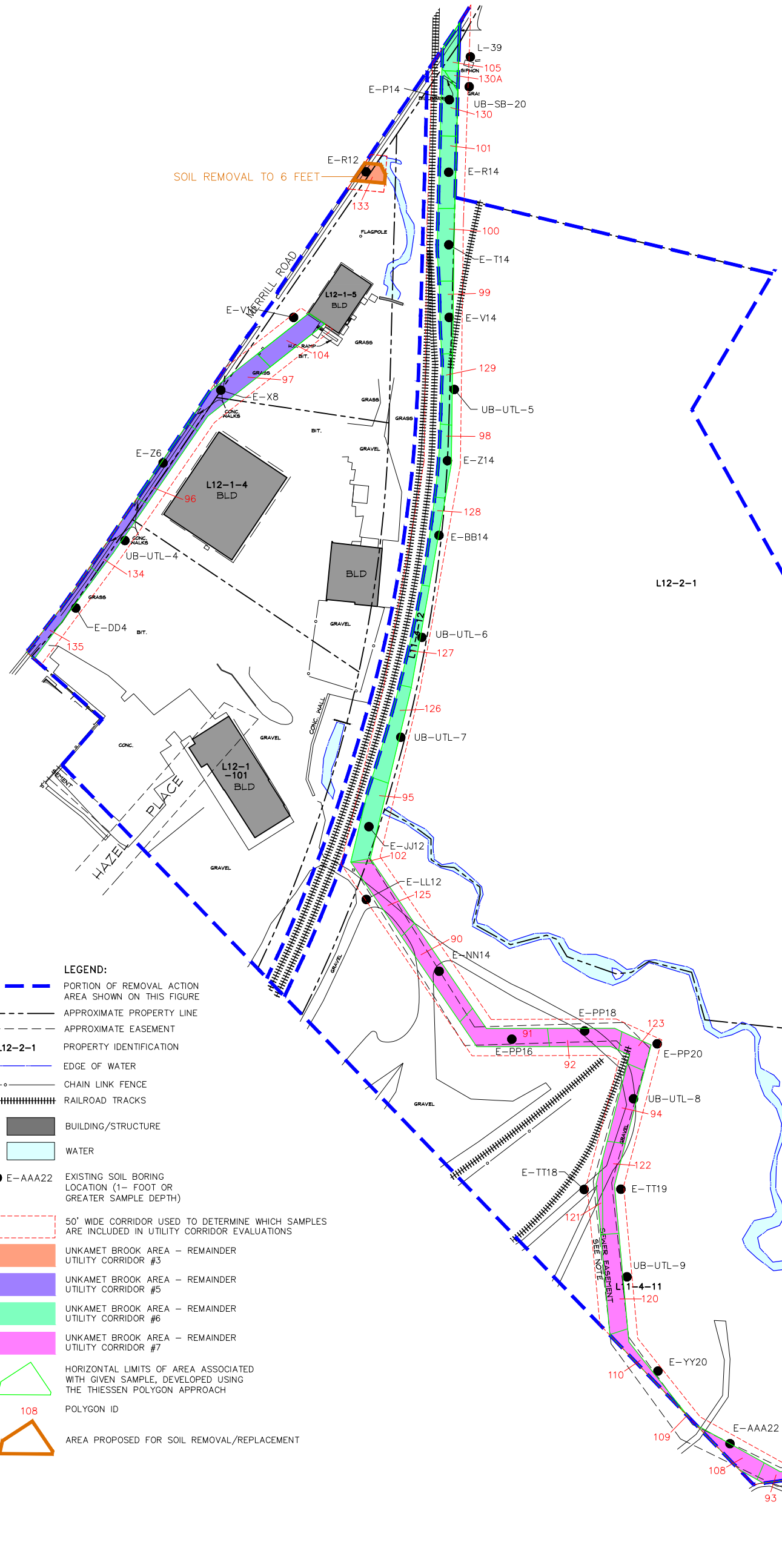
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 3- TO 4-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-5

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
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40190XDP
40190x13



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
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LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- APPROXIMATE PROPERTY LINE
- APPROXIMATE EASEMENT
- L12-2-1 PROPERTY IDENTIFICATION
- EDGE OF WATER
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING/STRUCTURE
- WATER
- E-AAA22 EXISTING SOIL BORING LOCATION (1- FOOT OR GREATER SAMPLE DEPTH)
- 50' WIDE CORRIDOR USED TO DETERMINE WHICH SAMPLES ARE INCLUDED IN UTILITY CORRIDOR EVALUATIONS
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- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #5
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- UNKAMET BROOK AREA - REMAINDER UTILITY CORRIDOR #7
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THIESSEN POLYGON APPROACH
- 108 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL/REPLACEMENT

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

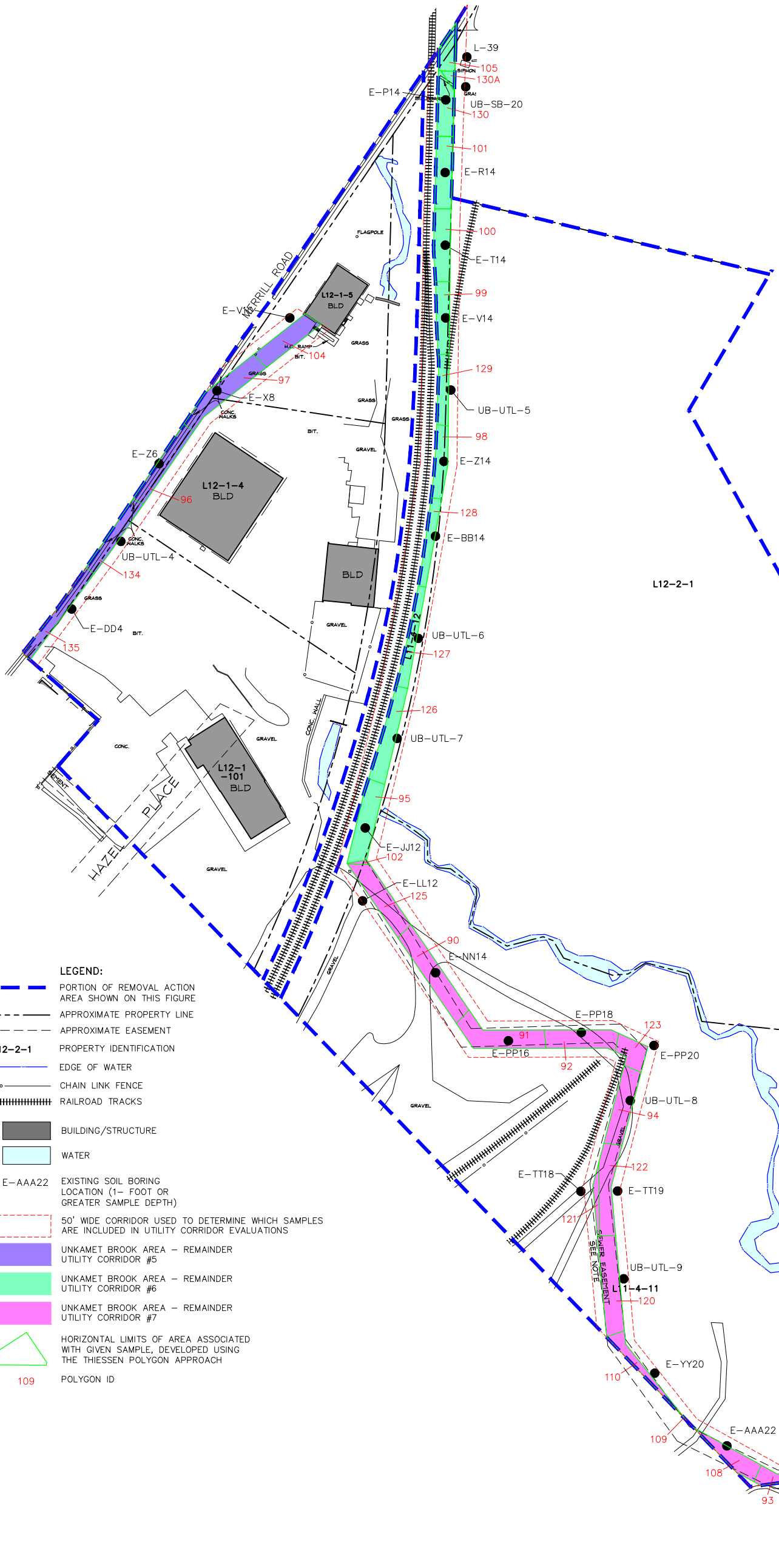
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 4- TO 7-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-6

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
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40190X12
40190XDP
40190x13



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
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- 109 POLYGON ID

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

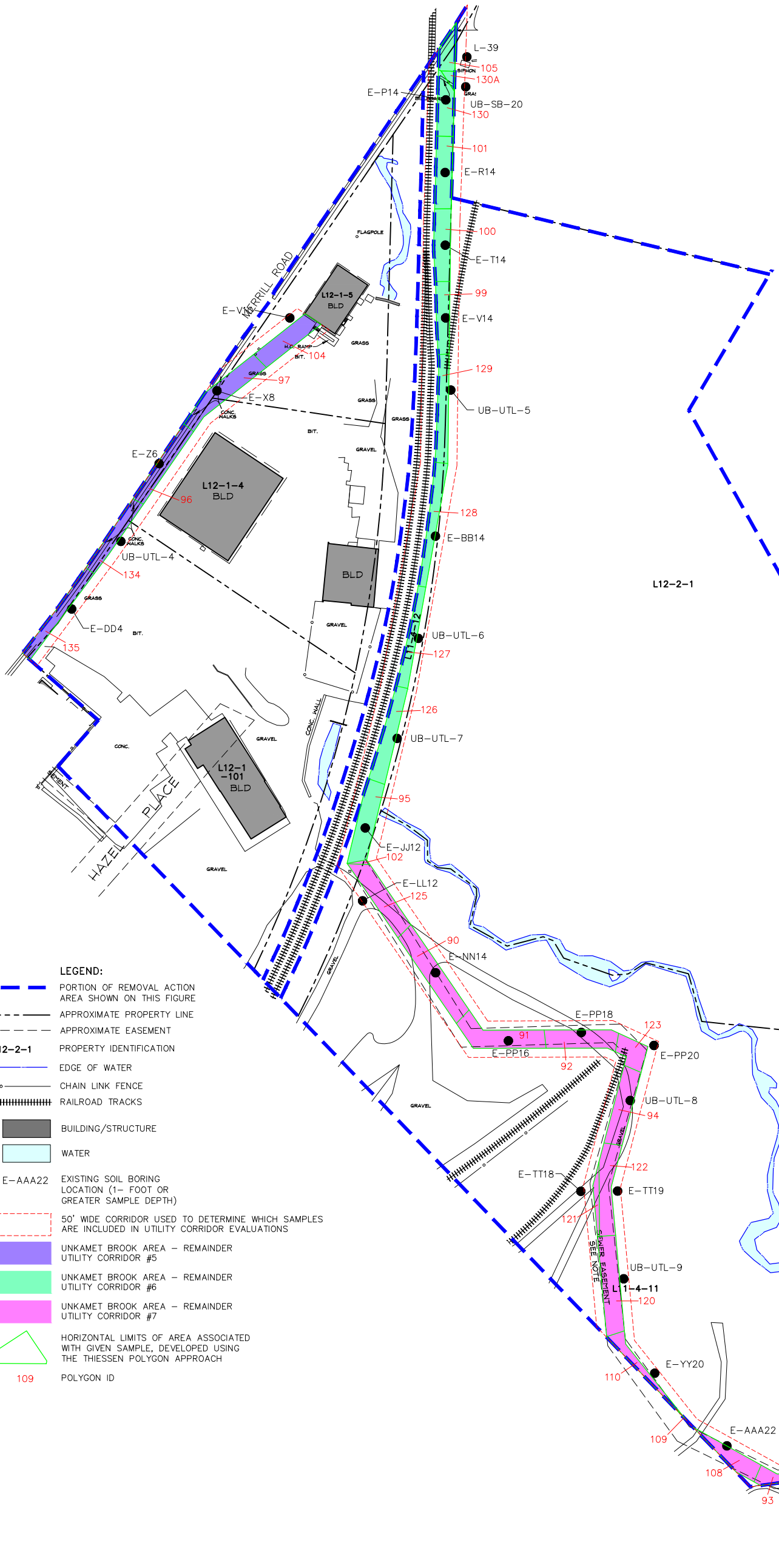
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 7- TO 8-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-7

CITY: SYRACUSE DIV/GROUP: ENV CAD DB: B.DECLERCQ PM: C.AVERILL TM: M.DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\RDRA\L12-1-5\REVISED-2014\40190G56.DWG LAYOUT: B-8 SAVED: 4/1/2014 10:50 AM PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 10:51 AM BY: SARTORI, KATHERINE

XREFS: IMAGES: PROJECTNAME: ----
40190X12
40190XDP
40190x13



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- L12-2-1 PROPERTY IDENTIFICATION
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GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA- REMAINDER

PROPERTIES LOCATED SOUTH OF MERRILL ROAD - UTILITY CORRIDOR THIESSEN POLYGON MAP - 8- TO 10-FOOT DEPTH INCREMENT

ARCADIS

FIGURE
B-8

Appendix C

Revised Dioxin Re-evaluation

APPENDIX C

REVISED RE-EVALUATION OF DIOXIN/FURAN SOIL DATA FROM UNKAMET BROOK AREA

In an e-mail dated June 25, 2012, the U.S. Environmental Protection Agency (EPA) requested that General Electric Company (GE) re-evaluate the dioxin/furan soil data from the Unkamet Brook Area to apply revised evaluation criteria based on EPA's new non-cancer Reference Dose (RfD) for dioxin. As GE has previously advised EPA, EPA does not have authority to require GE to apply these revised criteria for dioxin, since those criteria are not the Performance Standards set out in the Consent Decree (CD) and Statement of Work (SOW) for dioxin/furan Toxicity Equivalency Quotient (TEQ) concentrations in soil. Nevertheless, at EPA's request, GE voluntarily performed such a re-evaluation of the Unkamet Brook soil data, and submitted that re-evaluation to EPA on October 8, 2012. Based on discussions with and comments from EPA, GE has now revised that re-evaluation. Further, based on EPA's comments and that revised re-evaluation, GE is voluntarily proposing to expand the soil removals in certain limited areas within the Unkamet Brook Area, as described below. In doing so, however, GE reserves the right to contest any requirement to conduct additional remediation based on application of EPA's revised dioxin evaluation criteria.

The first step in the re-evaluation of the dioxin/furan soil data at the Unkamet Brook Area involved the recalculation of the total TEQ concentrations for all sample results using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010. The dioxin/furan sampling data, together with those recalculated TEQ concentrations, are presented in attached Tables C-1 through C-14 for the following 14 properties/averaging areas at the Unkamet Brook Area with such data:

<u>Unkamet Brook Area-West</u>

- Parcel K11-7-2 – portion within Unkamet Brook Area (Table C-1);
- Parcel K11-7-8 (Table C-2);
- Parcel K11-7-9 (Table C-3);
- Parcel K12-9-1 – commercial portion (Table C-4);
- Parcel L12-2-2 – commercial portion (Table C-5);
- Parcel L12-2-2 – non-industrial portion (Table C-6);

<u>Unkamet Brook Area-Remainder</u>

- Parcel K12-9-1 – northern wetland (Table C-7);
- Parcel K12-9-1 – non-industrial portion (Table C-8);
- Parcel L11-4-11 (Table C-9);
- Parcel L11-4-12 (Table C-10);
- Parcel L12-1-4 (Table C-11);
- Parcel L12-1-5 (Table C-12);

- Parcel L12-1-101 (Table C-13); and
- Parcel L12-2-1 (Table C-14). *

The locations of all samples analyzed for dioxins/furans are shown on attached Figures C-1A through C-1E, C-2A, and C-2B.

Next, GE applied to these recalculated TEQ data the revised evaluation criteria provided by EPA for dioxin/furan TEQs in soil at the Unkamet Brook Area, as specified in an attachment to EPA's June 25, 2012 e-mail. To do so, the maximum TEQ concentration for each averaging area and depth increment subject to evaluation was compared to the applicable revised criterion. For those averaging areas and depth increments where the maximum TEQ concentration exceeded the applicable revised criterion, the 95% upper confidence limit on the mean (95% UCL) of the TEQ data was calculated and compared to the applicable revised criterion.

The results of the comparisons of the maximum TEQ concentrations and, where applicable, 95% UCL concentrations to the revised EPA PRGs are presented in Tables C-1A through C-14A. As shown in those tables, 10 of the 14 averaging areas at the Unkamet Brook Area contain no samples with TEQ concentrations exceeding the revised criteria. These are:

- Parcel K11-7-2 (Table C-1A);
- Parcel K11-7-8 (Table C-2A);
- Parcel K11-7-9 (Table C-3A);
- Parcel K12-9-1 – commercial portion (Table C-4A);
- Parcel L12-2-2 – commercial portion (Table C-5A);
- Parcel K12-9-1 – northern inundated wetland (Table C-7A);
- Parcel K12-9-1 – non-industrial portion (Table C-8A);
- Parcel L12-1-4 (Table C-11A);
- Parcel L12-1-5 (Table C-12A); and
- Parcel L12-1-101 (Table C-13A).

In addition, at Parcel L11-4-12, while there is one sample with a TEQ concentration exceeding the relevant criterion (the 0-1' sample from location E-T14), the 95% UCLs for the relevant depth increments are below the criteria (Table C-10A).

* The Unkamet Brook Area also contains an additional averaging area – the southern inundated wetland area within Parcel K12-9-1. However, no dioxin/furan soil data were collected from that area, since GE has proposed to remove and replace all soil within the top foot of this area, which will achieve the PCB and Appendix IX+3 Performance Standards for this area, as shown in the foregoing Revised Final RD/RA Work Plan for Unkamet Brook Area-Remainder. Note also that the portion of Parcel L12-3-1 that was formerly within the Unkamet Brook Area has now been excluded from that Area and the CD Site, as stated in Condition No. 6 of EPA's conditional approval letter of December 16, 2009.

The pre-remediation data for the three remaining averaging areas, shown in Tables C-6A, C-9A, and C-14A, respectively, are summarized below.

Averaging Area	Property Type	Depth Incr.	Rev PRG (ppt)	# Sample(s) w/ TEQs > Criterion	95% UCL (ppt)	Sample(s) Causing UCL Exceedance
Parcel L12-2-2 – non-industrial portion	Rec w/o ERE	0-1’	400	None	--	NA
		0-3’	400	1	731	E-P15 (1-3’) (8,000 ppt)
		3-15’	20,000	1	6,455	None
Parcel L11-4-11	Rec w/o ERE	0-1’	400	7	2,228	E-LL14 (0-1’) (25,000 ppt) UFP2-L3 (0-0.5’) (2,300 ppt)
		0-3’	400	7 (same as above)	1,610	E-LL14 (0-1’) (25,000 ppt)
		3-15’	20,000	None	--	NA
Parcel L12-2-1	Rec w/ ERE	0-1’	400	3	22,364	UFP2-R1 (0-0.5’) (290,000 ppt)
		1-3’	600	1	276	None
		3-15’	20,000	None	--	NA

The locations of all samples with TEQ concentrations exceeding the revised criteria are highlighted in blue on Figures C-1C and C-1E, and the locations of the four samples causing the 95% UCL exceedances are highlighted in blue on Figures C-2A and C-2B.

As shown above, at Parcel L12-2-2 (non-industrial portion), there is one sample causing an exceedance of the revised criteria – namely, the 1-3’ sample from location E-P15. That sample is located in a previously identified one-foot PCB removal area, as shown on Figure C-2A. GE proposes to expand that removal area to a depth of 3 feet (as well as to make a slight horizontal expansion to the west to connect with the existing 3-foot removal on adjacent Parcel L11-4-12), as also shown on Figure C-2A. Following such removal, the maximum remaining TEQ concentration will be below the relevant criterion, as shown in Table C-6B.

At Parcel L11-4-11, there are two samples causing exceedances of the revised criteria – namely, the 0-1’ sample from location E-LL14 and the 0-0.5’ sample from location UFP2-L3. However, the previously calculated TEQ concentration in the sample from E-LL14 exceeded the applicable Performance Standard set forth in the SOW. As a result, soil removal was proposed in the *Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* (Remainder Conceptual Work Plan; March 2009), and approved by EPA, to address the TEQ concentration in that sample (see Figure C-2B). A post-remediation evaluation of this averaging area, presented in Table C-9B, shows that, following such soil removal, the 95% UCL TEQ concentration in the 0-1’ depth interval would be 406 ppt (compared to a criterion of 400 ppt), and the 95% UCL in the 0-3’ depth interval would be below the criterion. The 0-0.5’ sample from UFP2-L3 is in the middle of a previously identified one-foot removal area, as shown on Figure C-2B. To address that

sample, GE proposes to make a limited horizontal expansion of those removal limits, as also shown on Figure C-2B. Following such removal, the 95% UCL TEQ concentration in the 0-1' depth interval will be below the relevant revised criterion, as shown in Table C-9C.

At Parcel L12-2-1, there is one sample causing an exceedance of the revised criteria – namely, the 0-0.5' sample from location UFP2-R1. However, the previously calculated TEQ concentration in that sample exceeded the applicable Performance Standard set forth in the SOW. As a result, soil removal was previously proposed in the Remainder Conceptual Work Plan, and was approved by EPA, to address the dioxin/furan TEQ concentration in that sample (see Figure C-2B). A post-remediation evaluation of this averaging area indicates that, following such soil removal, the TEQ concentrations at that area will be below EPA's revised criteria, as shown in Table C-14B.

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Data Tables

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:						
	RAA10-W-A18 0-1 09/02/03	RAA10-W-A18 1-6 09/02/03	RAA10-W-B17 0-1 09/03/03	RAA10-W-B17 6-15 09/03/03	RAA10-W-C15 0-1 09/02/03	RAA10-W-C15 6-15 09/02/03	RAA10-W-C18 0-1 09/03/03
Furans							
2,3,7,8-TCDF	2.1	0.16	1.8	0.13	0.47	0.13	3
TCDFs (total)	17	0.7	26	0.53	9.7	0.19	24
1,2,3,7,8-PeCDF	1	ND(0.13) X	0.76	ND(0.085) X	0.29	ND(0.072) X	1
2,3,4,7,8-PeCDF	2.1	0.17	4.9	0.23	1.7	0.053	3.1
PeCDFs (total)	29	1.5	68	1	14	0.053	32
1,2,3,4,7,8-HxCDF	0.86	ND(0.1) X	1.5	0.23	0.42	ND(0.26)	2.4
1,2,3,6,7,8-HxCDF	ND(0.12)	ND(0.12)	ND(0.12)	ND(0.12)	ND(0.12)	ND(0.12)	ND(0.12)
1,2,3,7,8,9-HxCDF	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)
2,3,4,6,7,8-HxCDF	ND(0.08)	ND(0.08)	ND(0.08)	ND(0.08)	ND(0.08)	ND(0.08)	ND(0.08)
HxCDFs (total)	ND(0.065)	ND(0.065)	ND(0.065)	ND(0.065)	ND(0.065)	ND(0.065)	ND(0.065)
1,2,3,4,6,7,8-HpCDF	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)
1,2,3,4,7,8,9-HpCDF	0.38	ND(0.28)	0.54	ND(0.085) X	0.24	ND(0.26)	0.84
HpCDFs (total)	ND(0.074)	ND(0.074)	ND(0.074)	ND(0.074)	ND(0.074)	ND(0.074)	ND(0.074)
OCDF	7.8	ND(0.4) X	2.3	0.46	0.73	ND(0.53)	13
Dioxins							
2,3,7,8-TCDD	ND(0.13) X	ND(0.11)	ND(0.13) X	ND(0.11) X	ND(0.097) X	ND(0.14) X	ND(0.34) X
TCDDs (total)	0.35	0.16	0.49	0.44	ND(0.3)	ND(0.4)	11
1,2,3,7,8-PeCDD	ND(0.22) X	ND(0.28)	0.29	ND(0.19) X	ND(0.2) X	0.11	0.82
PeCDDs (total)	2.4	1.1	3.3	2.5	0.4	0.11	17
1,2,3,4,7,8-HxCDD	0.27	ND(0.28)	0.2	ND(0.098) X	ND(0.1) X	ND(0.26)	0.42
1,2,3,6,7,8-HxCDD	ND(0.24)	ND(0.24)	ND(0.24)	ND(0.24)	ND(0.24)	ND(0.24)	ND(0.24)
1,2,3,7,8,9-HxCDD	0.61	ND(0.28)	0.47	0.15	0.23	ND(0.11) X	1.3
HxCDDs (total)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.21)
1,2,3,4,6,7,8-HpCDD	ND(0.51)	ND(0.51)	ND(0.51)	ND(0.51)	ND(0.51)	ND(0.51)	ND(0.51)
HpCDDs (total)	ND(0.69)	ND(0.69)	ND(0.69)	ND(0.69)	ND(0.69)	ND(0.69)	ND(0.69)
OCDD	ND(4.8)	ND(4.8)	ND(4.8)	ND(4.8)	ND(4.8)	ND(4.8)	ND(4.8)
Total TEQs (EPA 2010 TEFs)	1.3	0.34	2.3	0.32	0.83	0.29	2.8

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-D12 0-1 08/12/03	RAA10-W-D19 1-6 05/29/03	RAA10-W-D19 6-15 05/29/03	RAA10-W-D20 0-1 09/30/03	RAA10-W-E8 0-1 05/30/03	RAA10-W-E8 1-6 05/30/03
Furans							
2,3,7,8-TCDF		0.34 J	ND(1.5) X	ND(0.68) X [ND(1) X]	ND(0.81)	0.87 J	ND(0.54)
TCDFs (total)		10	ND(1)	ND(0.9) [ND(0.9)]	200 I	1.8	ND(0.53)
1,2,3,7,8-PeCDF		ND(0.53)	ND(1.1) QX	ND(2.2) [ND(2.3)]	2.5	1.1 J	ND(0.55)
2,3,4,7,8-PeCDF		3.2	ND(0.85) X	ND(0.79) X [ND(2.3)]	ND(0.7)	ND(0.56) X	ND(0.55)
PeCDFs (total)		33	0.97	ND(2.2) [ND(2.3)]	370 I	7.5	ND(0.55)
1,2,3,4,7,8-HxCDF		0.42 J	ND(2.5)	ND(2.2) [ND(0.36) X]	ND(0.26)	ND(1.2) X	ND(0.55)
1,2,3,6,7,8-HxCDF		0.61 J	ND(2.5)	ND(0.81) X [0.42 J]	41 I	ND(0.54)	ND(0.55)
1,2,3,7,8,9-HxCDF		ND(0.23) X	ND(2.5)	ND(2.2) [ND(2.3)]	ND(0.29)	ND(0.58)	ND(0.55)
2,3,4,6,7,8-HxCDF		1.9 J	ND(2.5)	ND(2.2) [ND(2.3)]	1.2	ND(0.61) X	ND(0.55)
HxCDFs (total)		29	ND(2.5)	ND(2.2) [0.42]	170 I	2.3	ND(0.55)
1,2,3,4,6,7,8-HpCDF		1.2 J	1.3 J	1.2 J [ND(1.1) X]	ND(0.24)	ND(1.3) X	ND(0.59)
1,2,3,4,7,8,9-HpCDF		0.21 J	ND(2.5)	0.65 J [ND(2.3)]	ND(0.33)	ND(0.69)	ND(0.72)
HpCDFs (total)		3.8	1.3	1.2 [ND(2.3)]	15	ND(0.62)	ND(0.65)
OCDF		0.56 J	1.8 J	2.5 J [1.8 J]	13	1.2 J	ND(1.3)
Dioxins							
2,3,7,8-TCDD		ND(0.1)	ND(1.4)	ND(1.4) [ND(1.3)]	ND(0.68)	ND(0.46)	ND(0.49)
TCDDs (total)		0.11	ND(3.8)	ND(3.5) [ND(3.7)]	ND(0.68)	ND(0.46)	ND(0.49)
1,2,3,7,8-PeCDD		0.18 J	ND(2.5)	ND(2.2) [ND(2.3)]	ND(1.1)	ND(0.54)	ND(0.55)
PeCDDs (total)		0.77	ND(2.5)	ND(2.2) [ND(2.3)]	ND(1.1)	ND(0.54)	ND(0.55)
1,2,3,4,7,8-HxCDD		ND(0.14) X	ND(2.5)	ND(2.2) [ND(2.3)]	ND(0.33)	ND(0.54)	ND(0.55)
1,2,3,6,7,8-HxCDD		ND(0.24) X	ND(2.5)	0.84 J [ND(2.3)]	ND(0.34)	ND(0.54)	ND(0.55)
1,2,3,7,8,9-HxCDD		0.21 J	ND(2.5)	ND(1) X [ND(2.3)]	ND(0.33)	ND(0.54)	ND(0.55)
HxCDDs (total)		0.54	ND(2.5)	0.84 [ND(2.3)]	3.6	ND(0.54)	ND(0.71)
1,2,3,4,6,7,8-HpCDD		1.1 J	3 J	ND(2.3) X [ND(1.9) X]	25	2.3 J	ND(0.57)
HpCDDs (total)		2.1	4.6	ND(2.2) [1]	46	4.5	ND(0.57)
OCDD		5.9	10 J	8 J [7.8 J]	190	16	ND(2.8) X
Total TEQs (EPA 2010 TEFs)		1.6	3.1	2.6 [2.9]	6.3	1	0.85

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-E9 0-1 05/30/03	RAA10-W-E9 6-10 05/30/03	RAA10-W-E10 0-1 08/12/03	RAA10-W-E13 1-6 08/19/03	RAA10-W-F6 6-15 03/05/04	RAA10-W-F13 0-1 05/28/03	RAA10-W-F13 6-15 05/28/03
Furans								
2,3,7,8-TCDF		0.56 J	ND(0.38)	ND(0.27)	0.32 J	ND(0.4)	ND(0.18) X	ND(0.14) X
TCDFs (total)		5	ND(0.38)	ND(1)	3	13 I	1.3	0.091
1,2,3,7,8-PeCDF		0.97 JQ	ND(0.53)	ND(0.35)	0.19 J	ND(0.39)	0.091 J	ND(0.26)
2,3,4,7,8-PeCDF		0.88 J	ND(0.53)	ND(0.35)	0.41 J	ND(0.43)	ND(0.33) X	ND(0.26)
PeCDFs (total)		19	ND(0.53)	0.49	3.8	34 I	3.8	ND(0.26)
1,2,3,4,7,8-HxCDF		1.6 J	ND(0.53)	ND(0.3)	0.16 J	ND(0.25)	ND(0.11) X	ND(0.26)
1,2,3,6,7,8-HxCDF		0.55 J	ND(0.53)	ND(0.27)	0.17 J	ND(0.25)	ND(0.13) X	ND(0.26)
1,2,3,7,8,9-HxCDF		0.15 J	ND(0.53)	ND(0.35)	ND(0.27)	ND(0.21)	ND(0.28)	ND(0.26)
2,3,4,6,7,8-HxCDF		1.4 J	ND(0.53)	ND(0.3)	0.25 J	2	ND(0.26) X	ND(0.26)
HxCDFs (total)		23	ND(0.53)	0.92	3.2	7.4	1.3	ND(0.26)
1,2,3,4,6,7,8-HpCDF		2 J	ND(0.53)	ND(0.27)	0.34 J	ND(2.3) X	ND(0.24)	ND(0.081)
1,2,3,4,7,8,9-HpCDF		0.24 J	ND(0.53)	ND(0.32)	ND(0.044) X	ND(0.18)	ND(0.28)	ND(0.26)
HpCDFs (total)		4.9	ND(0.53)	ND(0.28)	0.66	ND(0.18)	ND(0.24)	ND(0.081)
OCDF		0.89 J	ND(1.1)	ND(0.55)	0.23 J	6.4	ND(0.57)	ND(0.52)
Dioxins								
2,3,7,8-TCDD		ND(0.21)	ND(0.7)	ND(0.15)	ND(0.11)	ND(0.38)	ND(0.13)	ND(0.11)
TCDDs (total)		ND(0.78)	ND(0.69)	ND(0.26)	0.068	ND(0.38)	0.35	0.095
1,2,3,7,8-PeCDD		ND(0.55) X	ND(0.53)	ND(0.53)	ND(0.27)	ND(1.3)	ND(0.28)	ND(0.26)
PeCDDs (total)		ND(0.52)	ND(1)	ND(0.53)	0.089	ND(1.3)	ND(0.45)	ND(0.18)
1,2,3,4,7,8-HxCDD		ND(0.52)	ND(0.53)	ND(0.41)	ND(0.27)	ND(0.41)	ND(0.28)	ND(0.26)
1,2,3,6,7,8-HxCDD		0.18 J	ND(0.53)	ND(0.37)	0.074 J	ND(0.4)	ND(0.28)	ND(0.26)
1,2,3,7,8,9-HxCDD		ND(0.15) X	ND(0.53)	ND(0.41)	ND(0.068) X	ND(0.36)	ND(0.28)	ND(0.26)
HxCDDs (total)		1.2	ND(0.53)	ND(0.39)	0.34	ND(0.41)	ND(0.47)	0.11
1,2,3,4,6,7,8-HpCDD		1.4 J	0.55 J	0.34 J	0.44 J	ND(2.2) X	ND(0.37) X	ND(0.19) X
HpCDDs (total)		2.6	0.55	0.56	0.8	2.4	ND(0.32)	ND(0.17)
OCDD		10 J	3 J	3 J	2.8 J	13	2 J	ND(1.5)
Total TEQs (EPA 2010 TEFs)		1.2	0.93	0.55	0.46	1.3	0.36	0.33

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-F20 0-1 05/29/03	RAA10-W-G4 0-1 03/05/04	RAA10-W-G5 0-1 07/22/08	RAA10-W-G5 1-6 07/22/08	RAA10-W-G7 0-1 03/08/04	RAA10-W-G21 0-1 09/24/03	RAA10-W-G21 1-6 09/24/03	RAA10-W-H3 1-6 07/22/08
Furans									
2,3,7,8-TCDF		ND(2.7)	ND(0.35)	ND(0.21) X	ND(0.28)	0.91 Y	3.2 Y	0.55 J	ND(0.23)
TCDFs (total)		ND(2.7)	62 I	4.9	ND(0.28)	110 I	22 Q	3.8 Q	ND(0.24)
1,2,3,7,8-PeCDF		ND(2.7) X	ND(0.3)	ND(0.54)	ND(0.58)	ND(0.37)	1 JQ	ND(0.24)	ND(0.56)
2,3,4,7,8-PeCDF		ND(2.6)	2	1.3 J	ND(0.58)	ND(0.38)	1.5 JQ	ND(0.22)	ND(0.56)
PeCDFs (total)		36	96 I	16	ND(0.58)	120 I	11 Q	1.8 Q	ND(0.56)
1,2,3,4,7,8-HxCDF		ND(2.9)	0.56	ND(0.54)	ND(0.58)	ND(0.25)	1.4 J	ND(0.29) X	ND(0.56)
1,2,3,6,7,8-HxCDF		ND(2.6)	ND(0.23)	ND(0.54)	ND(0.58)	ND(0.24)	1.1 J	0.21 J	ND(0.56)
1,2,3,7,8,9-HxCDF		ND(3.3)	ND(0.22)	ND(0.54)	ND(0.58)	ND(0.22)	0.24 J	0.092 J	ND(0.56)
2,3,4,6,7,8-HxCDF		ND(3.3) X	ND(0.21)	0.65 J	ND(0.58)	ND(0.22)	1.9 J	0.19 J	ND(0.56)
HxCDFs (total)		26	25 I	8.2	ND(0.58)	37 I	29	1.7	ND(0.56)
1,2,3,4,6,7,8-HpCDF		5.5 J	1.6	0.73 J	ND(0.58)	6.6	4.9	ND(0.62)	ND(0.56)
1,2,3,4,7,8,9-HpCDF		ND(3.2)	ND(0.16)	ND(0.54)	ND(0.58)	ND(0.24)	0.56 J	ND(0.27)	ND(0.56)
HpCDFs (total)		5.5	1.8	1.4 J	ND(0.58)	11	12	0.96	ND(0.56)
OCDF		ND(5.8) X	ND(0.34)	ND(1.1)	ND(1.2)	ND(0.56)	7.4	0.87 J	ND(1.1)
Dioxins									
2,3,7,8-TCDD		ND(2.1)	ND(0.3)	ND(0.19)	ND(0.27)	ND(0.15)	ND(0.4)	ND(0.2)	ND(0.29)
TCDDs (total)		ND(2.1)	ND(0.3)	ND(0.19)	ND(0.27)	ND(0.15)	ND(0.5)	ND(0.38)	ND(0.29)
1,2,3,7,8-PeCDD		ND(2.6)	ND(0.6)	ND(0.54)	ND(0.58)	ND(0.5)	ND(0.36) X	ND(0.12) X	ND(0.56)
PeCDDs (total)		ND(2.6)	ND(0.6)	ND(0.54)	ND(0.58)	ND(0.5)	1.6 Q	0.81 Q	ND(0.56)
1,2,3,4,7,8-HxCDD		ND(2.6)	ND(0.23)	ND(0.54)	ND(0.58)	ND(0.23)	0.19 J	ND(0.27)	ND(0.56)
1,2,3,6,7,8-HxCDD		ND(2.6)	ND(0.23)	ND(0.54)	ND(0.58)	ND(0.22)	0.7 J	ND(0.16)	ND(0.56)
1,2,3,7,8,9-HxCDD		ND(2.6)	ND(0.21)	ND(0.54)	ND(0.58)	ND(0.2)	ND(0.56)	ND(0.27)	ND(0.56)
HxCDDs (total)		ND(3.5)	ND(0.23)	0.89 J	ND(0.58)	ND(0.23)	7.3	ND(0.34)	ND(0.56)
1,2,3,4,6,7,8-HpCDD		8.6 J	ND(0.24)	ND(1)	ND(0.58)	ND(0.32)	14	1 J	ND(0.56)
HpCDDs (total)		15	2.1	2.1 J	ND(0.58)	2.1	25	1.9	ND(0.56)
OCDD		60	9.3	ND(4.6)	ND(4.4)	ND(0.49)	130	ND(7.1)	ND(3.6)
Total TEQs (EPA 2010 TEFs)		4.3	1.2	1	0.75	0.63	2.4	0.38	0.74

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-H6 0-1 07/24/08	RAA10-W-H6 6-12 07/24/08	RAA10-W-H9 0-1 03/08/04	RAA10-W-H9 6-15 03/08/04	RAA10-W-H15 0-1 05/28/03	RAA10-W-H15 1-6 05/28/03	RAA10-W-H15 6-15 05/28/03	RAA10-W-I2 0-1 03/05/04
Furans									
2,3,7,8-TCDF		3.5 J	ND(0.89) X	ND(0.22) [ND(0.2)]	ND(0.12)	0.63 J	0.18 J	0.13 J	1.3 Y
TCDFs (total)		150	ND(0.53)	ND(0.22) [ND(0.2)]	ND(0.12)	9.7	4.5	0.21	80 I
1,2,3,7,8-PeCDF		ND(2.6)	ND(0.56)	ND(0.27) [ND(0.17)]	ND(0.17)	ND(0.26) X	ND(0.12) X	ND(0.27)	0.76
2,3,4,7,8-PeCDF		44	ND(0.56)	ND(0.3) [ND(0.19)]	ND(0.18)	2.5 J	ND(1.6) X	ND(0.1) X	3
PeCDFs (total)		470 J	ND(0.56)	ND(0.3) [ND(0.19)]	ND(0.18)	31	17	0.67	140 I
1,2,3,4,7,8-HxCDF		6 J	ND(0.56)	ND(0.22) [ND(0.095)]	ND(0.17)	ND(0.43) X	ND(0.28)	ND(0.27)	ND(0.3)
1,2,3,6,7,8-HxCDF		7.4 J	ND(0.56)	ND(0.2) [ND(0.091)]	ND(0.17)	0.51 J	0.27 J	ND(0.27)	ND(0.3)
1,2,3,7,8,9-HxCDF		ND(4.1)	ND(0.56)	ND(0.31) [ND(0.11)]	ND(0.2)	ND(0.6)	ND(0.34)	ND(0.27)	ND(0.23)
2,3,4,6,7,8-HxCDF		16 J	ND(0.56)	ND(0.21) [ND(0.091)]	ND(0.14)	1.9 J	0.86 J	ND(0.27)	2
HxCDFs (total)		240	ND(0.56)	ND(0.31) [ND(0.11)]	ND(0.2)	31	13	0.41	46 I
1,2,3,4,6,7,8-HpCDF		18 J	ND(0.56)	ND(0.25) [ND(0.091)]	ND(0.21)	1.6 J	ND(0.6)	ND(0.11)	3.5
1,2,3,4,7,8,9-HpCDF		ND(6.3)	ND(0.56)	ND(0.47) [ND(0.15)]	ND(0.34)	0.16 J	ND(0.058) X	ND(0.27)	ND(0.2)
HpCDFs (total)		18	ND(0.56)	ND(0.47) [ND(0.15)]	ND(0.34)	4.9	1.9	ND(0.11)	8.4
OCDF		ND(13)	ND(1.1)	ND(1.5) [ND(0.26)]	ND(0.96)	1.4 J	0.42 J	ND(0.54)	5.8
Dioxins									
2,3,7,8-TCDD		ND(2) J	ND(0.24)	ND(0.22) [ND(0.13)]	ND(0.14)	ND(0.11)	ND(0.11)	ND(0.11)	ND(0.22)
TCDDs (total)		ND(2) J	ND(0.24)	ND(0.22) [ND(0.13)]	ND(0.14)	ND(0.23)	ND(0.27)	ND(0.29)	ND(0.22)
1,2,3,7,8-PeCDD		ND(3) J	ND(0.56)	ND(0.55) [ND(0.24)]	ND(0.3)	ND(0.25)	ND(0.44) X	ND(0.27)	ND(0.86)
PeCDDs (total)		17 J	ND(0.56)	ND(0.55) [ND(0.24)]	ND(0.3)	ND(0.25)	ND(0.27)	ND(0.27)	ND(0.86)
1,2,3,4,7,8-HxCDD		ND(3.2)	ND(0.56)	ND(0.34) [ND(0.11)]	ND(0.21)	ND(0.16) X	ND(0.27)	ND(0.27)	ND(0.28)
1,2,3,6,7,8-HxCDD		ND(7.6) X	ND(0.56)	ND(0.33) [ND(0.099)]	ND(0.2)	ND(0.14) X	ND(0.15) X	ND(0.27)	ND(0.28)
1,2,3,7,8,9-HxCDD		4.1 J	ND(0.56)	ND(0.34) [ND(0.11)]	ND(0.21)	ND(0.25)	ND(0.27)	ND(0.27)	ND(0.26)
HxCDDs (total)		49	ND(0.56)	ND(0.34) [ND(0.11)]	ND(0.21)	1.4	ND(0.49)	0.17	ND(0.28)
1,2,3,4,6,7,8-HpCDD		15 J	ND(0.57)	ND(0.45) [ND(0.12)]	ND(0.34)	1.4 J	ND(0.57)	ND(0.25)	5.4
HpCDDs (total)		34	ND(0.46)	ND(0.45) [ND(0.12)]	ND(0.34)	1.4	1.1	ND(0.41)	13
OCDD		27 J	ND(4.2)	ND(0.71) [ND(0.17) X]	ND(0.5)	11	3.3 J	ND(1.4) X	34
Total TEQs (EPA 2010 TEFs)		21	0.75	0.55 [0.26]	0.33	1.4	0.73	0.32	2.1

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-I2 1-6 03/05/04	RAA10-W-I2 6-15 03/05/04	RAA10-W-I4 0-1 07/23/08	RAA10-W-I4 1-6 07/23/08	RAA10-W-I7 0-1 03/09/04	RAA10-W-I7 1-6 03/09/04	RAA10-W-I10 0-1 08/19/03	RAA10-W-I21 0-1 05/29/03
Furans									
2,3,7,8-TCDF		ND(0.26)	ND(0.22)	0.18 J	ND(0.17) X	ND(0.24)	ND(0.28)	3 J	ND(6.5) X
TCDFs (total)		ND(0.26)	ND(0.22)	0.38	0.98	170 I	ND(0.28)	23	100
1,2,3,7,8-PeCDF		ND(0.23)	ND(0.2)	ND(0.52)	ND(0.51)	2.6	ND(0.25)	3.7 J	ND(6) X
2,3,4,7,8-PeCDF		ND(0.24)	ND(0.21)	ND(0.52)	ND(0.51)	110	ND(0.27)	7 J	ND(22) X
PeCDFs (total)		27 I	23 I	ND(0.52)	2.7	420 I	ND(0.27)	26	430
1,2,3,4,7,8-HxCDF		ND(0.17)	1.7	ND(0.52)	ND(0.51)	12	ND(0.11)	3.8 J	ND(14) X
1,2,3,6,7,8-HxCDF		ND(0.16)	1.4	ND(0.52)	ND(0.51)	17	ND(0.1)	4.6 J	11 J
1,2,3,7,8,9-HxCDF		ND(0.14)	ND(1.2) X	ND(0.52)	ND(0.51)	9.6	ND(0.17)	1.9 JQ	ND(4.1) X
2,3,4,6,7,8-HxCDF		ND(0.14)	ND(1) X	ND(0.52)	ND(0.51)	16	ND(0.11)	6.3 J	40
HxCDFs (total)		ND(0.17)	15 I	0.48	1.4	400 I	ND(0.17)	63	450
1,2,3,4,6,7,8-HpCDF		ND(0.11)	ND(1.8) X	ND(0.52)	ND(0.51)	26	ND(0.29)	5.7 J	61
1,2,3,4,7,8,9-HpCDF		ND(0.13)	ND(1.5) X	ND(0.52)	ND(0.51)	4.8	ND(0.42)	2.3 J	ND(6.1) X
HpCDFs (total)		ND(0.13)	ND(0.11)	0.79	0.21	66	ND(0.42)	13	150
OCDF		ND(0.32)	ND(3.3) X	ND(1)	ND(1)	6.4	ND(0.47)	7.2 J	42 J
Dioxins									
2,3,7,8-TCDD		ND(0.13)	ND(0.15)	ND(0.18)	ND(0.18)	ND(0.091)	ND(0.3)	ND(1.2)	ND(2.3)
TCDDs (total)		ND(0.13)	ND(0.15)	ND(0.18)	ND(0.18)	ND(0.091)	ND(0.3)	ND(2.2)	ND(2.3)
1,2,3,7,8-PeCDD		ND(0.54)	ND(0.49)	ND(0.52)	ND(0.51)	4.7	ND(0.45)	2.8 J	ND(6.1) X
PeCDDs (total)		ND(0.54)	ND(0.49)	ND(0.52)	ND(0.51)	66	ND(0.45)	2.8	12
1,2,3,4,7,8-HxCDD		ND(0.18)	ND(0.15)	ND(0.52)	ND(0.51)	3.4	ND(0.16)	2.8 J	ND(3.5) X
1,2,3,6,7,8-HxCDD		ND(0.18)	ND(0.15)	ND(0.52)	ND(0.51)	31	ND(0.16)	3.2 J	7.6 J
1,2,3,7,8,9-HxCDD		ND(0.17)	ND(1) X	ND(0.52)	ND(0.51)	15	ND(0.17)	ND(3.9) X	ND(4.6) X
HxCDDs (total)		ND(0.18)	ND(0.15)	ND(0.52)	ND(0.51)	220	ND(0.17)	6	28
1,2,3,4,6,7,8-HpCDD		ND(0.23)	1.8	ND(0.54) X	ND(0.51)	77	ND(0.22)	6.5 J	71
HpCDDs (total)		ND(0.23)	3.5	ND(4.7)	ND(3.7)	160	ND(0.22)	9.2	140
OCDD		5.4	5.7	ND(0.63)	ND(0.3)	32	ND(0.25)	22 J	600
Total TEQs (EPA 2010 TEFs)		0.46	0.91	0.65	0.63	49	0.49	8.6	18

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:								
	Sample ID:	RAA10-W-I21	RAA10-W-I22	RAA10-W-J2	RAA10-W-J2	RAA10-W-J4	RAA10-W-J4	RAA10-W-J4	RAA10-W-J5
	Sample Depth(Feet):	6-15	1-6	0-1	6-15	0-1	1-6	6-15	1-6
Parameter	Date Collected:	05/29/03	09/25/03	07/22/08	07/22/08	03/09/04	03/09/04	03/09/04	07/25/08
Furans									
2,3,7,8-TCDF		ND(2.5)	ND(0.36)	ND(0.25) X	2.2 Y	ND(0.15)	ND(0.35)	ND(0.26)	ND(0.24)
TCDFs (total)		ND(2.5)	2.7	3.2	19	2.9 I	3.2 I	ND(0.26)	ND(0.24)
1,2,3,7,8-PeCDF		ND(2.7)	ND(0.29)	ND(0.53)	ND(0.67)	ND(0.14)	ND(0.4)	ND(0.28)	ND(0.52)
2,3,4,7,8-PeCDF		ND(2.7)	1.6	0.93 J	1.3 J	ND(0.15)	ND(0.46)	ND(0.32)	ND(0.52)
PeCDFs (total)		ND(2.7)	10 I	9.6	11	ND(0.15)	19 I	ND(0.32)	ND(0.52)
1,2,3,4,7,8-HxCDF		ND(2.7)	2	ND(0.53)	ND(0.67)	ND(0.1)	ND(0.28)	ND(0.18)	ND(0.52)
1,2,3,6,7,8-HxCDF		ND(2.7)	2.7	ND(0.53)	ND(0.67)	ND(0.096)	ND(0.28)	ND(0.17)	ND(0.52)
1,2,3,7,8,9-HxCDF		ND(2.7)	2	ND(0.53)	ND(0.67)	ND(0.09)	ND(0.24)	ND(0.17)	ND(0.52)
2,3,4,6,7,8-HxCDF		ND(2.7)	2.2	0.89 J	0.73 J	ND(0.092)	ND(0.24)	ND(0.18)	ND(0.52)
HxCDFs (total)		ND(2.7)	15 I	9.9	7.7	ND(0.1)	12 I	5.8 I	ND(0.52)
1,2,3,4,6,7,8-HpCDF		ND(2.9)	ND(0.15)	3.2 J	1.4 J	ND(0.082)	1.3	ND(0.14)	ND(0.52)
1,2,3,4,7,8,9-HpCDF		ND(3.5)	2	ND(0.53)	ND(0.67)	ND(0.096)	ND(0.23)	ND(0.15)	ND(0.52)
HpCDFs (total)		ND(3.1)	1.8	7.3	2.9 J	ND(0.096)	1.4	ND(0.15)	ND(0.52)
OCDF		ND(5.5)	ND(0.22)	6.8 J	ND(1.8)	ND(0.29)	ND(0.52)	ND(0.35)	ND(1)
Dioxins									
2,3,7,8-TCDD		ND(2)	ND(0.44)	ND(0.22)	ND(0.24)	ND(0.11)	ND(0.36)	ND(0.23)	ND(0.23)
TCDDs (total)		ND(2)	1	ND(0.22)	ND(0.24)	ND(0.11)	ND(0.36)	ND(0.23)	ND(0.23)
1,2,3,7,8-PeCDD		ND(2.7)	ND(0.32)	ND(0.53)	ND(0.67)	ND(0.34)	ND(0.73)	ND(0.58)	ND(0.52)
PeCDDs (total)		ND(2.7)	ND(0.32)	ND(0.53)	ND(0.67)	ND(0.34)	ND(0.73)	ND(0.58)	ND(0.52)
1,2,3,4,7,8-HxCDD		ND(2.7)	1.8	ND(0.53)	ND(0.67)	ND(0.12)	ND(0.32)	ND(0.23)	ND(0.52)
1,2,3,6,7,8-HxCDD		ND(2.7)	1.7	ND(0.53)	ND(0.67)	ND(0.12)	ND(0.33)	ND(0.25)	ND(0.52)
1,2,3,7,8,9-HxCDD		ND(2.7)	1.7	ND(0.53)	ND(0.67)	ND(0.11)	ND(0.3)	ND(0.23)	ND(0.52)
HxCDDs (total)		ND(3.7)	5.2	1.1 J	ND(0.67)	ND(0.12)	ND(0.33)	ND(0.25)	ND(0.52)
1,2,3,4,6,7,8-HpCDD		ND(3.1)	ND(0.14)	6.2	ND(1.8)	ND(0.16)	ND(0.25)	ND(0.22)	ND(0.52)
HpCDDs (total)		ND(3.1)	ND(0.14)	11	3.3 J	ND(0.16)	ND(0.25)	ND(0.22)	0.37
OCDD		11 J	6.2	44	ND(16)	6.6	7.5	ND(0.25)	3.2 J
Total TEQs (EPA 2010 TEFs)		4	2.3	1.2	1.4	0.32	0.78	0.54	0.67

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-J10 6-15 03/08/04	RAA10-W-J21 0-1 08/26/03	RAA10-W-J21 6-15 08/26/03	RAA10-W-K8 0-1 03/09/04	RAA10-W-K8 6-15 03/09/04	RAA10-W-K11 1-6 08/19/03	RAA10-W-K11 6-11 08/19/03
Furans								
2,3,7,8-TCDF		ND(0.23)	2.1 J	ND(0.11)	ND(0.86) [ND(0.18)]	ND(0.2)	0.13 J [0.15 J]	0.081 J
TCDFs (total)		ND(0.23)	34	ND(0.11)	ND(0.86) I [ND(0.18)]	2.7 I	0.98 [0.78]	0.081
1,2,3,7,8-PeCDF		ND(0.22)	3.4 J	ND(0.1)	ND(0.86) [ND(0.23)]	ND(0.22)	ND(0.082) X [ND(0.29)]	ND(0.049) X
2,3,4,7,8-PeCDF		ND(0.26)	35	ND(0.11)	ND(0.89) [ND(0.24)]	ND(0.25)	0.15 J [0.21 J]	ND(0.055) X
PeCDFs (total)		4.5 I	250	ND(0.21)	ND(0.89) I [ND(0.24)]	ND(0.25)	2.2 [2.9]	ND(0.27)
1,2,3,4,7,8-HxCDF		ND(0.14)	24	ND(0.067)	ND(0.8) [ND(0.1)]	ND(0.14)	ND(0.15) X [0.16 J]	ND(0.27)
1,2,3,6,7,8-HxCDF		ND(0.13)	12 J	ND(0.11)	ND(0.86) [ND(0.097)]	ND(0.15)	0.094 J [0.11 J]	ND(0.077) X
1,2,3,7,8,9-HxCDF		ND(0.14)	12 J	ND(0.11)	ND(0.7) [ND(0.11)]	ND(0.13)	ND(0.29) [ND(0.29)]	ND(0.27)
2,3,4,6,7,8-HxCDF		ND(0.15)	20 J	ND(0.27)	ND(0.66) [ND(0.092)]	ND(0.13)	0.11 J [0.16 J]	ND(0.27)
HxCDFs (total)		2.7	270	ND(0.29)	ND(0.86) [ND(0.11)]	ND(0.15)	2.1 [2.9]	ND(0.051)
1,2,3,4,6,7,8-HpCDF		ND(0.13)	22 J	0.12 J	ND(0.64) [ND(0.11)]	ND(0.09)	0.15 J [0.21 J]	ND(0.077)
1,2,3,4,7,8,9-HpCDF		ND(0.15)	8.4 J	ND(0.27)	ND(0.82) [ND(0.17)]	ND(0.11)	ND(0.29) [ND(0.29)]	ND(0.27)
HpCDFs (total)		ND(0.15)	61	0.12	ND(0.82) [ND(0.17)]	ND(0.11)	0.34 [0.21]	ND(0.077)
OCDF		ND(0.56)	ND(13)	ND(0.54)	ND(3.4) [ND(0.42)]	ND(0.24)	ND(0.11) X [0.17 J]	ND(0.53)
Dioxins								
2,3,7,8-TCDD		ND(0.2)	ND(1.3) X	ND(0.11)	ND(0.83) [ND(0.17)]	ND(0.22)	ND(0.11) [ND(0.091) X]	ND(0.11)
TCDDs (total)		ND(0.2)	10	0.078	ND(0.83) [ND(0.17)]	ND(0.22)	ND(0.28) [0.19]	ND(0.26)
1,2,3,7,8-PeCDD		ND(0.58)	7.8 J	ND(0.12) X	ND(1.8) [ND(0.32)]	ND(0.48)	ND(0.29) [ND(0.058) X]	ND(0.27)
PeCDDs (total)		ND(0.58)	260	ND(0.17)	ND(1.8) [ND(0.32)]	ND(0.48)	0.18 [0.16]	ND(0.28)
1,2,3,4,7,8-HxCDD		ND(0.2)	8.7 J	ND(0.27)	ND(1) [ND(0.12)]	ND(0.18)	ND(0.29) [ND(0.29)]	ND(0.096) X
1,2,3,6,7,8-HxCDD		ND(0.2)	38	ND(0.27)	ND(1.1) [ND(0.12)]	ND(0.18)	ND(0.29) [0.065 J]	ND(0.27)
1,2,3,7,8,9-HxCDD		ND(0.18)	19 J	ND(0.27)	ND(1) [ND(0.14)]	ND(0.16)	ND(0.29) [ND(0.29)]	ND(0.27)
HxCDDs (total)		ND(0.2)	320	ND(0.4)	ND(1.1) [ND(0.14)]	ND(0.18)	0.13 [0.19]	ND(0.42)
1,2,3,4,6,7,8-HpCDD		ND(0.29)	90	ND(0.29)	ND(1.4) [ND(0.14)]	ND(0.16)	0.33 J [0.31 J]	0.21 J
HpCDDs (total)		ND(0.29)	190	ND(0.29)	ND(1.4) [ND(0.14)]	ND(0.16)	0.62 [0.61]	0.21
OCDD		ND(0.47)	ND(90	1.9 J	ND(2.6) [3.8]	2.1	2.4 J [2.5 J]	1.6 J
Total TEQs (EPA 2010 TEFs)		0.51	34	0.22	1.8 [0.35]	0.46	0.36 [0.26]	0.29

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-K17 1-6 08/20/03	RAA10-W-K18 0-1 08/25/03	RAA10-W-K19 0-1 08/25/03	RAA10-W-K19 1-6 08/25/03	RAA10-W-L11 0-1 03/08/04	RAA10-W-L19 0-1 09/23/03	RAA10-W-L19 6-15 09/23/03	RAA10-W-L20 0-1 10/01/03
Furans									
2,3,7,8-TCDF		ND(0.1)	2.4 Y	4.4 Y	0.26 J	ND(0.22)	ND(0.18) X [ND(0.16) X]	ND(0.14)	ND(11) XY
TCDFs (total)		ND(0.1)	95	120	6	ND(0.22)	7.6 [4.9]	ND(0.14)	4700 I
1,2,3,7,8-PeCDF		ND(0.094) X	ND(1.8)	1.8 J	0.19 J	ND(0.3)	ND(0.17) [ND(0.14)]	ND(0.24)	17
2,3,4,7,8-PeCDF		0.13 J	31	43	2.1 J	ND(0.32)	1.9 J [1.6 J]	ND(0.24)	12
PeCDFs (total)		1.9	350	500	24	ND(0.32)	19 [16]	ND(0.24)	6200 I
1,2,3,4,7,8-HxCDF		0.06 J	6.6	8.5	0.51 J	ND(0.29)	ND(0.42) [ND(0.38)]	ND(0.25)	250 I
1,2,3,6,7,8-HxCDF		0.11 J	6.7	9.6	0.59 J	ND(0.27)	0.56 J [0.44 J]	ND(0.24)	250
1,2,3,7,8,9-HxCDF		ND(0.26)	3 J	3.1 J	0.22 J	ND(0.4)	0.19 J [ND(0.38)]	ND(0.32)	ND(1)
2,3,4,6,7,8-HxCDF		0.11 J	22	35	1.6 J	ND(0.28)	1.1 J [0.89 J]	ND(0.25)	24
HxCDFs (total)		1.5	300	450	22	17	17 [13]	ND(0.26)	3100 I
1,2,3,4,6,7,8-HpCDF		0.22 J	19	35	1.7 J	ND(0.33)	1.9 J [1.3 J]	ND(0.24)	100
1,2,3,4,7,8,9-HpCDF		ND(0.26)	2.9 J	3.6 J	0.22 J	ND(0.59)	ND(0.26) [ND(0.24)]	ND(0.26)	5.6
HpCDFs (total)		0.48	54	96	4.7	3.2	3.7 [2.3]	ND(0.24)	580 I
OCDF		0.22 J	11	23	1.1 J	ND(2)	1.5 J [0.86 J]	ND(0.74)	79
Dioxins									
2,3,7,8-TCDD		ND(0.1)	ND(0.23) X	ND(0.32) X	ND(0.11)	ND(0.24)	ND(0.19) [ND(0.16)]	ND(0.36)	ND(0.25)
TCDDs (total)		ND(0.22)	2	2.9	ND(0.23)	ND(0.24)	0.14 [ND(0.29)]	ND(0.36)	3.8
1,2,3,7,8-PeCDD		0.075 J	ND(1.7) X	ND(2.5) X	ND(0.24) X	ND(0.56)	ND(0.18) X [ND(0.2) X]	ND(0.24)	ND(3) X
PeCDDs (total)		0.075	15	16	0.56	ND(0.56)	2.4 [1.6]	ND(0.42)	ND(1.5)
1,2,3,4,7,8-HxCDD		ND(0.1) X	1.2 J	ND(1.3) X	ND(0.14) X	ND(0.33)	ND(0.42) [ND(0.41)]	ND(0.47)	2.8
1,2,3,6,7,8-HxCDD		ND(0.26)	5.1 J	4.2 J	0.26 J	ND(0.29)	0.66 J [0.52 J]	ND(0.42)	9.8
1,2,3,7,8,9-HxCDD		0.079 J	2.7 J	2.3 J	0.19 J	ND(0.3)	ND(0.38) [ND(0.27)]	ND(0.44)	6
HxCDDs (total)		0.19	50	42	1.1	ND(0.33)	5.4 [4.1]	ND(0.44)	19
1,2,3,4,6,7,8-HpCDD		0.77 J	15	19	1.1 J	ND(0.64)	2.6 J [1.7 J]	ND(0.26) X	200
HpCDDs (total)		1.8	33	39	2.3	ND(0.64)	5 [3.4]	ND(0.2)	350
OCDD		14	47	140	8.1	ND(15) X	16 J [8.8 J]	2.1 J	2600
Total TEQs (EPA 2010 TEFs)		0.29	16	22	1.2	0.6	1.2 [0.99]	0.48	72

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-M7 0-1 07/25/08	RAA10-W-M7 6-15 07/25/08	RAA10-W-M8 0-1 03/09/04	RAA10-W-M8 1-6 03/09/04	RAA10-W-M8 6-15 03/09/04	RAA10-W-M15 0-1 08/18/03	RAA10-W-M15 1-6 08/18/03	RAA10-W-M15 6-12 08/18/03
Furans									
2,3,7,8-TCDF		ND(0.48)	0.2 J	ND(0.34)	ND(0.31)	ND(0.51)	0.37 J	0.078 J	0.064 J
TCDFs (total)		ND(0.48)	0.62	40 I	63 I	120 I	6.4	0.3	0.064
1,2,3,7,8-PeCDF		ND(0.53)	ND(0.54)	ND(0.4)	ND(0.25)	ND(0.51)	ND(0.27)	ND(0.26)	ND(0.29)
2,3,4,7,8-PeCDF		ND(0.53)	ND(0.54)	ND(0.42)	ND(0.31)	ND(0.52)	2.2 J	0.094 J	0.05 J
PeCDFs (total)		0.53	0.19	63 I	100 I	240 I	18	0.59	0.05
1,2,3,4,7,8-HxCDF		ND(0.53)	ND(0.54)	ND(0.26)	1.7	1.7	0.98 J	ND(0.26)	ND(0.29)
1,2,3,6,7,8-HxCDF		ND(0.53)	ND(0.54)	ND(0.26)	8.6 I	ND(0.46)	0.7 J	ND(0.078)	ND(0.05) X
1,2,3,7,8,9-HxCDF		ND(0.53)	ND(0.54)	ND(0.27)	3	ND(0.47)	0.48 J	ND(0.26)	ND(0.29)
2,3,4,6,7,8-HxCDF		ND(0.53)	ND(0.54)	ND(0.28)	2.8	ND(0.43)	1.7 J	ND(0.26)	ND(0.29)
HxCDFs (total)		2.5	0.29	39 I	93 I	120 I	22	0.57	ND(0.29)
1,2,3,4,6,7,8-HpCDF		0.85 J	0.56 J	ND(0.2)	ND(0.2)	ND(0.22)	1.2 J	ND(0.086)	ND(0.073)
1,2,3,4,7,8,9-HpCDF		ND(0.59)	ND(0.54)	ND(0.27)	3.5	ND(0.26)	0.32 J	ND(0.26)	ND(0.29)
HpCDFs (total)		1.6	0.75	ND(0.27)	2.7	ND(0.26)	3.3	ND(0.086)	ND(0.073)
OCDF		ND(1.4)	ND(1.1)	ND(0.47)	ND(0.32)	4.6	0.46 J	ND(0.52)	ND(0.57)
Dioxins									
2,3,7,8-TCDD		ND(0.44)	ND(0.17)	ND(0.21)	ND(0.3)	ND(0.24)	ND(0.11)	ND(0.11)	ND(0.11)
TCDDs (total)		ND(0.44)	ND(0.17)	ND(0.21)	ND(0.3)	ND(0.24)	2.6	0.092	ND(0.11)
1,2,3,7,8-PeCDD		ND(0.53)	ND(0.54)	ND(0.74)	ND(0.76)	ND(1)	ND(0.33) X	ND(0.26)	ND(0.29)
PeCDDs (total)		ND(0.53)	ND(0.54) Q	ND(0.74)	ND(0.76)	ND(1)	5.3	ND(0.26)	ND(0.36)
1,2,3,4,7,8-HxCDD		ND(0.61)	ND(0.54)	ND(0.28)	1.9	ND(0.33)	0.27 J	ND(0.26)	ND(0.29)
1,2,3,6,7,8-HxCDD		ND(0.56)	ND(0.54)	ND(0.27)	ND(0.19)	ND(0.32)	2 J	ND(0.26)	ND(0.29)
1,2,3,7,8,9-HxCDD		ND(0.61)	ND(0.54)	ND(0.25)	ND(0.2)	ND(0.29)	1.1 J	ND(0.26)	ND(0.29)
HxCDDs (total)		ND(0.61)	ND(0.54)	ND(0.28)	1.8	ND(0.33)	17	0.16	0.11
1,2,3,4,6,7,8-HpCDD		1.1 J	ND(0.54)	ND(0.25)	2.4	ND(0.27)	4.6	ND(0.34) X	0.3 J
HpCDDs (total)		1.1	0.88	ND(0.25)	2.5	ND(0.27)	9.7	0.28	0.58
OCDD		7.1 J	3.2 J	ND(0.38)	7.1	10	6.7	2.2 J	2 J
Total TEQs (EPA 2010 TEFs)		0.84	0.68	0.66	2.5	1.1	1.7	0.32	0.33

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-N8 1-6 07/25/08	RAA10-W-N13 0-1 09/23/03	RAA10-W-N17 0-1 09/23/03	RAA10-W-N18 0-1 10/01/03	RAA10-W-N18 1-6 10/01/03	RAA10-W-P8 0-1 07/25/08	RAA10-W-P9 0-1 03/10/04	RAA10-W-P9 6-11 03/10/04
Furans									
2,3,7,8-TCDF		ND(0.23) [ND(0.3)]	ND(0.19) X	3.3 Y	ND(1.5) Y	ND(0.15)	2 J	2.2 Y	ND(0.15)
TCDFs (total)		ND(0.23) [ND(0.3)]	4	24 QI	110 I	0.49	30 J	22 I	5
1,2,3,7,8-PeCDF		ND(0.55) [ND(0.56)]	ND(0.13) X	1.1 J	ND(1.4) X	ND(0.14)	ND(1.1) X	ND(0.39)	ND(0.18)
2,3,4,7,8-PeCDF		ND(0.55) [ND(0.56)]	1.2 J	4.8	1	ND(0.12)	6.1	5.8	ND(0.22)
PeCDFs (total)		ND(0.55) [ND(0.56)]	15	64 Q	160 I	3.6 I	91 J	80 I	14
1,2,3,4,7,8-HxCDF		ND(0.55) [ND(0.56)]	ND(0.33)	2 J	11 I	ND(0.092)	ND(2.3) X	ND(0.35)	ND(0.18)
1,2,3,6,7,8-HxCDF		ND(0.55) [ND(0.56)]	0.44 J	2.2 J	1.2	ND(0.094)	2.5 J	ND(0.32)	ND(0.17)
1,2,3,7,8,9-HxCDF		ND(0.55) [ND(0.56)]	ND(0.42)	0.55 J	ND(0.31)	ND(0.12)	ND(1.3)	ND(0.49)	ND(0.24)
2,3,4,6,7,8-HxCDF		ND(0.55) [ND(0.56)]	1.4 J	5.8	1.5	ND(0.11)	7	ND(0.34)	ND(0.18)
HxCDFs (total)		ND(0.55) [ND(0.56)]	19	78	110 I	ND(0.12)	98	58	ND(0.24)
1,2,3,4,6,7,8-HpCDF		ND(0.55) [ND(0.56)]	1.8 J	10	18	ND(0.22)	26	14	ND(0.19)
1,2,3,4,7,8,9-HpCDF		ND(0.55) [ND(0.56)]	ND(0.25)	0.94 J	ND(0.45)	ND(0.29)	2 J	ND(0.61)	ND(0.38)
HpCDFs (total)		ND(0.55) [ND(0.56)]	4.5	24	38 I	ND(0.29)	65	28	ND(0.38)
OCDF		ND(1.1) [ND(1.1)]	1.4 J	11	18	ND(0.54)	29	ND(1.8)	ND(1.1)
Dioxins									
2,3,7,8-TCDD		ND(0.23) [ND(0.25)]	ND(0.21)	ND(0.14) X	ND(0.2)	ND(0.2)	ND(0.46)	ND(0.28)	ND(0.094)
TCDDs (total)		ND(0.23) [ND(0.25)]	ND(0.31)	0.27	ND(0.2)	5.7	ND(0.46) Q	ND(0.28)	ND(0.094)
1,2,3,7,8-PeCDD		ND(0.55) [ND(0.56)]	ND(0.25)	ND(0.4)	ND(0.75)	ND(0.22)	ND(0.69)	ND(1.3)	ND(0.49)
PeCDDs (total)		ND(0.55) [ND(0.56)]	ND(0.2)	3.2 Q	ND(0.75)	0.67	1	ND(1.3)	ND(0.49)
1,2,3,4,7,8-HxCDD		ND(0.55) [ND(0.56)]	ND(0.26)	0.4 J	ND(0.34)	ND(0.2)	ND(0.83)	ND(0.47)	ND(0.25)
1,2,3,6,7,8-HxCDD		ND(0.55) [ND(0.56)]	ND(0.19) X	1.1 J	ND(0.36)	ND(0.21)	ND(3.1) X	ND(0.44)	ND(0.25)
1,2,3,7,8,9-HxCDD		ND(0.55) [ND(0.56)]	ND(0.25)	0.86 J	ND(0.34)	ND(0.2)	1.3 J	ND(0.46)	ND(0.25)
HxCDDs (total)		ND(0.55) [ND(0.56)]	ND(0.43)	9.4	ND(0.36)	5.4	13 J	52	ND(0.25)
1,2,3,4,6,7,8-HpCDD		ND(0.55) [ND(0.56)]	2.2 J	12	26	ND(0.24)	38	ND(0.69)	ND(0.42)
HpCDDs (total)		ND(0.55) [ND(0.56)]	4.3	23	55	ND(0.24)	61	ND(0.69)	ND(0.42)
OCDD		2.4 J [2.8 J]	31	98	180	4.5	130	30	ND(1.1)
Total TEQs (EPA 2010 TEFs)		0.7 [0.73]	1	3.9	3.3	0.31	5.2	3.1	0.42

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-W-R13 0-1 03/10/04	RAA10-W-R13 6-15 03/10/04	RAA10-W-S11 0-1 03/10/04	RAA10-W-S11 1-6 03/10/04	RAA10-W-S11 6-15 03/10/04	RAA10-W-T12 0-1 08/25/08	PG14B1012 10-12 06/10/91	PG15B1416 14-16 06/17/91	UBW050204 2-4 10/30/96
Furans									
2,3,7,8-TCDF	ND(0.71)	ND(0.095)	ND(0.11)	ND(0.26)	ND(0.1)	1.7	ND(83)	ND(26)	ND(0.21)
TCDFs (total)	44 I	ND(0.095)	8.7 I	ND(0.26)	ND(0.1)	15	ND(83)	ND(49)	ND(0.21)
1,2,3,7,8-PeCDF	ND(0.94)	ND(0.14)	2.7	ND(0.29)	ND(0.15)	ND(0.75) X	NA	NA	ND(0.19)
2,3,4,7,8-PeCDF	ND(1.1)	ND(0.16)	ND(0.2)	ND(0.32)	ND(0.2)	1.8 J	NA	NA	ND(0.19)
PeCDFs (total)	71 I	ND(0.16)	13 I	6.1	ND(0.2)	21	ND(180)	ND(81)	ND(0.21)
1,2,3,4,7,8-HxCDF	ND(0.87)	2	5	ND(0.32)	4.4	1.4 J	NA	NA	ND(0.1)
1,2,3,6,7,8-HxCDF	ND(0.85)	2.1	5.4	ND(0.31)	ND(2.8) X	1.2 J	NA	NA	ND(0.095)
1,2,3,7,8,9-HxCDF	ND(1.4)	2.8	4.2	ND(0.44)	4.7	0.63	NA	NA	ND(0.12)
2,3,4,6,7,8-HxCDF	ND(0.86)	ND(0.15)	2.8	ND(0.35)	4.1	1.5 J	NA	NA	ND(0.61)
HxCDFs (total)	43 I	6.4	19	ND(0.44)	7.9	23	ND(82)	ND(95)	ND(0.61)
1,2,3,4,6,7,8-HpCDF	ND(5.3) X	2.8	ND(5.4) X	ND(0.34)	5	14	NA	NA	ND(0.19)
1,2,3,4,7,8,9-HpCDF	ND(2.1)	2.2	ND(0.4)	ND(0.55)	ND(0.44)	0.94 J	NA	NA	ND(0.077)
HpCDFs (total)	ND(2.1)	4.4	ND(0.4)	ND(0.55)	5.8	31	ND(240)	ND(160)	ND(0.3)
OCDF	ND(7.4)	ND(0.74)	ND(1)	ND(1.6)	ND(1.9)	28	ND(210)	ND(160)	ND(1.7)
Dioxins									
2,3,7,8-TCDD	ND(0.89)	ND(0.11)	ND(0.095)	ND(0.3)	ND(0.094)	0.28	ND(86)	ND(55)	ND(0.2)
TCDDs (total)	ND(0.89)	ND(0.11)	ND(0.095)	ND(0.3)	ND(0.094)	0.31	ND(140)	ND(64)	ND(0.42)
1,2,3,7,8-PeCDD	ND(3)	ND(0.28)	2.1	ND(1.1)	ND(0.42)	0.52	NA	NA	ND(0.15)
PeCDDs (total)	ND(3)	ND(0.28)	2.3	ND(1.1)	ND(0.42)	2.8	ND(120)	ND(78)	ND(0.15)
1,2,3,4,7,8-HxCDD	ND(1.4)	ND(0.14)	ND(4.9) X	ND(0.52)	3.2	0.52	NA	NA	ND(0.56)
1,2,3,6,7,8-HxCDD	ND(1.3)	ND(0.13)	5.2	ND(0.46)	5.6	1.4 J	NA	NA	ND(0.44)
1,2,3,7,8,9-HxCDD	ND(1.3)	ND(0.14)	2.3	ND(0.48)	3.5	1.3 J	NA	NA	ND(0.47)
HxCDDs (total)	ND(1.4)	ND(0.14)	7.2	ND(0.52)	12	12	ND(160)	ND(110)	ND(0.56)
1,2,3,4,6,7,8-HpCDD	36	ND(0.2)	ND(0.47)	ND(0.82)	ND(0.53)	25	NA	NA	ND(2.4)
HpCDDs (total)	36	ND(0.2)	ND(0.47)	ND(0.82)	ND(0.53)	47	ND(200)	ND(170)	ND(2.4)
OCDD	43	6.2	ND(9.9) X	ND(1.5)	ND(1.4)	170	ND(280)	ND(160)	46
Total TEQs (EPA 2010 TEFs)	3.1	1	5	0.92	3	3.3	48	29	0.49

TABLE C-1
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-2

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	UBW071416 14-16 08/02/96	UBW080810 8-10 08/03/96	UB-SS-1 0-0.5 03/04/97	UB-SS-2 0-0.5 03/04/97	UB-SS-3 0-0.5 03/04/97	UB-SS-4 0-0.5 03/04/97
Furans							
2,3,7,8-TCDF		ND(72)	ND(0.24)	ND(140)	ND(460)	ND(340)	ND(260)
TCDFs (total)		ND(72)	ND(0.24)	ND(140)	ND(460)	ND(340)	ND(260)
1,2,3,7,8-PeCDF		ND(49)	ND(0.2)	ND(110)	ND(720)	ND(160)	ND(270)
2,3,4,7,8-PeCDF		ND(53)	ND(0.17)	ND(110)	ND(710)	ND(150)	ND(270)
PeCDFs (total)		ND(49)	ND(0.2)	ND(110)	ND(710)	ND(150)	ND(270)
1,2,3,4,7,8-HxCDF		ND(37)	ND(0.063)	ND(85)	ND(510)	ND(160)	ND(360)
1,2,3,6,7,8-HxCDF		ND(31)	ND(0.051)	ND(92)	ND(550)	ND(170)	ND(390)
1,2,3,7,8,9-HxCDF		ND(41)	ND(0.079)	ND(100)	ND(630)	ND(190)	ND(440)
2,3,4,6,7,8-HxCDF		ND(35)	ND(0.3)	ND(88)	ND(530)	ND(160)	ND(370)
HxCDFs (total)		ND(31)	ND(0.3)	ND(85)	ND(510)	ND(160)	ND(1300) X
1,2,3,4,6,7,8-HpCDF		ND(32)	ND(0.073)	ND(100)	ND(290)	ND(150)	ND(220) X
1,2,3,4,7,8,9-HpCDF		ND(36)	ND(0.12)	ND(130)	ND(370)	ND(200)	ND(180)
HpCDFs (total)		ND(32)	ND(0.12)	ND(100)	ND(290)	ND(150)	ND(550) X
OCDF		ND(36)	ND(1)	ND(240)	ND(350)	ND(230)	ND(410)
Dioxins							
2,3,7,8-TCDD		ND(71)	ND(0.34)	ND(38)	ND(120)	ND(55)	ND(52)
TCDDs (total)		ND(71)	ND(0.34)	ND(38)	ND(120)	ND(55)	ND(52)
1,2,3,7,8-PeCDD		ND(60)	ND(0.17)	ND(180)	ND(570)	ND(220)	ND(270)
PeCDDs (total)		ND(60)	ND(0.17)	ND(180)	ND(570)	ND(220)	ND(270)
1,2,3,4,7,8-HxCDD		ND(56)	ND(0.2)	ND(160)	ND(300)	ND(190)	ND(280)
1,2,3,6,7,8-HxCDD		ND(46)	ND(0.2)	ND(140)	ND(270)	ND(170)	ND(260)
1,2,3,7,8,9-HxCDD		ND(50)	ND(0.22)	ND(140)	ND(270)	ND(170)	ND(260)
HxCDDs (total)		ND(46)	ND(0.22)	ND(140)	ND(270)	ND(170)	ND(260)
1,2,3,4,6,7,8-HpCDD		ND(70)	ND(0.27)	ND(190)	ND(260)	ND(270)	ND(530)
HpCDDs (total)		ND(70)	ND(0.27)	ND(190)	ND(260)	ND(270)	ND(530)
OCDD		ND(88)	ND(1.3)	ND(280)	ND(520) X	ND(750)	ND(890) X
Total TEQs (EPA 2010 TEFs)		93	0.36	180	640	240	340

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. NA - Not analyzed.
3. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
4. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
5. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-2
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-8

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: Sample Depth(Feet): Parameter Date Collected:	RAA10-W-P15 0-1 03/25/04	RAA10-W-P15 1-3 03/25/04	RAA10-W-P15 3-6 03/25/04	RAA10-W-P15 6-15 03/25/04
Furans				
2,3,7,8-TCDF	7.8 Y	0.5 J	ND(0.27)	ND(0.3) X [ND(0.32) X]
TCDFs (total)	81	0.9	ND(0.27)	ND(0.24) [ND(0.32)]
1,2,3,7,8-PeCDF	2.6 J	ND(0.54)	ND(0.17) X	0.17 J [0.91 J]
2,3,4,7,8-PeCDF	5.8 J	0.24 J	0.18 J	ND(0.18) X [0.81 J]
PeCDFs (total)	67	1.3	0.48	0.17 [1.7]
1,2,3,4,7,8-HxCDF	3.9 J	ND(0.26)	ND(0.19)	ND(0.14) X [0.97 J]
1,2,3,6,7,8-HxCDF	3.3 J	0.29 J	ND(0.18) X	0.17 J [0.86 J]
1,2,3,7,8,9-HxCDF	0.97 J	ND(0.54)	ND(0.49)	ND(0.55) [ND(0.89) X]
2,3,4,6,7,8-HxCDF	5.5 J	ND(0.54)	ND(0.49)	ND(0.55) [0.99 J]
HxCDFs (total)	64	1.6	ND(0.19)	0.13 [2.8]
1,2,3,4,6,7,8-HpCDF	18	ND(0.65) X	0.34 J	ND(0.32) [1 J]
1,2,3,4,7,8,9-HpCDF	ND(1.2) X	ND(0.54)	ND(0.49)	ND(0.55) [0.9 J]
HpCDFs (total)	34	ND(0.54)	0.34	ND(0.32) [ND(2)]
OCDF	39	ND(1) X	0.38 J	ND(0.41) X [ND(1.8)]
Dioxins				
2,3,7,8-TCDD	ND(0.3)	ND(0.25)	ND(0.3)	ND(0.24) [ND(0.3)]
TCDDs (total)	1.9	ND(0.54)	ND(0.45)	ND(0.58) [ND(0.5)]
1,2,3,7,8-PeCDD	ND(0.81) X	ND(0.54)	ND(0.49)	ND(0.55) [0.97 J]
PeCDDs (total)	3.7	ND(0.8)	ND(0.49)	ND(0.82) [0.97]
1,2,3,4,7,8-HxCDD	ND(0.55) X	ND(0.54)	ND(0.49)	ND(0.55) [1 J]
1,2,3,6,7,8-HxCDD	1.3 J	ND(0.54)	ND(0.49)	ND(0.55) [1 J]
1,2,3,7,8,9-HxCDD	1.2 J	ND(0.54)	ND(0.49)	ND(0.55) [ND(1.2) X]
HxCDDs (total)	14	ND(0.54)	ND(0.7)	ND(0.8) [2]
1,2,3,4,6,7,8-HpCDD	18	ND(0.64)	ND(0.36) X	ND(0.55) [ND(1)]
HpCDDs (total)	33	ND(0.64)	ND(0.49)	ND(0.55) [ND(1)]
OCDD	150	ND(4.2)	ND(1.8)	ND(2) [ND(3.6)]
Total TEQs (EPA 2010 TEFs)	5.7	0.72	0.62	0.61 [2]

TABLE C-2
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-8

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-W-Q15 0-1 03/26/04	RAA10-W-R15 0-1 03/26/04	RAA10-W-R15 1-3 03/26/04	RAA10-W-R15 3-6 03/26/04	RAA10-W-R15 6-15 03/26/04
Furans					
2,3,7,8-TCDF	10 Y	5.8 YQ	0.87 J	0.43 J	0.38 J
TCDFs (total)	140	75	4.8	0.43	0.38
1,2,3,7,8-PeCDF	4.2 J	2.9 J	0.34 J	0.19 J	ND(0.17) X
2,3,4,7,8-PeCDF	10	6.5	0.57 J	0.14 J	ND(0.15) X
PeCDFs (total)	130	72 Q	3.8	0.32	ND(0.54)
1,2,3,4,7,8-HxCDF	8.6	3.8 J	0.37 J	ND(0.56)	ND(0.54)
1,2,3,6,7,8-HxCDF	6.5	3.1 J	0.39 J	ND(0.56)	ND(0.54)
1,2,3,7,8,9-HxCDF	1.3 J	1 J	0.21 J	ND(0.56)	ND(0.54)
2,3,4,6,7,8-HxCDF	11	5.9	0.44 J	ND(0.56)	ND(0.54)
HxCDFs (total)	180	84	3.7	ND(0.56)	ND(0.54)
1,2,3,4,6,7,8-HpCDF	120	28	1.6 J	ND(0.26)	ND(0.23)
1,2,3,4,7,8,9-HpCDF	2.4 J	1.4 J	ND(0.59)	ND(0.56)	ND(0.54)
HpCDFs (total)	190	50	ND(1.6)	ND(0.26)	ND(0.23)
OCDF	70	19	ND(1.2)	ND(1.1)	ND(1.1)
Dioxins					
2,3,7,8-TCDD	0.34 J	ND(0.38)	ND(0.27)	ND(0.31)	ND(0.28)
TCDDs (total)	1.8	ND(0.53)	ND(0.6)	ND(0.66)	ND(0.61)
1,2,3,7,8-PeCDD	ND(1.3) X	ND(0.62) X	ND(0.59)	ND(0.56)	ND(0.54)
PeCDDs (total)	10	4.5	ND(0.94)	ND(1.1)	ND(0.82)
1,2,3,4,7,8-HxCDD	2.7 J	0.55 J	ND(0.59)	ND(0.56)	ND(0.54)
1,2,3,6,7,8-HxCDD	3.8 J	1.4 J	ND(0.59)	ND(0.56)	ND(0.54)
1,2,3,7,8,9-HxCDD	3.8 J	0.94 J	ND(0.59)	ND(0.56)	ND(0.54)
HxCDDs (total)	43	12	ND(0.59)	ND(0.91)	ND(0.54)
1,2,3,4,6,7,8-HpCDD	61	15	ND(1.1)	ND(0.56)	ND(0.42) X
HpCDDs (total)	110	30	ND(1.9)	ND(0.56)	ND(0.54)
OCDD	440	110	ND(6.2)	ND(1.5)	ND(1.9)
Total TEQs (EPA 2010 TEFs)	12	5.6	0.96	0.73	0.67

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 20 based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-3
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-9

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-O16 0-1 04/09/04	RAA10-W-O16 1-3 04/09/04	RAA10-W-O16 3-6 04/09/04	RAA10-W-O16 6-15 04/09/04
Furans					
2,3,7,8-TCDF		15 Y	0.45 J	0.19 J	0.2 J
TCDFs (total)		160 QI	1.1	0.19	0.2
1,2,3,7,8-PeCDF		6 J	0.24 J	ND(0.12) X	ND(0.17) X
2,3,4,7,8-PeCDF		12	ND(0.27)	ND(0.072)	ND(0.14)
PeCDFs (total)		140 Q	1.6	ND(0.072)	ND(0.14)
1,2,3,4,7,8-HxCDF		6 J	ND(0.23) X	ND(0.06) X	ND(0.11) X
1,2,3,6,7,8-HxCDF		5.1 J	ND(0.23)	ND(0.12)	ND(0.18)
1,2,3,7,8,9-HxCDF		1.3 J	ND(0.58)	ND(0.5)	ND(0.56)
2,3,4,6,7,8-HxCDF		8.7	0.14 J	ND(0.5)	ND(0.56)
HxCDFs (total)		130	1.4	ND(0.12)	ND(0.18)
1,2,3,4,6,7,8-HpCDF		29	0.55 J	ND(0.19) X	0.19 J
1,2,3,4,7,8,9-HpCDF		1.9 J	ND(0.58)	ND(0.5)	ND(0.56)
HpCDFs (total)		66	0.55	ND(0.5)	0.19
OCDF		43	0.67 J	0.16 J	ND(1.1)
Dioxins					
2,3,7,8-TCDD		ND(0.59) X	ND(0.23)	ND(0.2)	ND(0.22)
TCDDs (total)		4.4	ND(0.7)	ND(0.6)	ND(0.6)
1,2,3,7,8-PeCDD		ND(1.2) X	ND(0.58)	ND(0.5)	ND(0.56)
PeCDDs (total)		11 Q	ND(0.58)	ND(0.74)	ND(0.84)
1,2,3,4,7,8-HxCDD		ND(1.1) X	ND(0.58)	ND(0.5)	ND(0.56)
1,2,3,6,7,8-HxCDD		3.1 J	ND(0.58)	ND(0.5)	ND(0.56)
1,2,3,7,8,9-HxCDD		2.2 J	ND(0.58)	ND(0.5)	ND(0.56)
HxCDDs (total)		27	ND(0.58)	ND(0.5)	ND(0.98)
1,2,3,4,6,7,8-HpCDD		43	1.2 J	ND(0.34)	ND(0.36)
HpCDDs (total)		84	2	0.53	ND(0.36)
OCDD		330	7.1 J	1.6 J	1.7 J
Total TEQs (EPA 2010 TEFs)		11	0.69	0.53	0.6

TABLE C-3
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K11-7-9

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-P16 0-1 04/09/04	RAA10-W-P17 1-3 04/09/04	RAA10-W-P17 3-6 04/09/04	RAA10-W-P17 6-15 04/09/04
Furans					
2,3,7,8-TCDF		13 Y	1.3 J	0.28 J	0.21 J
TCDFs (total)		54	7.1	0.28	0.35
1,2,3,7,8-PeCDF		2.3 J	0.38 J	ND(0.16) X	ND(0.54)
2,3,4,7,8-PeCDF		4.1 J	0.64 J	ND(0.14) X	ND(0.54)
PeCDFs (total)		49 Q	7.1	ND(0.18)	ND(0.54)
1,2,3,4,7,8-HxCDF		2.6 J	0.45 J	0.11 J	ND(0.54)
1,2,3,6,7,8-HxCDF		1.8 J	0.48 J	ND(0.14) X	ND(0.15)
1,2,3,7,8,9-HxCDF		0.57 J	ND(0.49)	ND(0.56)	ND(0.54)
2,3,4,6,7,8-HxCDF		3.1 J	0.49 J	ND(0.56)	ND(0.54)
HxCDFs (total)		48	7.2	ND(0.35)	ND(0.15)
1,2,3,4,6,7,8-HpCDF		11	1.6 J	0.26 J	0.15 J
1,2,3,4,7,8,9-HpCDF		0.83 J	ND(0.16) X	ND(0.56)	ND(0.54)
HpCDFs (total)		27	3.2	0.26	0.15
OCDF		16	2.2 J	0.34 J	ND(1.1)
Dioxins					
2,3,7,8-TCDD		ND(0.68) X	ND(0.26) X	ND(0.22)	ND(0.22)
TCDDs (total)		0.53	0.14	ND(0.66)	ND(0.6)
1,2,3,7,8-PeCDD		ND(0.4) X	ND(0.11) X	ND(0.56)	ND(0.54)
PeCDDs (total)		4.9 Q	0.3	ND(0.82)	0.19
1,2,3,4,7,8-HxCDD		0.39 J	ND(0.49)	ND(0.56)	ND(0.54)
1,2,3,6,7,8-HxCDD		1.3 J	0.25 J	ND(0.56)	ND(0.54)
1,2,3,7,8,9-HxCDD		0.94 J	ND(0.3) X	ND(0.56)	ND(0.54)
HxCDDs (total)		12	1.1	ND(0.89)	0.21
1,2,3,4,6,7,8-HpCDD		18	4.2 J	ND(0.48)	ND(0.28) X
HpCDDs (total)		36	8.1	ND(0.66)	ND(0.54)
OCDD		140	31	2.3 J	2 J
Total TEQs (EPA 2010 TEFs)		5	0.91	0.62	0.67

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 201(based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individua compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference
J - Indicates that the associated numerical value is an estimated concentration
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	51G-01 0-1 08/27/02	60G-01 1-6 08/27/02	60G-02 6-15 08/27/02	MG-01 0-1 08/29/02	MG-02 1-6 08/29/02	RAA10-N-AA2 0-1 10/29/03	RAA10-N-AA2 6-15 10/29/03	RAA10-N-AA6 6-15 11/11/03
Furans									
2,3,7,8-TCDF		15 Y	2 J	ND(2.3)	2 Y	0.6 J	17 Y	ND(0.22) X	ND(0.22)
TCDFs (total)		130	7.3	4.7	31	3.8	410 Q	0.78	ND(0.22)
1,2,3,7,8-PeCDF		4.5	0.66 J	ND(5.2)	5.5	1.1 J	6.8	0.14 J	ND(0.55)
2,3,4,7,8-PeCDF		26	1.5 J	ND(5.2)	3.1	0.57 J	34	0.12 J	ND(0.55)
PeCDFs (total)		320 QI	10	ND(5.1)	52 QI	5.8	220 Q	0.99	ND(0.55)
1,2,3,4,7,8-HxCDF		8.2	ND(2)	ND(5.2)	3.5	0.45 J	10	0.082 J	ND(0.55)
1,2,3,6,7,8-HxCDF		8	0.5 J	ND(5.2)	1.1 J	0.19 J	12	0.12 J	ND(0.55)
1,2,3,7,8,9-HxCDF		ND(4.9)	ND(2)	ND(5.2)	0.47 J	0.084 J	1.8 JQ	ND(0.54)	ND(0.55)
2,3,4,6,7,8-HxCDF		20	0.64 J	ND(5.2)	3.3	0.32 J	33	0.06 J	ND(0.55)
HxCDFs (total)		380	8.8	ND(5.1)	49	3.7	480 Q	0.99	ND(0.55)
1,2,3,4,6,7,8-HpCDF		40	ND(1.4) X	3.1 J	5.2	0.57 J	34	0.14 J	ND(0.2)
1,2,3,4,7,8,9-HpCDF		3.8	ND(2)	ND(5.2)	0.75 J	ND(0.086) X	4.4 J	ND(0.54)	ND(0.55)
HpCDFs (total)		110	ND(2)	3.1	14	1.2	94	0.24	ND(0.2)
OCDF		54	ND(3.9)	ND(10)	5.1	ND(0.6) X	22	ND(0.086) X	ND(1.1)
Dioxins									
2,3,7,8-TCDD		0.6 J	ND(1.2)	ND(3.5)	ND(0.12)	ND(0.1)	ND(0.38) X	ND(0.16) X	ND(0.32)
TCDDs (total)		5.1	ND(2.6)	ND(7.6)	0.31	ND(0.1)	9 Q	ND(0.56)	ND(0.68)
1,2,3,7,8-PeCDD		1.3 J	ND(2)	ND(5.2)	ND(0.38) X	ND(0.24)	0.33 J	ND(0.065) X	ND(0.55)
PeCDDs (total)		15 Q	ND(3.4)	ND(7.7)	2.2 Q	ND(0.24)	12 Q	ND(0.73)	ND(1)
1,2,3,4,7,8-HxCDD		1.4 J	ND(2)	ND(5.2)	0.33 J	ND(0.24)	1.3 J	ND(0.12) X	ND(0.55)
1,2,3,6,7,8-HxCDD		5.8	ND(2)	ND(5.2)	0.52 J	ND(0.24)	2.8 J	0.095 J	ND(0.55)
1,2,3,7,8,9-HxCDD		2.4	ND(2)	ND(5.2)	0.37 J	ND(0.24)	2 JQ	0.086 J	ND(0.55)
HxCDDs (total)		57	ND(2)	ND(12)	4.7	0.24	25 Q	0.18	ND(0.55)
1,2,3,4,6,7,8-HpCDD		84	ND(1.5) X	ND(5.2)	4.4	0.78 J	23	0.4 J	0.52 J
HpCDDs (total)		150	ND(2)	ND(5.1)	8.4	1.4	49	0.65	0.52
OCDD		760	5.4 J	14 J	32	5.3	200	3.4 J	ND(2.3)
Total TEQs (EPA 2010 TEFs)		20	2.9	7.3	2.7	0.61	20	0.26	0.74

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-AA10 0-1 10/24/03	RAA10-N-AA10 1-6 10/24/03	RAA10-N-AA14 0-1 10/02/03	RAA10-N-AA18 0-1 10/01/03	RAA10-N-CC3 6-15 10/29/03	RAA10-N-CC4 0-1 10/28/03	RAA10-N-CC8 0-1 10/24/03
Furans							
2,3,7,8-TCDF	ND(0.54) X	1.4 J [0.98 J]	ND(0.35)	ND(1.1) Y	0.18 J	1.4 J	3.7 Y
TCDFs (total)	3.2	9 J [4.8 J]	360 I	200 I	0.47	14	100
1,2,3,7,8-PeCDF	0.33 J	1.3 J [0.77 J]	3	2.2	ND(0.11)	ND(0.38)	1.8 J
2,3,4,7,8-PeCDF	0.72 J	1.8 J [1.1 J]	3.6	0.64	ND(0.1)	0.96 J	5.9
PeCDFs (total)	7 Q	12 [6.8]	1300 I	180 I	ND(0.47)	20	150 Q
1,2,3,4,7,8-HxCDF	1.2 J	0.9 J [0.72 J]	98 I	12 I	0.14 J	ND(0.53) X	3.8 J
1,2,3,6,7,8-HxCDF	0.66 J	ND(0.46) X [ND(0.42) X]	7.2	0.46	ND(0.13) X	0.49 J	2.4 J
1,2,3,7,8,9-HxCDF	ND(0.43)	ND(0.29) [ND(0.24)]	ND(0.31)	ND(0.32)	ND(0.053) X	0.27 J	ND(1)
2,3,4,6,7,8-HxCDF	0.99 J	0.62 J [0.48 J]	ND(0.28)	0.71	ND(0.049) X	0.67 J	5.8
HxCDFs (total)	27 Q	8.4 [7.2]	820 I	96 I	ND(0.43)	12	100
1,2,3,4,6,7,8-HpCDF	25	1.6 J [1.3 J]	13	4.3	ND(0.14) X	4.4 J	13
1,2,3,4,7,8,9-HpCDF	1.6 J	ND(0.56) X [0.48 J]	5.5	2.1	ND(0.51)	0.4 J	1.9 J
HpCDFs (total)	110	3.8 [3.6]	120 I	15	0.12	8.5	32
OCDF	130	4 J [3.3 J]	6.7	21	0.12 J	3.5 J	14
Dioxins							
2,3,7,8-TCDD	ND(0.26)	ND(0.21) X [ND(0.22)]	ND(0.16)	ND(0.3)	ND(0.16) X	ND(0.22)	ND(0.29) X
TCDDs (total)	0.22	ND(0.71) [ND(0.76)]	4.7	10	0.033	ND(0.84)	0.54
1,2,3,7,8-PeCDD	ND(0.41) X	ND(0.53) [ND(0.54)]	ND(1.5)	ND(1.4)	ND(0.053) X	0.26 J	ND(0.57) X
PeCDDs (total)	2.7 Q	ND(0.25) [ND(0.54)]	ND(1.5)	ND(1.4)	ND(0.7)	0.26	2.8
1,2,3,4,7,8-HxCDD	0.94 J	ND(0.53) [ND(0.54)]	ND(0.47)	ND(0.64)	ND(0.078) X	0.15 J	0.54 J
1,2,3,6,7,8-HxCDD	5.2 J	0.25 J [ND(0.54)]	ND(0.49)	ND(0.7)	ND(0.078)	ND(0.4) X	1.6 J
1,2,3,7,8,9-HxCDD	2.7 J	0.22 J [ND(0.54)]	ND(0.47)	ND(0.67)	ND(0.098) X	ND(0.31)	1.3 J
HxCDDs (total)	23	1.2 [0.3]	ND(0.49)	ND(0.7)	ND(0.078)	1.3	17
1,2,3,4,6,7,8-HpCDD	170	1.3 J [0.87 J]	6.7	3	ND(0.34)	3.2 J	18
HpCDDs (total)	260	2.2 [1.4]	15	7.6	ND(0.53)	5.4	33
OCDD	1500	6.6 J [4.3 J]	40	15	2.5 J	23	160
Total TEQs (EPA 2010 TEFs)	8.6	1.4 [1.1]	13	2.8	0.19	1.2	5.1

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-CC8 6-15 10/24/03	RAA10-N-CC14 0-1 10/23/03	RAA10-N-CC14 6-15 10/23/03	RAA10-N-CC20 0-1 10/02/03	RAA10-N-EE3 0-1 10/29/03	RAA10-N-EE5 0-1 10/28/03	RAA10-N-EE8 0-1 10/24/03	RAA10-N-EE14 0-1 11/10/03
Furans								
2,3,7,8-TCDF	0.48 J	2 Y	0.21 J	ND(1.4) Y	6.9 Y	1.9 JY	2.3 Y	ND(0.84) X
TCDFs (total)	1.3	57	0.7	460 I	110 Q	71 I	48	10
1,2,3,7,8-PeCDF	0.28 J	1.2 J	0.093 J	5.8	2.6 J	25	1.6 J	0.71 J
2,3,4,7,8-PeCDF	0.42 J	4.5	ND(0.14)	6.9	8.6	3.8 J	11	1.6 J
PeCDFs (total)	2.6	70 Q	0.74	580 I	58 Q	94	140 Q	12 Q
1,2,3,4,7,8-HxCDF	ND(0.24)	3.9	ND(0.25) X	37 I	6.5	9.2	3.8 J	0.94 J
1,2,3,6,7,8-HxCDF	ND(0.26)	2.2 J	0.13 J	2.1	5.2 J	1.9 J	3.4 J	0.77 J
1,2,3,7,8,9-HxCDF	ND(0.56)	0.73 JQ	ND(0.077) X	ND(0.38)	1.1 JQ	0.81 J	ND(1.1) J	ND(0.59)
2,3,4,6,7,8-HxCDF	ND(0.56)	4.3	0.072 J	6.8	16	4.5 J	10	1.3 J
HxCDFs (total)	2.4	70 Q	0.52	320 I	250 Q	80	160 Q	15
1,2,3,4,6,7,8-HpCDF	ND(0.34)	ND(11)	ND(0.18)	26	27	8.7	14	3.7 J
1,2,3,4,7,8,9-HpCDF	ND(0.56)	1.7 J	0.079 J	ND(0.61)	3.4 J	ND(1.4) X	1.9 J	0.52 J
HpCDFs (total)	0.68	28	0.37	50	78	20	39	7.1
OCDF	0.4 J	ND(10)	ND(0.15)	37	14	9.7 J	7.4 J	4.7 J
Dioxins								
2,3,7,8-TCDD	ND(0.39)	0.27 J	ND(0.13)	ND(0.31)	ND(0.36) X	ND(0.22)	ND(0.26)	ND(0.39) X
TCDDs (total)	ND(0.75)	0.66	ND(0.38)	12	5.5	ND(0.46)	0.36	1.4
1,2,3,7,8-PeCDD	ND(0.56)	0.58 J	ND(0.3)	ND(1.6)	1.8 J	ND(0.8) X	0.9 J	0.54 J
PeCDDs (total)	ND(0.56)	5.3 Q	ND(0.56)	ND(1.6)	12 Q	2.8	5.2 Q	1.6 Q
1,2,3,4,7,8-HxCDD	ND(0.56)	ND(0.44) X	ND(0.3)	ND(1)	1.3 J	ND(0.56)	0.47 J	ND(0.4) X
1,2,3,6,7,8-HxCDD	ND(0.56)	1.4 J	ND(0.3)	ND(1.1)	2 J	1.2 J	1 J	0.77 J
1,2,3,7,8,9-HxCDD	ND(0.56)	1.1 J	ND(0.3)	ND(1.1)	1.9 JQ	0.96 J	0.89 J	1.3 J
HxCDDs (total)	ND(0.56)	15	ND(0.3)	ND(1.1)	31 Q	5.3	14	8.9
1,2,3,4,6,7,8-HpCDD	0.55 J	ND(17)	ND(0.22)	22	17	11	5.6	6.9
HpCDDs (total)	0.87	31	0.22	43	36	21	12	13
OCDD	ND(2.5)	140	ND(1.3)	120	140	95	43	51
Total TEQs (EPA 2010 TEFs)	0.84	4.4	0.35	9	9.7	5	7	2.1

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-EE18 0-1 10/02/03	RAA10-N-EE18 6-15 10/02/03	RAA10-N-GG4 0-1 10/28/03	RAA10-N-GG4 1-6 10/28/03	RAA10-N-GG4 6-15 10/28/03	RAA10-N-GG6 0-1 11/12/03	RAA10-N-GG18 0-1 10/14/03
Furans								
2,3,7,8-TCDF		ND(1.2) Y	45 Y	5.1 Y	1.9 JY	0.12 J	2.6 Y	0.55 J
TCDFs (total)		320 I	300	110	35	0.25	33 Q	1
1,2,3,7,8-PeCDF		4.9	ND(0.5)	1.6 J	1.1 J	ND(0.098)	1.4 J	ND(0.37) X
2,3,4,7,8-PeCDF		3	20	6.1 J	5.2 J	ND(0.094) X	4.7 J	ND(0.99) X
PeCDFs (total)		480 I	160 I	160	64	ND(0.15)	66 Q	2.1
1,2,3,4,7,8-HxCDF		44 I	8.9	3.4 J	2.4 J	ND(0.54)	9.8	0.68 J
1,2,3,6,7,8-HxCDF		ND(0.28)	1.3	2.8 J	2.3 J	ND(0.11)	3.9 J	ND(0.56)
1,2,3,7,8,9-HxCDF		ND(0.11)	ND(0.34)	ND(1) X	0.65 JQ	ND(0.54)	1.4 JQ	ND(0.8)
2,3,4,6,7,8-HxCDF		3.1	1.3	6.4	5.9	ND(0.54)	12	0.6 J
HxCDFs (total)		300 I	46 I	120	80 Q	ND(0.11)	160 Q	5.4
1,2,3,4,6,7,8-HpCDF		18	ND(0.29)	19	9.5	ND(0.54)	36	2.9 J
1,2,3,4,7,8,9-HpCDF		3.7	ND(0.36)	1.7 J	1 J	ND(0.54)	4.4 J	ND(0.77)
HpCDFs (total)		48	2.4	47	24	ND(0.54)	81	7
OCDF		36	4.6	17	4.8 J	ND(1.1)	24	6.1 J
Dioxins								
2,3,7,8-TCDD		ND(0.51)	ND(0.64)	ND(0.94)	ND(0.22)	ND(0.21)	ND(0.63) X	ND(0.35)
TCDDs (total)		2.9	ND(0.64)	1.3	0.2	ND(0.43)	5.4	ND(0.36)
1,2,3,7,8-PeCDD		ND(1.8)	ND(1.3)	ND(0.38) X	0.49 J	ND(0.54)	3.8 J	ND(0.56)
PeCDDs (total)		ND(1.8)	ND(1.3)	4	3.4	ND(0.7)	24 Q	ND(1)
1,2,3,4,7,8-HxCDD		ND(0.98)	ND(0.53)	0.46 J	0.3 J	ND(0.54)	ND(3.3) X	ND(1.1)
1,2,3,6,7,8-HxCDD		ND(1)	ND(0.59)	1.2 J	0.66 J	ND(0.54)	5.4 J	ND(0.92)
1,2,3,7,8,9-HxCDD		ND(1)	ND(0.56)	ND(1) X	0.56 J	ND(0.54)	4.5 J	ND(1.1)
HxCDDs (total)		ND(1)	ND(0.59)	13	7.2	ND(0.87)	59	0.99
1,2,3,4,6,7,8-HpCDD		76	ND(0.39)	18	5.5	ND(0.29)	47	8.2
HpCDDs (total)		140	ND(0.39)	33	13	ND(0.29)	89	17
OCDD		610	14	170	78	1.7 J	590	66
Total TEQs (EPA 2010 TEFs)		10	13	5.5	4.1	0.58	12	1.3

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-GG20 1-6 10/14/03	RAA10-N-GG20 6-15 10/14/03	RAA10-N-GG22 0-1 10/14/03	RAA10-N-II5 0-1 10/28/03	RAA10-N-II5 6-15 10/28/03	RAA10-N-II7 0-1 10/17/03	RAA10-N-II7 1-6 10/17/03	RAA10-N-II10 0-1 10/17/03
Furans									
2,3,7,8-TCDF		0.38 J	1.3 J	0.51 J	1.8 J	ND(0.2) X	1.1 J	1.4 JY [1.4 JY]	1.8 J
TCDFs (total)		0.71	33	2.3	16	0.096	9.5	28 [26]	23
1,2,3,7,8-PeCDF		ND(0.83) X	0.52 J	0.34 J	1.2 J	ND(0.14) X	0.67 J	0.7 J [0.78 J]	ND(0.53)
2,3,4,7,8-PeCDF		4.3 J	2.5 J	ND(0.35) X	1.7 J	ND(0.11)	1.6 J	3.8 J [3.8 J]	1.7 J
PeCDFs (total)		9.3	12	2.8	26	0.11	20	58 Q [55 Q]	22
1,2,3,4,7,8-HxCDF		10	14	0.52 J	0.69 J	0.1 J	1 J	1.9 J [1.9 J]	1.4 J
1,2,3,6,7,8-HxCDF		1.1 J	ND(1.5) X	0.33 J	0.58 J	ND(0.19)	0.94 J	1.8 J [1.7 J]	0.84 J
1,2,3,7,8,9-HxCDF		1.8 J	ND(1.2)	0.23 J	ND(0.24) X	ND(0.54)	0.42 J	0.59 J [0.46 JQ]	0.65 J
2,3,4,6,7,8-HxCDF		1.2 J	1.2 J	0.41 J	0.96 J	ND(0.54)	1.8 J	4.2 J [4.2 J]	0.96 J
HxCDFs (total)		17	34	4.2	15	0.29	24	62 [61 Q]	13
1,2,3,4,6,7,8-HpCDF		1 J	15	1.7 J	3.3 J	ND(0.2) X	3 J	7.8 [8.1]	2.8 J
1,2,3,4,7,8,9-HpCDF		1 J	7 J	ND(0.58)	0.35 J	ND(0.54)	0.58 J	0.89 J [0.91 J]	0.88 J
HpCDFs (total)		2.1	42	2.5	7.2	ND(0.54)	7.6	18 [19]	5.7
OCDF		ND(3.2)	20	1.8 J	4.4 J	ND(1.1)	1.9 J	3.9 J [4.4 J]	4.3 J
Dioxins									
2,3,7,8-TCDD		ND(0.37)	ND(0.43)	ND(0.33)	ND(0.26) X	ND(0.26)	ND(0.21)	ND(0.35) [ND(0.23) X]	ND(0.24) X
TCDDs (total)		ND(0.58)	4.2	ND(0.84)	0.23	ND(0.73)	ND(0.74)	ND(0.59) [0.38]	0.11
1,2,3,7,8-PeCDD		ND(0.58)	ND(0.77)	ND(0.21) X	ND(0.71)	ND(0.16) X	0.55 J	ND(0.41) X [ND(0.46) X]	ND(0.34)
PeCDDs (total)		ND(0.83)	0.51	0.36	0.58	ND(0.92)	0.55	1.5 [1.3]	1.1
1,2,3,4,7,8-HxCDD		ND(1.4)	ND(3.3) X	ND(0.58)	ND(0.19) X	ND(0.54)	0.36 J	ND(0.29) X [0.29 J]	0.28 J
1,2,3,6,7,8-HxCDD		ND(1.2)	ND(2.9) X	ND(0.4) X	ND(0.79) X	ND(0.54)	ND(0.54) X	0.86 J [0.68 J]	0.46 J
1,2,3,7,8,9-HxCDD		ND(1.4)	ND(4.9) X	ND(0.45) X	0.48 J	ND(0.54)	0.5 J	0.63 J [0.53 J]	0.5 J
HxCDDs (total)		ND(1.3)	20	2	5.3	ND(1.1)	1.8	7.1 [6.8]	3.2
1,2,3,4,6,7,8-HpCDD		0.98 J	12	3.6 J	9.3	0.43 J	2.9 J	7.8 [6.6]	2.2 J
HpCDDs (total)		0.98	26	6.3	17	0.58	6.2	14 [13]	4
OCDD		ND(3.9) X	110	20	91	1.9 J	34	49 [60]	11
Total TEQs (EPA 2010 TEFs)		3.5	4.4	0.73	2	0.41	2	3 [3]	1.6

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:							
	Sample ID:	RAA10-N-II10	RAA10-N-II10	RAA10-N-II16	RAA10-N-II16	RAA10-N-II18	RAA10-N-II20	RAA10-N-II20
	Sample Depth(Feet):	1-6	6-15	0-1	1-6	0-1	0-1	6-15
	Date Collected:	10/17/03	10/17/03	10/07/03	10/07/03	10/02/03	10/14/03	10/14/03
Furans								
2,3,7,8-TCDF		ND(0.58) X	ND(0.2) X	56 Y	ND(0.27)	ND(0.96) Y	0.64 J	0.47 J
TCDFs (total)		0.91	ND(0.21) Q	980 I	ND(0.27) I	250 I	5.6	9.2
1,2,3,7,8-PeCDF		ND(0.22)	ND(0.22)	26	ND(0.13)	2.4	0.48 J	0.29 J
2,3,4,7,8-PeCDF		0.37 J	0.22 J	18	ND(0.1)	2.8	0.56 J	1.2 J
PeCDFs (total)		3.2	ND(0.44)	1600 I	4.1 I	320 I	6.2	2.6
1,2,3,4,7,8-HxCDF		0.78 J	0.45 J	170 I	ND(0.89) X	25 I	ND(0.58) X	1.5 J
1,2,3,6,7,8-HxCDF		ND(0.3)	ND(0.21)	12	ND(0.098)	1.3	0.55 J	ND(0.43) X
1,2,3,7,8,9-HxCDF		0.22 J	ND(0.22) X	ND(0.83)	ND(0.12)	ND(0.26)	0.21 J	ND(0.55)
2,3,4,6,7,8-HxCDF		0.49 J	ND(0.53)	8.1	ND(0.12)	0.82	0.74 J	ND(0.55)
HxCDFs (total)		5.7	ND(0.66)	730 I	1.6 I	150 I	8.3	1.9
1,2,3,4,6,7,8-HpCDF		1.5 J	0.35 J	32	ND(0.28)	ND(0.33)	2.9 J	0.85 J
1,2,3,4,7,8,9-HpCDF		0.53 J	0.33 J	27	ND(0.33) X	ND(0.41)	0.3 J	0.88 J
HpCDFs (total)		4	0.68	100	ND(0.37)	11	5.2	1.7
OCDF		2.2 J	ND(1.1)	43	ND(0.41)	ND(0.42)	2.4 J	1.6 J
Dioxins								
2,3,7,8-TCDD		ND(0.22) X	ND(0.21)	ND(1.1)	ND(0.15)	ND(0.31)	ND(0.27)	ND(0.59)
TCDDs (total)		0.29	ND(0.78) Q	ND(1.1)	ND(0.15)	ND(0.31)	ND(0.71)	ND(0.68)
1,2,3,7,8-PeCDD		ND(0.5)	ND(0.53)	ND(4.6) X	ND(0.48)	ND(1.1)	0.3 J	ND(0.19) X
PeCDDs (total)		ND(0.86)	ND(0.9) Q	ND(2.9)	ND(0.48)	ND(1.1)	2	ND(0.55)
1,2,3,4,7,8-HxCDD		0.15 J	ND(0.53)	ND(1.7)	ND(0.22)	ND(0.7)	0.38 J	ND(0.65)
1,2,3,6,7,8-HxCDD		0.25 J	ND(0.22) X	ND(1.8)	ND(0.22)	ND(0.76)	0.6 J	ND(0.63)
1,2,3,7,8,9-HxCDD		ND(0.23) X	0.34 J	ND(3.9) X	ND(0.21)	ND(0.73)	0.57 J	ND(0.66)
HxCDDs (total)		1.6	0.34	180	ND(0.22)	ND(0.76)	5.1	ND(0.64)
1,2,3,4,6,7,8-HpCDD		4 J	ND(0.59)	ND(77) X	ND(0.19)	ND(0.79)	6.5	0.68 J
HpCDDs (total)		8.7	ND(0.59)	ND(2.1)	0.76	2.4	11	0.68
OCDD		59	ND(3)	270	ND(2.4) X	54	33	ND(2.4)
Total TEQs (EPA 2010 TEFs)		0.96	0.63	36	0.45	4.7	1.2	1.2

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-JJ6 6-15 10/17/03	RAA10-N-JJ20 0-1 10/02/03	RAA10-N-JJ22 1-6 10/16/03	RAA10-N-JJ22 6-15 10/16/03	RAA10-N-KK5 0-1 10/23/03	RAA10-N-KK10 0-1 10/08/03	RAA10-N-KK10 1-6 10/08/03	RAA10-N-KK10 6-15 10/08/03
Furans								
2,3,7,8-TCDF	0.21 J	44 Y	6.4 Y	ND(1.1) X	1.8 Y	ND(1.1) Y	ND(0.17)	ND(0.68)
TCDFs (total)	0.37	160 I	140	36	73	50 I	ND(0.17)	1
1,2,3,7,8-PeCDF	ND(0.26)	28	5.1 J	0.91 J	ND(2.1)	ND(0.84) X	ND(0.11)	ND(0.36)
2,3,4,7,8-PeCDF	ND(0.22)	27	16	3.5 J	6	ND(0.99) X	ND(0.094)	ND(0.32)
PeCDFs (total)	ND(0.48)	4600 I	74	12	110 QI	75 I	0.58	ND(0.36)
1,2,3,4,7,8-HxCDF	ND(0.15)	240 I	37	5.6 J	2.6 J	4.8	ND(0.059)	ND(0.21)
1,2,3,6,7,8-HxCDF	ND(0.22)	28	5 J	ND(0.67) X	2.5 J	ND(0.55) X	ND(0.061)	ND(0.2)
1,2,3,7,8,9-HxCDF	0.11 J	ND(0.96)	4.3 J	0.7 J	0.32 J	ND(0.19)	ND(0.073)	ND(0.25)
2,3,4,6,7,8-HxCDF	0.12 J	49	3.8 J	0.54 J	3.3	ND(0.58) X	ND(0.075)	ND(0.23)
HxCDFs (total)	ND(0.6)	2200 I	86	10	96	39 I	0.14	4.1
1,2,3,4,6,7,8-HpCDF	0.2 J	130	26	3 J	11	1.8	ND(0.22)	ND(0.26)
1,2,3,4,7,8,9-HpCDF	ND(0.49)	27	20	3.3 J	1.2 J	ND(0.25)	ND(0.26)	ND(0.32)
HpCDFs (total)	0.2	290 I	69	8.1	27	1.8	ND(0.26)	ND(0.32)
OCDF	ND(0.98)	160	93	12 J	8	ND(0.37)	ND(0.42)	ND(0.75)
Dioxins								
2,3,7,8-TCDD	ND(0.19) X	ND(1.3)	ND(0.27) X	ND(0.59)	ND(0.18) X	ND(0.15)	ND(0.11)	ND(0.6)
TCDDs (total)	ND(0.2)	ND(1.3)	7.8	ND(0.76)	2	ND(0.15)	ND(0.11)	ND(0.6)
1,2,3,7,8-PeCDD	ND(0.25)	ND(4.5)	0.37 J	ND(0.59)	0.58 J	ND(0.62)	ND(0.35)	ND(0.71)
PeCDDs (total)	ND(0.25)	ND(4.5)	5.2	ND(0.59)	2.8 Q	ND(0.62)	ND(0.35)	ND(0.71)
1,2,3,4,7,8-HxCDD	ND(0.14) X	ND(2.6)	0.32 J	ND(0.59)	0.35 J	ND(0.24)	ND(0.22)	ND(0.4)
1,2,3,6,7,8-HxCDD	0.26 J	ND(2.8)	0.98 J	ND(0.59)	1.2 J	ND(0.26)	ND(0.23)	ND(0.42)
1,2,3,7,8,9-HxCDD	0.29 J	ND(2.7)	ND(2) X	ND(0.59)	0.86 JQ	ND(0.25)	ND(0.22)	ND(0.41)
HxCDDs (total)	0.55	ND(2.8)	6.9	ND(1.1)	8.9 Q	ND(0.26)	ND(0.23)	ND(0.42)
1,2,3,4,6,7,8-HpCDD	ND(0.36)	84	13	0.83 J	12	ND(1.6) X	ND(0.18)	ND(0.45)
HpCDDs (total)	ND(0.53)	160	23	1.5	24	2	ND(0.18)	ND(0.45)
OCDD	ND(1.8)	460	110	ND(5)	89	9.5	ND(0.33)	ND(0.75)
Total TEQs (EPA 2010 TEFs)	0.39	53	13	2.6	4.3	1.2	0.31	0.86

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-KK16 6-15 10/03/03	RAA10-N-KK18 0-1 10/03/03	RAA10-N-LL6 0-1 10/31/03	RAA10-N-LL12 0-1 10/07/03	RAA10-N-LL20 0-1 10/20/03	RAA10-N-LL20 1-6 10/20/03
Furans							
2,3,7,8-TCDF		ND(0.076)	ND(1.7) X	5.7 Y	ND(0.5) Y	11 Y	0.43 J
TCDFs (total)		0.13	240 I	64	42 I	140 Q	2.1
1,2,3,7,8-PeCDF		ND(0.073)	ND(1.1) X	3.3 J	1.4	3.9 JQ	ND(0.16)
2,3,4,7,8-PeCDF		ND(0.06)	1.6	7.5	1.2	16 JQ	ND(0.18)
PeCDFs (total)		ND(0.073)	240 I	110	77 I	170 QI	1.6
1,2,3,4,7,8-HxCDF		ND(0.05)	8 I	4 J	9 I	5.4 J	0.12 J
1,2,3,6,7,8-HxCDF		ND(0.05)	ND(1.8) X	3.7 J	2	5.1 J	ND(0.15)
1,2,3,7,8,9-HxCDF		ND(0.064)	ND(0.27)	1.1 J	ND(0.15)	ND(6.4) Q	ND(0.54)
2,3,4,6,7,8-HxCDF		ND(0.06)	ND(2.7) X	6.5	0.91	8 J	0.056 J
HxCDFs (total)		0.37	82 I	100	50 I	130 Q	0.46
1,2,3,4,6,7,8-HpCDF		ND(0.84)	ND(5.1) X	23	ND(9.8) X	37	ND(0.26)
1,2,3,4,7,8,9-HpCDF		ND(1)	ND(0.9)	1.6 J	ND(2.3) X	3 J	ND(0.54)
HpCDFs (total)		ND(1)	5.4	54	ND(0.21)	83	ND(0.38)
OCDF		ND(0.56)	ND(2.1)	21	6.2	58	ND(0.37) X
Dioxins							
2,3,7,8-TCDD		ND(0.11)	ND(0.17)	ND(0.57)	ND(0.13)	ND(1.8)	ND(0.22) X
TCDDs (total)		ND(0.11)	ND(0.17)	2.4	0.38	4.3 Q	ND(0.94)
1,2,3,7,8-PeCDD		ND(0.37)	ND(0.083)	ND(0.57) X	ND(0.54)	2.7 J	ND(0.15) X
PeCDDs (total)		ND(0.37)	ND(0.083)	5	ND(0.54)	7.7 Q	ND(0.54)
1,2,3,4,7,8-HxCDD		ND(0.22)	ND(0.57)	ND(0.44) X	ND(0.25)	2.6 J	ND(0.069) X
1,2,3,6,7,8-HxCDD		ND(0.24)	ND(0.59)	3.1 J	ND(0.27)	5.5 J	0.11 J
1,2,3,7,8,9-HxCDD		ND(0.23)	ND(0.56)	1.8 J	ND(0.26)	6.3 J	ND(0.13)
HxCDDs (total)		0.52	ND(0.59)	25	0.74	44	ND(0.31)
1,2,3,4,6,7,8-HpCDD		ND(0.2)	7.3	23	ND(4.4) X	100	ND(0.64)
HpCDDs (total)		2.2	14	41	8.6	180	1.1
OCDD		ND(2) X	55	120	49	720	ND(3.8)
Total TEQs (EPA 2010 TEFs)		0.31	2.1	6.4	2.2	17	0.34

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-M7 0-1 11/13/03	RAA10-N-M7 6-15 11/13/03	RAA10-N-MM6 1-6 10/23/03	RAA10-N-MM6 6-15 10/23/03	RAA10-N-MM7 0-1 10/31/03	RAA10-N-MM12 6-15 10/07/03
Furans							
2,3,7,8-TCDF		120 Y	ND(0.38)	1.5 Y	0.081 J	3.5 Y	ND(0.22) [ND(0.89) Y]
TCDFs (total)		930	ND(0.38)	28	0.081	51	16 I [16 I]
1,2,3,7,8-PeCDF		57	ND(0.18) X	0.62 J	ND(0.046) X	2.1 J	ND(0.2) [2.1]
2,3,4,7,8-PeCDF		73	ND(0.17)	2.5 J	ND(0.048) X	5.4 J	ND(1.7) X [2.4]
PeCDFs (total)		700 Q	ND(0.17)	53	0.18	42 Q	18 I [18 I]
1,2,3,4,7,8-HxCDF		76	ND(0.63)	1 J	ND(0.035)	4.6 J	4.5 I [4.8]
1,2,3,6,7,8-HxCDF		51	ND(0.63)	0.9 J	0.064 J	3 J	ND(1) X [2.1]
1,2,3,7,8,9-HxCDF		6.8	ND(0.63)	0.33 J	ND(0.26)	0.95 JQ	0.69 [ND(1.8) X]
2,3,4,6,7,8-HxCDF		22	ND(0.63)	2.3 J	ND(0.26)	5.1 J	1.4 [2.4]
HxCDFs (total)		420	ND(0.63)	38	0.31	120 Q	14 I [19 I]
1,2,3,4,6,7,8-HpCDF		64	ND(0.25) X	3.3	ND(0.083)	76	ND(4.2) X [ND(5.6) X]
1,2,3,4,7,8,9-HpCDF		14	ND(0.63)	0.48 J	ND(0.26)	4.2 J	ND(2.6) X [ND(3.1) X]
HpCDFs (total)		110	ND(0.63)	8.4	0.15	250	5.9 [5.9]
OCDF		55	ND(1.3)	2.6 J	ND(0.52)	210	12 [13]
Dioxins							
2,3,7,8-TCDD		0.93 J	ND(0.64)	ND(0.11)	ND(0.1)	ND(0.51)	ND(0.22) [ND(0.3)]
TCDDs (total)		9.6	ND(0.8)	0.13	ND(0.33)	4.4	ND(0.22) [ND(0.3)]
1,2,3,7,8-PeCDD		ND(3) X	ND(0.63)	ND(0.27)	ND(0.26)	1.3 J	ND(0.9) [ND(3.5) X]
PeCDDs (total)		20 Q	ND(1.1)	0.47	ND(0.49)	7.3 Q	ND(0.9) [ND(0.87)]
1,2,3,4,7,8-HxCDD		1.9 J	ND(0.63)	0.12 J	ND(0.26)	1.1 J	ND(0.58) [ND(1.4) X]
1,2,3,6,7,8-HxCDD		4.4 J	ND(0.63)	ND(0.26)	ND(0.26)	8.2	ND(0.081) [ND(2) X]
1,2,3,7,8,9-HxCDD		3.6 J	ND(0.63)	ND(0.23)	ND(0.26)	3.6 J	ND(0.61) [ND(1.5) X]
HxCDDs (total)		50	ND(0.63)	1.6	ND(0.26)	48	ND(0.61) [ND(0.6)]
1,2,3,4,6,7,8-HpCDD		21	0.68 J	2 J	ND(0.17) X	190	9.7 [9.7]
HpCDDs (total)		50	0.68	3.8	ND(0.26)	380	17 [18]
OCDD		280	ND(3.6)	12	ND(1.1)	2100	68 [66]
Total TEQs (EPA 2010 TEFs)		57	0.92	1.7	0.27	16	1.9 [4.4]

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-MM18 0-1 10/31/03	RAA10-N-MM18 6-15 10/31/03	RAA10-N-NN12 0-1 10/07/03	RAA10-N-NN14 1-6 10/07/03	RAA10-N-O5 0-1 03/02/04	RAA10-N-O7 1-6 11/14/03	RAA10-N-OO7 0-1 10/22/03
Furans							
2,3,7,8-TCDF	3.3 Y	ND(0.31)	ND(1.1) X	14 Y	14 Y	9.5 Y	3.5 Y
TCDFs (total)	33	ND(0.31)	19 I	65 I	1900 I	160	68
1,2,3,7,8-PeCDF	1.4 J	ND(0.58)	1.2	4.6	15	3.2 J	ND(2.9)
2,3,4,7,8-PeCDF	4 J	ND(0.2)	1.3	4.6	21	12	6
PeCDFs (total)	52	ND(0.42)	32 I	41 I	2800 I	160 Q	130 QI
1,2,3,4,7,8-HxCDF	3.2 J	ND(0.58)	2.9 I	5.4 I	28	7.8	2.5 J
1,2,3,6,7,8-HxCDF	2.1 J	ND(0.58)	ND(1.4) X	2.1	4.9	4.8 J	2.2 J
1,2,3,7,8,9-HxCDF	1 J	ND(0.58)	1.1	1.2	ND(1.3)	1.2 JQ	0.51 JQ
2,3,4,6,7,8-HxCDF	4.3 J	ND(0.58)	ND(1.5) X	2.1	4.1	10	5.2
HxCDFs (total)	60	ND(0.32)	19 I	20 I	870 I	140 Q	87 Q
1,2,3,4,6,7,8-HpCDF	7.7	0.31 J	ND(6.6) X	ND(7.5) X	24	20	15
1,2,3,4,7,8,9-HpCDF	1.3 J	ND(0.58)	ND(1.7) X	ND(2) X	7.2	3.3 J	0.97 J
HpCDFs (total)	18	ND(0.31)	ND(0.27)	ND(0.25)	56 I	49	31
OCDF	7.2 J	ND(1.2)	2.9	2.9	32	26	14
Dioxins							
2,3,7,8-TCDD	ND(0.42)	ND(0.45)	ND(0.12)	ND(0.16)	ND(0.43)	ND(0.42)	5.6
TCDDs (total)	2.4	ND(0.74)	ND(0.12)	5.9	ND(0.43)	3.2	9.5
1,2,3,7,8-PeCDD	ND(0.34) X	ND(0.58)	ND(1.8) X	ND(1.3) X	ND(8.2)	1.2 J	0.85 J
PeCDDs (total)	2 Q	ND(1)	ND(0.32)	ND(0.46)	ND(8.2)	6.2 Q	8.6 Q
1,2,3,4,7,8-HxCDD	ND(0.4)	ND(0.58)	1.3	ND(1.2) X	ND(2.3)	0.81 J	0.55 J
1,2,3,6,7,8-HxCDD	ND(0.59) X	ND(0.58)	2.4	1.4	ND(2.3)	1.8 J	1.9 J
1,2,3,7,8,9-HxCDD	ND(0.72)	ND(0.58)	4.8	ND(1.9) X	ND(2.1)	1.8 J	1.4 J
HxCDDs (total)	4.5	ND(1.1)	21	13	ND(2.3)	22	20
1,2,3,4,6,7,8-HpCDD	6.2	ND(0.58)	24	6.6	8.3	12	23
HpCDDs (total)	12	ND(0.58)	60	16	16	24	42
OCDD	38	ND(3.1)	290	71	65	78	180
Total TEQs (EPA 2010 TEFs)	3.4	0.79	4	5.4	17	9.5	11

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-OO16 0-1 10/22/03	RAA10-N-PP8 0-1 10/16/03	RAA10-N-PP8 6-15 10/16/03	RAA10-N-PP12 0-1 10/16/03	RAA10-N-PP14 6-15 10/20/03	RAA10-N-Q3 1-6 03/02/04	RAA10-N-Q3 6-15 03/02/04
Furans								
2,3,7,8-TCDF		2.8 Y	0.71 J	ND(0.25)	8.2 Y	0.49 J	53 J [14 J]	270 Y
TCDFs (total)		50	6.8	ND(0.25)	140 Q	2.6	2600 J [1000 J]	19000 I
1,2,3,7,8-PeCDF		1.3 J	0.45 J	ND(0.56)	4.8 JQ	ND(0.22) X	62 J [15 J]	400
2,3,4,7,8-PeCDF		7.3	1.5 J	ND(0.56)	18	0.21 J	71 J [18 J]	420
PeCDFs (total)		63 Q	23 Q	ND(0.56)	170 QI	1.5	4000 J [1300 J]	34000 I
1,2,3,4,7,8-HxCDF		1.8 J	0.55 J	ND(0.56)	9.1	0.21 J	120 J [22 J]	740
1,2,3,6,7,8-HxCDF		1.8 J	0.61 J	ND(0.56)	7.9	0.22 J	65 J [10 J]	330
1,2,3,7,8,9-HxCDF		0.35 JQ	ND(0.14) X	ND(0.56)	1.9 JQ	0.06 J	ND(2.5) [1.3]	90
2,3,4,6,7,8-HxCDF		4	1.2 J	ND(0.56)	16	0.072 J	14 J [5.5 J]	130
HxCDFs (total)		60 Q	17	ND(0.56)	240 Q	1.1	2400 J [620 J]	22000 I
1,2,3,4,6,7,8-HpCDF		9	2.1 J	0.14 J	46	ND(0.34)	110 J [27 J]	770
1,2,3,4,7,8,9-HpCDF		0.88 J	0.24 J	ND(0.56)	2.9 J	0.076 J	32 J [7.7 J]	220
HpCDFs (total)		21	4.3	0.14	90	0.5	220 J [53 J]	1600 I
OCDF		14	1.4 J	ND(1.1)	33	0.34 J	170 J [28 J]	840
Dioxins								
2,3,7,8-TCDD		ND(0.18) X	ND(0.22)	ND(0.22)	ND(0.53) X	ND(0.18) X	ND(0.62) [ND(0.26)]	R
TCDDs (total)		0.82	ND(0.68)	ND(0.82)	4.5	0.056	ND(0.62) [ND(0.26)]	4.9
1,2,3,7,8-PeCDD		0.55 J	ND(0.17) X	ND(0.56)	1.7 J	ND(0.12) X	ND(15) [ND(3.3)]	R
PeCDDs (total)		1.8 Q	0.37	ND(0.96)	13 Q	0.084	ND(15) [ND(3.3)]	ND(19)
1,2,3,4,7,8-HxCDD		0.53 J	0.15 J	ND(0.56)	ND(1.2) X	ND(0.5)	ND(4.6) [ND(0.68)]	ND(5.3)
1,2,3,6,7,8-HxCDD		1.3 J	0.42 J	ND(0.56)	5.3 J	0.14 J	ND(4.6) [ND(0.71)]	ND(4.9)
1,2,3,7,8,9-HxCDD		1.3 J	0.33 J	ND(0.56)	3.5 J	ND(0.17)	ND(4.2) [ND(0.64)]	ND(4.4)
HxCDDs (total)		12	1.5	ND(0.56)	50	ND(0.37)	ND(4.6) [ND(0.71)]	95
1,2,3,4,6,7,8-HpCDD		19	3.5 J	ND(0.4) X	56	ND(0.48)	15 [7.3]	75
HpCDDs (total)		37	7	ND(0.56)	110	ND(0.74)	29 J [14 J]	180
OCDD		170	28	2 J	390	ND(2.5)	43 J [23 J]	150
Total TEQs (EPA 2010 TEFs)		5.1	1.2	0.7	15	0.38	59 [14]	310

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-Q7 0-1 03/03/04	RAA10-N-QQ8 1-6 10/22/03	RAA10-N-RR10 0-1 10/22/03	RAA10-N-RR10 6-15 10/22/03	RAA10-N-S1 0-1 03/01/04	RAA10-N-S1 6-15 03/01/04	RAA10-N-S2 0-1 03/01/04
Furans							
2,3,7,8-TCDF	4 Y	0.086 J	85 Y	0.099 J	7.6 Y	ND(0.17)	ND(0.31)
TCDFs (total)	330 I	0.23	12000 Q	0.24	1000 I	ND(0.17)	5.6 I
1,2,3,7,8-PeCDF	6.3	ND(0.065) X	120 Q	ND(0.059) X	1.5	ND(0.17)	ND(0.28)
2,3,4,7,8-PeCDF	6.7	ND(0.061) X	3500 Q	ND(0.07)	18	ND(0.19)	ND(0.3)
PeCDFs (total)	760 I	0.25	32000 QI	0.45	1400 I	ND(0.19)	18 I
1,2,3,4,7,8-HxCDF	ND(1.4)	ND(0.27)	1100	ND(0.031)	5.1	ND(0.099)	ND(0.17)
1,2,3,6,7,8-HxCDF	52	0.067 J	950	0.072 J	ND(0.94)	ND(0.1)	ND(0.17)
1,2,3,7,8,9-HxCDF	ND(1.1)	ND(0.27)	300 Q	ND(0.27)	ND(0.49)	ND(0.082)	ND(0.16)
2,3,4,6,7,8-HxCDF	4.1	ND(0.27)	2000	ND(0.028) X	4.4	ND(0.093)	ND(0.15)
HxCDFs (total)	490 I	0.35	27000 QI	0.29	490 I	ND(0.1)	9.1 I
1,2,3,4,6,7,8-HpCDF	14	0.17 J	1100	ND(0.061)	17	ND(0.073)	2.4
1,2,3,4,7,8,9-HpCDF	7.1	ND(0.27)	290	ND(0.27)	2.1	ND(0.078)	ND(0.14)
HpCDFs (total)	35	0.29	3100	0.061	50 I	ND(0.078)	2.6
OCDF	22	0.19 J	320	ND(0.55)	22	ND(0.18)	ND(3.6) X
Dioxins							
2,3,7,8-TCDD	ND(0.61)	ND(0.11)	24	ND(0.11)	ND(0.25)	ND(0.15)	ND(0.15)
TCDDs (total)	ND(0.61)	ND(0.43)	670 Q	ND(0.42)	ND(0.25)	ND(0.15)	ND(0.15)
1,2,3,7,8-PeCDD	ND(3.2)	ND(0.27)	420	ND(0.27)	ND(2.3)	ND(0.3)	ND(0.53)
PeCDDs (total)	ND(3.2)	ND(0.53)	3000 Q	ND(0.54)	ND(2.3)	ND(0.3)	ND(0.53)
1,2,3,4,7,8-HxCDD	ND(1.1)	ND(0.27)	270	ND(0.27)	ND(0.74)	ND(0.13)	ND(0.21)
1,2,3,6,7,8-HxCDD	ND(1.2)	ND(0.27)	2000	ND(0.27)	ND(0.71)	ND(0.13)	ND(0.21)
1,2,3,7,8,9-HxCDD	ND(1.1)	ND(0.27)	930	ND(0.27)	ND(0.65)	ND(0.12)	ND(0.19)
HxCDDs (total)	ND(1.2)	ND(0.27)	15000	0.15	ND(0.74)	ND(0.13)	ND(0.21)
1,2,3,4,6,7,8-HpCDD	ND(0.98)	0.24 J	4400	ND(0.22) X	32	ND(0.1)	4.4
HpCDDs (total)	ND(0.98)	0.24	8700	0.12	62	ND(0.1)	7.6
OCDD	44	2.8 J	2600	1.2 J	290	ND(3.2) X	24
Total TEQs (EPA 2010 TEFs)	11	0.31	2300	0.28	10	0.31	0.61

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-S7 1-6 03/03/04	RAA10-N-U2 1-6 03/01/04	RAA10-N-U5 6-15 10/30/03	RAA10-N-U6 0-1 03/02/04	RAA10-N-W1 0-1 03/01/04	RAA10-N-W3 6-15 10/30/03	RAA10-N-W4 1-6 10/30/03
Furans								
2,3,7,8-TCDF		ND(1.8)	ND(0.092)	ND(0.28) X	ND(0.72)	ND(0.55)	0.15 J	1.1 J [1.4 J]
TCDFs (total)		340 I	ND(0.092)	0.24	160 I	280 I	0.3	8.1 [9.6]
1,2,3,7,8-PeCDF		ND(2.1)	ND(0.088)	ND(0.18) X	ND(0.62)	2.3	ND(0.12) X	0.43 J [0.5 J]
2,3,4,7,8-PeCDF		ND(2.2)	ND(0.092)	0.22 JQ	ND(0.7)	ND(0.51)	ND(0.095) X	0.87 J [1.2 J]
PeCDFs (total)		690 I	ND(0.092)	1.5 Q	270 I	510 I	ND(0.54)	8.6 [14]
1,2,3,4,7,8-HxCDF		ND(2.2)	ND(0.048)	ND(0.14) X	ND(0.58)	ND(0.48)	ND(0.54)	0.44 J [0.45 J]
1,2,3,6,7,8-HxCDF		ND(2.1)	ND(0.048)	ND(0.21)	19	ND(0.45)	ND(0.12)	ND(0.43) X [0.48 J]
1,2,3,7,8,9-HxCDF		ND(2)	ND(0.04)	ND(0.57)	ND(0.24)	ND(0.36)	ND(0.54)	ND(0.57) [ND(0.58)]
2,3,4,6,7,8-HxCDF		ND(2)	ND(0.042)	0.13 J	ND(0.61)	ND(0.43)	ND(0.54)	0.64 J [0.9 J]
HxCDFs (total)		400 I	1.2 I	1.3	160 I	220 I	ND(0.12)	8.6 [13]
1,2,3,4,6,7,8-HpCDF		ND(1.4)	0.51	ND(0.26)	5.2	6.4	ND(0.082)	2 J [2.5 J]
1,2,3,4,7,8,9-HpCDF		ND(1.6)	ND(0.04)	ND(0.57)	ND(0.28)	ND(0.24)	ND(0.54)	ND(0.26) X [ND(0.58)]
HpCDFs (total)		ND(1.6)	0.57	ND(0.26)	6.5	7.2	ND(0.082)	4 [5.6]
OCDF		ND(4.7)	ND(0.082)	ND(1.1)	19	7.1	ND(1.1)	3.2 J [3.2 J]
Dioxins								
2,3,7,8-TCDD		ND(0.63)	ND(0.072)	ND(0.29)	ND(0.29)	ND(0.14)	ND(0.22)	ND(0.4) [ND(0.25)]
TCDDs (total)		ND(0.63)	ND(0.072)	ND(0.76)	ND(0.29)	ND(0.14)	ND(0.76)	ND(0.78) [ND(0.25)]
1,2,3,7,8-PeCDD		ND(5.5)	ND(0.18)	ND(0.57)	ND(2.7)	ND(1.2)	0.073 J	ND(0.57) [ND(0.58)]
PeCDDs (total)		ND(5.5)	ND(0.18)	ND(0.83)	ND(2.7)	ND(1.2)	0.073	ND(0.57) [ND(0.97)]
1,2,3,4,7,8-HxCDD		ND(2.1)	ND(0.062)	ND(0.57)	ND(0.76)	ND(0.21)	ND(0.54)	ND(0.57) [ND(0.58)]
1,2,3,6,7,8-HxCDD		ND(2)	ND(0.062)	0.26 J	ND(0.75)	ND(0.22)	ND(0.54)	ND(0.57) [ND(0.58)]
1,2,3,7,8,9-HxCDD		ND(1.9)	ND(0.056)	ND(0.57)	ND(0.68)	ND(0.2)	ND(0.54)	ND(0.32) X [ND(0.58)]
HxCDDs (total)		ND(2.1)	ND(0.062)	0.26	ND(0.76)	ND(0.22)	ND(0.54)	0.47 [1.2]
1,2,3,4,6,7,8-HpCDD		ND(2.3)	ND(0.056)	ND(0.56) X	ND(9.7) X	5.5	ND(0.23) X	3.2 J [2.5 J]
HpCDDs (total)		ND(2.3)	ND(0.056)	ND(0.57)	12	12	ND(0.54)	6.2 [4.6]
OCDD		150	ND(0.072)	ND(2.6)	96	41	ND(0.93) X	16 [18]
Total TEQs (EPA 2010 TEFs)		4.7	0.17	0.67	4.2	1.2	0.39	1.2 [1.3]

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-W5 0-1 10/30/03	RAA10-N-W7 0-1 03/03/04	RAA10-N-Y6 0-1 11/11/03	RAA10-N-Y6 1-6 11/11/03	RAA10-N-Y7 6-15 11/12/03	RAA10-N-Y18 0-1 10/23/03
Furans							
2,3,7,8-TCDF		1.9 J	ND(0.86)	0.3 J	ND(0.44) X	ND(0.36)	2.8 Y
TCDFs (total)		16	220 I	1.1	1.6	ND(0.36)	170
1,2,3,7,8-PeCDF		0.81 J	ND(8) X	ND(0.51)	0.32 J	ND(0.56)	ND(2.1)
2,3,4,7,8-PeCDF		2.2 J	2.3	ND(0.27)	0.48 J	ND(0.56)	13
PeCDFs (total)		26	390 I	1.6	4.6	ND(0.56)	170 Q
1,2,3,4,7,8-HxCDF		1.1 J	4.6	ND(0.51)	ND(0.54)	ND(0.56)	8.5
1,2,3,6,7,8-HxCDF		0.93 J	3.6	ND(0.51)	0.23 J	ND(0.56)	4.8
1,2,3,7,8,9-HxCDF		ND(0.6)	ND(5.6) X	ND(0.51)	ND(0.54)	ND(0.56)	1.8 JQ
2,3,4,6,7,8-HxCDF		1.7 J	2	ND(0.51)	0.25 J	ND(0.56)	10
HxCDFs (total)		24	220 I	1.4	3.2	ND(0.56)	150 Q
1,2,3,4,6,7,8-HpCDF		3.8 J	10	0.53 J	0.68 J	ND(0.56)	15
1,2,3,4,7,8,9-HpCDF		0.47 J	ND(4.8) X	ND(0.51)	ND(0.54)	ND(0.56)	3.1
HpCDFs (total)		8.5	12	1.1	1.2	ND(0.56)	37
OCDF		4.2 J	14	1.1 J	ND(1.1)	ND(0.72) X	9.7
Dioxins							
2,3,7,8-TCDD		ND(0.3)	ND(0.4)	ND(0.26)	ND(0.29)	ND(0.56)	ND(0.2) X
TCDDs (total)		0.3	ND(0.4)	ND(0.64)	ND(0.71)	ND(0.56)	2.9
1,2,3,7,8-PeCDD		0.16 J	ND(2.9)	ND(0.51)	ND(0.54)	ND(0.56)	1.2 J
PeCDDs (total)		0.35	ND(2.9)	ND(0.87)	ND(0.93)	ND(0.97)	12 Q
1,2,3,4,7,8-HxCDD		ND(0.17) X	ND(0.7)	ND(0.51)	ND(0.54)	ND(0.56)	0.92 J
1,2,3,6,7,8-HxCDD		ND(0.48) X	ND(0.67)	ND(0.51)	ND(0.54)	ND(0.56)	3.8
1,2,3,7,8,9-HxCDD		0.41 J	ND(2.2) X	ND(0.51)	ND(0.54)	ND(0.56)	2.3 J
HxCDDs (total)		2	ND(0.7)	ND(0.51)	ND(0.54)	ND(0.56)	34
1,2,3,4,6,7,8-HpCDD		4.2 J	ND(8.2) X	1.2 J	0.64 J	0.96 J	11
HpCDDs (total)		7.7	6.6	2	1.1	1.5	22
OCDD		24	28	9.9 J	ND(4)	4.4 J	34
Total TEQs (EPA 2010 TEFs)		1.8	4.3	0.69	0.8	0.9	9.1

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	UBW090810 8-10 08/09/96	UBW100810 8-10 08/09/96	UBB020406 4-6 08/09/96	UBB071214 12-14 08/09/96	UBB081012 10-12 08/09/96	UBB091012 10-12 08/09/96	UBB100810 8-10 08/09/96	UBB101214 12-14 08/09/96
Furans									
2,3,7,8-TCDF		ND(3.4)	ND(2.2)	ND(0.3)	ND(51)	ND(280)	ND(17)	ND(2.2)	ND(71)
TCDFs (total)		ND(3.4)	ND(2.2)	ND(0.35)	ND(210) X	ND(280)	ND(180) X	ND(2.2)	ND(71)
1,2,3,7,8-PeCDF		ND(3.5)	ND(1.9)	ND(0.11)	ND(120)	ND(430)	ND(63)	ND(1.9)	ND(31)
2,3,4,7,8-PeCDF		ND(3.1)	ND(1.7)	ND(0.095)	ND(140)	ND(470)	ND(69)	ND(1.7)	ND(33)
PeCDFs (total)		ND(7.8)	ND(2.7)	ND(0.12)	ND(790) X	ND(430)	ND(24) X	ND(2.7)	ND(31)
1,2,3,4,7,8-HxCDF		ND(2.2)	ND(1.1)	ND(0.11)	ND(63)	ND(200)	ND(25)	ND(1.1)	ND(25)
1,2,3,6,7,8-HxCDF		ND(1.8)	ND(0.91)	ND(0.087)	ND(52)	ND(170)	ND(20)	ND(0.91)	ND(21)
1,2,3,7,8,9-HxCDF		ND(2.3)	ND(1.1)	ND(0.14)	ND(70)	ND(220)	ND(27)	ND(1.1)	ND(24)
2,3,4,6,7,8-HxCDF		ND(1.8)	ND(0.93)	ND(0.27)	ND(60)	ND(190)	ND(23)	ND(0.93)	ND(29)
HxCDFs (total)		ND(2.3)	ND(1.1)	ND(0.27)	ND(450) X	ND(170)	ND(66) X	ND(1.1)	ND(21)
1,2,3,4,6,7,8-HpCDF		ND(2.2)	ND(1)	ND(0.12)	ND(59) X	ND(160)	ND(29)	ND(1)	ND(28)
1,2,3,4,7,8,9-HpCDF		ND(2.9)	ND(1.3)	ND(0.2)	ND(31)	ND(180)	ND(32)	ND(1.3)	ND(33)
HpCDFs (total)		ND(2.9)	ND(1.3)	ND(0.2)	ND(140) X	ND(160)	ND(29)	ND(1.3)	ND(28)
OCDF		ND(9.4)	ND(11)	ND(1.4)	ND(51)	ND(73)	ND(30)	ND(11)	ND(29)
Dioxins									
2,3,7,8-TCDD		ND(2.7)	ND(3.1)	ND(0.26)	ND(77)	ND(320)	ND(37)	ND(3.1)	ND(43)
TCDDs (total)		ND(2.7)	ND(3.1)	ND(0.26)	ND(77)	ND(320)	ND(37)	ND(3.1)	ND(43)
1,2,3,7,8-PeCDD		ND(4)	ND(3.4)	ND(0.28)	ND(69)	ND(200)	ND(57)	ND(3.4)	ND(32)
PeCDDs (total)		ND(4)	ND(3.4)	ND(0.28)	ND(500) X	ND(2800) X	ND(57)	ND(3.4)	ND(32)
1,2,3,4,7,8-HxCDD		ND(3.9)	ND(2.7)	ND(0.18)	ND(97)	ND(120)	ND(43)	ND(2.7)	ND(39)
1,2,3,6,7,8-HxCDD		ND(3.9)	ND(2.7)	ND(0.18)	ND(80)	ND(95)	ND(36)	ND(2.7)	ND(34)
1,2,3,7,8,9-HxCDD		ND(4)	ND(2.8)	ND(0.2)	ND(86)	ND(100)	ND(38)	ND(2.8)	ND(36)
HxCDDs (total)		ND(4)	ND(2.8)	ND(0.2)	ND(80)	ND(95)	ND(36)	ND(2.8)	ND(34)
1,2,3,4,6,7,8-HpCDD		ND(5.2)	ND(1.7)	ND(0.26)	ND(110)	ND(150)	ND(43)	ND(1.7)	ND(27)
HpCDDs (total)		ND(5.2)	ND(1.7)	ND(0.26)	ND(110)	ND(150)	ND(43)	ND(1.7)	ND(27)
OCDD		ND(15)	ND(11)	ND(2)	ND(160)	ND(100)	ND(95)	ND(11)	ND(84)
Total TEQs (EPA 2010 TEFs)		5.1	4.3	0.37	130	410	70	4.3	57

TABLE C-4
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	UBB120002 0-2 07/30/96	UBB120406 4-6 07/30/96	UBB140406 4-6 08/07/96	UBB150810 8-10 08/09/96	UBB181012 10-12 08/09/96	UB-SS-5 0-0.5 03/04/97	UB-SS-7 0-0.5 03/04/97	UB-SS-8 0-0.5 03/04/97	UB-SS-9 0-0.5 03/04/97
Furans										
2,3,7,8-TCDF		5.1 Y	ND(0.16)	1.4 Y	ND(0.43) Y	ND(16000)	ND(180)	ND(140)	ND(170)	ND(160)
TCDFs (total)		55	ND(0.18)	29	12	ND(16000)	ND(180)	ND(140)	ND(170)	ND(160)
1,2,3,7,8-PeCDF		ND(2.3)	ND(0.17)	ND(0.97)	ND(0.31)	ND(8200)	ND(190)	ND(160)	ND(160)	ND(160)
2,3,4,7,8-PeCDF		2.8 J	ND(0.15)	ND(1.5)	ND(0.79)	ND(8800)	ND(190)	ND(160)	ND(160)	ND(150)
PeCDFs (total)		42	ND(0.3)	49	ND(1.8)	ND(8200)	ND(190)	ND(160)	ND(160)	ND(150)
1,2,3,4,7,8-HxCDF		5.2	ND(0.082)	3 J	ND(0.52)	ND(390)	ND(120)	ND(160)	ND(120)	ND(170)
1,2,3,6,7,8-HxCDF		ND(1.7)	ND(0.065)	ND(2.2)	ND(0.22)	ND(340)	ND(130)	ND(180)	ND(130)	ND(180)
1,2,3,7,8,9-HxCDF		ND(0.27)	ND(0.1)	ND(0.15)	ND(0.26)	ND(440)	ND(150)	ND(200)	ND(150)	ND(200)
2,3,4,6,7,8-HxCDF		2.9 J	ND(0.33)	ND(2.1)	ND(0.93)	ND(380)	ND(130)	ND(170)	ND(120)	ND(170)
HxCDFs (total)		37	ND(0.33)	41	ND(1.5)	ND(340)	ND(120)	ND(160)	ND(120)	ND(170)
1,2,3,4,6,7,8-HpCDF		8.4	ND(0.28)	4.4 J	ND(0.83)	ND(420)	ND(270)	ND(330)	ND(170)	ND(160)
1,2,3,4,7,8,9-HpCDF		ND(1.5)	ND(0.46)	ND(0.64)	ND(0.38)	ND(480)	ND(350)	ND(430)	ND(210)	ND(200)
HpCDFs (total)		24	ND(0.46)	10	ND(0.83)	ND(420)	ND(270)	ND(330)	ND(170)	ND(160)
OCDF		30	ND(0.74)	ND(4.5)	ND(4.2)	ND(510)	ND(250)	ND(270)	ND(260)	ND(400)
Dioxins										
2,3,7,8-TCDD		ND(0.24)	ND(0.2)	ND(0.28)	ND(5.7)	ND(4500)	ND(68)	ND(65)	ND(63)	ND(65)
TCDDs (total)		0.81	ND(0.2)	0.57	1.2	ND(4500)	ND(68)	ND(65)	ND(63)	ND(65)
1,2,3,7,8-PeCDD		ND(0.33)	ND(0.14)	ND(0.47)	ND(0.33)	ND(6200)	ND(230)	ND(180)	ND(180)	ND(270)
PeCDDs (total)		ND(0.69)	ND(0.14)	ND(1.1)	ND(0.33)	ND(6200)	ND(230)	ND(180)	ND(180)	ND(270)
1,2,3,4,7,8-HxCDD		ND(0.47)	ND(0.13)	ND(0.4)	ND(0.24)	ND(980)	ND(200)	ND(170)	ND(170)	ND(250)
1,2,3,6,7,8-HxCDD		ND(1.6)	ND(0.13)	ND(0.88)	ND(0.24)	ND(910)	ND(180)	ND(150)	ND(160)	ND(230)
1,2,3,7,8,9-HxCDD		ND(1.5)	ND(0.14)	ND(1.2)	ND(0.26)	ND(920)	ND(180)	ND(150)	ND(160)	ND(230)
HxCDDs (total)		4.8	ND(0.14)	3.4	ND(0.36)	ND(910)	ND(180)	ND(150)	ND(160)	ND(230)
1,2,3,4,6,7,8-HpCDD		35	ND(0.25)	6.8	ND(0.93)	ND(490)	ND(200)	ND(180)	ND(150)	ND(350)
HpCDDs (total)		56	ND(0.25)	14	ND(0.4)	ND(490)	ND(200)	ND(180)	ND(150)	ND(350)
OCDD		270	ND(2.5)	70	ND(5.6)	ND(920)	ND(880)	ND(400)	ND(300)	ND(910)
Total TEQs (EPA 2010 TEFs)		4.1	0.26	1.7	3.3	7800	250	220	210	280

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-A22 0-1 05/26/04	RAA10-E-B22 0-1 05/20/04	RAA10-E-B22 1-3 05/20/04	RAA10-E-C24 0-1 05/26/04	RAA10-E-D22 0-1 05/20/04	RAA10-E-D22 6-15 05/20/04	RAA10-E-D24 0-1 05/17/04	RAA10-E-D26 0-1 05/26/04
Furans								
2,3,7,8-TCDF	ND(22)	1.4 J	0.63 J [1.2 J]	ND(1.6) X	ND(21)	0.26 J	ND(0.34) X	1.4 J
TCDFs (total)	ND(22)	5.7 J	4.4 J [7.9 J]	3.6 JQ	ND(21)	0.26 J	2.4 Q	79
1,2,3,7,8-PeCDF	ND(54)	ND(2.6)	0.21 J [0.63 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21) Q	0.58 J
2,3,4,7,8-PeCDF	ND(54)	ND(2.6)	0.31 J [0.74 J]	ND(2.5)	ND(52)	ND(0.59)	0.26 JQ	17
PeCDFs (total)	ND(54)	ND(2.6) Q	2.6 J [4.4 J]	ND(2.5) Q	ND(52)	ND(0.59)	0.93 JQ	190 QI
1,2,3,4,7,8-HxCDF	ND(54)	ND(2.6)	0.22 J [0.68 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	1.2 J
1,2,3,6,7,8-HxCDF	ND(54)	ND(2.6)	ND(0.21) [0.6 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	3 J
1,2,3,7,8,9-HxCDF	ND(54)	ND(2.6)	ND(0.21) [ND(0.52)]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21) Q	1 J
2,3,4,6,7,8-HxCDF	ND(54)	ND(2.6)	ND(0.21) [0.58 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	7.1
HxCDFs (total)	ND(54)	ND(2.6)	2.8 J [4.7 J]	7.2 J	ND(52)	ND(0.59)	0.93 JQ	96
1,2,3,4,6,7,8-HpCDF	ND(54)	ND(2.6)	3.5 [3.9 J]	4.6 J	ND(52)	ND(0.59)	0.24 J	4.2 J
1,2,3,4,7,8,9-HpCDF	ND(54)	ND(2.6)	ND(0.21) [ND(0.52)]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	ND(0.54)
HpCDFs (total)	ND(54)	ND(2.6)	6.4 [6.8]	8.2 J	ND(52)	ND(0.59)	0.24 J	9.4
OCDF	ND(110)	ND(5.1)	2.4 J [2.9 J]	ND(5.1)	ND(100)	ND(1.2)	ND(0.42)	2.7 J
Dioxins								
2,3,7,8-TCDD	ND(22)	ND(1)	ND(0.084) [ND(0.21)]	ND(1)	ND(21)	ND(0.24)	ND(0.084)	ND(0.22)
TCDDs (total)	ND(60)	ND(2.4)	ND(0.24) [ND(0.21)]	ND(3.1) Q	ND(57)	ND(0.7)	ND(0.19) Q	ND(0.59)
1,2,3,7,8-PeCDD	ND(54)	ND(2.6)	ND(0.21) [ND(0.52)]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	ND(0.54)
PeCDDs (total)	ND(88)	ND(3.5)	ND(0.4) Q [ND(0.91) Q]	ND(3.9)	ND(69)	ND(0.8)	ND(0.38) Q	2.4 JQ
1,2,3,4,7,8-HxCDD	ND(54)	ND(2.6)	ND(0.21) [ND(0.52)]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21) J	ND(0.54)
1,2,3,6,7,8-HxCDD	ND(54)	ND(2.6)	0.24 J [0.7 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	1.4 J
1,2,3,7,8,9-HxCDD	ND(54)	ND(2.6)	ND(0.21) [0.61 J]	ND(2.5)	ND(52)	ND(0.59)	ND(0.21)	0.91 J
HxCDDs (total)	ND(54)	ND(4.5)	0.46 J [ND(0.98)]	ND(2.5)	ND(97)	ND(1.1)	ND(0.41)	13
1,2,3,4,6,7,8-HpCDD	ND(54)	ND(2.6)	1.9 J [2.7 J]	3.4 J	ND(52)	ND(0.59)	0.44 J	4.4 J
HpCDDs (total)	ND(54)	ND(2.6)	3.2 [4.4 J]	3.4 J	ND(52)	ND(0.59)	0.72 J	8.9
OCDD	ND(110)	8.9 J	13 [15]	22 J	140 J	1.3 J	2.1 J	19
Total TEQs (EPA 2010 TEFs)	68	3.4	0.51 [1.2]	3.3	66	0.76	0.33	7.3

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-D26 1-3 05/26/04	RAA10-E-D26 3-6 05/26/04	RAA10-E-D26 6-15 05/26/04	RAA10-E-E19 0-1 05/19/04	RAA10-E-E23 0-1 05/17/04	RAA10-E-F20 1-3 05/20/04	RAA10-E-F20 3-6 05/20/04
Furans								
2,3,7,8-TCDF		0.94 J	5.7 Y	ND(0.33) X	5.6 Y	0.83 Y	0.49 J	0.28 J
TCDFs (total)		62 I	60	ND(0.27)	18 Q	10 Q	3.2	2.2
1,2,3,7,8-PeCDF		ND(0.52)	2.1 J	ND(0.68)	1 J	0.54 J	ND(0.22)	ND(0.24)
2,3,4,7,8-PeCDF		14	7.9	ND(0.68)	3.6	2.2 J	0.41 J	ND(0.24)
PeCDFs (total)		150 QI	78 Q	ND(0.68)	54 Q	19 Q	3.6	0.9 J
1,2,3,4,7,8-HxCDF		0.92 J	3.2 J	ND(0.68)	2.6	0.8 J	0.24 J	ND(0.24)
1,2,3,6,7,8-HxCDF		2.5 J	4.3 J	ND(0.68)	2.4 J	0.6 J	ND(0.22)	ND(0.24)
1,2,3,7,8,9-HxCDF		0.67 J	1.5 J	ND(0.68)	0.63 JQ	ND(0.27) Q	ND(0.22)	ND(0.24)
2,3,4,6,7,8-HxCDF		5.9	3.8 J	ND(0.68)	4.7	1.3 J	ND(0.22)	ND(0.24)
HxCDFs (total)		76	100	ND(0.68)	70 Q	19 Q	2 J	0.44 J
1,2,3,4,6,7,8-HpCDF		3.2 J	120	ND(0.68)	11	11	0.51 J	0.32 J
1,2,3,4,7,8,9-HpCDF		ND(0.52)	1.7 J	ND(0.68)	1.2 J	ND(0.27)	ND(0.22)	ND(0.24)
HpCDFs (total)		7.4	210	ND(0.68)	27	19 Q	0.83 J	0.32 J
OCDF		2.4 J	55	ND(1.4)	14	5.4 J	0.5 J	ND(0.48)
Dioxins								
2,3,7,8-TCDD		ND(0.21)	0.42 J	ND(0.27)	ND(0.15) X	ND(0.11)	ND(0.088)	ND(0.097)
TCDDs (total)		ND(0.64)	ND(0.8)	ND(0.73)	0.48 JQ	ND(0.31) Q	ND(0.23)	ND(0.21)
1,2,3,7,8-PeCDD		ND(0.52)	ND(0.74)	ND(0.68)	0.54 J	0.29 J	ND(0.22)	ND(0.24)
PeCDDs (total)		1.8 JQ	1.6 J	ND(0.98)	4.7 Q	1.9 JQ	ND(0.38)	ND(0.34)
1,2,3,4,7,8-HxCDD		ND(0.52)	ND(0.74)	ND(0.68)	0.85 J	ND(0.27)	ND(0.22)	ND(0.24)
1,2,3,6,7,8-HxCDD		1.4 J	2.2 J	ND(0.68)	1.7 J	0.68 J	ND(0.22)	ND(0.24)
1,2,3,7,8,9-HxCDD		0.86 J	0.97 J	ND(0.68)	1.5 J	0.4 J	ND(0.22)	ND(0.24)
HxCDDs (total)		11	19	ND(1.1)	18	5.6	ND(0.22)	ND(0.42)
1,2,3,4,6,7,8-HpCDD		4 J	34	ND(0.68)	21	5.1	0.36 J	ND(0.24)
HpCDDs (total)		8.4	72	ND(0.68)	39	9.5	0.62 J	ND(0.24)
OCDD		15	410	ND(1.4)	150	41	ND(1.6)	ND(0.99)
Total TEQs (EPA 2010 TEFs)		6	8.4	0.86	4.5	1.8	0.43	0.33

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-F20 6-15 05/20/04	RAA10-E-F26 0-1 05/25/04	RAA10-E-G21 0-1 05/19/04	RAA10-E-G24 0-1 05/18/04	RAA10-E-G28 0-1 05/26/04	RAA10-E-H20 0-1 07/28/04	RAA10-E-H26 0-1 05/26/04
Furans								
2,3,7,8-TCDF		0.13 J	3.2 Y	0.65 JQ	0.7 J	6.4 Y	0.32 J	0.58 J
TCDFs (total)		0.13 J	260 I	19 Q	4	840 I	2.2	17 Q
1,2,3,7,8-PeCDF		ND(0.22)	9.5	0.53 JQ	0.33 J	10	ND(0.22)	ND(0.54) Q
2,3,4,7,8-PeCDF		ND(0.22)	130	3.5 Q	0.78 J	390	0.45 J	5.5 Q
PeCDFs (total)		ND(0.22)	830 Q	19 Q	7.3	2400 EQ	4.6	15 Q
1,2,3,4,7,8-HxCDF		ND(0.22)	99	3	0.59 J	78	ND(0.29)	0.77 J
1,2,3,6,7,8-HxCDF		ND(0.22)	37	2 J	0.43 J	52	ND(0.26)	1.2 J
1,2,3,7,8,9-HxCDF		ND(0.22)	62	0.36 JQ	ND(0.22)	54	ND(0.34)	ND(0.54)
2,3,4,6,7,8-HxCDF		ND(0.22)	68	2.8	0.74 J	150	ND(0.28)	2.9 J
HxCDFs (total)		ND(0.22)	780 I	38 Q	10	1700 I	2.8	35
1,2,3,4,6,7,8-HpCDF		ND(0.22)	61	7	2.3	71	0.49 J	2 J
1,2,3,4,7,8,9-HpCDF		ND(0.22)	23	0.98 J	0.22 J	21	ND(0.23)	ND(0.54)
HpCDFs (total)		ND(0.22)	160	12	6.4	210	0.49 J	5 J
OCDF		ND(0.44)	14	6.3	2.2 J	20	0.6 J	1.4 J
Dioxins								
2,3,7,8-TCDD		ND(0.088)	3.5	ND(0.14)	ND(0.087)	3.3	ND(0.12)	ND(0.3)
TCDDs (total)		ND(0.26)	210	0.9 JQ	ND(0.24)	170	ND(0.26)	ND(0.56) Q
1,2,3,7,8-PeCDD		ND(0.22)	73	0.36 JQ	ND(0.22)	59	ND(0.22)	0.61 J
PeCDDs (total)		ND(0.36)	1300	2.8 Q	ND(0.41) Q	870 Q	ND(0.22)	3.4 JQ
1,2,3,4,7,8-HxCDD		ND(0.22)	44	0.26 J	ND(0.22)	38	ND(0.53)	ND(0.54)
1,2,3,6,7,8-HxCDD		ND(0.22)	220	0.83 JQ	0.28 J	180	ND(0.47)	1.2 J
1,2,3,7,8,9-HxCDD		ND(0.22)	100	0.52 J	ND(0.22)	87	ND(0.51)	0.94 J
HxCDDs (total)		ND(0.41)	2400	8.3 Q	1.2 J	1800	0.54 J	10
1,2,3,4,6,7,8-HpCDD		ND(0.22)	400	4.5	3.3	360	0.88 J	5 J
HpCDDs (total)		ND(0.22)	940	9.1	5.9	940	1.6 J	11
OCDD		ND(0.67)	200	30	51	300	7.2	21
Total TEQs (EPA 2010 TEFs)		0.29	180	2.8	0.92	250	0.51	3.4

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-H26 1-3 05/26/04	RAA10-E-H26 3-6 05/26/04	RAA10-E-H26 6-15 05/26/04	RAA10-E-I18 0-1 05/19/04	RAA10-E-I20 0-1 05/17/04	RAA10-E-I25 0-1 05/27/04
Furans							
2,3,7,8-TCDF		2.1 J	0.43 J	ND(0.25)	4.6 Y	0.7 J [0.51 J]	0.98 J
TCDFs (total)		17 Q	0.43 J	ND(0.25)	34 Q	12 Q [7.4]	28
1,2,3,7,8-PeCDF		0.69 J	ND(0.69)	ND(0.63)	1.3 J	0.72 J [0.32 J]	ND(0.49)
2,3,4,7,8-PeCDF		2 J	ND(0.69)	ND(0.63)	3.8	2.6 JQ [2.5]	9.2
PeCDFs (total)		11 Q	ND(0.69)	ND(0.63)	25 Q	25 Q [21 Q]	86
1,2,3,4,7,8-HxCDF		0.65 J	ND(0.69)	ND(0.63)	2.3 J	0.72 J [0.63 J]	0.96 J
1,2,3,6,7,8-HxCDF		1.3 J	ND(0.69)	ND(0.63)	1.8 J	0.6 J [0.58 J]	ND(1.6) X
1,2,3,7,8,9-HxCDF		ND(0.62)	ND(0.69)	ND(0.63)	0.52 J	ND(0.26) Q [0.27 JQ]	0.66 J
2,3,4,6,7,8-HxCDF		1 J	ND(0.69)	ND(0.63)	2.9	1.2 J [1.3 J]	4.2 J
HxCDFs (total)		13	ND(0.69)	ND(0.63)	40	18 Q [16 Q]	53
1,2,3,4,6,7,8-HpCDF		5.1 J	ND(0.69)	ND(0.63)	5.3	5.2 [2.4]	5.6
1,2,3,4,7,8,9-HpCDF		ND(0.62)	ND(0.69)	ND(0.63)	0.74 J	0.28 J [0.26 J]	ND(0.49)
HpCDFs (total)		8.9	ND(0.69)	ND(0.63)	11	11 J [5.3 J]	13
OCDF		2.6 J	ND(1.4)	ND(1.3)	3.8 J	8.2 J [2.3 J]	6 J
Dioxins							
2,3,7,8-TCDD		ND(0.25)	ND(0.28)	ND(0.25)	ND(0.092)	ND(0.1) [ND(0.086)]	ND(0.19)
TCDDs (total)		ND(0.65)	ND(0.8)	ND(0.74)	0.61 JQ	1 J [0.11 J]	1.5 J
1,2,3,7,8-PeCDD		ND(0.62)	ND(0.69)	ND(0.63)	ND(0.23)	ND(0.26) [0.25 J]	0.73 J
PeCDDs (total)		ND(1.1)	ND(1)	ND(0.92)	1.5 JQ	1.5 JQ [1.2 JQ]	4 J
1,2,3,4,7,8-HxCDD		ND(0.62)	ND(0.69)	ND(0.63)	ND(0.23)	ND(0.26) [0.22 J]	ND(0.49)
1,2,3,6,7,8-HxCDD		0.64 J	ND(0.69)	ND(0.63)	0.54 J	0.7 J [0.66 J]	1.8 J
1,2,3,7,8,9-HxCDD		ND(0.62)	ND(0.69)	ND(0.63)	0.35 J	0.44 J [0.41 J]	1.2 J
HxCDDs (total)		1.6 J	ND(1.2)	ND(1.1)	4.3	5.8 [5.8]	20
1,2,3,4,6,7,8-HpCDD		2.8 J	ND(0.69)	ND(0.63)	2.6	5.5 J [3 J]	11
HpCDDs (total)		5.3 J	ND(0.69)	ND(0.63)	5.1	9.9 J [5.6 J]	46
OCDD		18	ND(3.2)	ND(2.4)	20	60 J [26 J]	80
Total TEQs (EPA 2010 TEFs)		1.9	0.9	0.79	2.8	1.8 [1.7]	5.1

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter / Sample ID:	RAA10-E-I27	RAA10-E-J24	RAA10-E-J24	RAA10-E-J24	RAA10-E-K16	RAA10-E-K22	RAA10-E-K24
Sample Depth(Feet):	0-1	1-3	3-6	6-15	0-1	0-1	0-1
Date Collected:	05/27/04	05/26/04	05/26/04	05/26/04	05/19/04	06/09/04	06/01/04
Furans							
2,3,7,8-TCDF	0.54 J	0.73 J	1.8 JI	ND(0.23) X	0.56 J	0.35 J	0.6 J
TCDFs (total)	7.8	5.8	18 QI	ND(0.22)	6	1.6 J	46
1,2,3,7,8-PeCDF	ND(0.42)	ND(0.49)	0.78 J	ND(0.56)	0.38 J	ND(0.47)	ND(0.52)
2,3,4,7,8-PeCDF	1.4 J	0.8 J	2.3 J	ND(0.56)	1.7 J	ND(0.47)	17
PeCDFs (total)	15	5.6	7.1 Q	ND(0.56)	9.1	3.5 J	160 I
1,2,3,4,7,8-HxCDF	ND(0.42)	ND(0.49)	1.2 J	ND(0.56)	0.88 J	ND(0.47)	ND(1.6) X
1,2,3,6,7,8-HxCDF	0.45 J	ND(0.49)	1.1 J	ND(0.56)	0.65 J	ND(0.47)	2.8 J
1,2,3,7,8,9-HxCDF	ND(0.42)	ND(0.49)	ND(0.6)	ND(0.56)	ND(0.24) X	ND(0.47)	1.1 J
2,3,4,6,7,8-HxCDF	0.62 J	ND(0.49)	1.8 J	ND(0.56)	0.92 J	ND(0.47)	8.2
HxCDFs (total)	8	4.6 J	25	ND(0.56)	12	1.1 J	100
1,2,3,4,6,7,8-HpCDF	0.97 J	3.1 J	14	ND(0.56)	1.8 J	0.73 J	3.3 J
1,2,3,4,7,8,9-HpCDF	ND(0.42)	ND(0.49)	0.65 J	ND(0.56)	0.4 J	ND(0.47)	0.57 J
HpCDFs (total)	1.9 J	5.2	26	ND(0.56)	3.9	0.73 J	9.3
OCDF	ND(0.85)	1.8 J	6.9 J	ND(1.1)	2.3 J	1.7 J	2.4 J
Dioxins							
2,3,7,8-TCDD	0.18 J	ND(0.26) X	ND(0.25)	ND(0.22)	ND(0.083)	ND(0.19)	ND(0.21)
TCDDs (total)	ND(0.51)	ND(0.57)	ND(0.65) Q	ND(0.66)	0.34 J	ND(0.62)	ND(0.55)
1,2,3,7,8-PeCDD	ND(0.42)	ND(0.49)	ND(0.6)	ND(0.56)	ND(0.21)	ND(0.47)	1.9 J
PeCDDs (total)	1.2 J	0.8 J	ND(0.6) Q	ND(0.81)	0.64 J	ND(0.72)	13
1,2,3,4,7,8-HxCDD	ND(0.42)	ND(0.49)	ND(0.6)	ND(0.56)	ND(0.21)	ND(0.47)	0.86 J
1,2,3,6,7,8-HxCDD	0.61 J	ND(0.52) X	0.97 J	ND(0.56)	0.33 J	ND(0.47)	3.8 J
1,2,3,7,8,9-HxCDD	ND(0.5) X	ND(0.49)	0.69 JQ	ND(0.56)	0.26 J	0.54 J	2.7 J
HxCDDs (total)	4.6	2.8 J	3.9 JQ	ND(0.56)	2.7	1.1 J	42
1,2,3,4,6,7,8-HpCDD	1.8 J	3.4 J	7.2	ND(0.56)	2.5	2.3 J	7.7
HpCDDs (total)	4 J	6.1	14	ND(0.56)	4.8	4.5 J	21
OCDD	7.3 J	21	71	ND(1.4)	14	14	21
Total TEQs (EPA 2010 TEFs)	1.2	1	2.4	0.7	1.1	0.72	9.4

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-K26 0-1 06/01/04	RAA10-E-L16 1-3 05/18/04	RAA10-E-L16 3-6 05/18/04	RAA10-E-L16 6-15 05/18/04	RAA10-E-L22 0-1 05/27/04	RAA10-E-L22 1-3 05/27/04	RAA10-E-L22 3-6 05/27/04	RAA10-E-L22 6-15 05/27/04
Furans									
2,3,7,8-TCDF		1 J	1.4 Y	8.8 Y	1 J	0.6 J	ND(0.35) X	0.48 J	0.45 J [0.31 J]
TCDFs (total)		48 I	12	110	7.8 I	8.1	2.3	2.1	0.45 J [0.31 J]
1,2,3,7,8-PeCDF		0.53 J	0.77 J	3.5 J	ND(0.32)	ND(0.51)	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
2,3,4,7,8-PeCDF		11	1.8 J	13 J	ND(0.32)	2.2 J	0.76 J	ND(0.48)	ND(0.68) [ND(0.63)]
PeCDFs (total)		120 I	18	66 Q	8.2	18	5 J	0.51 J	ND(0.68) [ND(0.63)]
1,2,3,4,7,8-HxCDF		0.92 J	ND(2) X	7.1 J	0.48 J	1.2 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
1,2,3,6,7,8-HxCDF		2.2 J	0.8 J	5.4 J	0.35 J	0.81 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
1,2,3,7,8,9-HxCDF		0.56 J	0.83 JQ	ND(2.3) Q	ND(0.32) Q	ND(0.51) Q	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
2,3,4,6,7,8-HxCDF		5.2	1.5 J	9.7 J	0.68 J	1.2 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
HxCDFs (total)		68	22 Q	130 Q	10 Q	16	3.5 J	ND(0.48)	ND(0.68) [ND(0.63)]
1,2,3,4,6,7,8-HpCDF		2.6 J	3.5	18	1.1 J	4.1 J	1 J	0.64 J	0.94 J [1.2 J]
1,2,3,4,7,8,9-HpCDF		ND(0.49)	0.67 J	2.5 J	ND(0.32)	0.63 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
HpCDFs (total)		5.7	7.8	41	2.5 J	12	2.6 J	1.1 J	1.7 J [2 J]
OCDF		1.5 J	1.9 J	12 J	1.1 J	7.2 J	1.4 J	ND(0.96)	ND(1.4) [ND(1.3)]
Dioxins									
2,3,7,8-TCDD		ND(0.2)	ND(0.1) X	ND(0.64)	ND(0.13)	ND(0.2)	ND(0.21)	ND(0.19)	ND(0.27) [ND(0.25)]
TCDDs (total)		ND(0.6)	0.4 J	ND(1.6)	0.19 J	ND(0.58)	ND(0.55)	ND(0.59)	ND(0.8) [ND(0.55)]
1,2,3,7,8-PeCDD		0.67 J	0.43 J	ND(1.6)	ND(0.32)	ND(0.51)	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
PeCDDs (total)		3.7 J	4.5 Q	2.6 JQ	ND(0.59) Q	0.87 JQ	ND(0.91)	ND(0.78)	ND(0.94) [ND(0.86)]
1,2,3,4,7,8-HxCDD		ND(0.49)	0.26 J	ND(1.6)	ND(0.32)	ND(0.51)	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
1,2,3,6,7,8-HxCDD		1.2 J	0.46 J	ND(1.6)	ND(0.32)	0.94 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
1,2,3,7,8,9-HxCDD		0.83 J	0.39 J	ND(1.6)	ND(0.32)	0.6 J	ND(0.52)	ND(0.48)	ND(0.68) [ND(0.63)]
HxCDDs (total)		12	4.5	4.5 J	0.34 J	7.3	ND(0.52)	ND(0.96)	ND(1.1) [ND(1.2)]
1,2,3,4,6,7,8-HpCDD		4.5 J	2.2	7.3 J	0.75 J	11	1.8 J	0.54 J	0.81 J [0.65 J]
HpCDDs (total)		10	4.1	14 J	1.5 J	23	3.2 J	0.54 J	0.81 J [0.65 J]
OCDD		24	11	49	5.4 J	170	18	ND(4.4)	ND(5.2) [ND(4.1)]
Total TEQs (EPA 2010 TEFs)		5.5	1.8	9	0.63	2.3	0.89	0.65	0.9 [0.83]

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-L24 3-6 05/10/04	RAA10-E-L25 0-1 06/01/04	RAA10-E-M23 0-1 06/01/04	RAA10-E-N18 1-3 05/18/04	RAA10-E-N18 3-6 05/18/04	RAA10-E-N18 6-15 05/18/04	RAA10-E-N22 0-1 05/10/04
Furans								
2,3,7,8-TCDF		0.7 J	0.68 J	ND(0.52)	0.94 J	3.3 Y	0.22 J	ND(0.16)
TCDFs (total)		4.6	14	2.3	8.1	37 I	0.61 J	ND(0.29)
1,2,3,7,8-PeCDF		0.23 J	ND(0.51)	ND(0.5)	0.41 J	1.4 J	ND(0.26)	ND(0.22)
2,3,4,7,8-PeCDF		0.28 J	4.1 J	1.1 J	0.98 J	2.7	ND(0.26)	ND(0.22)
PeCDFs (total)		2.1 J	39	9.7	10	30 Q	ND(0.26)	0.73 J
1,2,3,4,7,8-HxCDF		ND(0.22)	ND(0.67)	ND(0.71)	0.89 J	2.4	ND(0.26)	ND(0.22)
1,2,3,6,7,8-HxCDF		ND(0.22)	0.86 J	ND(0.67)	0.6 J	1.6 J	ND(0.26)	ND(0.22)
1,2,3,7,8,9-HxCDF		ND(0.22)	ND(0.79)	ND(0.84)	ND(0.24)	0.44 JQ	ND(0.26)	ND(0.22)
2,3,4,6,7,8-HxCDF		ND(0.22)	1.6 J	ND(0.7)	0.98 J	2.7	ND(0.26)	ND(0.22)
HxCDFs (total)		1.4 J	22	4.2 J	13	38 Q	0.63 J	0.61 J
1,2,3,4,6,7,8-HpCDF		1.1 J	1.1 J	ND(0.5)	1.7 J	8.1	1.2 J	0.23 J
1,2,3,4,7,8,9-HpCDF		ND(0.22)	ND(0.51)	ND(0.5)	0.27 J	0.76 J	ND(0.26)	ND(0.22)
HpCDFs (total)		1.8 J	2.4 J	ND(0.5)	3.6	17	2.1 J	0.23 J
OCDF		0.63 J	ND(1)	ND(1.1)	1.1 J	4.2 J	0.88 J	ND(0.45)
Dioxins								
2,3,7,8-TCDD		0.16 J	ND(0.3)	ND(0.46)	ND(0.095)	0.12 J	ND(0.1)	ND(0.09)
TCDDs (total)		ND(0.27)	ND(0.44)	ND(0.46)	ND(0.26)	0.38 J	ND(0.29)	ND(0.24)
1,2,3,7,8-PeCDD		ND(0.22)	ND(0.51)	ND(0.5)	ND(0.24)	ND(0.23)	ND(0.26)	ND(0.22)
PeCDDs (total)		0.45 J	0.8 J	ND(0.76)	0.36 J	1 JQ	ND(0.42)	ND(0.22)
1,2,3,4,7,8-HxCDD		ND(0.24)	ND(0.54)	ND(0.91)	ND(0.24)	ND(0.23) X	ND(0.26)	ND(0.22)
1,2,3,6,7,8-HxCDD		ND(0.22)	ND(0.57) X	ND(0.86)	0.32 J	0.49 J	ND(0.26)	ND(0.22)
1,2,3,7,8,9-HxCDD		ND(0.23)	0.6 J	ND(0.88)	ND(0.25) X	0.36 J	ND(0.26)	ND(0.22)
HxCDDs (total)		1.3 J	1.8 J	ND(0.9)	1.7 J	4.3	ND(0.47)	ND(0.44)
1,2,3,4,6,7,8-HpCDD		0.86 J	1.8 J	0.71 J	0.99 J	2.8	0.6 J	0.38 J
HpCDDs (total)		1.8 J	4.2 J	1.4 J	2 J	5.7	1 J	0.77 J
OCDD		6	7.5 J	ND(3.4)	11	43	5.7	2.3 J
Total TEQs (EPA 2010 TEFs)		0.55	2.2	1.1	0.95	2.5	0.37	0.29

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-N24 1-3 05/10/04	RAA10-E-N24 6-15 05/10/04	RAA10-E-N25 0-1 06/01/04	RAA10-E-O19 0-1 05/13/04	RAA10-E-O21 0-1 05/13/04	RAA10-E-O24 0-1 06/01/04	RAA10-E-P22 0-1 05/10/04
Furans							
2,3,7,8-TCDF	ND(0.27)	ND(0.14)	0.74 J	11 Y	ND(0.29)	ND(1.2)	ND(0.26) X
TCDFs (total)	0.85	ND(0.14)	57 Q	2000 IQ	5.7	11	2.3
1,2,3,7,8-PeCDF	ND(0.21)	ND(0.25)	0.8 J	6.3 Q	ND(0.26) X	ND(0.53)	ND(0.21)
2,3,4,7,8-PeCDF	ND(0.21)	ND(0.25)	14 Q	270 Q	1.5 J	2.6 J	0.5 J
PeCDFs (total)	0.69 J	ND(0.25)	180 Q	2400 IQ	15 Q	40 Q	4.5
1,2,3,4,7,8-HxCDF	ND(0.21)	ND(0.25)	ND(0.8) X	27	2.8	ND(0.64)	ND(0.21)
1,2,3,6,7,8-HxCDF	ND(0.21)	ND(0.25)	2.9 J	52	0.64 J	0.85 J	ND(0.21)
1,2,3,7,8,9-HxCDF	ND(0.21)	ND(0.25)	0.72 JQ	14 Q	0.43 J	ND(0.76)	ND(0.21)
2,3,4,6,7,8-HxCDF	ND(0.21)	ND(0.25)	6.4	100	1 J	1.7 J	0.21 J
HxCDFs (total)	0.3 J	ND(0.25)	71 Q	1500 IQ	15	28	2.7
1,2,3,4,6,7,8-HpCDF	0.21 J	ND(0.25)	3.8 J	42	2.8	ND(2) X	0.37 J
1,2,3,4,7,8,9-HpCDF	ND(0.21)	ND(0.25)	ND(1.4)	7.3	2	ND(0.67)	ND(0.21)
HpCDFs (total)	ND(0.21)	ND(0.25)	8.8	100	9	2.2 J	0.75 J
OCDF	ND(0.42)	ND(0.49)	ND(5.7)	18	11	ND(2)	0.48 J
Dioxins							
2,3,7,8-TCDD	ND(0.084)	ND(0.098)	ND(0.42)	0.66 JQ	ND(0.077)	ND(0.27)	ND(0.083)
TCDDs (total)	ND(0.26)	ND(0.3)	ND(0.42) Q	29 Q	0.28	ND(0.27)	ND(0.083)
1,2,3,7,8-PeCDD	ND(0.21)	ND(0.25)	ND(0.96) X	12 Q	0.26 J	0.79 J	ND(0.21)
PeCDDs (total)	ND(0.21)	ND(0.45)	5.6 Q	120 Q	2	ND(1)	ND(0.21)
1,2,3,4,7,8-HxCDD	ND(0.21)	ND(0.25)	ND(1.2)	6.1	0.16 J	ND(1.2)	ND(0.21)
1,2,3,6,7,8-HxCDD	ND(0.21)	ND(0.25)	1.8 JQ	34	ND(0.43)	ND(1.1)	ND(0.21)
1,2,3,7,8,9-HxCDD	ND(0.21)	ND(0.25)	ND(1.6) X	18	0.45 J	ND(1.1)	ND(0.21)
HxCDDs (total)	ND(0.21)	ND(0.43)	20 Q	360	3.9	11	0.42 J
1,2,3,4,6,7,8-HpCDD	0.37 J	ND(0.26) X	3.7 J	65	2.1	58	0.79 J
HpCDDs (total)	0.68 J	ND(0.25)	9.3	150	4	150	2.2
OCDD	1.8 J	1.4 J	ND(9.5)	95	16	1800	5.1
Total TEQs (EPA 2010 TEFs)	0.28	0.32	6.5	120	1.5	8.3	0.43

TABLE C-5
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (COMMERCIAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-P24 1-3 05/10/04	RAA10-E-P24 3-6 05/10/04	RAA10-E-P24 6-15 05/10/04	RAA10-E-Q24 0-1 06/01/04	UBB110406 4-6 07/31/96	UBB131214 12-14 07/30/96
Furans							
2,3,7,8-TCDF		ND(0.22) X	1.7 Y	ND(0.15)	0.7 J	1400 Y	ND(73)
TCDFs (total)		ND(0.082)	13	ND(0.15)	52	11000	ND(73)
1,2,3,7,8-PeCDF		ND(0.2)	0.76 J	ND(0.25)	ND(0.51)	ND(480)	ND(22)
2,3,4,7,8-PeCDF		ND(0.2)	1.1 J	ND(0.25)	17	ND(480)	ND(25)
PeCDFs (total)		ND(0.2)	10	ND(0.25)	180 Q	7600	ND(22)
1,2,3,4,7,8-HxCDF		ND(0.2)	1.3 J	ND(0.25)	0.98 J	ND(1000)	ND(17)
1,2,3,6,7,8-HxCDF		ND(0.2)	1.1 J	ND(0.25)	2.7 J	ND(480)	ND(14)
1,2,3,7,8,9-HxCDF		ND(0.2)	0.44 J	ND(0.25)	ND(1)	ND(130)	ND(19)
2,3,4,6,7,8-HxCDF		ND(0.2)	0.91 J	ND(0.25)	7	ND(1300)	ND(16)
HxCDFs (total)		ND(0.2)	61	ND(0.25)	97	12000	ND(14)
1,2,3,4,6,7,8-HpCDF		ND(0.2)	120	0.56 J	2.6 J	4600 J	ND(15)
1,2,3,4,7,8,9-HpCDF		ND(0.2)	0.53 J	ND(0.25)	ND(0.79)	ND(180)	ND(17)
HpCDFs (total)		ND(0.2)	210	0.89 J	7	9500	ND(15)
OCDF		ND(0.41)	37	ND(0.49)	ND(2.4)	ND(3100)	ND(26)
Dioxins							
2,3,7,8-TCDD		ND(0.082)	0.11 J	ND(0.099)	ND(0.28)	ND(160)	ND(35)
TCDDs (total)		ND(0.22)	ND(0.38)	ND(0.28)	ND(0.28)	ND(220)	ND(35)
1,2,3,7,8-PeCDD		ND(0.2)	ND(0.27)	ND(0.25)	0.99 J	ND(86)	ND(46)
PeCDDs (total)		ND(0.32)	ND(0.27)	ND(0.42)	7.1	ND(450)	ND(46)
1,2,3,4,7,8-HxCDD		ND(0.2)	ND(0.27)	ND(0.25)	ND(1.2)	ND(92)	ND(37)
1,2,3,6,7,8-HxCDD		ND(0.2)	ND(0.73) X	ND(0.25)	1.8 J	ND(450)	ND(31)
1,2,3,7,8,9-HxCDD		ND(0.2)	0.3 J	ND(0.25)	ND(1.2)	ND(320)	ND(33)
HxCDDs (total)		ND(0.39)	4.4	ND(0.39)	19	ND(1500)	ND(31)
1,2,3,4,6,7,8-HpCDD		0.23 J	13	0.25 J	4 J	ND(2400)	ND(39)
HpCDDs (total)		0.23 J	22	0.25 J	11	ND(2400)	ND(39)
OCDD		1 J	140	1.4 J	10	27000	ND(39)
Total TEQs (EPA 2010 TEFs)		0.26	3.1	0.33	7.8	680	57

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-E27 0-1 05/27/04	RAA10-E-I29 0-1 05/27/04	RAA10-E-M27 0-1 06/07/04	RAA10-E-N16 0-1 05/18/04	RAA10-E-N26 0-1 05/28/04	RAA10-E-O15 0-1 05/19/04	RAA10-E-O17 0-1 02/24/05	RAA10-E-P16 0-1 06/18/04
Furans									
2,3,7,8-TCDF		4.1 Y	3.6 Y	5.4 Y	97 Y	2.9 Y	140 Y	90 Y	4.1 Y
TCDFs (total)		160 I	110 QI	85 Q	2800 QI	29	3100 QI	750	86 Q
1,2,3,7,8-PeCDF		2.3 J	2.7 JI	4 JQ	75 Q	2.2 J	120	58	2.2 J
2,3,4,7,8-PeCDF		50	36	19 Q	64 Q	6	530	98	4.8 J
PeCDFs (total)		510 QI	200 QI	220 Q	2500 QI	71 Q	4800 QI	1400	110 Q
1,2,3,4,7,8-HxCDF		ND(6.2) X	10	13	280	7.5	540	200	5.6
1,2,3,6,7,8-HxCDF		9.9	9.8	7.2	180	3.8 J	310	150	3.8 J
1,2,3,7,8,9-HxCDF		3 JQ	3.4 JQ	3.5 JQ	37 Q	2.4 J	57 Q	ND(2.7)	0.6 JQ
2,3,4,6,7,8-HxCDF		26	28	16	170	6.2	220	44	2.3 J
HxCDFs (total)		350 Q	390 Q	290 Q	2600 QI	180	4100 QI	1200	46
1,2,3,4,6,7,8-HpCDF		46	32	130	290	170	430	230	10
1,2,3,4,7,8,9-HpCDF		2.8 J	3.5 J	4.5 J	79	2.2 J	120	48	1.3 J
HpCDFs (total)		97	85	280	550	310	800	400	21
OCDF		39	36	110	230	72	340	170	16
Dioxins									
2,3,7,8-TCDD		ND(0.4) X	0.42 J	0.8 JQ	1.3	0.35 J	1.3	ND(0.56)	ND(0.25) X
TCDDs (total)		2.2 J	1.5 J	4.8 Q	31 Q	1.1 J	49 Q	10	ND(0.6)
1,2,3,7,8-PeCDD		2.8 J	3.2 J	3.4 JQ	8.8 Q	ND(0.76) X	16	ND(3.1)	ND(0.54)
PeCDDs (total)		33 Q	33 Q	28 Q	92 Q	6.1	220 Q	20	1.5 JQ
1,2,3,4,7,8-HxCDD		2.7 J	3.1 J	6.9	8.3	0.98 J	18	ND(2.9)	ND(0.54)
1,2,3,6,7,8-HxCDD		8	9.3	28	28	11	56	10	1.1 J
1,2,3,7,8,9-HxCDD		5.1 J	5.8	10	15	2.5 J	28	5.7 J	1.1 J
HxCDDs (total)		66	75	160	280	47	440	93	8
1,2,3,4,6,7,8-HpCDD		52	71	520	80	150	120	43	18
HpCDDs (total)		160	160	890	170	260	280	85	32
OCDD		550	590	4600	300	1000	210	190	150
Total TEQs (EPA 2010 TEFs)		27	25	40	120	13	330	88	4.6

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-P19 0-1 06/17/04	RAA10-E-Q18 0-1 06/02/04	RAA10-E-Q20 0-1 06/02/04	RAA10-E-Q25 0-1 06/01/04	RAA10-E-R15 0-1 06/17/04	RAA10-E-R17 0-1 06/02/04	RAA10-E-R19 0-1 06/02/04	RAA10-E-R21 0-1 06/02/04
Furans									
2,3,7,8-TCDF		4.4 Y	3 J	ND(0.48)	4.3 Y	19 Y	1.3 J	0.89 J	ND(0.26)
TCDFs (total)		82 Q	70	ND(0.48)	69 I	1700 I	7.2	1.4 J	ND(0.26)
1,2,3,7,8-PeCDF		1.8 J	1.1 J	ND(0.67)	1.5 J	6.1 J	ND(0.62)	ND(0.67)	ND(0.61)
2,3,4,7,8-PeCDF		23	8.9	ND(0.67)	14	190	0.79 J	ND(0.67)	ND(0.61)
PeCDFs (total)		260 Q	99	ND(0.67)	200 QI	4200 I	5.1 J	2 J	ND(0.61)
1,2,3,4,7,8-HxCDF		7.8	2.4 J	ND(0.67)	3.6 J	15	ND(0.62)	ND(0.67)	ND(0.61)
1,2,3,6,7,8-HxCDF		5.4	2.6 J	ND(0.67)	5.1 J	40	ND(0.62)	ND(0.67)	ND(0.61)
1,2,3,7,8,9-HxCDF		1.6 JQ	ND(0.84)	ND(0.76)	1.6 J	6.6 JQ	ND(0.63)	ND(0.67)	ND(0.61)
2,3,4,6,7,8-HxCDF		14	4.1 J	ND(0.67)	11	82	ND(0.62)	ND(0.67)	ND(0.61)
HxCDFs (total)		190 Q	61	ND(0.67)	180	1700 Q	9.7	3.9 J	ND(0.61)
1,2,3,4,6,7,8-HpCDF		12	23	ND(0.67)	83	46	14	7.9	1.6 J
1,2,3,4,7,8,9-HpCDF		3.4 J	ND(0.84)	ND(0.82)	1.3 J	4.2 J	ND(0.62)	ND(0.67)	ND(0.61)
HpCDFs (total)		34	41	ND(0.71)	140	100	22	13	2.8 J
OCDF		16	12 J	ND(2.6)	34	42	6 J	4.3 J	ND(1.2)
Dioxins									
2,3,7,8-TCDD		ND(0.34)	ND(0.37)	ND(0.51)	ND(0.36) X	1.2 J	ND(0.37)	ND(0.28)	ND(0.27)
TCDDs (total)		0.85 J	ND(0.85)	ND(0.51)	ND(0.72)	20	ND(0.65)	ND(0.86)	ND(0.6)
1,2,3,7,8-PeCDD		1 J	1.5 J	ND(0.67)	1.5 J	7.6 J	ND(0.62)	ND(0.67)	ND(0.61)
PeCDDs (total)		10 Q	13	ND(0.67)	11	90	ND(1.1)	ND(1)	ND(0.96)
1,2,3,4,7,8-HxCDD		0.8 J	ND(0.84)	ND(1.2)	1.1 J	ND(4) X	ND(0.62)	ND(0.67)	ND(0.61)
1,2,3,6,7,8-HxCDD		2.4 J	4.5 J	ND(1.1)	5.1 J	13	ND(0.62)	ND(0.67)	ND(0.61)
1,2,3,7,8,9-HxCDD		1.4 J	1.7 J	ND(1.1)	3 J	7.7 J	ND(0.62)	ND(0.67)	ND(0.61)
HxCDDs (total)		23	28	ND(1.1)	39	130	0.74 J	ND(0.67)	ND(1.1)
1,2,3,4,6,7,8-HpCDD		18	40	ND(1)	39	64	5.2 J	2.4 J	ND(0.82) X
HpCDDs (total)		33	70	ND(1)	70	120	8.5	4 J	ND(0.61)
OCDD		120	250	5.7 J	270	360	35	19	4.4 J
Total TEQs (EPA 2010 TEFs)		13	7.7	1.1	12	87	1.4	1.1	0.81

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-S18 0-1 06/02/04	RAA10-E-S23 0-1 06/02/04	RAA10-E-T20 0-1 06/14/04	RAA10-E-T23 0-1 06/04/04	UOP3S-15 0-1 04/09/91	RAA10-E-R24 1-3 06/02/04	RAA10-E-R20 1-3 06/16/04	RAA10-E-R16 1-3 07/27/04
Furans									
2,3,7,8-TCDF		0.76 J	0.99 J	4.1 Y	3.6 Y	ND(21)	0.66 J	0.44 J	0.24 J
TCDFs (total)		3.8	5.2	27	22	ND(37)	36	0.44 J	0.98 J
1,2,3,7,8-PeCDF		ND(0.66)	ND(0.65)	3.5 J	1.2 J	NA	ND(0.91)	ND(0.65)	ND(0.27)
2,3,4,7,8-PeCDF		ND(0.66)	0.81 J	3.8 J	2.7 J	NA	11	ND(0.65)	ND(0.27)
PeCDFs (total)		2.3 J	2.4 J	30	21	ND(18)	120	ND(0.65)	0.82 J
1,2,3,4,7,8-HxCDF		ND(0.66)	ND(0.65)	4.4 J	2.7 J	NA	1.6 J	ND(0.65)	ND(0.27)
1,2,3,6,7,8-HxCDF		ND(0.66)	ND(0.65)	3.5 J	ND(1.2) X	NA	2 J	ND(0.65)	ND(0.27)
1,2,3,7,8,9-HxCDF		ND(0.66)	ND(0.65)	2.5 J	ND(0.72) X	NA	ND(1.8)	ND(0.65)	ND(0.27)
2,3,4,6,7,8-HxCDF		ND(0.66)	ND(0.65)	2.4 J	1.6 J	NA	4.8 J	ND(0.65)	ND(0.27)
HxCDFs (total)		4.3 J	13	43	68	78	64	ND(0.65)	1.3 J
1,2,3,4,6,7,8-HpCDF		6.5 J	25	48	120	NA	4.1 J	1.2 J	1.9 J
1,2,3,4,7,8,9-HpCDF		ND(0.66)	ND(0.65)	2.4 J	1.2 J	NA	ND(0.92)	ND(0.65)	ND(0.27)
HpCDFs (total)		11	42	84	210	220	8.3	2 J	3.4
OCDF		3.6 J	9.6 J	28	52	ND(190)	ND(2.4)	ND(1.3)	1 J
Dioxins									
2,3,7,8-TCDD		ND(0.35)	ND(0.31)	0.75 J	ND(0.28) X	ND(16)	ND(0.35)	0.27 J	ND(0.11)
TCDDs (total)		ND(0.75)	ND(0.7)	ND(0.75)	ND(0.81)	ND(16)	ND(0.64)	ND(0.86)	ND(0.34)
1,2,3,7,8-PeCDD		ND(0.66)	ND(0.65)	2.6 J	ND(0.64)	NA	1.4 J	ND(0.65)	ND(0.27)
PeCDDs (total)		ND(0.66)	ND(0.95)	3.5 J	2.6 J	ND(23)	18	ND(0.95)	ND(0.48)
1,2,3,4,7,8-HxCDD		ND(0.66)	ND(0.65)	2.8 J	ND(0.64)	NA	ND(1.7)	ND(0.65)	ND(0.27)
1,2,3,6,7,8-HxCDD		ND(0.66)	ND(0.65)	3.6 J	1.4 J	NA	ND(4.1) X	ND(0.65)	ND(0.27)
1,2,3,7,8,9-HxCDD		ND(0.66)	ND(0.65)	2.2 J	ND(0.64)	NA	2.3 J	ND(0.65)	ND(0.27)
HxCDDs (total)		ND(0.66)	ND(1.2)	11	4.8 J	ND(42)	40	ND(0.65)	ND(0.27)
1,2,3,4,6,7,8-HpCDD		2.9 J	3.9 J	17	20	NA	8.2	0.92 J	0.76 J
HpCDDs (total)		5 J	6.2 J	27	33	ND(48)	19	1.6 J	0.76 J
OCDD		21	26	120	170	470	20	5.4 J	6.3
Total TEQs (EPA 2010 TEFs)		1.1	1.5	8.3	4.5	11	6.6	1	0.4

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID:	RAA10-E-P15	RAA10-E-N26	RAA10-E-F28	RAA10-E-J28	RAA10-E-L28	RAA10-E-N16	RAA10-E-T22	RAA10-E-T22
Sample Depth(Feet):	1-3	1-3	1-3	1-3	1-3	1-3	1-3	3-6
Parameter Date Collected:	05/19/04	05/28/04	05/25/04	05/27/04	05/28/04	05/18/04	06/09/04	06/09/04
Furans								
2,3,7,8-TCDF	5500 YE	1 J	14 Y	1.8 J	6 Y	ND(50)	0.32 J	ND(0.39) X
TCDFs (total)	60000 I	3.6	1200 I	20	60 Q	ND(50)	0.32 J	ND(0.24)
1,2,3,7,8-PeCDF	5000	ND(0.65)	7.6	1.6 J	2.7 J	ND(130)	ND(0.61)	ND(0.61)
2,3,4,7,8-PeCDF	9400	0.71 J	260	5 J	13	ND(130)	ND(0.61)	ND(0.61)
PeCDFs (total)	81000 QI	3.1 J	2400 I	64	110 Q	ND(130)	ND(0.61)	ND(0.61)
1,2,3,4,7,8-HxCDF	20000 EI	0.84 J	ND(36) X	5.3 J	6.2 J	ND(130)	ND(0.61)	ND(0.61)
1,2,3,6,7,8-HxCDF	13000 EI	ND(0.65)	43	3.7 J	3.8 J	ND(130)	ND(0.61)	ND(0.61)
1,2,3,7,8,9-HxCDF	2100 Q	ND(0.65)	25	0.87 J	2.6 JQ	ND(130)	ND(0.61)	ND(0.61)
2,3,4,6,7,8-HxCDF	4000	ND(0.65)	100	3.5 J	8.1	ND(130)	ND(0.61)	ND(0.61)
HxCDFs (total)	85000 QI	21	1400	60	190 Q	ND(130)	ND(0.61)	ND(0.61)
1,2,3,4,6,7,8-HpCDF	15000 EI	50	86	20	210	ND(130)	ND(0.61)	ND(0.61)
1,2,3,4,7,8,9-HpCDF	4100	ND(0.65)	10	1.6 J	2.5 J	ND(130)	ND(0.61)	ND(0.61)
HpCDFs (total)	26000 I	77	190	36	360	ND(130)	ND(0.61)	ND(0.61)
OCDF	11000	15	31	14	82	ND(250)	ND(1.2)	ND(1.2)
Dioxins								
2,3,7,8-TCDD	26	ND(0.26)	ND(6.9)	ND(0.29) X	0.59 J	ND(50)	ND(0.28)	ND(0.34)
TCDDs (total)	800	ND(0.72)	29	ND(0.55)	ND(0.75)	ND(140)	ND(0.74)	ND(0.72)
1,2,3,7,8-PeCDD	160	ND(0.65)	ND(31) X	0.65 J	2.7 J	ND(130)	ND(0.61)	ND(0.61)
PeCDDs (total)	2100 Q	ND(1.1)	490 Q	2.2 J	20 Q	ND(170)	ND(0.99)	ND(1)
1,2,3,4,7,8-HxCDD	170	ND(0.65)	24	ND(0.72) X	6 J	ND(130)	ND(0.61)	ND(0.61)
1,2,3,6,7,8-HxCDD	450	ND(0.65)	130	2 J	16	ND(130)	ND(0.61)	ND(0.61)
1,2,3,7,8,9-HxCDD	280	ND(0.65)	61	1.2 J	4.5 J	ND(130)	ND(0.61)	ND(0.61)
HxCDDs (total)	5100	1.3 J	1200	14	110	ND(220)	ND(1.1)	ND(1.2)
1,2,3,4,6,7,8-HpCDD	1400	5.2 J	200	29	260	ND(130)	ND(0.61)	ND(0.61)
HpCDDs (total)	3100	8.9	470	56	510	ND(130)	ND(0.61)	ND(0.61)
OCDD	2800	47	180	250	2000	ND(250)	ND(3.8)	ND(1.7)
Total TEQs (EPA 2010 TEFs)	8000	1.8	140	5.5	24	160	0.81	0.82

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID:	RAA10-E-N26	RAA10-E-J28	RAA10-E-P15	RAA10-E-P18	RAA10-E-R16	RAA10-E-R20	RAA10-E-R24
Sample Depth(Feet):	3-6	3-6	3-6	3-6	3-6	3-6	3-6
Parameter / Date Collected:	05/28/04	05/27/04	05/19/04	06/17/04	07/27/04	06/16/04	06/02/04
Furans							
2,3,7,8-TCDF	0.22 J	1.8 J	38000 Y	ND(0.26)	ND(0.14) X	0.27 J	ND(0.45)
TCDFs (total)	0.22 J	12	590000 I	ND(0.26)	ND(0.1)	0.27 J	ND(0.45)
1,2,3,7,8-PeCDF	ND(0.53)	ND(0.65)	18000	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.65)
2,3,4,7,8-PeCDF	ND(0.53)	1.2 J	34000	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.65)
PeCDFs (total)	ND(0.53)	8.6	510000 I	ND(0.65)	ND(0.26)	ND(0.56)	2.6 J
1,2,3,4,7,8-HxCDF	ND(0.53)	0.92 J	90000	ND(0.65)	ND(0.26)	ND(0.56)	ND(1)
1,2,3,6,7,8-HxCDF	ND(0.53)	ND(0.65)	50000	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.96)
1,2,3,7,8,9-HxCDF	ND(0.53)	ND(0.65)	9700	ND(0.65)	ND(0.26)	ND(0.56)	ND(1.2)
2,3,4,6,7,8-HxCDF	ND(0.53)	ND(0.68) X	21000	ND(0.65)	ND(0.26)	ND(0.56)	ND(1)
HxCDFs (total)	1.2 J	19	390000	ND(0.65)	ND(0.26)	ND(0.56)	ND(1)
1,2,3,4,6,7,8-HpCDF	0.74 J	30	94000 I	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.63)
1,2,3,4,7,8,9-HpCDF	ND(0.53)	ND(0.65)	27000	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.71)
HpCDFs (total)	1.6 J	53	160000 I	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.63)
OCDF	ND(1.1)	16	88000	ND(1.3)	ND(0.53)	ND(1.1)	ND(2.5)
Dioxins							
2,3,7,8-TCDD	ND(0.21)	ND(0.26)	180	ND(0.26)	ND(0.1)	ND(0.22)	ND(0.49)
TCDDs (total)	ND(0.66)	ND(0.62)	7300	ND(0.65)	ND(0.33)	ND(0.63)	ND(0.49)
1,2,3,7,8-PeCDD	ND(0.53)	ND(0.65)	ND(450) X	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.63)
PeCDDs (total)	ND(0.53)	0.69 JQ	10000	ND(0.89)	ND(0.41)	ND(0.79)	ND(0.97)
1,2,3,4,7,8-HxCDD	ND(0.53)	ND(0.65)	540	ND(0.65)	ND(0.26)	ND(0.56)	ND(1.6)
1,2,3,6,7,8-HxCDD	ND(0.53)	0.8 J	840	ND(0.65)	ND(0.26)	ND(0.56)	ND(1.5)
1,2,3,7,8,9-HxCDD	ND(0.53)	ND(0.65)	740	ND(0.65)	ND(0.26)	ND(0.56)	ND(1.5)
HxCDDs (total)	ND(0.89)	2.6 J	14000	ND(0.97)	ND(0.26)	ND(0.99)	ND(1.5)
1,2,3,4,6,7,8-HpCDD	2.6 J	9.4	6800	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.94)
HpCDDs (total)	4.4 J	16	16000	ND(0.65)	ND(0.26)	ND(0.56)	ND(0.94)
OCDD	20	87	25000	3.8 J	0.87 J	1.4 J	ND(6.6)
Total TEQs (EPA 2010 TEFs)	0.76	2	34000	0.83	0.33	0.72	1.2

TABLE C-6
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-2 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-F28 6-15 05/25/04	RAA10-E-J28 6-15 05/27/04	RAA10-E-N26 6-15 05/28/04	RAA10-E-P15 6-15 05/19/04	RAA10-E-P20 6-15 06/16/04	RAA10-E-R18 6-15 06/09/04	RAA10-E-R24 6-15 06/02/04
Furans								
2,3,7,8-TCDF		0.51 J	0.32 J	0.3 J	3000 Y	ND(0.26) X	0.46 J	ND(0.39) [ND(0.26)]
TCDFs (total)		36 I	ND(0.32)	0.3 J	48000	ND(0.25)	0.46 J	ND(0.39) [ND(0.26)]
1,2,3,7,8-PeCDF		2.8 J	ND(0.8)	ND(0.65)	1600	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
2,3,4,7,8-PeCDF		16	ND(0.8)	ND(0.65)	2600	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
PeCDFs (total)		120 I	ND(0.8)	ND(0.65)	39000	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
1,2,3,4,7,8-HxCDF		42	ND(0.8)	ND(0.65)	8600	ND(0.62)	ND(0.94)	ND(0.59) [ND(0.66)]
1,2,3,6,7,8-HxCDF		13	ND(0.8)	ND(0.65)	4600	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
1,2,3,7,8,9-HxCDF		23	ND(0.8)	ND(0.65)	930	ND(0.62)	ND(0.94)	ND(0.7) [ND(0.66)]
2,3,4,6,7,8-HxCDF		17	ND(0.8)	ND(0.65)	1900	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
HxCDFs (total)		220 I	ND(0.8)	ND(0.65)	34000	ND(0.62)	ND(0.94)	ND(0.6) [ND(0.66)]
1,2,3,4,6,7,8-HpCDF		26	ND(0.8)	ND(0.65)	8200	ND(0.62)	ND(0.94)	ND(0.71) [ND(0.66)]
1,2,3,4,7,8,9-HpCDF		9.1	ND(0.8)	ND(0.65)	2700	ND(0.62)	ND(0.94)	ND(0.92) [ND(0.66)]
HpCDFs (total)		65	ND(0.8)	ND(0.65)	15000	ND(0.62)	ND(0.94)	ND(0.8) [ND(0.66)]
OCDF		4.8 J	ND(1.6)	ND(1.3)	9700	ND(1.2)	ND(1.9)	ND(2.2) [ND(1.3)]
Dioxins								
2,3,7,8-TCDD		1.3 J	ND(0.32)	ND(0.26)	16	ND(0.25)	ND(0.5)	ND(0.4) [ND(0.27)]
TCDDs (total)		74	ND(0.92)	ND(0.73)	1000	ND(0.7)	ND(1.1)	ND(0.45) [ND(0.73)]
1,2,3,7,8-PeCDD		49	ND(0.8)	ND(0.65)	41	ND(0.62)	ND(0.94)	ND(0.58) [ND(0.66)]
PeCDDs (total)		770	ND(1.1)	ND(1)	1100 Q	ND(0.91)	ND(0.94)	ND(0.78) [ND(1.1)]
1,2,3,4,7,8-HxCDD		36	ND(0.8)	ND(0.65)	56	ND(0.62)	ND(0.94)	ND(1.2) [ND(0.66)]
1,2,3,6,7,8-HxCDD		210	ND(0.8)	ND(0.65)	88	ND(0.62)	ND(0.94)	ND(1.2) [ND(0.66)]
1,2,3,7,8,9-HxCDD		110	ND(0.8)	ND(0.65)	63	ND(0.62)	ND(0.94)	ND(1.2) [ND(0.66)]
HxCDDs (total)		2000	ND(1.4)	ND(1.2)	1700	ND(0.62)	ND(0.94)	ND(1.2) [ND(0.66)]
1,2,3,4,6,7,8-HpCDD		320	ND(0.8)	ND(0.65)	680	ND(0.62)	ND(0.94)	ND(1.1) [ND(0.66)]
HpCDDs (total)		830	ND(0.8)	ND(0.65)	1500	ND(0.62)	ND(0.94)	ND(1.1) [ND(0.66)]
OCDD		110	ND(4.9)	1.5 J	2100	2 J	ND(3.4)	ND(6.4) [1.8 J]
Total TEQs (EPA 2010 TEFs)		100	1	0.84	3000	0.78	1.3	0.885

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. NA - Not analyzed.
3. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
4. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
5. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.
Q - Indicates the presence of quantitative interferences.

TABLE C-7
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (NORTHERN WETLAND)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-L17 0-1 02/28/05	RAA10-N-M18 0-1 03/04/05	RAA10-N-M20 0-1 03/04/05	RAA10-N-O20 0-1 03/03/05	RAA10-N-O22 0-1 03/03/05	RAA10-N-Q20 0-1 03/03/05	RAA10-N-Q22 0-1 03/03/05	RAA10-N-S22 0-1 03/03/05
Furans									
2,3,7,8-TCDF		16 J	2.7 Y	22 Y	25 YI	31 YI	130 YI	7.4 Y	12 YI
TCDFs (total)		150 J	10	170	230	260	1000	67	120
1,2,3,7,8-PeCDF		ND(5) J	ND(3.3)	5.3 J	ND(4.4)	ND(6.1)	25	ND(2.1)	ND(3.3)
2,3,4,7,8-PeCDF		ND(5.2) J	ND(3.2)	6.1 J	ND(4.5)	8.3 J	28	ND(2.7)	ND(3.8)
PeCDFs (total)		32 J	ND(3.3)	71	30	80	380	21	43
1,2,3,4,7,8-HxCDF		ND(4.8) J	ND(2.1)	ND(5)	ND(3.7)	ND(5.4)	18	ND(3.2)	ND(4.9)
1,2,3,6,7,8-HxCDF		ND(2.3) J	ND(2)	ND(3.5)	ND(1.9)	ND(4.5)	14 JI	ND(2.5)	ND(2.9)
1,2,3,7,8,9-HxCDF		ND(0.48) J	ND(2.5)	ND(1.6)	ND(0.48)	ND(0.69)	ND(1.2)	ND(0.92)	ND(0.77)
2,3,4,6,7,8-HxCDF		ND(2.5) J	ND(2.2)	ND(4.3)	ND(1.9)	ND(3.2)	12 J	ND(2.4)	ND(3.4)
HxCDFs (total)		ND(14) J	ND(2.5)	41	7.8	37	180	31	15
1,2,3,4,6,7,8-HpCDF		ND(9.9) J	ND(1.7)	8.6 J	5.7 J	13	38	ND(7.3)	10 J
1,2,3,4,7,8,9-HpCDF		ND(1.5) J	ND(1.8)	ND(1.2)	ND(0.65)	ND(1.5)	ND(3.8)	ND(0.95)	ND(1.5)
HpCDFs (total)		ND(9.9) J	ND(1.8)	16	5.7	23	68	8.1	20
OCDF		ND(18) J	ND(3.6)	ND(5.9)	ND(4.4)	15 J	36	ND(8.2)	ND(9.9)
Dioxins									
2,3,7,8-TCDD		ND(0.65) J	ND(2.5)	ND(1.4)	ND(0.37)	ND(0.56)	ND(0.82)	ND(0.57)	ND(0.71)
TCDDs (total)		ND(2) J	ND(2.5)	1.7	2.1	7.1	23	ND(0.73)	1.9
1,2,3,7,8-PeCDD		ND(1.8) J	ND(4.3)	ND(2.8)	ND(0.65)	ND(0.99)	ND(1.4)	ND(1.1)	ND(1.7)
PeCDDs (total)		ND(1.9) J	ND(4.3)	ND(2.8)	ND(1)	ND(1.8)	ND(2.4)	ND(1.1)	ND(1.7)
1,2,3,4,7,8-HxCDD		ND(1) J	ND(2.8)	ND(2)	ND(0.48)	ND(0.71)	ND(1.2)	ND(0.73)	ND(0.85)
1,2,3,6,7,8-HxCDD		ND(1.9) J	ND(2.5)	ND(1.8)	ND(0.65)	ND(1.3)	ND(3.2)	ND(0.95)	ND(1.4)
1,2,3,7,8,9-HxCDD		ND(2.1) J	ND(2.6)	ND(1.8)	ND(0.8)	ND(1.7)	ND(3.2)	ND(0.95)	ND(1.4)
HxCDDs (total)		ND(4.5) J	ND(2.8)	ND(3.2)	ND(2.1)	ND(4.7)	12	ND(2.4)	ND(3.8)
1,2,3,4,6,7,8-HpCDD		ND(16) J	13 J	9.1 J	4.9 J	15	26	ND(7.5)	12 J
HpCDDs (total)		ND(16) J	30	18	9.6	28	49	ND(7.5)	21
OCDD		96 J	140	42	30	97	140	45	76
Total TEQs (EPA 2010 TEFs)		4.9	5.6	7.6	4.5	8	29	2.8	4.3

TABLE C-7
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (NORTHERN WETLAND)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-T23.5 / 0-1 / 01/28/04	RAA10-N-U22 / 0-1 / 03/03/05
Furans			
2,3,7,8-TCDF		ND(1.8)	220 J
TCDFs (total)		53 I	1900 J
1,2,3,7,8-PeCDF		ND(1.7)	48 J
2,3,4,7,8-PeCDF		ND(1.7)	85 J
PeCDFs (total)		80 I	1400 J
1,2,3,4,7,8-HxCDF		ND(1.5)	84 J
1,2,3,6,7,8-HxCDF		ND(1.4)	69 J
1,2,3,7,8,9-HxCDF		ND(1)	ND(5) J
2,3,4,6,7,8-HxCDF		ND(1.1)	64 J
HxCDFs (total)		42 I	1400 J
1,2,3,4,6,7,8-HpCDF		8.8 I	200 J
1,2,3,4,7,8,9-HpCDF		ND(0.74)	34 J
HpCDFs (total)		9.7 I	490 J
OCDF		ND(2)	240 J
Dioxins			
2,3,7,8-TCDD		ND(1.2)	3.5 J
TCDDs (total)		ND(1.2)	32 J
1,2,3,7,8-PeCDD		ND(4.1)	ND(13) J
PeCDDs (total)		ND(4.1)	ND(13) J
1,2,3,4,7,8-HxCDD		ND(1.7)	ND(7.5) J
1,2,3,6,7,8-HxCDD		ND(1.6)	24 J
1,2,3,7,8,9-HxCDD		ND(1.5)	14 J
HxCDDs (total)		ND(1.7)	220 J
1,2,3,4,6,7,8-HpCDD		ND(1.2)	160 J
HpCDDs (total)		ND(1.2)	320 J
OCDD		ND(22) X	990 J
Total TEQs (EPA 2010 TEFs)		3.6	93

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-8
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-AA24 1-3 05/11/04	RAA10-N-BB25 0-1 01/14/04	RAA10-N-C24 1-3 03/15/05	RAA10-N-C26 0-1 01/12/04	RAA10-N-C26 2-3 03/02/04	RAA10-N-CC22 6-15 05/12/04	RAA10-N-CC22.5 0-1 01/28/04	RAA10-N-G20 0-1 03/23/04
Furans									
2,3,7,8-TCDF		ND(0.26)	28 Y	ND(2.1)	29 Y	ND(0.35)	0.69 J	27 Y	ND(0.41) X
TCDFs (total)		1.6	390 I	ND(2.1)	470 I	59 I	4.1	4200 I	ND(0.48)
1,2,3,7,8-PeCDF		ND(0.17)	6.4	ND(1.1)	ND(2.7)	ND(0.34)	ND(0.24)	ND(6.1)	ND(0.92)
2,3,4,7,8-PeCDF		ND(0.18)	9.9	ND(1.1)	16	ND(0.36)	ND(0.29)	37	ND(0.92)
PeCDFs (total)		1.2	330 I	ND(1.5)	380 I	84 I	2.3	3300 I	ND(0.92)
1,2,3,4,7,8-HxCDF		0.2 J	7.8	ND(1.2)	ND(1.8)	5.2	0.34 J	ND(3.3)	ND(0.92)
1,2,3,6,7,8-HxCDF		0.16 J	3	ND(0.85)	ND(1.7)	5	0.24 J	ND(3.1)	ND(0.92)
1,2,3,7,8,9-HxCDF		0.083 J	ND(0.59)	ND(0.53)	ND(1)	4.4	ND(0.077) X	ND(3)	ND(0.92)
2,3,4,6,7,8-HxCDF		ND(0.083)	2.9	ND(0.53)	8	3.6	ND(0.17)	ND(2.7)	ND(0.92)
HxCDFs (total)		0.99	140 I	ND(1.2)	150 I	58 I	2.2	980 I	ND(0.92)
1,2,3,4,6,7,8-HpCDF		ND(0.23)	21 I	ND(1.5)	28 I	7.4	ND(0.45)	95 I	ND(0.92)
1,2,3,4,7,8,9-HpCDF		ND(0.22)	ND(0.29)	ND(0.71)	ND(0.89)	4	0.14 J	ND(1.1)	ND(0.92)
HpCDFs (total)		ND(0.23)	29 I	ND(1.5)	47 I	12	0.94	130 I	ND(0.92)
OCDF		0.24 J	11	ND(1.6)	24	9.7	ND(0.56)	ND(27) X	0.54 J
Dioxins									
2,3,7,8-TCDD		ND(0.086)	ND(0.55)	ND(0.85)	ND(1.8)	ND(0.28)	ND(0.12)	ND(1.5)	ND(0.53)
TCDDs (total)		ND(0.23)	ND(0.55)	ND(0.85)	ND(1.8)	ND(0.28)	ND(0.33)	ND(1.5)	ND(1.1)
1,2,3,7,8-PeCDD		0.083 J	ND(2.9)	ND(2.2)	ND(4.6)	ND(1.3)	ND(0.3)	ND(12)	ND(0.92)
PeCDDs (total)		0.24	ND(2.9)	ND(2.2)	ND(4.6)	ND(1.3)	ND(0.51)	ND(12)	ND(0.92)
1,2,3,4,7,8-HxCDD		0.041 J	ND(0.76)	ND(1.1)	ND(1.5)	4.1	ND(0.3)	ND(4)	ND(0.92)
1,2,3,6,7,8-HxCDD		ND(0.095)	ND(0.76)	ND(1.1)	ND(1.8)	3.7	ND(0.1) X	ND(4.1)	ND(0.92)
1,2,3,7,8,9-HxCDD		0.11 J	ND(0.7)	ND(1)	ND(1.6)	4.4	0.16 J	ND(3.8)	ND(0.92)
HxCDDs (total)		0.32	ND(0.76)	ND(1.1)	ND(1.8)	12	ND(0.31)	ND(4.1)	ND(1.7)
1,2,3,4,6,7,8-HpCDD		ND(0.27) X	10	ND(2.4)	31	4.6	ND(0.41)	17	ND(0.92)
HpCDDs (total)		ND(0.22)	10	ND(2.4)	58	4.8	ND(0.76)	17	ND(0.92)
OCDD		1.6 J	54	ND(16)	160	12	ND(2.5)	93	ND(2.2)
Total TEQs (EPA 2010 TEFs)		0.25	9.7	2.2	13	4.1	0.44	23	1.2

TABLE C-8
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-G20 6-15 03/23/04	RAA10-N-G26 0-1 01/07/04	RAA10-N-GG24 0-1 03/17/05	RAA10-N-GG26 3-6 03/29/04	RAA10-N-I16 0-1 01/15/04	RAA10-N-I16 2-3 03/02/04	RAA10-N-I22 0-1 01/07/04	RAA10-N-II24 0-1 10/20/03
Furans									
2,3,7,8-TCDF		ND(0.4) X	ND(3.7) Y [ND(2.5) Y]	2.9 Y	ND(0.4)	23 Y	ND(1.3)	ND(3.3) Y	7.3 JY
TCDFs (total)		ND(0.3)	66 I [49 I]	20	ND(0.4)	460 I	300 I	25 I	140 Q
1,2,3,7,8-PeCDF		ND(0.58)	ND(0.53) [ND(0.32)]	ND(1.4)	ND(0.28) X	ND(1.9)	ND(0.82)	ND(0.41)	3.8 J
2,3,4,7,8-PeCDF		ND(0.58)	ND(0.56) [ND(0.33)]	ND(1.7)	0.21 J	ND(1.9)	ND(0.85)	ND(0.41)	23 J
PeCDFs (total)		ND(0.58)	49 J [29 J]	22	1.1	320 I	110 I	20 I	230 Q
1,2,3,4,7,8-HxCDF		ND(0.58)	ND(0.33) [ND(0.98) X]	3.3 J	ND(0.57)	ND(1.3)	ND(0.5)	ND(0.28)	6.1 J
1,2,3,6,7,8-HxCDF		ND(0.58)	ND(0.31) [ND(0.19)]	ND(2.8)	ND(0.57)	ND(1.3)	ND(0.49)	ND(0.27)	6.2 J
1,2,3,7,8,9-HxCDF		ND(0.58)	ND(0.26) [ND(0.61) X]	ND(0.44)	ND(0.57)	ND(1.1)	ND(0.43)	ND(0.23)	ND(1.1) X
2,3,4,6,7,8-HxCDF		ND(0.58)	ND(0.26) J [1 J]	ND(2.5)	ND(0.57)	ND(2.1) X	ND(0.44)	ND(0.23)	12 J
HxCDFs (total)		ND(0.58)	2.9 J [12 J]	84	0.31	150 I	25 I	9.3 I	180 Q
1,2,3,4,6,7,8-HpCDF		0.46 J	4.3 I [3.4 I]	73	0.31 J	27 I	7.3	3.4 I	43
1,2,3,4,7,8,9-HpCDF		ND(0.58)	ND(0.22) J [0.82 J]	ND(2.6)	ND(0.57)	ND(0.82)	ND(0.38)	ND(0.2)	2.2 J
HpCDFs (total)		0.46	4.5 I [5.3 I]	240	0.31	36 I	8.1	3.4 I	88
OCDF		0.49 J	3.8 [3.1]	240	ND(0.55)	ND(15) X	9.7	2.9	56
Dioxins									
2,3,7,8-TCDD		ND(0.34)	ND(0.35) [ND(0.21)]	ND(0.19)	ND(0.36)	ND(1.1)	ND(0.83)	ND(0.37)	ND(1.6)
TCDDs (total)		ND(0.68)	ND(0.35) [ND(0.21)]	9.4	ND(0.62)	ND(1.1)	ND(0.83)	ND(0.37)	ND(2.4)
1,2,3,7,8-PeCDD		ND(0.58)	ND(1) [ND(0.69)]	ND(0.57)	ND(0.57)	ND(4.8)	ND(2.1)	ND(0.97)	1.6 J
PeCDDs (total)		ND(0.91)	ND(1) [ND(0.69)]	ND(1.4)	ND(1)	ND(4.8)	ND(2.1)	ND(0.97)	5.6 Q
1,2,3,4,7,8-HxCDD		ND(0.68)	ND(0.37) [ND(0.22)]	ND(0.65)	ND(0.57)	ND(1.8)	ND(0.91)	ND(0.38)	ND(1.3) X
1,2,3,6,7,8-HxCDD		ND(0.6)	ND(0.38) [ND(0.24)]	6.5	ND(0.57)	ND(7.1) X	ND(0.93)	ND(0.38)	3.4 J
1,2,3,7,8,9-HxCDD		ND(0.65)	ND(0.34) [ND(0.22)]	ND(2.4)	ND(0.57)	ND(1.6)	ND(0.84)	ND(0.35)	ND(3.3) X
HxCDDs (total)		ND(1)	ND(0.38) [ND(0.24)]	23	ND(0.57)	43	ND(0.93)	ND(0.38)	9.1
1,2,3,4,6,7,8-HpCDD		ND(0.62)	ND(3.7) X [3.6]	150	0.5 J	87	5.9	ND(3) X	53
HpCDDs (total)		ND(0.62)	ND(0.44) J [7.1 J]	240	0.5	180	5.6	ND(0.36)	90
OCDD		ND(1.2)	19 [18]	1100	3.3 J	200	26	ND(15) X	450
Total TEQs (EPA 2010 TEFs)		0.8	1.2 [0.99]	8.6	0.77	8.1	2.1	1.1	16

TABLE C-8
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-II24 1-6 10/20/03	RAA10-N-II24 6-15 10/20/03	RAA10-N-K10 0-1 03/24/04	RAA10-N-K12 3-6 03/24/04	RAA10-N-K16 1-3 03/24/04	RAA10-N-K20 3-6 03/22/04	RAA10-N-L12 0-1 01/19/04
Furans							
2,3,7,8-TCDF	0.29 J	1.2 J	4.5 Y	ND(0.66) X	2.7 J	19 Y	20 Y
TCDFs (total)	2.1 Q	10	69 QI	ND(0.68)	20	210	480 I
1,2,3,7,8-PeCDF	ND(0.17)	1.2 J	4.6 J	ND(0.96)	0.88 J	6 J	7.1
2,3,4,7,8-PeCDF	0.28 J	1.7 J	17	ND(0.39) X	1.2 J	8.4 J	24
PeCDFs (total)	1.8 Q	13 Q	96 Q	0.34	4.5	91	380 I
1,2,3,4,7,8-HxCDF	0.13 J	2.9 J	8.6	ND(0.96)	ND(0.43) X	5.3 J	9.9
1,2,3,6,7,8-HxCDF	ND(0.16)	1.9 J	5.4 J	ND(0.96)	ND(0.55) X	3.8 J	7.6
1,2,3,7,8,9-HxCDF	ND(0.53)	0.29 JQ	2.4 J	ND(0.96)	ND(1.3)	0.94 J	2.4
2,3,4,6,7,8-HxCDF	0.13 J	0.97 J	9.6	ND(0.96)	0.49 J	5.2 J	8.2
HxCDFs (total)	1.2	13 Q	140	ND(0.96)	4.9	60	300 I
1,2,3,4,6,7,8-HpCDF	ND(0.27)	5.8 J	17	1.1 J	ND(1.8) X	16 J	62 I
1,2,3,4,7,8,9-HpCDF	ND(0.077) X	0.46 J	4 J	ND(0.96)	ND(1.3)	ND(1.9) X	6.7
HpCDFs (total)	0.27	6.8	42	1.6	ND(1.3)	29	130 I
OCDF	0.4 J	3.1 J	31	ND(2.1) X	2.4 J	21 J	71
Dioxins							
2,3,7,8-TCDD	ND(0.21)	ND(0.28) X	ND(0.55)	ND(0.76)	ND(0.95)	ND(0.67)	ND(0.63)
TCDDs (total)	0.094	ND(0.28)	ND(0.55)	ND(0.76)	ND(1.6)	2.9	ND(0.63)
1,2,3,7,8-PeCDD	ND(0.53)	0.23 J	ND(1.6) X	ND(0.96)	ND(1.3)	ND(1.1) X	ND(3)
PeCDDs (total)	ND(0.96)	0.51 Q	7.2 Q	ND(1.5)	ND(2.2)	11	ND(3)
1,2,3,4,7,8-HxCDD	ND(0.53)	ND(0.13) X	2.2 J	ND(0.96)	ND(1.3)	ND(0.91) X	ND(1.2)
1,2,3,6,7,8-HxCDD	ND(0.17) X	0.29 J	3 J	ND(0.96)	ND(1.3)	2.1 J	5.2
1,2,3,7,8,9-HxCDD	ND(0.2) X	ND(0.3)	3 J	ND(0.96)	ND(1.3)	2.2 J	ND(1.3) X
HxCDDs (total)	ND(0.26)	1.1	28	ND(1.6)	ND(2.2)	21	22
1,2,3,4,6,7,8-HpCDD	ND(0.65)	1 J	24	ND(0.86) X	3.1 J	26	62
HpCDDs (total)	ND(1)	1.9	45	ND(0.96)	5.5	60	120
OCDD	3.9 J	ND(5.6)	160	4.4 J	19 J	180	580 EJ
Total TEQs (EPA 2010 TEFs)	0.61	1.8	11	1.3	2.3	8.5	18

TABLE C-8
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL K12-9-1 (RECREATIONAL)

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-M12 6-15 03/26/04	RAA10-N-O24 0-1 03/22/04	RAA10-N-O24 6-15 03/22/04	RAA10-N-O28 3-6 04/01/04	RAA10-N-S24 1-3 03/17/04	RAA10-N-S26 0-1 01/15/04	RAA10-N-T19.5 1-3 03/25/04	RAA10-N-W24 0-1 03/16/04	UB-SS-6 0-0.5 03/04/97
Furans										
2,3,7,8-TCDF		ND(0.39) X	9.4 Y	ND(0.38) X	ND(0.4)	ND(0.32)	ND(0.34)	25 Y	35 Y	ND(170)
TCDFs (total)		ND(0.31)	89	ND(0.34)	0.64	ND(0.32)	8.6 I	160	380	ND(170)
1,2,3,7,8-PeCDF		0.27 J	2.4 J	ND(0.6)	ND(0.25)	ND(0.37)	ND(0.32)	7.8 J	2.6	ND(140)
2,3,4,7,8-PeCDF		ND(0.48) X	3.4 J	ND(0.6)	ND(0.3)	ND(0.33)	ND(0.32)	17	22	ND(140)
PeCDFs (total)		0.27	37	ND(0.6)	ND(0.68)	ND(0.37)	8.8 I	120	450	ND(140)
1,2,3,4,7,8-HxCDF		0.66 J	ND(1.8) X	ND(0.31)	ND(0.2)	ND(0.2)	ND(0.21)	45	10	ND(170)
1,2,3,6,7,8-HxCDF		0.36 J	1.5 J	0.19 J	0.36 J	ND(0.2)	ND(0.2)	14	12	ND(180)
1,2,3,7,8,9-HxCDF		0.37 J	ND(1)	ND(0.6)	ND(0.68)	ND(0.26)	ND(0.15)	10 J	ND(1)	ND(200)
2,3,4,6,7,8-HxCDF		ND(0.36) X	1.8 J	ND(0.6)	ND(0.68)	ND(0.26)	ND(0.17)	19	16	ND(170)
HxCDFs (total)		1.6	20	ND(0.5)	ND(0.36)	ND(0.26)	ND(0.21)	320	570	ND(170)
1,2,3,4,6,7,8-HpCDF		ND(0.64)	5.9 J	0.36 J	ND(0.48)	ND(0.39)	1.8 I	150	77	ND(160)
1,2,3,4,7,8,9-HpCDF		ND(0.29) X	0.55 J	ND(0.6)	ND(0.68)	ND(0.51)	ND(0.15)	20	5.3	ND(200)
HpCDFs (total)		ND(0.64)	11	0.36	ND(0.68)	11	3.1 I	560	190	ND(160)
OCDF		ND(0.91)	5.6 J	ND(0.81) X	ND(1.4)	20	ND(0.3)	350	57	ND(350)
Dioxins										
2,3,7,8-TCDD		ND(0.34)	ND(0.52)	ND(0.37)	ND(0.28)	ND(0.28)	ND(0.27)	0.79 J	ND(0.28)	ND(75)
TCDDs (total)		ND(0.65)	1.3	ND(0.68)	ND(0.81)	ND(0.28)	ND(0.27)	7.6	ND(0.28)	ND(75)
1,2,3,7,8-PeCDD		ND(0.62)	ND(0.52) X	ND(0.6)	ND(0.68)	ND(0.33)	ND(0.68)	ND(1.9) X	ND(1.8)	ND(260)
PeCDDs (total)		ND(0.62)	1.6	1	ND(1)	ND(0.33)	ND(0.68)	18	ND(1.8)	ND(260)
1,2,3,4,7,8-HxCDD		ND(0.62)	ND(0.91)	ND(0.6)	ND(0.68)	ND(0.43)	ND(0.25)	ND(1.8) X	ND(0.51)	ND(210)
1,2,3,6,7,8-HxCDD		ND(0.62)	ND(0.9)	ND(0.6)	ND(0.68)	ND(0.43)	ND(0.27)	22	3.1	ND(190)
1,2,3,7,8,9-HxCDD		ND(0.62)	ND(0.9)	ND(0.6)	ND(0.68)	ND(0.45)	ND(0.24)	6.1 J	ND(0.51)	ND(190)
HxCDDs (total)		ND(0.96)	1.6	ND(0.91)	ND(0.68)	ND(0.45)	ND(0.27)	96	29	ND(190)
1,2,3,4,6,7,8-HpCDD		ND(0.51)	6.6 J	ND(0.66)	0.91 J	14	ND(1.1) X	520	100	ND(340)
HpCDDs (total)		ND(0.51)	13	ND(0.66)	0.91	14	1.1	880	220	ND(340)
OCDD		ND(2)	38	ND(2.1)	5.2 J	42 B	5.3	5800	740	ND(420)
Total TEQs (EPA 2010 TEFs)		0.84	3.4	0.8	0.8	0.82	0.66	47	20	270

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
E - Analyte exceeded calibration range.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-AAA30 0-1 07/15/04	RAA10-E-BBB25 0-1 01/12/05	RAA10-E-DDD27 0-1 12/18/08	RAA10-E-KK13 0-1 03/10/05	RAA10-E-LL12.5 0-1 06/08/07	RAA10-E-LL14 0-1 01/10/05	RAA10-E-MM13 0-1 08/05/04	RAA10-E-NNOO14 0-1 06/08/07
Furans									
2,3,7,8-TCDF		0.51 J [2.8 J]	66 Y	19 Y	53 J	350 Y	24000 Y	53 Y	56 J
TCDFs (total)		2.6 J [26 J]	610	180 Q	820 QI	2700 Q	180000 I	570 Q	520 Q
1,2,3,7,8-PeCDF		ND(0.32) [0.98 J]	49	5.7 JQ	40	330	18000	49	42 QI
2,3,4,7,8-PeCDF		ND(0.32) J [2.8 J]	90	15 JQ	160	480	29000	90	52 J
PeCDFs (total)		2.8 J [31 J]	890 Q	150 Q	1600 I	4400 QI	240000 I	750 Q	590 QI
1,2,3,4,7,8-HxCDF		ND(0.34) J [2.2 J]	150	13 J	170	920	61000 I	140	100 I J
1,2,3,6,7,8-HxCDF		ND(0.32) [1.4 J]	82	8 J	88	580	36000 I	89	76 I
1,2,3,7,8,9-HxCDF		ND(0.39) [0.63 J]	17 Q	ND(4.9)	33	100	6500	16	12
2,3,4,6,7,8-HxCDF		ND(0.32) J [2 J]	48	9.4 J	110	250	14000	45	31
HxCDFs (total)		6.9 J [78 J]	590 Q	130 Q	1500	4100	240000 I	750	490 I
1,2,3,4,6,7,8-HpCDF		9.1 J [96 J]	150	41 JQ	260	1000	44000	150	120 J
1,2,3,4,7,8,9-HpCDF		ND(0.33) [0.77 J]	36	7.8 J	55	270	11000	42	27
HpCDFs (total)		17 J [180 J]	290	140 Q	700	1800	73000	270	210
OCDF		4.1 J [48 J]	180	74 J	520 J	1300	58000	130	110
Dioxins									
2,3,7,8-TCDD		ND(0.13) [ND(0.18) X]	2.2 J	28 Q	2.4 J	15	110	ND(0.78) X	0.92 JQ
TCDDs (total)		ND(0.13) J [1.7 J]	16	97 Q	48 Q	80	3000	13 Q	45 Q
1,2,3,7,8-PeCDD		ND(0.32) [0.36 J]	2.7 J	3.7 JQ	27	72	410	ND(3.1)	2.1 J
PeCDDs (total)		ND(0.32) J [3.9 J]	30 Q	71 Q	280	270 Q	6300 Q	15 Q	36 Q
1,2,3,4,7,8-HxCDD		ND(0.32) [0.31 J]	2.1 J	ND(3.4)	20	20	410	2.2 J	ND(2) X
1,2,3,6,7,8-HxCDD		ND(0.32) J [1.8 J]	4.3 J	3.6 J	70	48	630	4.7 J	4.8 J
1,2,3,7,8,9-HxCDD		ND(0.32) [0.82 J]	3.3 J	2.6 J	43	37	470	3.8 J	3.3 J
HxCDDs (total)		0.7 J [14 J]	53	160 Q	710	350	10000	59	53 Q
1,2,3,4,6,7,8-HpCDD		2.8 J [28 J]	80	74	490 J	130	4000	52	51 J
HpCDDs (total)		5.1 J [52 J]	150	160	880	270	8500	100	120
OCDD		23 J [260 J]	750	610	4100 J	380	12000	440	290 J
Total TEQs (EPA 2010 TEFs)		0.65 [4.7]	76	46	160	490	25000	70	51

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14	RAA10-E-RR16	RAA10-E-RR25
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter Date Collected:	08/03/04	01/10/05	08/02/04	01/07/05	03/08/05	01/05/05	01/11/05	08/06/04	09/23/04	07/14/04
Furans										
2,3,7,8-TCDF	5.6 Y	1200 YE	4.7 Y	28 Y	9 Y	6.4 Y	ND(1) X	3.9 Y	35 Y	14 Y
TCDFs (total)	53 Q	15000 QI	50 QI	310	170	47	8.1	43 Q	160	530 QI
1,2,3,7,8-PeCDF	2 JQ	1000	1.7 J	18 Q	4.5 J	2.8 J	ND(0.66)	2.5 J	10	4.8
2,3,4,7,8-PeCDF	4.3 JQ	1700	2.6 J	43	29	6.2 J	0.98 J	5.1	11	80
PeCDFs (total)	44 Q	16000 QI	29 Q	280 Q	440	56	8.4	52 Q	80	1400 Q
1,2,3,4,7,8-HxCDF	3.8 J	3500 EI	2 J	51	10	7 J	1.3 J	6.2	11	16
1,2,3,6,7,8-HxCDF	2.6 J	1800 I	1.4 J	30	13	3.2 J	0.9 J	4.1 J	7.7	42
1,2,3,7,8,9-HxCDF	0.64 J	360	ND(0.8)	ND(8.3) Q	ND(5.5)	ND(1.6)	ND(0.88)	ND(1.4) Q	ND(0.45)	9.4
2,3,4,6,7,8-HxCDF	3.3 J	770	1.8 J	26	42	5.1 J	1 J	3.8 J	5.8	140
HxCDFs (total)	40 Q	18000 I	22	500 Q	620	190	17	54 Q	120	2200 I
1,2,3,4,6,7,8-HpCDF	12 Q	2700	4.9 J	110	270	340	12	19	70	440
1,2,3,4,7,8,9-HpCDF	1.3 J	710	0.59 J	14	ND(4.7) X	2.9 J	1.2 J	1 J	4.5 J	12
HpCDFs (total)	24	6400	11	280	450	580	42	48	170	900
OCDF	16	2900	8.8 J	250	100	180	55	47	120	170
Dioxins										
2,3,7,8-TCDD	ND(0.49) X	7	ND(0.25) X	2.4 J	ND(0.72) X	ND(0.7) X	ND(0.48)	0.36 J	1.8	0.6 J
TCDDs (total)	9.9	320	1.1 J	15	ND(0.71)	ND(1)	ND(0.9)	1 J	23	5.3 Q
1,2,3,7,8-PeCDD	0.71 JQ	25	ND(0.56)	3.2 J	2.2 J	ND(0.78)	ND(0.66)	ND(0.96) X	ND(2.1)	3.2 J
PeCDDs (total)	12 Q	730 Q	2.3 JQ	30 Q	7.7 J	4.2 J	1 J	5 Q	14	28 Q
1,2,3,4,7,8-HxCDD	ND(0.71) X	26	ND(0.83)	3.8 J	2.6 J	0.95 J	ND(0.83)	ND(2.3) X	4.7 J	3.2 J
1,2,3,6,7,8-HxCDD	ND(1.4) X	44	ND(0.73)	11	5.8 J	5.1 J	2 J	4.2 J	7.7	9.1
1,2,3,7,8,9-HxCDD	1.3 J	33	ND(0.8)	7.8	3.7 J	2.1 J	1.1 J	4.5 J	5.8	6.2
HxCDDs (total)	12	1700	2.8 J	99	38	34	8	33	84	83
1,2,3,4,6,7,8-HpCDD	16	340	9.6	200	75	92	54	76	190	100
HpCDDs (total)	32	1400	21	350	130	170	100	190	440	190
OCDD	110	1900	79	2100	590	980	480	740	1500	790
Total TEQs (EPA 2010 TEFs)	4.8	1400	2.8	46	26	14	3.9	8.6	22	60

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID:	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
	Date Collected:	01/17/05	08/06/04	01/05/05	09/23/04	03/09/05	07/14/04	09/22/04	07/15/04	07/15/04
Furans										
2,3,7,8-TCDF		1.7 J	ND(25)	3.8 Y	640 J	3.1 Y	12 Y	7.8 Y	5.4 Y	21 Y
TCDFs (total)		7.9	ND(25)	26	3000	31	37 Q	56	65 QI	180 QI
1,2,3,7,8-PeCDF		ND(1)	ND(63)	1.2 J	520 J	ND(1.8)	4.8	3.5 J	2.1 J	8.2
2,3,4,7,8-PeCDF		2 J	ND(63)	2.6 J	700 J	ND(2.8)	4.4	6.4	6.6	26
PeCDFs (total)		22	ND(63)	22	4500	13	26 Q	140	94 QI	240 Q
1,2,3,4,7,8-HxCDF		3.5 J	ND(63)	2.7 J	1400 J	3.9 J	5.6	8.9	3.1	22
1,2,3,6,7,8-HxCDF		2.8 J	ND(63)	ND(1.8)	850 J	ND(2.3)	1.6 J	7.2	3	14
1,2,3,7,8,9-HxCDF		ND(0.58)	ND(63)	ND(2.4)	23	ND(0.39)	ND(1.4) X	ND(0.43)	0.98 J	5.3
2,3,4,6,7,8-HxCDF		2.7 J	ND(63)	ND(2)	230	ND(2.5)	1.2 J	5.5 J	7	14
HxCDFs (total)		59	ND(63)	70	5300	60	40	160	130	460
1,2,3,4,6,7,8-HpCDF		52	ND(63)	130	1500 J	31	63	85	75	790
1,2,3,4,7,8,9-HpCDF		1.9 J	ND(63)	ND(1)	420 J	ND(2.2)	0.94 J	3.6 J	1.3 J	8.2
HpCDFs (total)		110	ND(63)	220	2700	100	110	170	140	1400
OCDF		87	ND(120)	66	1300 J	81	32	62	40	430
Dioxins										
2,3,7,8-TCDD		ND(0.23)	ND(28)	ND(0.84)	3.2	ND(0.4)	ND(0.14)	ND(0.24)	0.24 J	0.61 J
TCDDs (total)		ND(0.62)	ND(75)	ND(0.84)	55	1.5	ND(0.4)	0.77	ND(0.36)	5.5
1,2,3,7,8-PeCDD		ND(0.65) X	ND(63)	ND(0.78)	12	ND(0.84)	ND(0.29)	ND(1.5)	0.5 J	ND(1.3) X
PeCDDs (total)		1.2 J	ND(110)	0.96 J	42	ND(1.8)	1.2 J	3.3	4.9 Q	11 Q
1,2,3,4,7,8-HxCDD		ND(1.1)	ND(82)	ND(1.7)	11	ND(2.1)	ND(0.39)	ND(1.4)	ND(0.46) X	1.2 J
1,2,3,6,7,8-HxCDD		3.3 J	ND(72)	ND(2.4) X	20	5.2 J	ND(0.86) X	5 J	1.7 J	9.3
1,2,3,7,8,9-HxCDD		2.4 J	ND(78)	ND(1.6)	16	ND(2.3)	ND(0.4)	ND(2.5)	1.1 J	3.5
HxCDDs (total)		25	ND(100)	11	220	130	5.3	50	16	59
1,2,3,4,6,7,8-HpCDD		74	ND(63)	43	210	240	14	64	30	180
HpCDDs (total)		130	ND(63)	81	550	1300	25	180	76	320
OCDD		600	610 J	450	1100 J	1800	160	460	250	1700
Total TEQs (EPA 2010 TEFs)		6.1	84	6.2	590	11	5.2	9.6	7	35

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID:	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1	UFP2-L3	UFP2-L3	RAA10-E-BBB26	RAA10-E-BBB28
	Sample Depth(Feet):	0-1	0-0.5	0.5-1	0-0.5	0.5-1	0-0.5	0.5-1	6-15	1-3
	Date Collected:	10/05/04	12/13/96	12/13/96	12/13/96	12/13/96	12/11/96	12/11/96	12/18/08	12/18/08
Furans										
2,3,7,8-TCDF		0.96 J	180	39	1400	89	2300 E	1200 E	1.6 Y [1.7 Y]	ND(0.93)
TCDFs (total)		4	2100	220	4600	1600	18000	12000	24 [24]	8 Q
1,2,3,7,8-PeCDF		ND(0.76)	79 J	ND(16)	140	ND(33)	1800	1100	0.57 J [0.51 J]	0.37 JQ
2,3,4,7,8-PeCDF		1.3 J	160	ND(19)	450	98 J	2600	1300	2.7 J [2.5 J]	0.43 JQ
PeCDFs (total)		8.2 Q	7500	310	19000	6000	21000	19000	43 Q [43 Q]	5.6 Q
1,2,3,4,7,8-HxCDF		ND(1.2)	310	ND(37)	680	130	6600 E	3100	14 [15]	0.71 J
1,2,3,6,7,8-HxCDF		ND(1.1)	510	ND(19)	380	88 J	3700 E	1700	1.9 J [1.6 J]	ND(0.41) X
1,2,3,7,8,9-HxCDF		ND(1.4)	ND(9)	ND(2.4)	ND(21)	ND(2.8)	86	52 J	1.1 J [1.1 J]	ND(0.38)
2,3,4,6,7,8-HxCDF		ND(1.2)	160	ND(18)	250	75 J	770	430	1.8 J [1.7 J]	ND(0.38) X
HxCDFs (total)		11	3800	290	9900	2300	21000	9500	50 [49]	2.5 Q
1,2,3,4,6,7,8-HpCDF		5.9	1600	170	2300	560	4500 E	2700	26 [26]	2 J
1,2,3,4,7,8,9-HpCDF		ND(1.2)	120 J	ND(10)	270	59 J	1100	890	17 [19]	ND(0.56)
HpCDFs (total)		16	3500	340	6800	1200	7600	4900	79 [82]	2.9
OCDF		13	1300	130 J	2400	360	4100	2100	140 [150]	3.1 J
Dioxins										
2,3,7,8-TCDD		ND(0.55)	ND(7.8)	ND(1.4)	ND(10)	ND(3.5)	10	ND(3.8)	ND(0.11) [ND(0.26)]	ND(0.41)
TCDDs (total)		ND(0.55)	110	250	220	39	260	110	1.8 [0.97]	2.6 Q
1,2,3,7,8-PeCDD		ND(0.99)	ND(30)	ND(6)	110 J	ND(18)	29	ND(18)	ND(0.53) [ND(0.53)]	ND(0.54)
PeCDDs (total)		ND(0.99)	91	88	600	68	370	36	2.1 Q [1.2 Q]	1.1 Q
1,2,3,4,7,8-HxCDD		ND(1.3)	ND(33)	ND(9.3)	87 J	ND(18)	29	ND(19)	ND(0.53) [ND(0.6)]	ND(0.55)
1,2,3,6,7,8-HxCDD		1.4 J	130	ND(19)	680	91 J	70	37 J	ND(0.53) [ND(0.57)]	ND(0.54)
1,2,3,7,8,9-HxCDD		ND(1.3)	76 J	ND(21)	260	ND(50)	88	42 J	ND(0.53) [ND(0.59)]	ND(0.54)
HxCDDs (total)		12	900	190	4500	670	800	310	2.8 [2.8]	1.2 Q
1,2,3,4,6,7,8-HpCDD		25	1300	130	15000	340	480	280	1.7 J [1.4 J]	1.3 J
HpCDDs (total)		78	ND(2400)	240	29000	660	1000	600	3.3 [2.8]	1.3
OCDD		240	11000	830	220000 E	1900	1900	1300	9.7 J [7.2 J]	8.1 J
Total TEQs (EPA 2010 TEFs)		2.9	280	23	1500	110	2300	1100	4.2 [4.3]	0.94

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-LL12 1-3 09/23/04	RAA10-E-LL14 3-6 01/10/05	RAA10-E-LL14 6-15 01/10/05	RAA10-E-NN14 6-15 08/03/04	RAA10-E-PP12 1-3 08/02/04	RAA10-E-PP16 6-15 09/23/04	RAA10-E-PP20 1-3 01/07/05	RAA10-E-PP24b 1-3 04/05/05
Furans									
2,3,7,8-TCDF		1.4 Y	68 Y	34 Y	0.22 J	2.5 Y	1.2 Y	11 Y	1.6 J
TCDFs (total)		13	1000 I	18000 QI	0.22 J	36 Q	2.1	130 Q	19 J
1,2,3,7,8-PeCDF		ND(0.78)	43	23 Q	ND(0.52)	1.2 J	ND(0.9)	6.7 I	ND(0.81)
2,3,4,7,8-PeCDF		ND(0.82)	230	210	ND(0.52)	2.4 J	ND(0.86)	11	ND(0.89)
PeCDFs (total)		ND(1.6)	2000 I	20000 Q	ND(0.52)	24 Q	ND(1.3)	110 QI	27 J
1,2,3,4,7,8-HxCDF		ND(1.6)	220	100	ND(0.52)	1.5 J	ND(0.99)	12	ND(1.9)
1,2,3,6,7,8-HxCDF		ND(0.63)	120	70	ND(0.52)	1.2 J	ND(0.55)	6.3	ND(1.2)
1,2,3,7,8,9-HxCDF		ND(0.29)	36	32 Q	ND(0.52)	ND(0.76)	ND(0.69)	1.7 J	ND(0.94)
2,3,4,6,7,8-HxCDF		ND(0.55)	150	140	ND(0.52)	1.5 J	ND(0.61)	7.5	ND(2.7)
HxCDFs (total)		ND(1.6)	2100	23000 Q	ND(0.52)	21	ND(1.2)	120	72 J
1,2,3,4,6,7,8-HpCDF		ND(2.1)	270	170	ND(0.52)	6.3	3.4 J	54	70 J
1,2,3,4,7,8,9-HpCDF		ND(0.35)	63	33	ND(0.52)	ND(0.55)	ND(0.68)	3.3 J	ND(0.81)
HpCDFs (total)		ND(2.1)	560	8000	ND(0.52)	12	3.4	110	120 J
OCDF		ND(2.2)	360	150	ND(1)	3.1 J	ND(3.4)	88	27 J
Dioxins									
2,3,7,8-TCDD		ND(0.35)	1.1 J	1.4 J	ND(0.21)	0.41 J	ND(0.6)	1.3 J	ND(0.4)
TCDDs (total)		ND(0.52)	20	400	ND(0.64)	4	ND(0.6)	21	ND(0.4)
1,2,3,7,8-PeCDD		ND(0.56)	6.6	13	ND(0.52)	0.89 J	ND(1.2)	2.1 J	ND(1.1)
PeCDDs (total)		ND(0.6)	80	900 Q	ND(0.52)	8.7 Q	ND(1.2)	30 Q	ND(1.1)
1,2,3,4,7,8-HxCDD		ND(0.38)	4.6 J	10	ND(0.52)	ND(0.79)	ND(0.77)	1.8 J	ND(0.82)
1,2,3,6,7,8-HxCDD		ND(0.35)	15	42	ND(0.52)	0.8 J	ND(0.69)	4.8 J	ND(1)
1,2,3,7,8,9-HxCDD		ND(0.35)	10	22	ND(0.52) X	ND(0.76)	ND(0.7)	2.7 J	ND(0.7)
HxCDDs (total)		ND(0.85)	160	2100	ND(1)	6.8	ND(0.77)	46	ND(3.6)
1,2,3,4,6,7,8-HpCDD		ND(1.2)	86	140	ND(0.52)	5.4 J	ND(1.3)	74	20 J
HpCDDs (total)		ND(1.2)	180	1700	ND(0.52)	9.9	ND(1.3)	140	34 J
OCDD		12 J	530	810	1.5 J	34	6.7 J	640	180 J
Total TEQs (EPA 2010 TEFs)		0.99	150	130	0.67	3.2	1.5	15	3

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-PP24b 3-6 04/05/05	RAA10-E-PP24b 6-15 04/05/05	RAA10-E-RR14 1-3 08/06/04	RAA10-E-RR22 3-6 01/17/05	RAA10-E-RR22 6-15 01/17/05	RAA10-E-RR24b 1-3 04/05/05	RAA10-E-RR24b 3-6 04/05/05	RAA10-E-RR24b 6-15 04/05/05
Furans									
2,3,7,8-TCDF		0.98 J	ND(0.3)	ND(0.2) X	ND(0.26)	ND(0.36) X	ND(0.51) Y	ND(0.52)	ND(0.49)
TCDFs (total)		7.8 J	ND(0.3)	ND(0.19)	ND(0.26)	0.24 J	3.5 J	0.66 J	ND(0.49)
1,2,3,7,8-PeCDF		ND(0.69)	ND(0.61)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.56)	ND(0.82)	ND(0.49)
2,3,4,7,8-PeCDF		ND(0.84)	ND(0.62)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.57)	ND(0.83)	ND(0.51)
PeCDFs (total)		15 J	ND(0.62)	ND(0.48)	ND(0.66)	ND(0.83)	11 J	ND(2.9)	ND(1)
1,2,3,4,7,8-HxCDF		ND(1.7)	ND(0.62)	ND(0.48)	ND(0.66)	ND(0.59)	ND(1.3)	ND(0.83)	ND(0.47)
1,2,3,6,7,8-HxCDF		ND(0.76)	ND(0.51)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.57)	ND(0.67)	ND(0.39)
1,2,3,7,8,9-HxCDF		ND(1)	ND(0.67)	ND(0.48) Q	ND(0.66)	ND(0.59)	ND(0.75)	ND(0.91)	ND(0.52)
2,3,4,6,7,8-HxCDF		ND(1.4)	ND(0.61)	ND(0.48)	ND(0.66)	ND(0.59)	ND(1.3)	ND(1.3)	ND(0.72)
HxCDFs (total)		39 J	ND(0.67)	ND(0.48)	ND(0.66)	ND(0.59)	32 J	16 J	7.5 J
1,2,3,4,6,7,8-HpCDF		46 J	ND(1.8)	ND(0.48)	ND(0.66)	0.89 J	18	8.9 J	6.8 J
1,2,3,4,7,8,9-HpCDF		ND(0.93)	ND(0.78)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.68)	ND(1)	ND(0.79)
HpCDFs (total)		81 J	ND(1.8)	ND(0.48) Q	ND(0.66)	0.89 J	33 J	15 J	11 J
OCDF		19 J	ND(0.83)	ND(0.97)	ND(1.3)	ND(1.2)	7.1 J	ND(2.1)	ND(1.3)
Dioxins									
2,3,7,8-TCDD		ND(0.39)	ND(0.4)	ND(0.19)	ND(0.26)	ND(0.24)	ND(0.33)	ND(0.53)	ND(0.3)
TCDDs (total)		ND(0.39)	ND(0.4)	ND(0.62)	ND(0.64)	ND(0.58)	ND(0.33)	ND(0.53)	ND(0.3)
1,2,3,7,8-PeCDD		ND(1)	ND(1)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.81)	ND(1.3)	ND(0.76)
PeCDDs (total)		ND(1)	ND(1)	ND(0.8)	ND(1.1)	ND(0.97)	ND(0.81)	ND(1.3)	ND(0.76)
1,2,3,4,7,8-HxCDD		ND(1.3)	ND(0.74)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.58)	ND(0.88)	ND(0.61)
1,2,3,6,7,8-HxCDD		ND(1)	ND(0.57)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.46)	ND(0.67)	ND(0.47)
1,2,3,7,8,9-HxCDD		ND(0.74)	ND(0.62)	ND(0.48)	ND(0.66)	ND(0.59)	ND(0.49)	ND(0.74)	ND(0.51)
HxCDDs (total)		ND(2.5)	ND(0.74)	ND(0.78)	ND(1.2)	ND(1.1)	ND(1.2)	ND(0.75)	ND(0.61)
1,2,3,4,6,7,8-HpCDD		13 J	ND(0.94)	1.2 J	ND(0.66)	ND(0.86)	5.8 J	ND(2.7)	ND(0.98)
HpCDDs (total)		21 J	ND(0.94)	2.6 J	ND(0.66)	1.5 J	11 J	ND(2.7)	ND(0.98)
OCDD		120 J	6.6 J	15	ND(3.6)	ND(4.6)	53 J	22 J	4.5 J
Total TEQs (EPA 2010 TEFs)		2.3	1.1	0.66	0.83	0.76	1.4	1.6	0.92

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-TT16 3-6 08/06/04	RAA10-E-TT24 1-3 01/18/05	RAA10-E-TT24 6-15 01/18/05	RAA10-E-TT26 3-6 01/05/05	RAA10-E-VV20 3-6 09/21/04	RAA10-E-VV22 1-3 03/09/05	RAA10-E-VV26 1-3 01/06/05	RAA10-E-VV26 3-6 01/06/05
Furans								
2,3,7,8-TCDF	ND(0.18)	ND(1.3) X	ND(0.22) [0.24 J]	0.76 J	18 Y	2.8 Y	2.7 J	ND(0.52) [ND(0.39)]
TCDFs (total)	ND(0.18)	12	ND(0.22) [0.24 J]	0.76 J	130	36	13	ND(0.52) [ND(0.39)]
1,2,3,7,8-PeCDF	ND(0.46)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.61)	5.2 J	ND(1.8)	1.1 J	ND(0.57) [ND(0.56)]
2,3,4,7,8-PeCDF	ND(0.46)	2.8 J	ND(0.56) [ND(0.54)]	ND(0.61)	7.3	ND(2.8)	2.2 J	ND(0.57) [ND(0.56)]
PeCDFs (total)	ND(0.46)	37	ND(0.56) [ND(0.54)]	1.5 J	160	31	17	ND(0.57) [ND(0.56)]
1,2,3,4,7,8-HxCDF	ND(0.46)	ND(1.2)	ND(0.56) [ND(0.54)]	ND(0.8)	8.9	5 J	2.2 J	ND(0.62) [ND(0.56)]
1,2,3,6,7,8-HxCDF	ND(0.46)	ND(1.3)	ND(0.56) [ND(0.54)]	ND(0.68)	6.6	3.2 J	1.2 J	ND(0.57) [ND(0.56)]
1,2,3,7,8,9-HxCDF	ND(0.46)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.92)	ND(0.5)	ND(0.4)	ND(1.2)	ND(0.72) [ND(0.56)]
2,3,4,6,7,8-HxCDF	ND(0.46)	3.6 J	ND(0.56) [ND(0.54)]	ND(0.78)	6.6	ND(3)	1.6 J	ND(0.6) [ND(0.56)]
HxCDFs (total)	ND(0.46)	60	ND(0.56) [ND(0.54)]	4.9 J	180	110	71	ND(0.61) [ND(0.56)]
1,2,3,4,6,7,8-HpCDF	ND(0.5)	31	ND(0.56) [ND(0.54)]	10	39	39	130	0.88 J [0.87 J]
1,2,3,4,7,8,9-HpCDF	ND(0.63)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.84)	3.8 J	3.2 J	ND(1.1)	ND(0.89) [ND(0.59)]
HpCDFs (total)	ND(0.56)	55	ND(0.56) [ND(0.54)]	17	88	140	230	0.88 J [1.6 J]
OCDF	ND(0.91)	15	ND(1.1) [ND(1.1)]	5.6 J	33	90	66	ND(2.3) [ND(2.3)]
Dioxins								
2,3,7,8-TCDD	ND(0.18)	ND(0.29)	ND(0.22) [ND(0.22)]	ND(0.51)	2.3	ND(0.34)	ND(0.62)	ND(0.7) [ND(0.4)]
TCDDs (total)	ND(0.57)	ND(0.81)	ND(0.57) [ND(0.63)]	ND(0.65)	7.7	2.7	ND(0.8)	ND(0.7) [ND(0.63)]
1,2,3,7,8-PeCDD	ND(0.46)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.61)	ND(1.3)	ND(0.96)	ND(0.68)	ND(0.59) [ND(0.56)]
PeCDDs (total)	ND(0.46)	ND(1.4)	ND(0.93) [ND(0.54)]	ND(1.1)	ND(2.9)	ND(2.5)	0.86 J	0.99 J [ND(1.1)]
1,2,3,4,7,8-HxCDD	ND(0.46)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.97)	ND(1.2)	ND(2.2)	ND(1)	ND(1) [ND(0.7)]
1,2,3,6,7,8-HxCDD	ND(0.46)	ND(0.74)	ND(0.56) [ND(0.54)]	ND(0.86)	3.1 J	7.7	2.4 J	ND(0.93) [ND(0.63)]
1,2,3,7,8,9-HxCDD	ND(0.46)	ND(0.72)	ND(0.56) [ND(0.54)]	ND(0.93)	ND(2.3)	7	ND(0.98)	ND(1) [ND(0.68)]
HxCDDs (total)	ND(0.84)	3.9 J	ND(1) [ND(1.1)]	ND(1)	28	210	14	ND(0.99) [ND(0.87)]
1,2,3,4,6,7,8-HpCDD	ND(0.53)	10	ND(0.56) [ND(0.54)]	4.5 J	33	400	32	ND(1.3) [ND(0.79)]
HpCDDs (total)	ND(0.53)	18	ND(0.56) [ND(0.54)]	8.3	69	1900	62	ND(1.3) [ND(0.79)]
OCDD	ND(5.5)	84	ND(2.9) [ND(2.8)]	40	180	2500	380	ND(4.1) [ND(5)]
Total TEQs (EPA 2010 TEFs)	0.58	2.8	0.7 [0.7]	1.3	11	16	5.5	1.1 [0.83]

TABLE C-9
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-11

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-XX20 6-12 09/22/04	RAA10-E-XX24 1-3 01/11/05	RAA10-E-XX26 3-6 01/11/05	RAA10-E-ZZ22 1-3 10/05/04	RAA10-E-ZZ26 1-3 01/11/05	RAA10-E-ZZ26 6-15 01/11/05	RAA10-E-ZZ28 3-6 01/11/05
Furans								
2,3,7,8-TCDF		21 Y	ND(1.1) X	0.63 J	3.2 Y	22 Y	ND(0.45) X	0.79 J
TCDFs (total)		170	ND(0.56)	0.63 J	32 Q	230	ND(0.34)	0.79 J
1,2,3,7,8-PeCDF		11	ND(0.69)	ND(0.68)	0.98 J	12	ND(0.58)	ND(0.56)
2,3,4,7,8-PeCDF		16	ND(0.81) X	ND(0.68)	5.6	25	ND(0.58)	ND(0.56)
PeCDFs (total)		220	1.1 J	ND(0.68)	49 Q	240	ND(0.58)	0.87 J
1,2,3,4,7,8-HxCDF		25	ND(0.72)	ND(0.68)	2.4 J	32	ND(0.58)	0.67 J
1,2,3,6,7,8-HxCDF		17	ND(0.69)	ND(0.68)	2 J	18	ND(0.58)	ND(0.56)
1,2,3,7,8,9-HxCDF		ND(0.62)	ND(0.83)	ND(0.7)	ND(1.2)	4.7 J	ND(0.58)	ND(0.72)
2,3,4,6,7,8-HxCDF		8	ND(0.7)	ND(0.68)	3.6 J	15	ND(0.58)	ND(0.61)
HxCDFs (total)		220	4.3 J	ND(0.68)	57	400	ND(0.58)	2.9 J
1,2,3,4,6,7,8-HpCDF		62	4.4 J	ND(0.68)	24	490	0.74 J	3.3 J
1,2,3,4,7,8,9-HpCDF		10	ND(0.8)	ND(0.68)	1.8 J	9	ND(0.58)	ND(0.82)
HpCDFs (total)		150	7.8	ND(0.68)	83	870	0.74 J	5.9
OCDF		91	3.2 J	ND(1.8)	84	350	ND(1.2)	2.5 J
Dioxins								
2,3,7,8-TCDD		2.1	ND(0.53)	ND(0.57)	0.64 J	ND(0.66) X	ND(0.46)	ND(0.39)
TCDDs (total)		7.4	ND(0.83)	ND(0.85)	1.2 J	7	ND(0.74)	ND(0.82)
1,2,3,7,8-PeCDD		ND(1.5)	ND(0.69)	ND(0.68)	ND(0.73) X	1.2 J	ND(0.58)	ND(0.56)
PeCDDs (total)		3	ND(0.69)	ND(1.1)	6.8 Q	13	ND(0.96)	ND(1.1)
1,2,3,4,7,8-HxCDD		ND(1.2)	ND(0.99)	ND(1.1)	1.3 J	1.1 J	ND(0.81)	ND(0.87)
1,2,3,6,7,8-HxCDD		3.8 J	ND(0.88)	ND(0.94)	4.4 J	7.6	ND(0.72)	ND(0.78)
1,2,3,7,8,9-HxCDD		ND(2.2)	ND(0.95)	ND(1)	2.6 J	2.6 J	ND(0.78)	ND(0.84)
HxCDDs (total)		32	ND(0.94)	ND(1)	120	51	ND(0.77)	ND(0.86)
1,2,3,4,6,7,8-HpCDD		55	2.4 J	ND(1.1)	210	150	2.9 J	1.9 J
HpCDDs (total)		110	5 J	ND(1.1)	1000	280	11	4.9 J
OCDD		430	15	4 J	2100	1700	16	18
Total TEQs (EPA 2010 TEFs)		18	1.2	1.1	14	32	0.96	1.1

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
3. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
4. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
5. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
E - Analyte exceeded calibration range.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-10
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-12

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-BB13 0-1 02/23/05	RAA10-E-BB14 6-15 02/22/05	RAA10-E-EE12 0-1 02/23/05	RAA10-E-GG13 0-1 02/22/05	RAA10-E-JJ11 0-1 02/21/05	RAA10-E-LL10 0-1 02/11/05
Furans						
2,3,7,8-TCDF	34 Y	1 JY	63 Y	100 Y [140 Y]	12 Y	61 Y
TCDFs (total)	2000	4.1	670	440 J [770 J]	88	680
1,2,3,7,8-PeCDF	15	ND(0.87)	29	65 J [79]	8.2	27
2,3,4,7,8-PeCDF	55	ND(1.1)	61	83 J [120]	14	76
PeCDFs (total)	4300	ND(2.3)	2000	430 [610]	250	2500
1,2,3,4,7,8-HxCDF	22	ND(3.4)	60	180 J [230]	24	68
1,2,3,6,7,8-HxCDF	85	ND(1.4)	80 I	130 J [140]	18 I	95
1,2,3,7,8,9-HxCDF	ND(1.6)	ND(0.99)	ND(1.9)	ND(4.9) [ND(5.7)]	ND(0.56)	ND(2.6)
2,3,4,6,7,8-HxCDF	99	ND(0.87)	82	49 J [52 J]	13	110
HxCDFs (total)	2800	ND(3.4)	2500	750 [1100]	330	2400
1,2,3,4,6,7,8-HpCDF	120	ND(2.7)	120	250 J [310]	44	140
1,2,3,4,7,8,9-HpCDF	8.5	ND(0.67)	23	53 J [63 J]	6.5	23
HpCDFs (total)	390	ND(2.7)	380	430 [520]	97	330
OCDF	45	ND(1.4)	67	180 J [190]	43	99
Dioxins						
2,3,7,8-TCDD	ND(0.51)	ND(0.21)	1.2	ND(4.4) [ND(4.1)]	ND(0.35)	1.4 J
TCDDs (total)	2.1	ND(0.21)	11	ND(5.6) J [21 J]	ND(1.1)	15
1,2,3,7,8-PeCDD	ND(2.4)	ND(0.41)	5.7	ND(4.3) [ND(5.2)]	ND(2.8)	9.7
PeCDDs (total)	4.6	ND(0.41)	12	ND(16) [ND(10)]	7.8	42
1,2,3,4,7,8-HxCDD	ND(2.3)	ND(0.62)	3.4 J	ND(2.4) [ND(4.4)]	ND(1.9)	6 J
1,2,3,6,7,8-HxCDD	5.3 J	ND(0.57)	9.4	ND(5.7) [ND(7.6)]	7.8	23
1,2,3,7,8,9-HxCDD	4.2 J	ND(0.57)	6.8	ND(6.4) [ND(6.8)]	4.6 J	15
HxCDDs (total)	49	ND(0.62)	94	42 J [ND(26) J]	73	260
1,2,3,4,6,7,8-HpCDD	75	ND(0.93)	54	58 J [75]	47	120
HpCDDs (total)	150	ND(0.93)	110	120 [150]	100	260
OCDD	470	ND(3.9)	300	560 [550]	310	670
Total TEQs (EPA 2010 TEFs)	47	1	60	84 [110]	16	78

TABLE C-10
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-12

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-LL10 1-3 02/11/05	RAA10-E-LL10 3-6 02/11/05	RAA10-E-LL10 6-15 02/11/05	RAA10-E-P14 0-1 02/24/05	RAA10-E-Q13 0-1 10/06/04	RAA10-E-R13 1-3 10/06/04	RAA10-E-R13 3-6 10/06/04
Furans							
2,3,7,8-TCDF	44 Y	6.4 Y	ND(0.6) Y	350 Y	19 Y	120 Y	66 Y
TCDFs (total)	700	150	20	2100	200 Q	1100 QI	1100 QI
1,2,3,7,8-PeCDF	27	4.6 J	ND(0.51)	140	14	59	27
2,3,4,7,8-PeCDF	94	12	ND(1.4)	180	34	110	180
PeCDFs (total)	2100	450	42	2700	330 Q	1100 Q	1900 QI
1,2,3,4,7,8-HxCDF	130	11	ND(1.8)	410	48	220	130
1,2,3,6,7,8-HxCDF	92	16	ND(1.8)	270 I	29	130	73
1,2,3,7,8,9-HxCDF	3.1 J	ND(0.62)	ND(0.16)	6.6	6.9	30	32
2,3,4,6,7,8-HxCDF	81	16	ND(2.1)	72	23	70	120
HxCDFs (total)	2300	440	34	2000	350	1000	1700
1,2,3,4,6,7,8-HpCDF	140	20	ND(2.7)	430	68	220	240
1,2,3,4,7,8,9-HpCDF	45	4.2 J	ND(0.47)	97	15	69	60
HpCDFs (total)	360	48	3.1	740	140	420	600
OCDF	130	12 J	ND(2.4)	350	60	210	260
Dioxins							
2,3,7,8-TCDD	2.4	ND(0.24)	ND(0.14)	1.4	ND(0.6)	1.8 J	9
TCDDs (total)	63	4.1	ND(0.18)	32	0.72 J	33 Q	50
1,2,3,7,8-PeCDD	32	ND(2.4)	ND(0.38)	11	ND(1.6) X	7.4	18
PeCDDs (total)	160	3.5	ND(1.3)	82	13 Q	100 Q	190 Q
1,2,3,4,7,8-HxCDD	18	ND(1.1)	ND(0.18)	8	ND(1.8)	4.7 J	14
1,2,3,6,7,8-HxCDD	87	4.9 J	ND(0.78)	44	5.2 J	11	39
1,2,3,7,8,9-HxCDD	57	3.3 J	ND(0.55)	17	3.3 J	7.9	26
HxCDDs (total)	1100	56	4.2	380	39	150	420
1,2,3,4,6,7,8-HpCDD	140	12	ND(2)	120	56	61	250
HpCDDs (total)	350	30	2.8	270	110	140	490
OCDD	140	38	9.3 J	350	530	340	1800
Total TEQs (EPA 2010 TEFs)	120	11	0.93	200	28	110	140

TABLE C-10
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L11-4-12

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:						
	Sample ID:	RAA10-E-T13	RAA10-E-T14	RAA10-E-T14	RAA10-E-V14	RAA10-E-W13	RAA10-E-Y13
	Sample Depth(Feet):	0-1	0-1	6-15	0-1	0-1	0-1
	Date Collected:	10/07/04	02/24/05	02/24/05	02/23/05	10/11/04	10/12/04
Furans							
2,3,7,8-TCDF		540 Y	28000 EJ	5.4 Y	200 Y	2.5	130 Y
TCDFs (total)		7900 QI	91000	44 J	950	20	770 Q
1,2,3,7,8-PeCDF		370	8800	ND(3.2)	120	2.2 J	120
2,3,4,7,8-PeCDF		1100	12000	ND(3.7)	180	4.1 J	160
PeCDFs (total)		9600 Q	110000	13	1200	47	720 Q
1,2,3,4,7,8-HxCDF		1600	25000	6.1 J	360	3 J	210
1,2,3,6,7,8-HxCDF		920	15000 I	4.2 J	210 I	2 J	65
1,2,3,7,8,9-HxCDF		280 Q	270 J	ND(0.68)	5.3 J	ND(1.2)	38 Q
2,3,4,6,7,8-HxCDF		720	3300	ND(1.2)	71	2.3 J	67
HxCDFs (total)		11000 Q	99000	18 J	1400	ND(34)	1000 Q
1,2,3,4,6,7,8-HpCDF		1800	21000	5.9 J	360	4.7 J	140
1,2,3,4,7,8,9-HpCDF		530	5600	ND(1.4)	84	ND(1.1) X	66
HpCDFs (total)		3800	36000	5.9 J	600	8.8 J	330
OCDF		2000	17000	ND(4.2)	220	5.1 J	240
Dioxins							
2,3,7,8-TCDD		25	40 J	ND(0.24) J	9.4	ND(0.47)	0.71 J
TCDDs (total)		320 Q	1300	ND(0.84)	29	ND(0.47)	8.8 Q
1,2,3,7,8-PeCDD		51	170 J	ND(0.47)	3.7 J	ND(0.66)	3.3 J
PeCDDs (total)		920 Q	630	ND(0.86)	21	ND(0.96)	8.4 Q
1,2,3,4,7,8-HxCDD		40	ND(140)	ND(0.29)	3	ND(1.2)	2.3 J
1,2,3,6,7,8-HxCDD		150	240 J	ND(0.26)	5.7 J	ND(1.1)	5.5
1,2,3,7,8,9-HxCDD		95	180 J	ND(0.27)	4.7 J	ND(1.2)	4.4 J
HxCDDs (total)		1500	2900	ND(0.83)	73	1.1	67
1,2,3,4,6,7,8-HpCDD		1100	1600	ND(0.57)	38	2.6 J	26
HpCDDs (total)		2100	3400	ND(0.62)	82	5.2 Y	53
OCDD		8300 E	5200	ND(3.1)	140	18	150
Total TEQs (EPA 2010 TEFs)		920	12000	2.7	160	3.2	110

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents
3. ND - Analyte was not detected. The number in parentheses is the associated detection limit
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EP. in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference
J - Indicates that the associated numerical value is an estimated concentration
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-11
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-4

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID:	RAA10-E-AA6	RAA10-E-AA12	RAA10-E-BB10	RAA10-E-BB10	RAA10-E-BB10	RAA10-E-BB10	RAA10-E-CC10
Sample Depth(Feet):	0-1	0-1	0-1	1-3	3-6	6-15	0-1
Parameter Date Collected:	10/13/04	10/15/04	10/14/04	10/14/04	10/14/04	10/14/04	10/19/04
Furans							
2,3,7,8-TCDF	5.3 Y	17 Y	14 Y	290 Y	31 Y	ND(1)	2.3 Y
TCDFs (total)	76 Q	360 Q	210 I	5500 QI	670 I	ND(1)	53 I
1,2,3,7,8-PeCDF	4.1 J	7.1 Q	20	250 Q	19	ND(0.85)	1.4 J
2,3,4,7,8-PeCDF	25	33 Q	44	500 Q	58	ND(0.85)	12
PeCDFs (total)	300 QI	250 Q	450 I	7500 QI	840 QI	ND(0.85)	180 I
1,2,3,4,7,8-HxCDF	21	16	94	2000	190	ND(0.85)	7.4
1,2,3,6,7,8-HxCDF	13	12	33	710	66	ND(0.85)	5.1 J
1,2,3,7,8,9-HxCDF	6.1	ND(4.5)	9.6	210	20	ND(0.85)	ND(3.3)
2,3,4,6,7,8-HxCDF	49	21	21	410	42	ND(0.85)	18
HxCDFs (total)	600	290	410	8000 I	860	ND(0.85)	300
1,2,3,4,6,7,8-HpCDF	83	33	93	2100	230	ND(0.85)	45
1,2,3,4,7,8,9-HpCDF	15	4.2 J	42	1000	100	ND(1)	4.2 J
HpCDFs (total)	220	70	210	4600	490	ND(0.9)	130
OCDF	63	40	180	4000	430	ND(1.7)	36
Dioxins							
2,3,7,8-TCDD	ND(0.33) X	3.1 Q	ND(0.61)	3.1 Q	ND(0.47) X	ND(1)	ND(0.28)
TCDDs (total)	1 JQ	8.8 Q	ND(0.61)	130 Q	2.5	ND(1)	ND(0.66)
1,2,3,7,8-PeCDD	ND(2.1) X	ND(1.4) X	ND(0.53)	7.9 Q	ND(0.66)	ND(0.85)	ND(0.61) X
PeCDDs (total)	4.9 J	19 Q	5.7	160 Q	16	ND(0.85)	4.4 J
1,2,3,4,7,8-HxCDD	2.4 J	ND(1.8)	ND(1.1) X	16	1.6 J	ND(1.1)	ND(1)
1,2,3,6,7,8-HxCDD	2.6 J	3.1 J	2.9 J	27	2.5 J	ND(0.95)	11
1,2,3,7,8,9-HxCDD	2.3 J	2.4 J	2 J	21	2 J	ND(1)	5.3 J
HxCDDs (total)	39	42	32	230	36	ND(1.6)	79
1,2,3,4,6,7,8-HpCDD	76	49	130	370	34	ND(1.1)	150
HpCDDs (total)	230	110	320	900	78	ND(1.1)	360
OCDD	2400	410	1300	6900 EJ	480	5.3 J	1900
Total TEQs (EPA 2010 TEFs)	28	24	39	600	60	1.5	17

TABLE C-11
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-4

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:							
	RAA10-E-DD10 0-1 02/09/05	RAA10-E-DD10 1-3 02/09/05	RAA10-E-Y9 0-1 02/25/05	RAA10-E-Z6 1-3 10/13/04	RAA10-E-Z6 3-6 10/13/04	RAA10-E-Z10 0-1 10/04/04	RAA10-E-Z12 0-1 10/13/04	RAA10-E-Z12 1-3 10/13/04
Furans								
2,3,7,8-TCDF	ND(0.52) Y	2.7 Y	0.74 JY	0.46 J	56 Y	ND(0.55) X	60 Y	47 Y
TCDFs (total)	26	33	0.74	4.8	610 Q	0.7 J	5000 QI	600 QI
1,2,3,7,8-PeCDF	ND(0.68)	ND(1.5)	ND(0.17)	ND(0.52)	42 Q	ND(0.5)	100 Q	54 Q
2,3,4,7,8-PeCDF	ND(2.2)	4.3 J	ND(0.2)	2.2 J	94 Q	ND(0.5)	690 Q	110 Q
PeCDFs (total)	220	140	ND(0.25)	17	970 QI	2.6 J	2600 QI	1300 QI
1,2,3,4,7,8-HxCDF	3.6 J	6 J	ND(0.31)	1.1 J	160	ND(0.76)	720	370
1,2,3,6,7,8-HxCDF	26 I	10 I	ND(0.2)	0.7 J	100	ND(0.67)	270	120
1,2,3,7,8,9-HxCDF	ND(0.46)	ND(0.36)	ND(0.13)	ND(0.79)	29 Q	ND(0.88)	120 Q	32 Q
2,3,4,6,7,8-HxCDF	14	7	ND(0.18)	1 J	220	ND(0.72)	450	110
HxCDFs (total)	720	220	ND(0.31)	14	2700 Q	0.91 J	5300 Q	2100 Q
1,2,3,4,6,7,8-HpCDF	41	12	ND(0.31)	2.3 J	340	0.81 J	490	340
1,2,3,4,7,8,9-HpCDF	5 J	ND(2.4)	ND(0.12)	ND(0.52)	58	ND(0.77)	220	130
HpCDFs (total)	200	42	ND(0.31)	4.6 J	890	1.6 J	1300	810
OCDF	11	7.9 J	ND(0.13)	2.4 J	300	ND(1.3)	670	710
Dioxins								
2,3,7,8-TCDD	ND(0.2)	ND(0.22)	ND(0.077)	ND(0.27)	0.73 J	ND(0.56)	15	1.3 J
TCDDs (total)	ND(0.2)	0.65	ND(0.14)	ND(0.6)	23 Q	ND(0.56)	690 Q	73
1,2,3,7,8-PeCDD	ND(0.3)	ND(0.61)	ND(0.39)	ND(0.52)	5.1 J	ND(0.52)	120 Q	15
PeCDDs (total)	ND(0.3)	ND(0.77)	ND(0.39)	ND(0.52)	49 Q	ND(0.71)	820 Q	140 Q
1,2,3,4,7,8-HxCDD	ND(0.48)	ND(0.41)	ND(0.1)	ND(0.55)	ND(6.1) X	ND(1.1)	54	8.9
1,2,3,6,7,8-HxCDD	ND(0.37)	ND(0.83)	ND(0.23)	0.54 J	8.6	ND(0.95)	200	16
1,2,3,7,8,9-HxCDD	ND(0.52)	ND(0.64)	ND(0.15)	ND(0.53)	6.3	ND(1)	110	10
HxCDDs (total)	ND(1.3)	3.3	ND(0.23)	1.2 J	100 Q	ND(1)	1800	220 Q
1,2,3,4,6,7,8-HpCDD	7.1	5.2 J	ND(0.21)	2 J	62	ND(0.88) X	370	53
HpCDDs (total)	16	10	ND(0.21)	3.5 J	140	ND(0.71)	820	120
OCDD	76	30	ND(2.3)	13	550	5.2 J	480	140
Total TEQs (EPA 2010 TEFs)	5.9	4.7	0.41	1.6	100	0.99	560	130

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
E - Analyte exceeded calibration range.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-12
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-5

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-S12 0-1 10/07/04	RAA10-E-T12 1-3 10/06/04	RAA10-E-T12 3-6 10/06/04	RAA10-E-T12 6-15 10/06/04	RAA10-E-U10 0-1 10/11/04	RAA10-E-U12 0-1 10/07/04	RAA10-E-W9 0-1 10/11/04
Furans								
2,3,7,8-TCDF		200 Y	1400 EJ	3200 EJ	2000 EJ	440 Y	34 Y	13 Y
TCDFs (total)		2200 I	12000 I	28000 QI	22000 I	5300 I	340	130
1,2,3,7,8-PeCDF		170	940	2500 EJ	950	370	31	16
2,3,4,7,8-PeCDF		260	1600	3300 EJ	1800	660	46	15
PeCDFs (total)		2500 I	15000	30000	20000 QI	6200	440	260
1,2,3,4,7,8-HxCDF		540	2600 EJ	6900 EJ	3700 EJ	1200	88	ND(16) X
1,2,3,6,7,8-HxCDF		330	1700	3800 EJ	2000	730	58	10
1,2,3,7,8,9-HxCDF		72	350	1100	620	140	11	4 J
2,3,4,6,7,8-HxCDF		170	1300	2200	1100	340	23	10
HxCDFs (total)		2600	18000	31000	17000 Q	5700	400	160
1,2,3,4,6,7,8-HpCDF		540	3400 EJ	6700 EJ	4200 EJ	1000	76	36
1,2,3,4,7,8,9-HpCDF		150	840	2200	1300	300	20	4.6 J
HpCDFs (total)		960	6600	13000	7800	1900	140	73
OCDF		400	2900	7200 EJ	3700	960	66	41
Dioxins								
2,3,7,8-TCDD		1.2 J	10	19	18	2.5	ND(0.54) X	ND(0.47)
TCDDs (total)		30	300	680	540	77	1.3 J	ND(0.69)
1,2,3,7,8-PeCDD		5 J	56	120	60	ND(10) X	ND(0.63)	ND(1.4)
PeCDDs (total)		73	670	1700 Q	1100 Q	120	6.4 Q	2.2 J
1,2,3,4,7,8-HxCDD		4.6 J	63	82	60	9.1	0.77 J	ND(1.6)
1,2,3,6,7,8-HxCDD		8.3	88	160	88	18	2.1 J	ND(3) X
1,2,3,7,8,9-HxCDD		ND(7.2) X	73	140	79	15	1.6 J	ND(1.6)
HxCDDs (total)		99	1200	2100	1400	240	24	7
1,2,3,4,6,7,8-HpCDD		54	870	740	560	110	19	19
HpCDDs (total)		120	2300	1700	1200	250	58	37
OCDD		270	8400 EJ	2100	1800	480	130	180
Total TEQs (EPA 2010 TEFs)		230	1400	3100	1700	520	39	12

TABLE C-12
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-5

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-W11 0-1 10/11/04	RAA10-E-X10 0-1 09/30/04	RAA10-E-X10 3-6 09/30/04	RAA10-E-X10 6-15 09/30/04	RAA10-E-X12 0-1 09/30/04	RAA10-E-X12 1-3 09/30/04	RAA10-E-X12 6-15 09/30/04
Furans								
2,3,7,8-TCDF		5.7 Y	1600 YE	23 Y	32 Y	13 Y	94 Y	4.2 Y [5.9 Y]
TCDFs (total)		58	15000 I	200 QI	290	110	1100 QI	24 [31]
1,2,3,7,8-PeCDF		3.9 J	1000	12	19	11	57	1.8 J [2.6 J]
2,3,4,7,8-PeCDF		6.8	1600	22	44	19	200	4.7 J [5.5 J]
PeCDFs (total)		62	15000 Q	200	400	230	2200 QI	42 [51]
1,2,3,4,7,8-HxCDF		12	3000 E	42	72	25	190	7.8 [9.9]
1,2,3,6,7,8-HxCDF		7.3	1600	23	43	11	110	3 J [4.8 J]
1,2,3,7,8,9-HxCDF		1.3 J	330	5 J	10	4.5 J	32	ND(2.2) [ND(4.7)]
2,3,4,6,7,8-HxCDF		3.3 J	890	14	47	10	130	3 J [ND(3.9)]
HxCDFs (total)		52	14000	190	670	160	1900	44 [49]
1,2,3,4,6,7,8-HpCDF		16	3400 E	45	130	27	280	9.6 [12]
1,2,3,4,7,8,9-HpCDF		2.3 J	760	13	30	11	64	3.2 J [ND(3)]
HpCDFs (total)		23	5600	82	280	59	570	22 [23]
OCDF		9.4 J	2900	42	140	39	260	13 [14]
Dioxins								
2,3,7,8-TCDD		ND(0.6)	11	ND(0.62)	ND(0.96)	ND(0.87)	ND(1.3)	ND(1.4) [ND(1.2)]
TCDDs (total)		ND(0.6)	260	1.5 J	ND(0.96)	ND(0.87)	19	ND(1.4) [ND(1.2)]
1,2,3,7,8-PeCDD		ND(0.55)	ND(51) X	1.3 J	ND(1.7) X	ND(1.3)	8.6	ND(1.2) [ND(1.3)]
PeCDDs (total)		ND(0.55)	460	14	14	ND(1.3)	92 Q	ND(1.2) [1.9 J]
1,2,3,4,7,8-HxCDD		ND(0.94)	43	ND(2.5)	ND(2.9)	ND(1.9)	5.3 J	ND(1.6) [ND(5)]
1,2,3,6,7,8-HxCDD		ND(0.83)	71	ND(2.2)	2.8 J	ND(1.7)	13	ND(1.4) [ND(4.4)]
1,2,3,7,8,9-HxCDD		ND(0.91)	62	ND(2.4)	ND(2.7)	ND(1.9)	9	ND(1.5) [ND(4.8)]
HxCDDs (total)		3.3 J	1000	12	30	3.8 J	150	ND(1.5) [ND(4.7)]
1,2,3,4,6,7,8-HpCDD		1.8 J	340	6.5	34	6.1	66	1.9 J [ND(3)]
HpCDDs (total)		3.8 J	710	13	74	12	130	1.9 J [ND(3)]
OCDD		10	960	38	420	49	400	20 [17]
Total TEQs (EPA 2010 TEFs)		6.1	1400	21	40	14	140	5 [6.4]

Notes:

1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
E - Analyte exceeded calibration range.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-13
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-101

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-CC6 0-1 10/19/04	RAA10-E-DD5 0-1 10/19/04	RAA10-E-DD6 1-3 02/15/05	RAA10-E-DD6 6-15 02/15/05	RAA10-E-DD8 0-1 02/09/05	RAA10-E-EE4 0-1 02/16/05	RAA10-E-EE6 0-1 10/19/04
Furans								
2,3,7,8-TCDF		5.6 Y	320 Y [240 Y]	8.4 Y	ND(0.57)	28 Y	0.74 JY	26 J
TCDFs (total)		91 I	2600 QI [2600 QI]	89	0.72	110	4.3	290 QI
1,2,3,7,8-PeCDF		3.8 JQ	71 [76]	4.3 J	ND(0.17)	8.8	ND(0.46)	22
2,3,4,7,8-PeCDF		26 Q	170 [200]	9.6	ND(0.19)	12	ND(0.81)	61 J
PeCDFs (total)		370 QI	1500 Q [1400 Q]	460	ND(0.88)	140	3.2	550 Q
1,2,3,4,7,8-HxCDF		15	200 [210]	14	ND(0.6)	27	ND(1.7)	100 J
1,2,3,6,7,8-HxCDF		12	110 [120]	61 I	ND(0.33)	12	ND(0.96)	40
1,2,3,7,8,9-HxCDF		4.2 J	33 [33 Q]	ND(0.46)	ND(0.11)	ND(1.3)	ND(0.11)	15 J
2,3,4,6,7,8-HxCDF		38	140 [150]	27	ND(0.1)	9.9	ND(0.79)	37
HxCDFs (total)		490 Q	1300 [1400 Q]	980	ND(0.61)	250	11	550 Q
1,2,3,4,6,7,8-HpCDF		44	360 [320]	88	ND(0.52)	36	ND(2.7)	99 J
1,2,3,4,7,8,9-HpCDF		6.2	46 [49]	7.9	ND(0.16)	12	ND(0.36)	43
HpCDFs (total)		120	550 [520]	250	ND(0.52)	90	2.8	240
OCDF		28	240 [300]	38	ND(0.61)	38	ND(3.1)	240 J
Dioxins								
2,3,7,8-TCDD		ND(0.33)	3.2 [3.3]	ND(0.22)	ND(0.1)	ND(0.26)	ND(0.17)	0.64 J
TCDDs (total)		ND(0.64)	48 Q [58 Q]	ND(0.46)	ND(0.1)	ND(0.46)	ND(0.17)	4.4 Q
1,2,3,7,8-PeCDD		1.7 J	11 [ND(14) X]	ND(1)	ND(0.32)	ND(0.69)	ND(0.23)	4 J
PeCDDs (total)		16 Q	82 Q [87 Q]	ND(2.5)	ND(0.32)	ND(1.1)	ND(0.23)	24 Q
1,2,3,4,7,8-HxCDD		1.2 J	8.4 [8.9]	ND(1.4)	ND(0.079)	ND(1.3)	ND(0.12)	3 J
1,2,3,6,7,8-HxCDD		4.8 J	10 [9.9]	ND(1.9)	ND(0.075)	ND(2)	ND(0.24)	5.8
1,2,3,7,8,9-HxCDD		2.3 J	9.3 [9.5]	ND(2.1)	ND(0.074)	ND(1.4)	ND(0.26)	4.6 J
HxCDDs (total)		44 Q	110 [110]	20	ND(0.28)	13	ND(0.85)	67
1,2,3,4,6,7,8-HpCDD		22	46 [41]	39	ND(0.35)	14	3.7 J	56
HpCDDs (total)		56	93 [82]	110	ND(0.35)	34	7.4	140
OCDD		300	200 [190]	950	ND(3.4)	170	26	1000 J
Total TEQs (EPA 2010 TEFs)		20	150 [160]	19	0.35	14	0.75	52

TABLE C-13
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-101

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-FF4 1-3 02/15/05	RAA10-E-FF4 3-6 02/15/05	RAA10-E-FF4 6-15 02/15/05	RAA10-E-FF8 3-6 02/16/05	RAA10-E-FF10 0-1 02/09/05	RAA10-E-FF10 3-6 02/09/05
Furans							
2,3,7,8-TCDF		5.7 Y	1.1 JY	ND(0.16)	ND(0.39)	52 Y	ND(0.26)
TCDFs (total)		50	6.1	ND(0.38)	ND(0.39)	230	ND(0.29)
1,2,3,7,8-PeCDF		ND(2.6)	ND(0.59)	ND(0.091)	ND(0.12)	41	ND(0.2)
2,3,4,7,8-PeCDF		5.9	ND(1.1)	ND(0.087)	ND(0.12)	56	ND(0.19)
PeCDFs (total)		130	14	ND(0.79)	ND(0.19)	500	ND(0.33)
1,2,3,4,7,8-HxCDF		5 J	ND(1.7)	ND(0.15)	ND(0.17)	100	ND(0.24)
1,2,3,6,7,8-HxCDF		4.8 J	ND(0.96)	ND(0.16)	ND(0.12)	74	ND(0.23)
1,2,3,7,8,9-HxCDF		ND(0.16)	ND(0.087)	ND(0.041)	ND(0.13)	ND(2)	ND(0.28)
2,3,4,6,7,8-HxCDF		3.6 J	ND(0.5)	ND(0.078)	ND(0.13)	29	ND(0.25)
HxCDFs (total)		97	8.2	ND(0.7)	ND(0.17)	670	ND(0.36)
1,2,3,4,6,7,8-HpCDF		14	ND(2)	ND(0.35)	ND(0.13)	150	ND(0.17)
1,2,3,4,7,8,9-HpCDF		ND(2.1)	ND(0.38)	ND(0.061)	ND(0.12)	27	ND(0.21)
HpCDFs (total)		33	ND(2.2)	ND(0.35)	ND(0.17)	260	ND(0.21)
OCDF		18	ND(2.7)	ND(0.31)	ND(0.28)	95	ND(0.34)
Dioxins							
2,3,7,8-TCDD		ND(0.12)	ND(0.086)	ND(0.068)	ND(0.11)	0.79 J	ND(0.16)
TCDDs (total)		ND(0.2)	ND(0.1)	ND(0.068)	ND(0.11)	2.1	ND(0.26)
1,2,3,7,8-PeCDD		ND(0.21)	ND(0.18)	ND(0.14)	ND(0.25)	ND(2.6)	ND(0.35)
PeCDDs (total)		ND(1.1)	ND(0.46)	ND(0.28)	ND(0.25)	ND(2.6)	ND(0.52)
1,2,3,4,7,8-HxCDD		ND(0.23)	ND(0.077)	ND(0.067)	ND(0.17)	ND(1.7)	ND(0.27)
1,2,3,6,7,8-HxCDD		ND(1.4)	ND(0.2)	ND(0.1)	ND(0.16)	4.1 J	ND(0.24)
1,2,3,7,8,9-HxCDD		ND(1.1)	ND(0.34)	ND(0.062)	ND(0.16)	3.5 J	ND(0.25)
HxCDDs (total)		4.1	ND(0.58)	ND(0.18)	ND(0.22)	39	ND(0.27)
1,2,3,4,6,7,8-HpCDD		15	ND(2.4)	ND(0.27)	ND(0.41)	37	ND(0.28)
HpCDDs (total)		28	ND(2.4)	ND(0.28)	ND(0.41)	79	ND(0.28)
OCDD		120	16	ND(1.7)	ND(3.8)	250	ND(3.7)
Total TEQs (EPA 2010 TEFs)		4.7	0.69	0.17	0.28	50	0.4

TABLE C-13
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-101

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-FF10 6-15 02/09/05	RAA10-E-GG6 0-1 02/18/05	RAA10-E-GG9 0-1 02/09/05	RAA10-E-GG11 0-1 02/23/05	RAA10-E-HH4 1-3 02/17/05	RAA10-E-HH4 3-6 02/17/05	RAA10-E-HH5 0-1 02/17/05	RAA10-E-HH6 1-3 02/17/05
Furans									
2,3,7,8-TCDF		1200 Y	2 J	ND(0.33)	74 Y	2 J	ND(0.43)	7.5 J	13 J
TCDFs (total)		7300	16 J	ND(0.33)	360	18 J	ND(0.43)	73 J	2.9 J
1,2,3,7,8-PeCDF		840	ND(1.4)	ND(0.2)	43	ND(1.4)	ND(0.76)	4.3 J	4.7 J
2,3,4,7,8-PeCDF		1400	ND(1.7)	ND(0.19)	54	ND(1.8)	ND(0.8)	5.5 J	8.9 J
PeCDFs (total)		10000	23 J	ND(0.52)	860	23 J	ND(0.8)	110 J	6.6 J
1,2,3,4,7,8-HxCDF		2600	4 J	ND(0.48)	110	2.9 J	ND(0.92)	11 J	9.2 J
1,2,3,6,7,8-HxCDF		1600	3.6 J	ND(0.37)	75 I	3.7 J	ND(0.92)	8.7 J	7.1 J
1,2,3,7,8,9-HxCDF		41 J	ND(0.46)	ND(0.46)	4.7 J	ND(0.71)	ND(0.82)	ND(0.45)	ND(0.53)
2,3,4,6,7,8-HxCDF		500	ND(2.1)	ND(0.41)	51	ND(2.1)	ND(0.86)	4.7 J	7.1 J
HxCDFs (total)		15000	51 J	ND(0.71)	1400	26 J	ND(0.92)	110 J	6.4 J
1,2,3,4,6,7,8-HpCDF		3100	50	ND(0.58)	200	7 J	ND(0.9)	41 J	190 J
1,2,3,4,7,8,9-HpCDF		640	ND(1.6)	ND(0.32)	58	ND(1.9)	ND(0.6)	ND(3.4)	3.3 J
HpCDFs (total)		5700	88	ND(0.58)	520	13 J	ND(0.9)	72 J	340 J
OCDF		1800	30	ND(0.44)	210	9.2 J	ND(0.86)	32 J	90 J
Dioxins									
2,3,7,8-TCDD		15	ND(0.27)	ND(0.15)	1.4 J	ND(0.15)	ND(0.39)	ND(0.19)	ND(0.25)
TCDDs (total)		200	ND(0.36)	ND(0.15)	17	ND(0.44)	ND(0.39)	ND(0.86)	ND(0.55)
1,2,3,7,8-PeCDD		61	ND(0.37)	ND(0.29)	4.2 J	ND(0.49)	ND(0.59)	ND(0.48)	ND(0.98)
PeCDDs (total)		330	ND(0.46)	ND(0.29)	8.5	ND(0.62)	ND(0.59)	ND(2)	ND(2.5)
1,2,3,4,7,8-HxCDD		54	ND(0.22)	ND(0.53)	4.8 J	ND(0.67)	ND(0.67)	ND(0.82)	ND(0.89)
1,2,3,6,7,8-HxCDD		100	ND(0.42)	ND(0.48)	9.6	ND(0.96)	ND(0.57)	ND(1.1)	ND(3.1)
1,2,3,7,8,9-HxCDD		60	ND(0.31)	ND(0.49)	7.4	ND(0.99)	ND(0.59)	ND(1.8)	ND(2.4)
HxCDDs (total)		1200	ND(0.94)	ND(0.53)	76	ND(1.2)	ND(0.67)	5.5 J	15 J
1,2,3,4,6,7,8-HpCDD		910	4 J	ND(0.33)	120	7.2 J	ND(0.93)	43 J	54 J
HpCDDs (total)		2200	8.7	ND(0.49)	270	12 J	ND(0.93)	100 J	140 J
OCDD		7400	30	ND(3.5)	1500	47 J	ND(3.7)	760 J	12 J
Total TEQs (EPA 2010 TEFs)		1200	2.5	0.44	66	2.1	0.93	8.7	10

TABLE C-13
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-1-101

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:							
	RAA10-E-HH6 6-15 02/17/05	RAA10-E-HH11 3-6 02/24/05	RAA10-E-II6 0-1 02/17/05	RAA10-E-II10 0-1 02/10/05	RAA10-E-JJ8 3-6 02/11/05	RAA10-E-KK8 0-1 02/11/05	RAA10-E-KK10 0-1 02/10/05	RAA10-E-LL8 1-3 02/10/05
Furans								
2,3,7,8-TCDF	ND(0.33) Y	200 Y	9 J	88 Y [62 Y]	1200 Y	19 J	20 Y	12 Y
TCDFs (total)	2.9 J	1300	60 J	470 [340]	3600	110	140	64
1,2,3,7,8-PeCDF	ND(0.25)	49	5 J	69 [52]	620	10 J	14	4.7 J
2,3,4,7,8-PeCDF	ND(0.44)	54	7.5 J	85 [61]	720	14 J	20	5.8
PeCDFs (total)	6.6 J	2100	110 J	880 [650]	5600	210	400	85
1,2,3,4,7,8-HxCDF	ND(0.83)	200	12 J	230 [160]	1800	28 J	39	13
1,2,3,6,7,8-HxCDF	ND(0.64)	110	9 J	130 I [100 I]	950 I	17 J	26	7.4
1,2,3,7,8,9-HxCDF	ND(0.36)	9.8	ND(0.47)	ND(2.4) [ND(1.5)]	35	ND(1.3)	ND(0.46)	ND(0.49)
2,3,4,6,7,8-HxCDF	ND(0.42)	51	6.1 J	47 [35]	280	11 J	17	4.7 J
HxCDFs (total)	6.4 J	2000	130 J	1100 [830]	7200	260	410	95
1,2,3,4,6,7,8-HpCDF	ND(2.3)	310	29 J	260 J [170]	1600	71 J	49	19
1,2,3,4,7,8,9-HpCDF	ND(0.21)	110	4 J	54 [38]	510	7.3 J	9.5	3.9 J
HpCDFs (total)	ND(2.3)	760	58 J	450 [310]	3000	130	110	38
OCDF	ND(1.7)	500	23 J	320 J [220]	1400	43 J	51	18
Dioxins								
2,3,7,8-TCDD	ND(0.11)	3	ND(0.23)	1.7 [1.2]	15	ND(0.37)	ND(0.24)	ND(0.32)
TCDDs (total)	ND(0.11)	39	0.84 J	16 J [8.7 J]	130	0.73	2.3	ND(0.48)
1,2,3,7,8-PeCDD	ND(0.26)	12	ND(0.64)	8.9 [6.1]	75	ND(0.93)	ND(1.7)	ND(0.71)
PeCDDs (total)	ND(0.59)	67	ND(1.5)	33 J [18 J]	350	ND(2.9)	ND(7)	ND(1.1)
1,2,3,4,7,8-HxCDD	ND(0.25)	11	ND(1.1)	6.4 [4.5 J]	60	ND(0.87)	ND(1.2)	ND(0.47)
1,2,3,6,7,8-HxCDD	ND(0.23)	44	ND(2.4)	12 [9.5]	66	ND(2)	4.2 J	ND(0.93)
1,2,3,7,8,9-HxCDD	ND(0.23)	26	ND(2.4)	12 [9]	59	ND(1.6)	2.9 J	ND(0.84)
HxCDDs (total)	ND(0.4)	440	12 J	150 [110]	960	7.6	31	3.7
1,2,3,4,6,7,8-HpCDD	ND(2)	160	36 J	54 [44]	290	9.9 J	35	13
HpCDDs (total)	ND(2.2)	350	68 J	120 [95]	670	21	72	28
OCDD	12 J	750	250 J	140 [180]	460	47 J	230	120
Total TEQs (EPA 2010 TEFs)	0.48	110	8.3	96 [69]	800	14	20	7

TABLE C-13
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PARCEL L12-1-101

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:						
	RAA10-E-LL8 3-6 02/10/05	RAA10-E-LL8 6-15 02/10/05	RAA10-E-LL9 0-1 02/10/05	RAA10-E-LL9 1-3 02/10/05	RAA10-E-LL9 3-6 02/10/05	RAA10-E-LL9 6-15 02/10/05	RAA10-E-MM9 0-1 02/11/05
Furans							
2,3,7,8-TCDF	9.2 Y	ND(0.16)	11 Y	ND(0.89) Y	16 Y	ND(0.18)	2.2 Y
TCDFs (total)	51	ND(0.16)	85	ND(0.89)	100	ND(0.18)	17
1,2,3,7,8-PeCDF	ND(2.5)	ND(0.27)	9.3	ND(0.28)	5.1 J	ND(0.28)	ND(1.8)
2,3,4,7,8-PeCDF	ND(2.4)	ND(0.26)	12	ND(0.45)	7.7	ND(0.27)	2.9 J
PeCDFs (total)	23	ND(0.27)	190	3.2	190	ND(0.28)	30
1,2,3,4,7,8-HxCDF	3.2 J	ND(0.22)	28	ND(1.5)	9.7	ND(0.31)	5.1 J
1,2,3,6,7,8-HxCDF	ND(2.4)	ND(0.21)	17	ND(0.75)	10 I	ND(0.29)	5.8 I
1,2,3,7,8,9-HxCDF	ND(0.76)	ND(0.25)	ND(0.41)	ND(0.24)	ND(0.36)	ND(0.36)	ND(0.19)
2,3,4,6,7,8-HxCDF	ND(1.9)	ND(0.23)	9.2	ND(0.41)	11	ND(0.32)	2.7 J
HxCDFs (total)	25	ND(0.25)	200	ND(2.5)	280	ND(0.36)	54
1,2,3,4,6,7,8-HpCDF	6.8	ND(0.2)	30	ND(1.7)	61	ND(0.49)	8.9
1,2,3,4,7,8,9-HpCDF	ND(1.1)	ND(0.25)	7	ND(0.28)	3.8 J	ND(0.31)	ND(1.1)
HpCDFs (total)	12	ND(0.25)	55	ND(1.7)	120	ND(0.49)	18
OCDF	ND(4.9)	ND(0.3)	28	ND(1.4)	36	ND(0.48)	6.8 J
Dioxins							
2,3,7,8-TCDD	ND(0.39)	ND(0.2)	ND(0.23)	ND(0.18)	ND(0.27)	ND(0.24)	ND(0.19)
TCDDs (total)	ND(0.52)	ND(0.2)	ND(0.4)	ND(0.18)	0.58	ND(0.24)	ND(0.22)
1,2,3,7,8-PeCDD	ND(0.96)	ND(0.38)	ND(0.73)	ND(0.33)	ND(0.61)	ND(0.52)	ND(0.38)
PeCDDs (total)	ND(0.96)	ND(0.38)	ND(2.2)	ND(0.33)	ND(1.6)	ND(0.69)	ND(1.1)
1,2,3,4,7,8-HxCDD	ND(0.59)	ND(0.31)	ND(0.53)	ND(0.22)	ND(0.5)	ND(0.34)	ND(0.31)
1,2,3,6,7,8-HxCDD	ND(0.52)	ND(0.27)	ND(1.4)	ND(0.2)	ND(1.4)	ND(0.31)	ND(1.1)
1,2,3,7,8,9-HxCDD	ND(0.53)	ND(0.29)	ND(1.1)	ND(0.2)	ND(1.1)	ND(0.32)	ND(0.66)
HxCDDs (total)	ND(1.3)	ND(0.31)	6.5	ND(0.38)	5	ND(0.34)	8
1,2,3,4,6,7,8-HpCDD	5.2 J	ND(0.35)	9.4	ND(0.92)	13	ND(0.43)	5.6
HpCDDs (total)	11	ND(0.35)	24	ND(1.1)	25	ND(0.43)	12
OCDD	48	ND(1.2)	55	7.5 J	84	ND(2.5)	32
Total TEQs (EPA 2010 TEFs)	2.9	0.44	12	0.59	8.9	0.56	3.1

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:
- I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
- J - Indicates that the associated numerical value is an estimated concentration.
- Q - Indicates the presence of quantitative interferences.
- X - Estimated maximum possible concentration.
- Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-BB18 0-1 06/22/04	RAA10-E-CC22 0-1 06/07/04	RAA10-E-DD14 0-1 02/22/05	RAA10-E-DD16 0-1 07/27/04	RAA10-E-DD22 0-1 09/07/04	RAA10-E-FF14 0-1 09/08/04	RAA10-E-FF18 0-1 09/08/04	RAA10-E-FF22 0-1 09/08/04	RAA10-E-HH16 0-1 09/09/04
Furans									
2,3,7,8-TCDF	ND(1.4) X	8 Y	34 Y	4 Y	5.1 Y	3.2 Y	1.7 Y	4.5 Y	2.7 YJ
TCDFs (total)	7.5	400 I	200	37 I	39	23	4.5	21	19
1,2,3,7,8-PeCDF	1.1 J	3.1 J	22	ND(1.4) X	2.3 J	ND(1.7)	ND(0.52)	ND(1.4)	1.3 J
2,3,4,7,8-PeCDF	1.5 J	100 J	32	3.5	4.5 J	ND(2.2)	ND(0.7)	ND(1.8)	2.7 J
PeCDFs (total)	26	810	250	52	50	9.3	ND(2.5)	5.8	38
1,2,3,4,7,8-HxCDF	6.5 J	6 J	61	5.1	4.4 J	ND(2.7)	ND(1.2)	ND(2.7)	2.3 J
1,2,3,6,7,8-HxCDF	2.4 J	14	38	1.8 J	2.2 J	ND(2.4)	ND(0.43)	ND(0.99)	1.8 J
1,2,3,7,8,9-HxCDF	ND(0.66)	3.6 JQ	ND(1.7)	0.65 J	0.9 J	ND(0.21)	ND(0.084)	ND(0.12)	ND(0.89)
2,3,4,6,7,8-HxCDF	0.94 J	34	18	3.2	3.2 J	ND(1.8)	ND(0.65)	ND(1)	2.8 J
HxCDFs (total)	30	470 Q	340	64	98	15	3.7	28	58
1,2,3,4,6,7,8-HpCDF	22	81	110	58	160	11	11	68	66
1,2,3,4,7,8,9-HpCDF	1.8 J	1.9 J	16	0.87 J	1.5 J	ND(0.96)	ND(0.31)	ND(0.62)	ND(0.74)
HpCDFs (total)	37	140	190	98	270	18	19	110	110
OCDF	27	36	56	26	84	ND(6)	ND(6.1)	31	32
Dioxins									
2,3,7,8-TCDD	ND(0.75) X	0.53 J	0.89 J	ND(0.13) X	ND(0.3) X	ND(0.13)	ND(0.12)	ND(0.11)	ND(0.39)
TCDDs (total)	ND(0.72)	7.9	4.9	1.1	ND(0.66)	ND(0.16)	ND(0.22)	ND(0.38)	ND(1)
1,2,3,7,8-PeCDD	ND(0.66)	3.1 J	ND(1.2)	ND(0.26)	ND(3.2) X	ND(0.46)	ND(0.29)	ND(0.27)	ND(0.74)
PeCDDs (total)	ND(0.66)	38	ND(3.5)	2.9	1.6 J	ND(0.47)	ND(0.29)	ND(0.68)	1.2 J
1,2,3,4,7,8-HxCDD	ND(0.66)	ND(1.7) X	ND(1.1)	0.35 J	ND(0.71)	ND(0.25)	ND(0.17)	ND(0.23)	ND(0.74)
1,2,3,6,7,8-HxCDD	ND(0.66)	7.2 J	ND(2.5)	0.97 J	2.1 J	ND(0.29)	ND(0.25)	ND(0.9)	ND(0.91) X
1,2,3,7,8,9-HxCDD	ND(0.66)	4.2 J	ND(2.6)	0.53 J	0.89 J	ND(0.26)	ND(0.14)	ND(0.41)	ND(0.74)
HxCDDs (total)	ND(0.66)	71	20	7	14	ND(1.2)	ND(0.84)	ND(2.2)	5.9 J
1,2,3,4,6,7,8-HpCDD	4.9 J	31	31	12	36	5 J	3.8 J	14	15
HpCDDs (total)	8.1	59	62	22	61	12	3.8	25	26
OCDD	36	210	220	120	350	98	31	130	140
Total TEQs (EPA 2010 TEFs)	2.9	43	30	4.1	8.4	1.8	0.89	2.6	3.9

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-HH20 0-1 12/15/04	RAA10-E-HH26 0-1 12/28/04	RAA10-E-II13 0-1 03/10/05	RAA10-E-JJ14 0-1 03/08/05	RAA10-E-JJ16 0-1 03/08/05	RAA10-E-JJ18 0-1 01/03/05	RAA10-E-JJ22 0-1 12/29/04	RAA10-E-JJ24 0-1 12/29/04
Furans								
2,3,7,8-TCDF	4.6 Y	12 Y	10 Y [12 Y]	110 Y	12 Y	2.4 YJ	1.5 J	3.3 Y
TCDFs (total)	36	110	200 [210]	3300 QI	220	39	9	23
1,2,3,7,8-PeCDF	2.2 J	4.8 J	5.6 J [5.9 J]	66	6.7 J	1.1 J	ND(0.71)	1.2 J
2,3,4,7,8-PeCDF	3.3 J	16	27 [30]	660	48	3.9 J	1.5 J	2.1 J
PeCDFs (total)	37	140	320 [340]	7000 QI	500	62	10	15
1,2,3,4,7,8-HxCDF	ND(3.4) X	15	14 [17]	290	21	2 J	1.4 J	2.3 J
1,2,3,6,7,8-HxCDF	ND(2) X	7.7 J	11 [13]	210	16	2.2 J	ND(0.8)	1.1 J
1,2,3,7,8,9-HxCDF	ND(1.9)	4.4 J	ND(3.9) X [ND(4.6)]	79	5.2 J	ND(1.4)	ND(1.1)	ND(1.2)
2,3,4,6,7,8-HxCDF	3.5 J	12	26 [24]	430	31	4.9 J	1.2 J	1.7 J
HxCDFs (total)	48	540	330 [330]	5700	430	84	42	60
1,2,3,4,6,7,8-HpCDF	58	1000	58 [60]	740	110	60	77	100
1,2,3,4,7,8,9-HpCDF	0.95 J	7.9 J	5.1 J [6.2 J]	110	6.1 J	0.81 J	0.72 J	0.93 J
HpCDFs (total)	98	1800	120 [130]	1700	200	100	130	180
OCDF	30	460	45 [52]	570	64	27	37	56
Dioxins								
2,3,7,8-TCDD	ND(0.9)	0.91 J	1.6 J [1.6 J]	5.3	ND(0.88) X	ND(0.51)	ND(0.36)	ND(0.4)
TCDDs (total)	ND(0.9)	1.4 J	8.8 [1.6 J]	130 Q	1.6 J	ND(0.87)	ND(0.81)	ND(0.79)
1,2,3,7,8-PeCDD	ND(0.84)	ND(2.5) X	ND(3.7) X [ND(3.1) X]	44	2.5 J	ND(0.72)	ND(0.71)	ND(0.74)
PeCDDs (total)	ND(0.84)	17	31 [28]	600	37	ND(0.72)	ND(0.71)	ND(0.74)
1,2,3,4,7,8-HxCDD	ND(1.1)	2.3 J	3.4 J [2.8 J]	34	2.4 J	ND(0.8)	ND(0.73)	ND(1)
1,2,3,6,7,8-HxCDD	1.3 J	13	7.2 J [8.2]	160	10	1 J	ND(1.2) X	1.6 J
1,2,3,7,8,9-HxCDD	ND(1)	4.2 J	5.5 J [5.3 J]	81	5.4 J	ND(0.77)	ND(0.71)	ND(1)
HxCDDs (total)	10	83	72 [63]	1400	90	5.4 J	4.4 J	6.9 J
1,2,3,4,6,7,8-HpCDD	19	260	64 [66]	690	56	17	19	28
HpCDDs (total)	38	440	130 [130]	1400	100	34	34	50
OCDD	220	2500	420 [420]	4600	410	220	190	280
Total TEQs (EPA 2010 TEFs)	4.9	36	22 [24]	420	31	4.7	3.3	4.7

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-JJ26 0-1 12/29/04	RAA10-E-LL17 0-1 06/08/07	RAA10-E-LL18 0-1 03/08/05	RAA10-E-LL24 0-1 01/03/05	RAA10-E-MM18 0-1 06/08/07	RAA10-E-MM20 0-1 07/12/04	RAA10-E-NN22 0-1 01/18/05	RAA10-E-NN26 0-1 01/04/05
Furans									
2,3,7,8-TCDF		11 Y	61 Y	78 Y	2.9 Y	84 Y [110 Y]	9.7 Y	6.7 Y	6.3 Y
TCDFs (total)		82	990 Q	1900 I	24	2700 QI [2500 Q]	120	70	110
1,2,3,7,8-PeCDF		4.4 J	29	40	1.4	41 [60 Q]	ND(5.4)	3 J	3.1 J
2,3,4,7,8-PeCDF		11	210	270	2.5	540 [370 Q]	13	7.8 J	14
PeCDFs (total)		94	2500 QI	3400 I	22	8100 J [4100 J]	170 QI	81	200
1,2,3,4,7,8-HxCDF		15	100	140	3	110 J [230 J]	22	6.2 J	6.7 J
1,2,3,6,7,8-HxCDF		6.3 J	68	100	1.5	210 [160]	7.2	3.5 J	8.1
1,2,3,7,8,9-HxCDF		3.5 J	19 Q	33	1	42 [55]	2.9 J	1.6 J	ND(2.3)
2,3,4,6,7,8-HxCDF		10	140	230	2	650 J [380 J]	11	7.1 J	22
HxCDFs (total)		460	2100 Q	3400	66	9300 J [5500 J]	290	160	370
1,2,3,4,6,7,8-HpCDF		880	550	1300	110	720 [860]	270	170	190
1,2,3,4,7,8,9-HpCDF		6.1 J	37	55	1.1	66 [88]	4 J	2.6 J	3.3 J
HpCDFs (total)		1500	1100	2300	180	1900 [2100]	480	300	350
OCDF		440	380	650	49	280 J [760 J]	150	88	100
Dioxins									
2,3,7,8-TCDD		0.82 J	3.7	3.9 J	0.43	2.8 Q [4.4 Q]	ND(1.4)	0.61 J	0.71 J
TCDDs (total)		1.8 J	46	50	0.9	73 J [130 J]	1.7 J	ND(1.5)	ND(0.99)
1,2,3,7,8-PeCDD		1.4 J	12	ND(31) X	0.72	3.8 J [ND(30) X]	ND(1.2)	ND(1.2)	1.3 J
PeCDDs (total)		11	150 Q	190	0.9	250 Q [290 Q]	6.6	6.9 J	5.1 J
1,2,3,4,7,8-HxCDD		1.9 J	8.6 J	17	0.79	18 [26]	ND(2.8)	ND(1.4) X	1.2 J
1,2,3,6,7,8-HxCDD		10	43	70	1.4	69 J [160 J]	4.4 J	3.4 J	ND(3.8) X
1,2,3,7,8,9-HxCDD		3.3 J	22	36	0.76	41 [66]	ND(2.4) X	1.7 J	ND(1.9) X
HxCDDs (total)		66	390	560	8.2	600 J [1000 J]	33	23	20
1,2,3,4,6,7,8-HpCDD		200	330	660	22	410 J [1800 J]	77	52	59
HpCDDs (total)		350	620	1200	37	790 J [3400 J]	140	88	100
OCDD		2100	2200	4900	180	2100 J [13000 E J]	720	460	500
Total TEQs (EPA 2010 TEFs)		30	140	210	5.3	310 [320]	17	11	15

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-OO23 0-1 07/13/04	RAA10-E-T18 0-1 06/11/04	RAA10-E-V16 0-1 06/15/04	RAA10-E-V19 0-1 06/04/04	RAA10-E-X18 0-1 06/16/04	RAA10-E-Z14 0-1 02/22/05	RAA10-E-Z16 0-1 06/21/04	RAA10-E-Z20 0-1 06/21/04
Furans									
2,3,7,8-TCDF		3.1 Y	2.9 Y	1.1 J	2.5 Y	1.9 J	600 Y	2.1 J	1.4 J [2 J]
TCDFs (total)		25	21	5.8	17	14	2300	63	7.6 J [15 J]
1,2,3,7,8-PeCDF		0.88 J	0.85 J	ND(0.65)	0.88 J	0.9 J	420	ND(0.8)	ND(0.62) [0.7 J]
2,3,4,7,8-PeCDF		2.8 J	2 J	0.86 J	2 J	1.4 J	470	12	0.71 J [1.3 J]
PeCDFs (total)		42	22	6.3 J	17	14	2700	110	6.2 J [22 J]
1,2,3,4,7,8-HxCDF		2.8 J	1.3 J	ND(0.65)	2.1 J	1.4 J	1100	1.8 J	ND(0.7) J [4.8 J]
1,2,3,6,7,8-HxCDF		1.6 J	ND(0.93) X	ND(0.65)	1.2 J	0.88 J	690 I	2.6 J	ND(0.62) [0.75 J]
1,2,3,7,8,9-HxCDF		ND(0.61) X	ND(0.7)	ND(0.65)	ND(0.61)	ND(0.64)	25	1 J	ND(0.62) [ND(0.64)]
2,3,4,6,7,8-HxCDF		3.2 J	1.1 J	ND(0.65)	1.3 J	0.96 J	240	5.1 J	ND(0.62) [0.81 J]
HxCDFs (total)		70	28	8.7	29	20	4200	67	14 J [27 J]
1,2,3,4,6,7,8-HpCDF		76	34	20	36	26	1200	14	22 [30]
1,2,3,4,7,8,9-HpCDF		0.97 J	ND(0.7)	ND(0.65)	0.72 J	ND(0.64)	390	ND(0.8)	ND(0.62) [ND(0.64)]
HpCDFs (total)		140	57	31	61	44	2300	23	37 [52]
OCDF		37	15	11 J	18	12 J	1000	7.2 J	9.2 J [14]
Dioxins									
2,3,7,8-TCDD		ND(0.22) X	ND(0.37)	ND(0.31)	ND(0.26)	ND(0.27)	8.4	ND(0.32)	ND(0.25) [ND(0.26)]
TCDDs (total)		ND(0.57)	ND(0.87)	ND(0.71)	ND(0.68)	ND(0.78)	53	ND(0.99)	ND(0.72) [ND(0.76)]
1,2,3,7,8-PeCDD		ND(0.6) X	ND(0.7)	ND(0.65)	ND(0.61)	ND(0.64)	9.3	ND(0.8)	ND(0.62) [ND(0.64)]
PeCDDs (total)		1.4 J	ND(0.7)	ND(0.95)	0.74 J	ND(1.1)	20	4.4 J	ND(0.62) [ND(0.64)]
1,2,3,4,7,8-HxCDD		ND(0.48)	ND(0.72) X	ND(0.65)	ND(0.61)	ND(0.64)	8.1 J	ND(0.8)	ND(0.62) [ND(0.64)]
1,2,3,6,7,8-HxCDD		1.4 J	ND(0.7)	ND(0.65)	0.72 J	0.66 J	17	1.8 J	ND(0.62) [0.67 J]
1,2,3,7,8,9-HxCDD		0.74 J	ND(0.7)	ND(0.65)	ND(0.61)	ND(0.64)	16	1.2 J	ND(0.62) [ND(0.64)]
HxCDDs (total)		9.2	2 J	ND(1.2)	2 J	1.6 J	170	14	1.5 J [1.4 J]
1,2,3,4,6,7,8-HpCDD		22	11	3.9 J	9.3	6.6	140	8	3.8 J [7.1 J]
HpCDDs (total)		39	20	6.8	16	12	280	13	6.6 J [12 J]
OCDD		200	110	29	66	49	1100	43	34 J [61 J]
Total TEQs (EPA 2010 TEFs)		4.3	2.7	1.4	2.6	2.1	460	6.1	1.4 [2.5]

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	UFP2-R1 0-0.5 12/16/96	UFP2-R1 0.5-1 12/16/96	RAA10-E-DD16 1-3 07/27/04	RAA10-E-DD20 1-3 06/22/04	RAA10-E-FF14 1-3 09/08/04	RAA10-E-KKLL19.5 1-3 03/31/05	RAA10-E-LL24 1-3 01/03/05	RAA10-E-NN26 1-3 01/04/05
Furans									
2,3,7,8-TCDF		120000 Y	180 Y	0.17 J	0.61 J	ND(0.54)	ND(0.54) Y	ND(0.4)	0.69 J [0.94 J]
TCDFs (total)		1700000	2400	0.32 J	1.6 J	ND(0.53)	ND(0.35)	ND(0.4)	1.5 J [2.7 J]
1,2,3,7,8-PeCDF		69000 J	90	ND(0.27)	ND(0.63)	ND(0.19)	ND(0.64)	ND(0.6)	ND(0.74) [ND(0.72)]
2,3,4,7,8-PeCDF		140000	200	ND(0.27)	ND(0.63)	ND(0.29)	ND(0.68)	ND(0.6)	ND(0.74) [ND(0.72)]
PeCDFs (total)		5500000	6700	ND(0.27)	0.69 J	ND(1.4)	ND(3.3)	ND(0.6)	2.5 J [3.4 J]
1,2,3,4,7,8-HxCDF		280000	ND(380) V	ND(0.27)	ND(0.63)	ND(0.88)	ND(0.85)	ND(0.6)	ND(0.74) [ND(0.72)]
1,2,3,6,7,8-HxCDF		170000	180	ND(0.27)	ND(0.63)	ND(0.48)	ND(0.85)	ND(0.6)	ND(0.74) [ND(0.72)]
1,2,3,7,8,9-HxCDF		ND(5800)	ND(9.7)	ND(0.27)	ND(0.63)	ND(0.1)	ND(0.93)	ND(0.6)	ND(0.74) [ND(0.72)]
2,3,4,6,7,8-HxCDF		220000	190	ND(0.27)	ND(0.63)	ND(0.44)	ND(0.91)	ND(0.6)	ND(0.74) [ND(0.72)]
HxCDFs (total)		6200000	5100	ND(0.27)	1.4 J	ND(2)	12	ND(0.6)	4.1 J [2.7 J]
1,2,3,4,6,7,8-HpCDF		1100000	930	ND(0.27)	3.2 J	ND(2.2)	16 J	0.71 J	3.3 J [3.5 J]
1,2,3,4,7,8,9-HpCDF		110000 J	160	ND(0.27)	ND(0.63)	ND(0.24)	ND(0.39)	ND(0.6)	ND(0.74) [ND(0.72)]
HpCDFs (total)		3100000	2700	ND(0.27)	4.9 J	ND(2.2)	27	0.71 J	5.2 J [5.9 J]
OCDF		1200000	850	ND(0.54)	1.6 J	ND(1.1)	ND(9.5)	ND(1.2)	ND(1.8) [2.6 J]
Dioxins									
2,3,7,8-TCDD		ND(5100)	7.6	ND(0.11)	ND(0.25)	ND(0.12)	ND(0.41)	ND(0.54)	ND(0.46) [ND(0.44)]
TCDDs (total)		33000	97	ND(0.34)	ND(0.68)	ND(1)	ND(0.41)	ND(0.54)	ND(0.93) [ND(0.8)]
1,2,3,7,8-PeCDD		ND(27000)	47	ND(0.27)	ND(0.63)	ND(0.29)	ND(0.79)	ND(0.6)	ND(0.74) [ND(0.72)]
PeCDDs (total)		ND(48000)	350	ND(0.38)	ND(1.1)	ND(0.29)	ND(0.79)	ND(1.1)	ND(1.2) [ND(1.3)]
1,2,3,4,7,8-HxCDD		ND(31000)	59	ND(0.27)	ND(0.63)	ND(0.1)	ND(0.79)	ND(0.92)	ND(0.84) [ND(0.82)]
1,2,3,6,7,8-HxCDD		170000	270	ND(0.27)	ND(0.63)	ND(0.068)	ND(0.74)	ND(0.82)	ND(0.74) [ND(0.73)]
1,2,3,7,8,9-HxCDD		79000 J	110	ND(0.27)	ND(0.63)	ND(0.15)	ND(0.7)	ND(0.89)	ND(0.8) [ND(0.79)]
HxCDDs (total)		970000	1600	ND(0.47)	ND(0.63)	ND(0.37)	ND(0.79)	ND(0.88)	ND(0.79) [ND(0.78)]
1,2,3,4,6,7,8-HpCDD		2900000	3200	ND(0.27)	1.1 J	ND(1.5)	6.3 J	ND(0.63)	1.6 J [1.6 J]
HpCDDs (total)		5400000	6300	ND(0.27)	1.1 J	ND(2.5)	6.3	ND(0.63)	2.8 J [2.7 J]
OCDD		25000000	28000 E	2.1 J	7.7 J	30	53 J	4.1 J	10 J [10 J]
Total TEQs (EPA 2010 TEFs)		290000	370	0.36	0.9	0.5	1.4	0.97	1.1 [1.1]

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Sample ID:	RAA10-E-X16	RAA10-E-Z14	RAA10-E-DD16	RAA10-E-DD20	RAA10-E-FF14	RAA10-E-FF18	RAA10-E-FF18	RAA10-E-HH24	RAA10-E-HH24
Sample Depth(Feet):	1-3	1-3	6-15	3-6	3-6	3-6	6-15	3-6	6-15
Parameter Date Collected:	06/15/04	02/22/05	07/27/04	06/22/04	09/08/04	09/08/04	09/08/04	12/28/04	12/28/04
Furans									
2,3,7,8-TCDF	0.34 J	1100 Y	0.096 J	0.28 J	ND(0.15) [ND(0.12)]	ND(0.091)	ND(0.077)	ND(0.42) X	ND(0.42)
TCDFs (total)	0.34 J	4000	0.096 J	0.28 J	ND(0.15) [ND(0.14)]	ND(0.091)	ND(0.077)	ND(0.28)	ND(0.42)
1,2,3,7,8-PeCDF	ND(0.56)	640	ND(0.18)	ND(0.63)	ND(0.12) [ND(0.13)]	ND(0.08)	ND(0.069)	ND(0.66)	ND(0.84)
2,3,4,7,8-PeCDF	ND(0.56)	810	ND(0.18)	ND(0.63)	ND(0.12) [ND(0.13)]	ND(0.08)	ND(0.069)	ND(0.66)	ND(0.84)
PeCDFs (total)	ND(0.56)	5100	ND(0.18)	ND(0.63)	ND(0.12) [ND(0.13)]	ND(0.082)	ND(0.08)	ND(0.66)	ND(0.84)
1,2,3,4,7,8-HxCDF	ND(0.56)	1800	ND(0.18)	ND(0.63)	ND(0.18) [ND(0.086)]	ND(0.079)	ND(0.043)	ND(0.66)	ND(0.84)
1,2,3,6,7,8-HxCDF	ND(0.56)	1300	ND(0.18)	ND(0.63)	ND(0.077) [ND(0.037)]	ND(0.025)	ND(0.024)	ND(0.66)	ND(0.84)
1,2,3,7,8,9-HxCDF	ND(0.56)	ND(26)	ND(0.18)	ND(0.63)	ND(0.09) [ND(0.045)]	ND(0.03)	ND(0.026)	ND(0.66)	ND(0.84)
2,3,4,6,7,8-HxCDF	ND(0.56)	360	ND(0.18)	ND(0.63)	ND(0.18) [ND(0.04)]	ND(0.027)	ND(0.023)	ND(0.66)	ND(0.84)
HxCDFs (total)	ND(0.56)	7300	ND(0.18)	ND(0.63)	ND(0.19) [ND(0.086)]	ND(0.079)	ND(0.043)	ND(0.66)	ND(0.84)
1,2,3,4,6,7,8-HpCDF	ND(0.56)	1900	ND(0.18)	ND(0.63)	ND(0.34) [ND(0.17)]	ND(0.16)	ND(0.064)	2.2 J	ND(0.84)
1,2,3,4,7,8,9-HpCDF	ND(0.56)	550	ND(0.18)	ND(0.63)	ND(0.11) [ND(0.057)]	ND(0.059)	ND(0.08)	ND(0.7)	ND(0.84)
HpCDFs (total)	ND(0.56)	3300	ND(0.18)	ND(0.63)	ND(0.34) [ND(0.17)]	ND(0.16)	ND(0.08)	3.8 J	ND(0.84)
OCDF	ND(1.1)	1400	ND(0.37)	ND(1.2)	ND(0.71) [ND(0.19)]	ND(0.18)	ND(0.13)	1.7 J	ND(1.7)
Dioxins									
2,3,7,8-TCDD	ND(0.22)	ND(5.2)	ND(0.076)	ND(0.25)	ND(0.11) [ND(0.1)]	ND(0.093)	ND(0.083)	ND(0.27)	ND(0.41)
TCDDs (total)	ND(0.6)	24	ND(0.21)	ND(0.79)	ND(0.11) [ND(0.1)]	ND(0.093)	ND(0.083)	ND(0.78)	ND(0.83)
1,2,3,7,8-PeCDD	ND(0.56)	ND(12)	ND(0.18)	ND(0.63)	ND(0.25) [ND(0.18)]	ND(0.15)	ND(0.15)	ND(0.66)	ND(0.84)
PeCDDs (total)	ND(0.76)	ND(22)	ND(0.18)	ND(0.63)	ND(0.25) [ND(0.18)]	ND(0.15)	ND(0.15)	ND(0.66)	ND(0.84)
1,2,3,4,7,8-HxCDD	ND(0.56)	ND(11)	ND(0.18)	ND(0.63)	ND(0.13) [ND(0.069)]	ND(0.079)	ND(0.11)	ND(0.66)	ND(0.84)
1,2,3,6,7,8-HxCDD	ND(0.56)	ND(20)	ND(0.18)	ND(0.63)	ND(0.1) [ND(0.055)]	ND(0.063)	ND(0.087)	ND(0.66)	ND(0.84)
1,2,3,7,8,9-HxCDD	ND(0.56)	ND(18)	ND(0.18)	ND(0.63)	ND(0.14) [ND(0.094)]	ND(0.067)	ND(0.09)	ND(0.66)	ND(0.84)
HxCDDs (total)	ND(1)	170	ND(0.28)	ND(1)	ND(0.15) [ND(0.2)]	ND(0.16)	ND(0.15)	ND(1.2)	ND(1.6)
1,2,3,4,6,7,8-HpCDD	ND(0.56)	150	ND(0.18)	ND(0.63)	ND(0.44) [ND(0.29)]	ND(0.11)	ND(0.082)	ND(1.2)	1 J
HpCDDs (total)	ND(0.56)	310	ND(0.18)	ND(0.63)	ND(0.44) [ND(0.29)]	ND(0.11)	ND(0.15)	ND(1.2)	1 J
OCDD	1.2 J	520	0.41 J	3.5 J	ND(2.4) [ND(2.6)]	ND(0.79)	ND(0.57)	7.9 J	3.2 J
Total TEQs (EPA 2010 TEFs)	0.73	760	0.23	0.81	0.26 [0.2]	0.16	0.15	0.89	1.1

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-KKLL19.5 3-6 03/31/05	RAA10-E-KKLL19.5 6-15 03/31/05	RAA10-E-LL24 6-15 01/03/05	RAA10-E-NN26 3-6 01/04/05	RAA10-E-T16 6-15 06/18/04	RAA10-E-X15 6-15 07/27/04	RAA10-E-X16 3-6 06/15/04
Furans								
2,3,7,8-TCDF		ND(0.8)	ND(0.63)	ND(0.32)	ND(0.32)	ND(0.42)	ND(0.15) X	ND(0.36)
TCDFs (total)		ND(0.8)	ND(0.63)	ND(0.32)	ND(0.32)	ND(0.42)	0.37 JQ	ND(0.36)
1,2,3,7,8-PeCDF		ND(0.53)	ND(0.47)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
2,3,4,7,8-PeCDF		ND(0.52)	ND(0.46)	ND(0.75)	ND(0.65)	ND(1)	0.36 J	ND(0.74)
PeCDFs (total)		ND(1.5)	ND(0.49)	ND(0.75)	ND(0.65)	ND(1)	1 JQ	ND(0.74)
1,2,3,4,7,8-HxCDF		ND(1.1)	ND(0.57)	ND(0.75)	ND(0.7)	ND(1)	ND(0.27)	ND(0.74)
1,2,3,6,7,8-HxCDF		ND(1.1)	ND(0.57)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
1,2,3,7,8,9-HxCDF		ND(1.2)	ND(0.63)	ND(0.75)	ND(0.81)	ND(1)	ND(0.27)	ND(0.74)
2,3,4,6,7,8-HxCDF		ND(1.2)	ND(0.62)	ND(0.75)	ND(0.68)	ND(1)	ND(0.27)	ND(0.74)
HxCDFs (total)		ND(3.3)	ND(0.63)	ND(0.75)	ND(0.69)	ND(1)	1.1 J	ND(0.74)
1,2,3,4,6,7,8-HpCDF		6.9	ND(0.41)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
1,2,3,4,7,8,9-HpCDF		ND(0.33)	ND(0.28)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
HpCDFs (total)		12	ND(0.41)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
OCDF		ND(4.4)	ND(0.82)	ND(1.5)	ND(1.3)	ND(2.1)	ND(0.54)	ND(1.5)
Dioxins								
2,3,7,8-TCDD		ND(0.45)	ND(0.41)	ND(0.51)	ND(0.39)	ND(0.46)	ND(0.11)	ND(0.45)
TCDDs (total)		ND(0.45)	ND(0.41)	ND(0.89)	ND(1)	ND(1.1)	ND(0.33)	ND(0.71)
1,2,3,7,8-PeCDD		ND(1.4)	ND(0.9)	ND(0.75)	ND(0.65)	ND(1)	ND(0.27)	ND(0.74)
PeCDDs (total)		ND(1.4)	ND(0.9)	ND(1.2)	ND(1.2)	ND(1.7)	ND(0.42)	ND(1)
1,2,3,4,7,8-HxCDD		ND(1.2)	ND(0.73)	ND(0.87)	ND(1.3)	ND(1)	ND(0.27)	ND(0.74)
1,2,3,6,7,8-HxCDD		ND(1.1)	ND(0.68)	ND(0.77)	ND(1.2)	ND(1)	ND(0.27)	ND(0.74)
1,2,3,7,8,9-HxCDD		ND(1.1)	ND(0.66)	ND(0.83)	ND(1.2)	ND(1)	ND(0.27)	ND(0.74)
HxCDDs (total)		ND(1.2)	ND(0.73)	ND(1.1)	ND(1.2)	ND(1)	ND(0.49)	ND(1.3)
1,2,3,4,6,7,8-HpCDD		3.6 J	ND(0.41)	ND(0.92)	ND(0.85)	ND(1)	0.28 J	ND(0.95)
HpCDDs (total)		3.6	ND(0.41)	ND(0.92)	ND(0.85)	ND(1)	0.28 J	ND(0.95)
OCDD		23	ND(2.6)	2.5 J	3.8 J	ND(4)	2 J	5.6 J
Total TEQs (EPA 2010 TEFs)		1.6	1	1.1	0.99	1.3	0.42	1

TABLE C-14
SUMMARY OF DIOXIN/FURAN SOIL SAMPLE DATA
PARCEL L12-2-1

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-X18 3-6 06/16/04	RAA10-E-X18 6-15 06/16/04	RAA10-E-Z14 3-6 02/22/05	RAA10-E-Z16 6-15 06/21/04	RAA10-E-Z20 6-15 06/21/04
Furans						
2,3,7,8-TCDF		ND(0.23) X	ND(0.23)	780 Y	ND(0.23)	ND(0.2)
TCDFs (total)		ND(0.21)	ND(0.23)	3200	ND(0.23)	ND(0.2)
1,2,3,7,8-PeCDF		ND(0.53)	ND(0.58)	520	ND(0.58)	ND(0.51)
2,3,4,7,8-PeCDF		ND(0.53)	ND(0.58)	630	ND(0.58)	ND(0.51)
PeCDFs (total)		ND(0.53)	ND(0.58)	3500	ND(0.58)	ND(0.51)
1,2,3,4,7,8-HxCDF		ND(0.53)	ND(0.58)	1500	ND(0.58)	ND(0.51)
1,2,3,6,7,8-HxCDF		ND(0.53)	ND(0.58)	900	ND(0.58)	ND(0.51)
1,2,3,7,8,9-HxCDF		ND(0.53)	ND(0.58)	ND(28)	ND(0.58)	ND(0.51)
2,3,4,6,7,8-HxCDF		ND(0.53)	ND(0.58)	280	ND(0.58)	ND(0.51)
HxCDFs (total)		ND(0.53)	ND(0.58)	5100	ND(0.58)	ND(0.51)
1,2,3,4,6,7,8-HpCDF		ND(0.53)	ND(0.58)	1400	ND(0.58)	ND(0.51)
1,2,3,4,7,8,9-HpCDF		ND(0.53)	ND(0.58)	400	ND(0.58)	ND(0.51)
HpCDFs (total)		ND(0.53)	ND(0.58)	2400	ND(0.58)	ND(0.51)
OCDF		ND(1.1)	ND(1.2)	940	ND(1.2)	ND(1)
Dioxins						
2,3,7,8-TCDD		ND(0.23)	ND(0.23)	ND(4.4)	ND(0.23)	ND(0.2)
TCDDs (total)		ND(0.64)	ND(0.74)	17	ND(0.72)	ND(0.63)
1,2,3,7,8-PeCDD		ND(0.53)	ND(0.58)	ND(10)	ND(0.58)	ND(0.51)
PeCDDs (total)		ND(0.8)	ND(0.84)	ND(18)	ND(0.99)	ND(0.76)
1,2,3,4,7,8-HxCDD		ND(0.53)	ND(0.58)	ND(8.6)	ND(0.58)	ND(0.51)
1,2,3,6,7,8-HxCDD		ND(0.53)	ND(0.58)	ND(15)	ND(0.58)	ND(0.51)
1,2,3,7,8,9-HxCDD		ND(0.53)	ND(0.58)	ND(13)	ND(0.58)	ND(0.51)
HxCDDs (total)		ND(0.95)	ND(0.97)	140	ND(1.1)	ND(0.85)
1,2,3,4,6,7,8-HpCDD		ND(0.53)	ND(0.58)	120	ND(0.58)	ND(0.51)
HpCDDs (total)		ND(0.53)	ND(0.58)	240	ND(0.58)	ND(0.51)
OCDD		1.3 J	ND(1.2)	370	ND(1.35)	ND(1.78)
Total TEQs (EPA 2010 TEFs)		0.68	0.73	580	0.73	0.64

Notes:
1. Samples were collected by GE subcontractors and submitted for analysis of Appendix IX+3 constituents.
2. ND - Analyte was not detected. The number in parentheses is the associated detection limit.
3. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:
I - Polychlorinated Diphenyl Ether (PCDPE) Interference.
J - Indicates that the associated numerical value is an estimated concentration.
Q - Indicates the presence of quantitative interferences.
X - Estimated maximum possible concentration.
Y - 2,3,7,8-TCDF results have been confirmed on a DB-225 column.

ARCADIS

Evaluation Tables

TABLE C-1A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-2
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-A18	RAA10-W-B17	RAA10-W-C15	RAA10-W-D12	RAA10-W-D20	RAA10-W-E8
	Sample ID:	RAA10-W-A18	RAA10-W-B17	RAA10-W-C15	RAA10-W-D12	RAA10-W-D20	RAA10-W-E8
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	09/02/03	09/03/03	09/02/03	08/12/03	09/30/03	05/30/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		1.3	2.3	0.83	1.6	6.3	1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-E9	RAA10-W-E10	RAA10-W-F13	RAA10-W-G4	RAA10-W-G5	RAA10-W-G7
	Sample ID:	RAA10-W-E9	RAA10-W-E10	RAA10-W-F13	RAA10-W-G4	RAA10-W-G5	RAA10-W-G7
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	05/30/03	08/12/03	05/28/03	03/05/04	07/22/08	03/08/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		1.2	0.55	0.36	1.2	1	0.63

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-G21	RAA10-W-H6	RAA10-W-H9	RAA10-W-H15	RAA10-W-I2	RAA10-W-I4
	Sample ID:	RAA10-W-G21	RAA10-W-H6	RAA10-W-H9	RAA10-W-H15	RAA10-W-I2	RAA10-W-I4
	Sample Depth(Feet):	0-1	0-1	0-1	1-6	0-1	0-1
Parameter	Date Collected:	09/24/03	07/24/08	03/08/04	05/28/03	03/05/04	07/23/08
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		2.4	21	0.55	0.73	2.1	0.65

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-I7	RAA10-W-I10	RAA10-W-I21	RAA10-W-J4	RAA10-W-J21	RAA10-W-K8
	Sample ID:	RAA10-W-I7	RAA10-W-I10	RAA10-W-I21	RAA10-W-J4	RAA10-W-J21	RAA10-W-K8
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	03/09/04	08/19/03	05/29/03	03/09/04	08/26/03	03/09/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		49	8.6	18	0.32	34	1.8

TABLE C-1A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-2
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-K18 / RAA10-W-K18 / 0-1 / 08/25/03	RAA10-W-K19 / RAA10-W-K19 / 0-1 / 08/25/03	RAA10-W-L11 / RAA10-W-L11 / 0-1 / 03/08/04	RAA10-W-L20 / RAA10-W-L20 / 0-1 / 10/01/03	RAA10-W-M7 / RAA10-W-M7 / 0-1 / 07/25/08	RAA10-W-M8 / RAA10-W-M8 / 0-1 / 03/09/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		16	22	0.6	72	0.84	0.66

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-M15 / RAA10-W-M15 / 0-1 / 08/18/03	RAA10-W-N13 / RAA10-W-N13 / 0-1 / 09/23/03	RAA10-W-N17 / RAA10-W-N17 / 0-1 / 09/23/03	RAA10-W-P8 / RAA10-W-P8 / 0-1 / 07/25/08	RAA10-W-P9 / RAA10-W-P9 / 0-1 / 03/10/04	RAA10-W-R13 / RAA10-W-R13 / 0-1 / 03/10/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		1.7	1	3.9	5.2	3.1	3.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-S11 / RAA10-W-S11 / 0-1 / 03/10/04	RAA10-W-T12 / RAA10-W-T12 / 0-1 / 08/25/08	UB-SS-1 / UB-SS-1 / 0-0.5 / 03/04/97	UB-SS-3 / UB-SS-3 / 0-0.5 / 03/04/97	UB-SS-4 / UB-SS-4 / 0-0.5 / 03/04/97
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)		5	3.3	180	240	340

Parameter	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	340	--	3,000	No

TABLE C-1A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-2
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-A18	RAA10-W-B17	RAA10-W-C15	RAA10-W-D19	RAA10-W-D19	RAA10-W-E8
	Sample ID:	RAA10-W-A18	RAA10-W-B17	RAA10-W-C15	RAA10-W-D19	RAA10-W-D19	RAA10-W-E8
	Sample Depth(Feet):	1-6	6-15	6-15	1-6	6-15	1-6
Parameter	Date Collected:	09/02/03	09/03/03	09/02/03	05/29/03	05/29/03	05/30/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		0.34	0.32	0.29	3.1	2.9	0.85

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-E9	RAA10-W-E13	RAA10-W-F6	RAA10-W-F13	RAA10-W-G5	RAA10-W-G21
	Sample ID:	RAA10-W-E9	RAA10-W-E13	RAA10-W-F6	RAA10-W-F13	RAA10-W-G5	RAA10-W-G21
	Sample Depth(Feet):	6-10	1-6	6-15	6-15	1-6	1-6
Parameter	Date Collected:	05/30/03	08/19/03	03/05/04	05/28/03	07/22/08	09/24/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		0.93	0.46	1.3	0.33	0.75	0.38

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-H3	RAA10-W-H6	RAA10-W-H9	RAA10-W-H15	RAA10-W-I2	RAA10-W-I2
	Sample ID:	RAA10-W-H3	RAA10-W-H6	RAA10-W-H9	RAA10-W-H15	RAA10-W-I2	RAA10-W-I2
	Sample Depth(Feet):	1-6	6-12	6-15	6-15	1-6	6-15
Parameter	Date Collected:	07/22/08	07/24/08	03/08/04	05/28/03	03/05/04	03/05/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		0.74	0.75	0.33	0.32	0.46	0.91

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-W-I4	RAA10-W-I7	RAA10-W-I21	RAA10-W-I22	RAA10-W-J2	RAA10-W-J4
	Sample ID:	RAA10-W-I4	RAA10-W-I7	RAA10-W-I21	RAA10-W-I22	RAA10-W-J2	RAA10-W-J4
	Sample Depth(Feet):	1-6	1-6	6-15	1-6	6-15	1-6
Parameter	Date Collected:	07/23/08	03/09/04	05/29/03	09/25/03	07/22/08	03/09/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		0.63	0.49	4	2.3	1.4	0.78

TABLE C-1A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-2
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Location ID:	RAA10-W-J4	RAA10-W-J5	RAA10-W-J10	RAA10-W-J21	RAA10-W-K8	RAA10-W-K11
Sample ID:	RAA10-W-J4	RAA10-W-J5	RAA10-W-J10	RAA10-W-J21	RAA10-W-K8	RAA10-W-K11
Sample Depth(Feet):	6-15	1-6	6-15	6-15	6-15	1-6
Parameter / Date Collected:	03/09/04	07/25/08	03/08/04	08/26/03	03/09/04	08/19/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.54	0.67	0.51	0.22	0.46	0.36

Location ID:	RAA10-W-K11	RAA10-W-K17	RAA10-W-K19	RAA10-W-L19	RAA10-W-M7	RAA10-W-M8
Sample ID:	RAA10-W-K11	RAA10-W-K17	RAA10-W-K19	RAA10-W-L19	RAA10-W-M7	RAA10-W-M8
Sample Depth(Feet):	6-11	1-6	1-6	6-15	6-15	1-6
Parameter / Date Collected:	08/19/03	08/20/03	08/25/03	09/23/03	07/25/08	03/09/04
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.29	0.29	1.2	0.48	0.68	2.5

Location ID:	RAA10-W-M8	RAA10-W-M15	RAA10-W-M15	RAA10-W-N8	RAA10-W-N18	RAA10-W-P9
Sample ID:	RAA10-W-M8	RAA10-W-M15	RAA10-W-M15	RAA10-W-N8	RAA10-W-N18	RAA10-W-P9
Sample Depth(Feet):	6-15	1-6	6-12	1-6	1-6	6-11
Parameter / Date Collected:	03/09/04	08/18/03	08/18/03	07/25/08	10/01/03	03/10/04
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	1.1	0.32	0.33	0.73	0.31	0.42

Location ID:	RAA10-W-R13	RAA10-W-S11	RAA10-W-S11	RF-14	RF-15	UB-MW-5
Sample ID:	RAA10-W-R13	RAA10-W-S11	RAA10-W-S11	PG14B1012	PG15B1416	UBW050204
Sample Depth(Feet):	6-15	1-6	6-15	10-12	14-16	2-4
Parameter / Date Collected:	03/10/04	03/10/04	03/10/04	06/10/91	06/17/91	10/30/96
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	1	0.92	3	48	29	0.49

TABLE C-1A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-2
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Parameter / Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	UB-MW-7 UBW071416 14-16 08/02/96	UB-MW-8 UBW080810 8-10 08/03/96	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	93	0.36	93	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-2A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-8
SCENARIO: COMMERCIAL BUT EVALUATED AS RESIDENTIAL

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-P15 / 0-1 / 03/25/04	RAA10-W-Q15 / 0-1 / 03/26/04	RAA10-W-R15 / 0-1 / 03/26/04
Dioxin/Furans				
Total TEQs (EPA 2010 TEFs)		5.7	12	5.6

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxin/Furans					
Total TEQs (EPA 2010 TEFs)		12	--	120	No

1- TO X-FOOT [X=15] DEPTH INCREMENT

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-P15 / 1-3 / 03/25/04	RAA10-W-P15 / 3-6 / 03/25/04	RAA10-W-P15 / 6-15 / 03/25/04	RAA10-W-R15 / 1-3 / 03/26/04	RAA10-W-R15 / 3-6 / 03/26/04	RAA10-W-R15 / 6-15 / 03/26/04
Dioxin/Furans							
Total TEQs (EPA 2010 TEFs)		0.72	0.62	2	0.96	0.73	0.67

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxin/Furans					
Total TEQs (EPA 2010 TEFs)		2	--	120	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-3A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K11-7-9
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-O16 0-1 04/09/04	RAA10-W-P16 0-1 04/09/04	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	11	5	11	--	3,000	No

1- TO 15-FOOT DEPTH INCREMENT

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-W-O16 1-3 04/09/04	RAA10-W-O16 3-6 04/09/04	RAA10-W-O16 6-15 04/09/04	RAA10-W-P17 1-3 04/09/04	RAA10-W-P17 3-6 04/09/04	RAA10-W-P17 6-15 04/09/04
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.69	0.53	0.6	0.91	0.62	0.67

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	0.91	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	51G-01	MG-01	RAA10-N-AA2	RAA10-N-AA10	RAA10-N-AA14	RAA10-N-AA18
	Sample ID:	51G-01	MG-01	RAA10-N-AA2	RAA10-N-AA10	RAA10-N-AA14	RAA10-N-AA18
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	08/27/02	08/29/02	10/29/03	10/24/03	10/02/03	10/01/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		20	2.7	20	8.6	13	2.8

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-CC4	RAA10-N-CC8	RAA10-N-CC14	RAA10-N-CC20	RAA10-N-EE3	RAA10-N-EE5
	Sample ID:	RAA10-N-CC4	RAA10-N-CC8	RAA10-N-CC14	RAA10-N-CC20	RAA10-N-EE3	RAA10-N-EE5
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	10/28/03	10/24/03	10/23/03	10/02/03	10/29/03	10/28/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		1.2	5.1	4.4	9	9.7	5

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-EE8	RAA10-N-EE14	RAA10-N-EE18	RAA10-N-GG4	RAA10-N-GG4	RAA10-N-GG6
	Sample ID:	RAA10-N-EE8	RAA10-N-EE14	RAA10-N-EE18	RAA10-N-GG4	RAA10-N-GG4	RAA10-N-GG6
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	1-6	0-1
Parameter	Date Collected:	10/24/03	11/10/03	10/02/03	10/28/03	10/28/03	11/12/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		7	2.1	10	5.5	4.1	12

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-GG18	RAA10-N-GG22	RAA10-N-II5	RAA10-N-II7	RAA10-N-II10	RAA10-N-II16
	Sample ID:	RAA10-N-GG18	RAA10-N-GG22	RAA10-N-II5	RAA10-N-II7	RAA10-N-II10	RAA10-N-II16
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	10/14/03	10/14/03	10/28/03	10/17/03	10/17/03	10/07/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		1.3	0.73	2	2	1.6	36

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-II18	RAA10-N-II20	RAA10-N-JJ20	RAA10-N-KK5	RAA10-N-KK10	RAA10-N-KK18
	Sample ID:	RAA10-N-II18	RAA10-N-II20	RAA10-N-JJ20	RAA10-N-KK5	RAA10-N-KK10	RAA10-N-KK18
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	10/02/03	10/14/03	10/02/03	10/23/03	10/08/03	10/03/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		4.7	1.2	53	4.3	1.2	2.1

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-LL6	RAA10-N-LL12	RAA10-N-LL20	RAA10-N-M7	RAA10-N-MM7	RAA10-N-MM18
	Sample ID:	RAA10-N-LL6	RAA10-N-LL12	RAA10-N-LL20	RAA10-N-M7	RAA10-N-MM7	RAA10-N-MM18
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	10/31/03	10/07/03	10/20/03	11/13/03	10/31/03	10/31/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		6.4	2.2	17	57	16	3.4

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-NN12	RAA10-N-O5	RAA10-N-OO7	RAA10-N-OO16	RAA10-N-PP8	RAA10-N-PP12
	Sample ID:	RAA10-N-NN12	RAA10-N-O5	RAA10-N-OO7	RAA10-N-OO16	RAA10-N-PP8	RAA10-N-PP12
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	10/07/03	03/02/04	10/22/03	10/22/03	10/16/03	10/16/03
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		4	17	11	5.1	1.2	15

Parameter	Location ID : / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID :	RAA10-N-Q7	RAA10-N-RR10	RAA10-N-S1	RAA10-N-S2	RAA10-N-U6	RAA10-N-W1
	Sample ID:	RAA10-N-Q7	RAA10-N-RR10	RAA10-N-S1	RAA10-N-S2	RAA10-N-U6	RAA10-N-W1
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	03/03/04	10/22/03	03/01/04	03/01/04	03/02/04	03/01/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		11	2,300	10	0.61	4.2	1.2

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-N-W5 / RAA10-N-W5 / 0-1 / 10/30/03	RAA10-N-W7 / RAA10-N-W7 / 0-1 / 03/03/04	RAA10-N-Y6 / RAA10-N-Y6 / 0-1 / 11/11/03	RAA10-N-Y18 / RAA10-N-Y18 / 0-1 / 10/23/03	UB-SB-12 / UBB120002 / 0-2 / 07/30/96	UB-SS-5 / UB-SS-5 / 0-0.5 / 03/04/97
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	1.8	4.3	0.69	9.1	4.1	250

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	UB-SS-7 / UB-SS-7 / 0-0.5 / 03/04/97	UB-SS-8 / UB-SS-8 / 0-0.5 / 03/04/97	UB-SS-9 / UB-SS-9 / 0-0.5 / 03/04/97
Dioxins/Furans			
Total TEQs (EPA 2010 TEFs)	220	210	280

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	2,300	--	3,000	No

1- TO 15-FOOT DEPTH INCREMENT

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	60G-01 / 60G-01 / 1-6 / 08/27/02	60G-02 / 60G-02 / 6-15 / 08/27/02	MG-02 / MG-02 / 1-6 / 08/29/02	RAA10-N-AA2 / RAA10-N-AA2 / 6-15 / 10/29/03	RAA10-N-AA6 / RAA10-N-AA6 / 6-15 / 11/11/03	RAA10-N-AA10 / RAA10-N-AA10 / 1-6 / 10/24/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	2.9	7.3	0.61	0.26	0.74	1.4

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Location ID :	RAA10-N-CC3	RAA10-N-CC8	RAA10-N-CC14	RAA10-N-EE18	RAA10-N-GG4	RAA10-N-GG20
Sample ID:	RAA10-N-CC3	RAA10-N-CC8	RAA10-N-CC14	RAA10-N-EE18	RAA10-N-GG4	RAA10-N-GG20
Sample Depth(Feet):	6-15	6-15	6-15	6-15	6-15	1-6
Parameter / Date Collected:	10/29/03	10/24/03	10/23/03	10/02/03	10/28/03	10/14/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.19	0.84	0.35	13	0.58	3.5

Location ID :	RAA10-N-GG20	RAA10-N-II5	RAA10-N-II7	RAA10-N-II10	RAA10-N-II10	RAA10-N-II16
Sample ID:	RAA10-N-GG20	RAA10-N-II5	RAA10-N-II7	RAA10-N-II10	RAA10-N-II10	RAA10-N-II16
Sample Depth(Feet):	6-15	6-15	1-6	1-6	6-15	1-6
Parameter / Date Collected:	10/14/03	10/28/03	10/17/03	10/17/03	10/17/03	10/07/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	4.4	0.41	3	0.96	0.63	0.45

Location ID :	RAA10-N-II20	RAA10-N-JJ6	RAA10-N-JJ22	RAA10-N-JJ22	RAA10-N-KK10	RAA10-N-KK10
Sample ID:	RAA10-N-II20	RAA10-N-JJ6	RAA10-N-JJ22	RAA10-N-JJ22	RAA10-N-KK10	RAA10-N-KK10
Sample Depth(Feet):	6-15	6-15	1-6	6-15	1-6	6-15
Parameter / Date Collected:	10/14/03	10/17/03	10/16/03	10/16/03	10/08/03	10/08/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	1.2	0.39	13	2.6	0.31	0.86

Location ID :	RAA10-N-KK16	RAA10-N-LL20	RAA10-N-M7	RAA10-N-MM6	RAA10-N-MM6	RAA10-N-MM12
Sample ID:	RAA10-N-KK16	RAA10-N-LL20	RAA10-N-M7	RAA10-N-MM6	RAA10-N-MM6	RAA10-N-MM12
Sample Depth(Feet):	6-15	1-6	6-15	1-6	6-15	6-15
Parameter / Date Collected:	10/03/03	10/20/03	11/13/03	10/23/03	10/23/03	10/07/03
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.31	0.34	0.92	1.7	0.27	4.4

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Location ID :	RAA10-N-MM18	RAA10-N-NN14	RAA10-N-O7	RAA10-N-PP8	RAA10-N-PP14	RAA10-N-Q3
Sample ID:	RAA10-N-MM18	RAA10-N-NN14	RAA10-N-O7	RAA10-N-PP8	RAA10-N-PP14	RAA10-N-Q3
Sample Depth(Feet):	6-15	1-6	1-6	6-15	6-15	1-6
Parameter / Date Collected:	10/31/03	10/07/03	11/14/03	10/16/03	10/20/03	03/02/04
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.79	5.4	9.5	0.7	0.38	59

Location ID :	RAA10-N-Q3	RAA10-N-QQ8	RAA10-N-RR10	RAA10-N-S1	RAA10-N-S7	RAA10-N-U2
Sample ID:	RAA10-N-Q3	RAA10-N-QQ8	RAA10-N-RR10	RAA10-N-S1	RAA10-N-S7	RAA10-N-U2
Sample Depth(Feet):	6-15	1-6	6-15	6-15	1-6	1-6
Parameter / Date Collected:	03/02/04	10/22/03	10/22/03	03/01/04	03/03/04	03/01/04
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	310	0.31	0.28	0.31	4.7	0.17

Location ID :	RAA10-N-U5	RAA10-N-W3	RAA10-N-W4	RAA10-N-Y6	RAA10-N-Y7	UB-MW-9
Sample ID:	RAA10-N-U5	RAA10-N-W3	RAA10-N-W4	RAA10-N-Y6	RAA10-N-Y7	UBW090810
Sample Depth(Feet):	6-15	6-15	1-6	1-6	6-15	8-10
Parameter / Date Collected:	10/30/03	10/30/03	10/30/03	11/11/03	11/12/03	08/09/96
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	0.67	0.39	1.3	0.8	0.9	5.1

Location ID :	UB-MW-10	UB-SB-2	UB-SB-7	UB-SB-8	UB-SB-9	UB-SB-10
Sample ID:	UBW100810	UBB020406	UBB071214	UBB081012	UBB091012	UBB100810
Sample Depth(Feet):	8-10	4-6	12-14	10-12	10-12	8-10
Parameter / Date Collected:	08/09/96	08/09/96	08/09/96	08/09/96	08/09/96	08/09/96
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	4.3	0.37	130	410	70	4.3

TABLE C-4A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (COMMERCIAL)
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	UB-SB-10 UBB101214 12-14 08/09/96	UB-SB-12 UBB120406 4-6 07/30/96	UB-SB-14 UBB140406 4-6 08/07/96	UB-SB-15 UBB150810 8-10 08/09/96	UB-SB-18 UBB181012 10-12 08/09/96
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)	57	0.26	1.7	3.3	7,800

Location ID : / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exeeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	7,800	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-5A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (INDUSTRIAL)
SCENARIO: COMMERICAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-A22 / RAA10-E-A22 / 0-1 / 05/26/04	RAA10-E-B22 / RAA10-E-B22 / 0-1 / 05/20/04	RAA10-E-C24 / RAA10-E-C24 / 0-1 / 05/26/04	RAA10-E-D22 / RAA10-E-D22 / 0-1 / 05/20/04	RAA10-E-D24 / RAA10-E-D24 / 0-1 / 05/17/04	RAA10-E-D26 / RAA10-E-D26 / 0-1 / 05/26/04	RAA10-E-E19 / RAA10-E-E19 / 0-1 / 05/19/04	RAA10-E-E23 / RAA10-E-E23 / 0-1 / 05/17/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	68	3.4	3.3	66	0.33	7.3	4.5	1.8

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-F26 / RAA10-E-F26 / 0-1 / 05/25/04	RAA10-E-G21 / RAA10-E-G21 / 0-1 / 05/19/04	RAA10-E-G24 / RAA10-E-G24 / 0-1 / 05/18/04	RAA10-E-G28 / RAA10-E-G28 / 0-1 / 05/26/04	RAA10-E-H20 / RAA10-E-H20 / 0-1 / 07/28/04	RAA10-E-H26 / RAA10-E-H26 / 0-1 / 05/26/04	RAA10-E-I18 / RAA10-E-I18 / 0-1 / 05/19/04	RAA10-E-I20 / RAA10-E-I20 / 0-1 / 05/17/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	180	2.8	0.92	250	0.51	3.4	2.8	1.8

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-I25 / RAA10-E-I25 / 0-1 / 05/27/04	RAA10-E-I27 / RAA10-E-I27 / 0-1 / 05/27/04	RAA10-E-K16 / RAA10-E-K16 / 0-1 / 05/19/04	RAA10-E-K22 / RAA10-E-K22 / 0-1 / 06/09/04	RAA10-E-K24 / RAA10-E-K24 / 0-1 / 06/01/04	RAA10-E-K26 / RAA10-E-K26 / 0-1 / 06/01/04	RAA10-E-L22 / RAA10-E-L22 / 0-1 / 05/27/04	RAA10-E-L25 / RAA10-E-L25 / 0-1 / 06/01/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	5.1	1.2	1.1	0.72	9.4	5.5	2.3	2.2

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-M23 / RAA10-E-M23 / 0-1 / 06/01/04	RAA10-E-N22 / RAA10-E-N22 / 0-1 / 05/10/04	RAA10-E-N25 / RAA10-E-N25 / 0-1 / 06/01/04	RAA10-E-O19 / RAA10-E-O19 / 0-1 / 05/13/04	RAA10-E-O21 / RAA10-E-O21 / 0-1 / 05/13/04	RAA10-E-O24 / RAA10-E-O24 / 0-1 / 06/01/04	RAA10-E-P22 / RAA10-E-P22 / 0-1 / 05/10/04	RAA10-E-Q24 / RAA10-E-Q24 / 0-1 / 06/01/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	1.1	0.29	6.5	120	1.5	8.3	0.43	7.8

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria?
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	250	--	3,000	No

TABLE C-5A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (INDUSTRIAL)
SCENARIO: COMMERICAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-A22	RAA10-E-B22	RAA10-E-B22	RAA10-E-C24	RAA10-E-D22	RAA10-E-D24	RAA10-E-D26	RAA10-E-D26
	Sample ID:	RAA10-E-A22	RAA10-E-B22	RAA10-E-B22	RAA10-E-C24	RAA10-E-D22	RAA10-E-D24	RAA10-E-D26	RAA10-E-D26
	Sample Depth(Feet):	0-1	0-1	1-3	0-1	0-1	0-1	0-1	1-3
Parameter	Date Collected:	05/26/04	05/20/04	05/20/04	05/26/04	05/20/04	05/17/04	05/26/04	05/26/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		68	3.4	1.2	3.3	66	0.33	7.3	6

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-E19	RAA10-E-E23	RAA10-E-F20	RAA10-E-F26	RAA10-E-G21	RAA10-E-G24	RAA10-E-G28	RAA10-E-H20
	Sample ID:	RAA10-E-E19	RAA10-E-E23	RAA10-E-F20	RAA10-E-F26	RAA10-E-G21	RAA10-E-G24	RAA10-E-G28	RAA10-E-H20
	Sample Depth(Feet):	0-1	0-1	1-3	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	05/19/04	05/17/04	05/20/04	05/25/04	05/19/04	05/18/04	05/26/04	07/28/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		4.5	1.8	0.43	180	2.8	0.92	250	0.51

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-H26	RAA10-E-H26	RAA10-E-I18	RAA10-E-I20	RAA10-E-I25	RAA10-E-I27	RAA10-E-J24	RAA10-E-K16
	Sample ID:	RAA10-E-H26	RAA10-E-H26	RAA10-E-I18	RAA10-E-I20	RAA10-E-I25	RAA10-E-I27	RAA10-E-J24	RAA10-E-K16
	Sample Depth(Feet):	0-1	1-3	0-1	0-1	0-1	0-1	1-3	0-1
Parameter	Date Collected:	05/26/04	05/26/04	05/19/04	05/17/04	05/27/04	05/27/04	05/26/04	05/19/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		3.4	1.9	2.8	1.8	5.1	1.2	1	1.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-K22	RAA10-E-K24	RAA10-E-K26	RAA10-E-L16	RAA10-E-L22	RAA10-E-L22	RAA10-E-L25	RAA10-E-M23
	Sample ID:	RAA10-E-K22	RAA10-E-K24	RAA10-E-K26	RAA10-E-L16	RAA10-E-L22	RAA10-E-L22	RAA10-E-L25	RAA10-E-M23
	Sample Depth(Feet):	0-1	0-1	0-1	1-3	0-1	1-3	0-1	0-1
Parameter	Date Collected:	06/09/04	06/01/04	06/01/04	05/18/04	05/27/04	05/27/04	06/01/04	06/01/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.72	9.4	5.5	1.8	2.3	0.89	2.2	1.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-N18	RAA10-E-N22	RAA10-E-N24	RAA10-E-N25	RAA10-E-O19	RAA10-E-O21	RAA10-E-O24	RAA10-E-P22
	Sample ID:	RAA10-E-N18	RAA10-E-N22	RAA10-E-N24	RAA10-E-N25	RAA10-E-O19	RAA10-E-O21	RAA10-E-O24	RAA10-E-P22
	Sample Depth(Feet):	1-3	0-1	1-3	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	05/18/04	05/10/04	05/10/04	06/01/04	05/13/04	05/13/04	06/01/04	05/10/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.95	0.29	0.28	6.5	120	1.5	8.3	0.43

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:			Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria?
	Location ID:	RAA10-E-P24	RAA10-E-Q24				
	Sample ID:	RAA10-E-P24	RAA10-E-Q24				
	Sample Depth(Feet):	1-3	0-1				
Parameter	Date Collected:	05/10/04	06/01/04				
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		0.26	7.8	250	--	3,000	No

TABLE C-5A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (INDUSTRIAL)
SCENARIO: COMMERICAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-D22	RAA10-E-D26	RAA10-E-D26	RAA10-E-F20	RAA10-E-F20	RAA10-E-H26	RAA10-E-H26	RAA10-E-J24
	Sample ID:	RAA10-E-D22	RAA10-E-D26	RAA10-E-D26	RAA10-E-F20	RAA10-E-F20	RAA10-E-H26	RAA10-E-H26	RAA10-E-J24
	Sample Depth(Feet):	6-15	3-6	6-15	3-6	6-15	3-6	6-15	3-6
Parameter	Date Collected:	05/20/04	05/26/04	05/26/04	05/20/04	05/20/04	05/26/04	05/26/04	05/26/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.76	8.4	0.86	0.33	0.29	0.9	0.79	2.4

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-J24	RAA10-E-L16	RAA10-E-L16	RAA10-E-L22	RAA10-E-L22	RAA10-E-L24	RAA10-E-N18	RAA10-E-N18
	Sample ID:	RAA10-E-J24	RAA10-E-L16	RAA10-E-L16	RAA10-E-L22	RAA10-E-L22	RAA10-E-L24	RAA10-E-N18	RAA10-E-N18
	Sample Depth(Feet):	6-15	3-6	6-15	3-6	6-15	3-6	3-6	6-15
Parameter	Date Collected:	05/26/04	05/18/04	05/18/04	05/27/04	05/27/04	05/10/04	05/18/04	05/18/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.7	9	0.63	0.65	0.9	0.55	2.5	0.37

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:					
	Location ID:	RAA10-E-N24	RAA10-E-P24	RAA10-E-P24	UB-SB-11	UB-SB-13
	Sample ID:	RAA10-E-N24	RAA10-E-P24	RAA10-E-P24	UBB110406	UBB131214
	Sample Depth(Feet):	6-15	3-6	6-15	4-6	12-14
Parameter	Date Collected:	05/10/04	05/10/04	05/10/04	07/31/96	07/30/96
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)		0.32	3.1	0.33	680	57

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit	Revised EPA PRG	Constituent Exceeds Comparison Criteria?
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		680	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010 based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-6A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-E27	RAA10-E-I29	RAA10-E-M27	RAA10-E-N16	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17
	Sample ID:	RAA10-E-E27	RAA10-E-I29	RAA10-E-M27	RAA10-E-N16	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	05/27/04	05/27/04	06/07/04	05/18/04	05/28/04	05/19/04	02/24/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		27	25	40	120	13	330	88

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-P16	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R17
	Sample ID:	RAA10-E-P16	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R17
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	06/18/04	06/17/04	06/02/04	06/02/04	06/01/04	06/17/04	06/02/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		4.6	13	7.7	1.1	12	87	1.4

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-R19	RAA10-E-R21	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20	RAA10-E-T23	UOP3S-15
	Sample ID:	RAA10-E-R19	RAA10-E-R21	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20	RAA10-E-T23	UOP3S-15
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	06/02/04	06/02/04	06/02/04	06/02/04	06/14/04	06/04/04	04/09/91
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		1.1	0.81	1.1	1.5	8.3	4.5	11

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		330	--	400	No

TABLE C-6A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-E27	RAA10-E-F28	RAA10-E-I29	RAA10-E-J28	RAA10-E-L28	RAA10-E-M27	RAA10-E-N16
Sample ID:	RAA10-E-E27	RAA10-E-F28	RAA10-E-I29	RAA10-E-J28	RAA10-E-L28	RAA10-E-M27	RAA10-E-N16
Sample Depth(Feet):	0-1	1-3	0-1	1-3	1-3	0-1	0-1
Parameter / Date Collected:	05/27/04	05/25/04	05/27/04	05/27/04	05/28/04	06/07/04	05/18/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	27	140	25	5.5	24	40	120

Location ID:	RAA10-E-N16	RAA10-E-N26	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17	RAA10-E-P15	RAA10-E-P16
Sample ID:	RAA10-E-N16	RAA10-E-N26	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17	RAA10-E-P15	RAA10-E-P16
Sample Depth(Feet):	1-3	0-1	1-3	0-1	0-1	1-3	0-1
Parameter / Date Collected:	05/18/04	05/28/04	05/28/04	05/19/04	02/24/05	05/19/04	06/18/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	160	13	1.8	330	88	8,000	4.6

Location ID:	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R16	RAA10-E-R17
Sample ID:	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R16	RAA10-E-R17
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	1-3	0-1
Parameter / Date Collected:	06/17/04	06/02/04	06/02/04	06/01/04	06/17/04	07/27/04	06/02/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	13	7.7	1.1	12	87	0.4	1.4

Location ID:	RAA10-E-R19	RAA10-E-R20	RAA10-E-R21	RAA10-E-R24	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20
Sample ID:	RAA10-E-R19	RAA10-E-R20	RAA10-E-R21	RAA10-E-R24	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20
Sample Depth(Feet):	0-1	1-3	0-1	1-3	0-1	0-1	0-1
Parameter / Date Collected:	06/02/04	06/16/04	06/02/04	06/02/04	06/02/04	06/02/04	06/14/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	1.1	1	0.81	6.6	1.1	1.5	8.3

TABLE C-6A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria?
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)	RAA10-E-T22 / RAA10-E-T22 / 1-3 / 06/09/04	0.81	4.5	11	8,000	731	400	**Yes**
	RAA10-E-T23 / RAA10-E-T23 / 0-1 / 06/04/04							
	UOP3S-15 / UOP3S-15 / 0-1 / 04/09/91							

3- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	RAA10-E-T22 / RAA10-E-T22 / 3-6 / 06/09/04	RAA10-E-N26 / RAA10-E-N26 / 3-6 / 05/28/04	RAA10-E-J28 / RAA10-E-J28 / 3-6 / 05/27/04	RAA10-E-P18 / RAA10-E-P18 / 3-6 / 06/17/04	RAA10-E-R16 / RAA10-E-R16 / 3-6 / 07/27/04	RAA10-E-R20 / RAA10-E-R20 / 3-6 / 06/16/04	RAA10-E-R24 / RAA10-E-R24 / 3-6 / 06/02/04
	0.82	0.76	2	0.83	0.33	0.72	1.2

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	RAA10-E-P15 / RAA10-E-P15 / 3-6 / 05/19/04	RAA10-E-F28 / RAA10-E-F28 / 6-15 / 05/25/04	RAA10-E-J28 / RAA10-E-J28 / 6-15 / 05/27/04	RAA10-E-N26 / RAA10-E-N26 / 6-15 / 05/28/04	RAA10-E-P15 / RAA10-E-P15 / 6-15 / 05/19/04	RAA10-E-P20 / RAA10-E-P20 / 6-15 / 06/16/04	RAA10-E-R18 / RAA10-E-R18 / 6-15 / 06/09/04
	34,000	100	1	0.84	3,000	0.78	1.3

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)	RAA10-E-R24 / RAA10-E-R24 / 6-15 / 06/02/04	0.885	34,000	6,455	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95%UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.

TABLE C-6B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter / Location ID:	RAA10-E-E27	RAA10-E-I29	RAA10-E-M27	RAA10-E-N16	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17
Sample ID:	RAA10-E-E27	RAA10-E-I29	RAA10-E-M27	RAA10-E-N16	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Date Collected:	05/27/04	05/27/04	06/07/04	05/18/04	05/28/04	05/19/04	02/24/05
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	27	25	40	120	13	330	88

Parameter / Location ID:	RAA10-E-P16	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R17
Sample ID:	RAA10-E-P16	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R17
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Date Collected:	06/18/04	06/17/04	06/02/04	06/02/04	06/01/04	06/17/04	06/02/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	4.6	13	7.7	1.1	12	87	1.4

Parameter / Location ID:	RAA10-E-R19	RAA10-E-R21	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20	RAA10-E-T23	UOP3S-15
Sample ID:	RAA10-E-R19	RAA10-E-R21	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20	RAA10-E-T23	UOP3S-15
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Date Collected:	06/02/04	06/02/04	06/02/04	06/02/04	06/14/04	06/04/04	04/09/91
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	1.1	0.81	1.1	1.5	8.3	4.5	11

Parameter / Location ID:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Sample ID:				
Sample Depth(Feet):				
Date Collected:				
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	330	--	400	No

TABLE C-6B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-E27	RAA10-E-F28	RAA10-E-I29	RAA10-E-J28	RAA10-E-L28	RAA10-E-M27	RAA10-E-N16
	Sample ID:	RAA10-E-E27	RAA10-E-F28	RAA10-E-I29	RAA10-E-J28	RAA10-E-L28	RAA10-E-M27	RAA10-E-N16
	Sample Depth(Feet):	0-1	1-3	0-1	1-3	1-3	0-1	0-1
Dioxins/Furans	Date Collected:	05/27/04	05/25/04	05/27/04	05/27/04	05/28/04	06/07/04	05/18/04
Total TEQs (EPA 2010 TEFs)		27	140	25	5.5	24	40	120

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-N16	RAA10-E-N26	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17	RAA10-E-P15	RAA10-E-P16
	Sample ID:	RAA10-E-N16	RAA10-E-N26	RAA10-E-N26	RAA10-E-O15	RAA10-E-O17	RAA10-E-P15	RAA10-E-P16
	Sample Depth(Feet):	1-3	0-1	1-3	0-1	0-1	1-3	0-1
Dioxins/Furans	Date Collected:	05/18/04	05/28/04	05/28/04	05/19/04	02/24/05	05/19/04	06/18/04
Total TEQs (EPA 2010 TEFs)		160	13	1.8	330	88	***1.00***	4.6

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R16	RAA10-E-R17
	Sample ID:	RAA10-E-P19	RAA10-E-Q18	RAA10-E-Q20	RAA10-E-Q25	RAA10-E-R15	RAA10-E-R16	RAA10-E-R17
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	1-3	0-1
Dioxins/Furans	Date Collected:	06/17/04	06/02/04	06/02/04	06/01/04	06/17/04	07/27/04	06/02/04
Total TEQs (EPA 2010 TEFs)		13	7.7	1.1	12	87	0.4	1.4

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-R19	RAA10-E-R20	RAA10-E-R21	RAA10-E-R24	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20
	Sample ID:	RAA10-E-R19	RAA10-E-R20	RAA10-E-R21	RAA10-E-R24	RAA10-E-S18	RAA10-E-S23	RAA10-E-T20
	Sample Depth(Feet):	0-1	1-3	0-1	1-3	0-1	0-1	0-1
Dioxins/Furans	Date Collected:	06/02/04	06/16/04	06/02/04	06/02/04	06/02/04	06/02/04	06/14/04
Total TEQs (EPA 2010 TEFs)		1.1	1	0.81	6.6	1.1	1.5	8.3

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:				Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria?
	Location ID:	RAA10-E-T22	RAA10-E-T23	UOP3S-15				
	Sample ID:	RAA10-E-T22	RAA10-E-T23	UOP3S-15				
	Sample Depth(Feet):	1-3	0-1	0-1				
Dioxins/Furans	Date Collected:	06/09/04	06/04/04	04/09/91				
Total TEQs (EPA 2010 TEFs)		0.81	4.5	11	330	--	400	No

TABLE C-6B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-2 (NON-INDUSTRIAL)
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Parameter / Location ID:	RAA10-E-T22	RAA10-E-N26	RAA10-E-J28	RAA10-E-P18	RAA10-E-R16	RAA10-E-R20	RAA10-E-R24
Sample ID:	RAA10-E-T22	RAA10-E-N26	RAA10-E-J28	RAA10-E-P18	RAA10-E-R16	RAA10-E-R20	RAA10-E-R24
Sample Depth(Feet):	3-6	3-6	3-6	3-6	3-6	3-6	3-6
Date Collected:	06/09/04	05/28/04	05/27/04	06/17/04	07/27/04	06/16/04	06/02/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	0.82	0.76	2	0.83	0.33	0.72	1.2

Parameter / Location ID:	RAA10-E-P15	RAA10-E-F28	RAA10-E-J28	RAA10-E-N26	RAA10-E-P15	RAA10-E-P20	RAA10-E-R18
Sample ID:	RAA10-E-P15	RAA10-E-F28	RAA10-E-J28	RAA10-E-N26	RAA10-E-P15	RAA10-E-P20	RAA10-E-R18
Sample Depth(Feet):	3-6	6-15	6-15	6-15	6-15	6-15	6-15
Date Collected:	05/19/04	05/25/04	05/27/04	05/28/04	05/19/04	06/16/04	06/09/04
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	34,000	100	1	0.84	3,000	0.78	1.3

Parameter / Location ID:	RAA10-E-R24	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Sample ID:	RAA10-E-R24				
Sample Depth(Feet):	6-15				
Date Collected:	06/02/04				
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)	0.885	34,000	6,455	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95%UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.
3. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of remedial actions.The backfill concentrations correspond to the average concentrations of such constituents as presented in the CD Sites Backfill Data Set.

TABLE C-7A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (NORTHERN WETLAND)
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-L17 0-1 02/28/05	RAA10-N-M18 0-1 03/04/05	RAA10-N-M20 0-1 03/04/05	RAA10-N-O20 0-1 03/03/05	RAA10-N-O22 0-1 03/03/05	RAA10-N-Q20 0-1 03/03/05	RAA10-N-Q22 0-1 03/03/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		4.9	5.6	7.6	4.5	8	29	2.8

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-S22 0-1 03/03/05	RAA10-N-T23.5 0-1 01/28/04	RAA10-N-U22 0-1 03/03/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		4.3	3.6	93	93	--	400	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytica detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-8A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (NON-INDUSTRIAL) - EXCLUDING 0- TO 1-FOOT RESULTS IN WETLAND AREAS
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Location ID / Sample ID / Sample Depth(Feet) / Date Collected:	RAA10-N-BB25 / RAA10-N-BB25 / 0-1 / 01/14/04	RAA10-N-C26 / RAA10-N-C26 / 0-1 / 01/12/04	RAA10-N-CC22.5 / RAA10-N-CC22.5 / 0-1 / 01/28/04	RAA10-N-G20 / RAA10-N-G20 / 0-1 / 03/23/04	RAA10-N-G26 / RAA10-N-G26 / 0-1 / 01/07/04	RAA10-N-GG24 / RAA10-N-GG24 / 0-1 / 03/17/05	RAA10-N-I16 / RAA10-N-I16 / 0-1 / 01/15/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		9.7	13	23	1.2	1.2	8.6	8.1

Parameter	Location ID / Sample ID / Sample Depth(Feet) / Date Collected:	RAA10-N-I22 / RAA10-N-I22 / 0-1 / 01/07/04	RAA10-N-II24 / RAA10-N-II24 / 0-1 / 10/20/03	RAA10-N-K10 / RAA10-N-K10 / 0-1 / 03/24/04	RAA10-N-L12 / RAA10-N-L12 / 0-1 / 01/19/04	RAA10-N-M26 / RAA10-N-M26 / 0-1 / 04/02/04	RAA10-N-O24 / RAA10-N-O24 / 0-1 / 03/22/04	RAA10-N-S26 / RAA10-N-S26 / 0-1 / 01/15/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		1.1	16	11	18	1.2	3.4	0.66

Parameter	Location ID / Sample ID / Sample Depth(Feet) / Date Collected:	RAA10-N-W24 / RAA10-N-W24 / 0-1 / 03/16/04	UB-SS-6 / UB-SS-6 / 0-0.5 / 03/04/97	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		20	270	270	--	400	No

1- TO 3-FOOT DEPTH INCREMENT:

Parameter	Location ID / Sample ID / Sample Depth(Feet) / Date Collected:	RAA10-N-AA24 / RAA10-N-AA24 / 1-3 / 05/11/04	RAA10-N-C24 / RAA10-N-C24 / 1-3 / 03/15/05	RAA10-N-C26 / RAA10-N-C26 / 2-3 / 03/02/04	RAA10-N-S24 / RAA10-N-S24 / 1-3 / 03/17/04	RAA10-N-T19.5 / RAA10-N-T19.5 / 1-3 / 03/25/04	RAA10-N-I16 / RAA10-N-I16 / 2-3 / 03/02/04	RAA10-N-K16 / RAA10-N-K16 / 1-3 / 03/24/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		0.25	2.2	4.1	0.82	47	2.1	2.3

Parameter	Location ID / Sample ID / Sample Depth(Feet) / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		47	--	600	No

TABLE C-8A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA K12-9-1 (NON-INDUSTRIAL) - EXCLUDING 0- TO 1-FOOT RESULTS IN WETLAND AREAS
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-CC22 / RAA10-N-CC22 / 6-15 / 05/12/04	RAA10-N-G20 / RAA10-N-G20 / 6-15 / 03/23/04	RAA10-N-GG26 / RAA10-N-GG26 / 3-6 / 03/29/04	RAA10-N-II24 / RAA10-N-II24 / 1-6 / 10/20/03	RAA10-N-II24 / RAA10-N-II24 / 6-15 / 10/20/03	RAA10-N-K12 / RAA10-N-K12 / 3-6 / 03/24/04	RAA10-N-K20 / RAA10-N-K20 / 3-6 / 03/22/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		0.44	0.8	0.77	0.61	1.8	1.3	8.5

Parameter	Location ID / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-N-M12 / RAA10-N-M12 / 6-15 / 03/26/04	RAA10-N-O24 / RAA10-N-O24 / 6-15 / 03/22/04	RAA10-N-O28 / RAA10-N-O28 / 3-6 / 04/01/04	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		0.84	0.8	0.8	8.5	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-9A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	03/10/05	06/08/07	01/10/05	08/05/04	06/08/07
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	46	160	490	25,000	70	51

Location ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	08/03/04	01/10/05	08/02/04	01/07/05	03/08/05	01/05/05	01/11/05	08/06/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.8	1,400	2.8	46	26	14	3.9	8.6

Location ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	09/23/04	07/14/04	01/17/05	08/06/04	01/05/05	09/23/04	03/09/05	07/14/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	22	60	6.1	84	6.2	590	11	5.2

Location ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-0.5	0.5-1	0-0.5	0.5-1
Parameter / Date Collected:	09/22/04	07/15/04	07/15/04	10/05/04	12/13/96	12/13/96	12/13/96	12/13/96
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	9.6	7	35	2.9	280	23	1,500	110

Location ID:	UFP2-L3	UFP2-L3				
Sample ID:	UFP2-L3	UFP2-L3	Maximum	95% Upper	Revised	Constituent Exceeds
Sample Depth(Feet):	0-0.5	0.5-1	Sample	Confidence	EPA	Comparison Criteria?
Parameter / Date Collected:	12/11/96	12/11/96	Result	Limit (UCL)	PRG	(see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	2,300	1,100	25,000	2,228	400	**Yes**

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample Depth(Feet):	0-1	0-1	1-3	0-1	0-1	1-3	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	12/18/08	03/10/05	09/23/04	06/08/07	01/10/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	0.94	46	160	0.99	490	25,000

TABLE C-9A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-MM13	RAA10-E-NNOO14	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP12	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP20
Sample ID:	RAA10-E-MM13	RAA10-E-NNOO14	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP12	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP20
Sample Depth(Feet):	0-1	0-1	0-1	0-1	1-3	0-1	0-1	1-3
Parameter / Date Collected:	08/05/04	06/08/07	08/03/04	01/10/05	08/02/04	08/02/04	01/07/05	01/07/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	70	51	4.8	1,400	3.2	2.8	46	15

Location ID:	RAA10-E-PP24	RAA10-E-PP24b	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14	RAA10-E-RR14	RAA10-E-RR16	RAA10-E-RR24b
Sample ID:	RAA10-E-PP24	RAA10-E-PP24b	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14	RAA10-E-RR14	RAA10-E-RR16	RAA10-E-RR24b
Sample Depth(Feet):	0-1	1-3	0-1	0-1	0-1	1-3	0-1	1-3
Parameter / Date Collected:	03/08/05	04/05/05	01/05/05	01/11/05	08/06/04	08/06/04	09/23/04	04/05/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	26	3	14	3.9	8.6	0.66	22	1.4

Location ID:	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT24	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV22
Sample ID:	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT24	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV22
Sample Depth(Feet):	0-1	0-1	0-1	1-3	0-1	0-1	0-1	1-3
Parameter / Date Collected:	07/14/04	01/17/05	08/06/04	01/18/05	01/05/05	09/23/04	03/09/05	03/09/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	60	6.1	84	2.8	6.2	590	11	16

Location ID:	RAA10-E-VV26	RAA10-E-VV27	RAA10-E-XX20	RAA10-E-XX24	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	RAA10-E-ZZ22
Sample ID:	RAA10-E-VV26	RAA10-E-VV27	RAA10-E-XX20	RAA10-E-XX24	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	RAA10-E-ZZ22
Sample Depth(Feet):	1-3	0-1	0-1	1-3	0-1	0-1	0-1	1-3
Parameter / Date Collected:	01/06/05	07/14/04	09/22/04	01/11/05	07/15/04	07/15/04	10/05/04	10/05/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	5.5	5.2	9.6	1.2	7	35	2.9	14

Location ID:	RAA10-E-ZZ26	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1	UFP2-L3	UFP2-L3	
Sample ID:	RAA10-E-ZZ26	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1	UFP2-L3	UFP2-L3	Maximum
Sample Depth(Feet):	1-3	0-0.5	0.5-1	0-0.5	0.5-1	0-0.5	0.5-1	Sample
Parameter / Date Collected:	01/11/05	12/13/96	12/13/96	12/13/96	12/13/96	12/11/96	12/11/96	Result
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	32	280	23	1,500	110	2,300	1,100	25,000

Location ID:	95% Upper	Revised	Constituent Exceeds
Sample ID:	Confidence	EPA	Comparison Criteria?
Sample Depth(Feet):	Limit (UCL)	PRG	(see Note 2)
Parameter / Date Collected:			
Dioxins/Furans			
Total TEQs (EPA 2010 TEFs)	1,610	400	**Yes**

TABLE C-9A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BBB26 / RAA10-E-BBB26 / 6-15 / 12/18/08	RAA10-E-LL14 / RAA10-E-LL14 / 3-6 / 01/10/05	RAA10-E-LL14 / RAA10-E-LL14 / 6-15 / 01/10/05	RAA10-E-NN14 / RAA10-E-NN14 / 6-15 / 08/03/04	RAA10-E-PP16 / RAA10-E-PP16 / 6-15 / 09/23/04	RAA10-E-PP24b / RAA10-E-PP24b / 3-6 / 04/05/05	RAA10-E-PP24b / RAA10-E-PP24b / 6-15 / 04/05/05	RAA10-E-RR22 / RAA10-E-RR22 / 3-6 / 01/17/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		4.3	150	130	0.67	1.5	2.3	1.1	0.83

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-RR22 / RAA10-E-RR22 / 6-15 / 01/17/05	RAA10-E-RR24b / RAA10-E-RR24b / 3-6 / 04/05/05	RAA10-E-RR24b / RAA10-E-RR24b / 6-15 / 04/05/05	RAA10-E-TT16 / RAA10-E-TT16 / 3-6 / 08/06/04	RAA10-E-TT24 / RAA10-E-TT24 / 6-15 / 01/18/05	RAA10-E-TT26 / RAA10-E-TT26 / 3-6 / 01/05/05	RAA10-E-VV20 / RAA10-E-VV20 / 3-6 / 09/21/04	RAA10-E-VV26 / RAA10-E-VV26 / 3-6 / 01/06/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.76	1.6	0.92	0.58	0.7	1.3	11	1.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-XX20 / RAA10-E-XX20 / 6-12 / 09/22/04	RAA10-E-XX26 / RAA10-E-XX26 / 3-6 / 01/11/05	RAA10-E-ZZ26 / RAA10-E-ZZ26 / 6-15 / 01/11/05	RAA10-E-ZZ28 / RAA10-E-ZZ28 / 3-6 / 01/11/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		18	1.1	0.96	1.1	150	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.

TABLE C-9B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	03/10/05	06/08/07	01/10/05	08/05/04	06/08/07
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	46	160	490	***1.00***	70	51

Location ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	08/03/04	01/10/05	08/02/04	01/07/05	03/08/05	01/05/05	01/11/05	08/06/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.8	1,400	2.8	46	26	14	3.9	8.6

Location ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	09/23/04	07/14/04	01/17/05	08/06/04	01/05/05	09/23/04	03/09/05	07/14/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	22	60	6.1	84	6.2	590	11	5.2

Location ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-0.5	0.5-1	0-0.5	0.5-1
Parameter / Date Collected:	09/22/04	07/15/04	07/15/04	10/05/04	12/13/96	12/13/96	12/13/96	12/13/96
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	9.6	7	35	2.9	280	23	1,500	110

Location ID:	UFP2-L3	UFP2-L3				
Sample ID:	UFP2-L3	UFP2-L3	Maximum	95% Upper	Revised	Constituent Exceeds
Sample Depth(Feet):	0-0.5	0.5-1	Sample	Confidence	EPA	Comparison Criteria?
Parameter / Date Collected:	12/11/96	12/11/96	Result	Limit (UCL)	PRG	(see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	2,300	1,100	2,300	406	400	**Yes**

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample Depth(Feet):	0-1	0-1	1-3	0-1	0-1	1-3	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	12/18/08	03/10/05	09/23/04	06/08/07	01/10/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	0.94	46	160	0.99	490	***1.00***

TABLE C-9B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-MM13 / RAA10-E-MM13 / 0-1 / 08/05/04	RAA10-E-NNOO14 / RAA10-E-NNOO14 / 0-1 / 06/08/07	RAA10-E-OO11 / RAA10-E-OO11 / 0-1 / 08/03/04	RAA10-E-OO18 / RAA10-E-OO18 / 0-1 / 01/10/05	RAA10-E-PP12 / RAA10-E-PP12 / 1-3 / 08/02/04	RAA10-E-PP14 / RAA10-E-PP14 / 0-1 / 08/02/04	RAA10-E-PP20 / RAA10-E-PP20 / 0-1 / 01/07/05	RAA10-E-PP20 / RAA10-E-PP20 / 1-3 / 01/07/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	70	51	4.8	1,400	3.2	2.8	46	15

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-PP24 / RAA10-E-PP24 / 0-1 / 03/08/05	RAA10-E-PP24b / RAA10-E-PP24b / 1-3 / 04/05/05	RAA10-E-PP26 / RAA10-E-PP26 / 0-1 / 01/05/05	RAA10-E-QQ18 / RAA10-E-QQ18 / 0-1 / 01/11/05	RAA10-E-RR14 / RAA10-E-RR14 / 0-1 / 08/06/04	RAA10-E-RR14 / RAA10-E-RR14 / 1-3 / 08/06/04	RAA10-E-RR16 / RAA10-E-RR16 / 0-1 / 09/23/04	RAA10-E-RR24b / RAA10-E-RR24b / 1-3 / 04/05/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	26	3	14	3.9	8.6	0.66	22	1.4

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-RR25 / RAA10-E-RR25 / 0-1 / 07/14/04	RAA10-E-SS21 / RAA10-E-SS21 / 0-1 / 01/17/05	RAA10-E-TT16 / RAA10-E-TT16 / 0-1 / 08/06/04	RAA10-E-TT24 / RAA10-E-TT24 / 1-3 / 01/18/05	RAA10-E-TT26 / RAA10-E-TT26 / 0-1 / 01/05/05	RAA10-E-UU19 / RAA10-E-UU19 / 0-1 / 09/23/04	RAA10-E-VV22 / RAA10-E-VV22 / 0-1 / 03/09/05	RAA10-E-VV22 / RAA10-E-VV22 / 1-3 / 03/09/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	60	6.1	84	2.8	6.2	590	11	16

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-VV26 / RAA10-E-VV26 / 1-3 / 01/06/05	RAA10-E-VV27 / RAA10-E-VV27 / 0-1 / 07/14/04	RAA10-E-XX20 / RAA10-E-XX20 / 0-1 / 09/22/04	RAA10-E-XX24 / RAA10-E-XX24 / 1-3 / 01/11/05	RAA10-E-YY24 / RAA10-E-YY24 / 0-1 / 07/15/04	RAA10-E-YY28 / RAA10-E-YY28 / 0-1 / 07/15/04	RAA10-E-ZZ22 / RAA10-E-ZZ22 / 0-1 / 10/05/04	RAA10-E-ZZ22 / RAA10-E-ZZ22 / 1-3 / 10/05/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	5.5	5.2	9.6	1.2	7	35	2.9	14

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-ZZ26 / RAA10-E-ZZ26 / 1-3 / 01/11/05	UFP1-L1 / UFP1-L1 / 0-0.5 / 12/13/96	UFP1-L1 / UFP1-L1 / 0.5-1 / 12/13/96	UFP1-R1 / UFP1-R1 / 0-0.5 / 12/13/96	UFP1-R1 / UFP1-R1 / 0.5-1 / 12/13/96	UFP2-L3 / UFP2-L3 / 0-0.5 / 12/11/96	UFP2-L3 / UFP2-L3 / 0.5-1 / 12/11/96	Maximum Sample Result
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	32	280	23	1,500	110	2,300	1,100	2,300

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans			
Total TEQs (EPA 2010 TEFs)	297	400	No

TABLE C-9B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-BBB26 / RAA10-E-BBB26 / 6-15 / 12/18/08	RAA10-E-LL14 / RAA10-E-LL14 / 3-6 / 01/10/05	RAA10-E-LL14 / RAA10-E-LL14 / 6-15 / 01/10/05	RAA10-E-NN14 / RAA10-E-NN14 / 6-15 / 08/03/04	RAA10-E-PP16 / RAA10-E-PP16 / 6-15 / 09/23/04	RAA10-E-PP24b / RAA10-E-PP24b / 3-6 / 04/05/05	RAA10-E-PP24b / RAA10-E-PP24b / 6-15 / 04/05/05	RAA10-E-RR22 / RAA10-E-RR22 / 3-6 / 01/17/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.3	150	130	0.67	1.5	2.3	1.1	0.83

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-RR22 / RAA10-E-RR22 / 6-15 / 01/17/05	RAA10-E-RR24b / RAA10-E-RR24b / 3-6 / 04/05/05	RAA10-E-RR24b / RAA10-E-RR24b / 6-15 / 04/05/05	RAA10-E-TT16 / RAA10-E-TT16 / 3-6 / 08/06/04	RAA10-E-TT24 / RAA10-E-TT24 / 6-15 / 01/18/05	RAA10-E-TT26 / RAA10-E-TT26 / 3-6 / 01/05/05	RAA10-E-VV20 / RAA10-E-VV20 / 3-6 / 09/21/04	RAA10-E-VV26 / RAA10-E-VV26 / 3-6 / 01/06/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	0.76	1.6	0.92	0.58	0.7	1.3	11	1.1

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-XX20 / RAA10-E-XX20 / 6-12 / 09/22/04	RAA10-E-XX26 / RAA10-E-XX26 / 3-6 / 01/11/05	RAA10-E-ZZ26 / RAA10-E-ZZ26 / 6-15 / 01/11/05	RAA10-E-ZZ28 / RAA10-E-ZZ28 / 3-6 / 01/11/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	18	1.1	0.96	1.1	150	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.
3. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of remedial actions.The backfill concentrations correspond to the average concentrations of such constituents as presented in the CD Sites Backfill Data Set.

TABLE C-9C
POST-APPENDIX IX+3 AND PCB REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12.5	RAA10-E-LL14	RAA10-E-MM13	RAA10-E-NNOO14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	03/10/05	06/08/07	01/10/05	08/05/04	06/08/07
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	46	160	490	***1.00***	70	51

Location ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample ID:	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP24	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	08/03/04	01/10/05	08/02/04	01/07/05	03/08/05	01/05/05	01/11/05	08/06/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.8	1,400	2.8	46	26	14	3.9	8.6

Location ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample ID:	RAA10-E-RR16	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV27
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter / Date Collected:	09/23/04	07/14/04	01/17/05	08/06/04	01/05/05	09/23/04	03/09/05	07/14/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	22	60	6.1	84	6.2	590	11	5.2

Location ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample ID:	RAA10-E-XX20	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1
Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-0.5	0.5-1	0-0.5	0.5-1
Parameter / Date Collected:	09/22/04	07/15/04	07/15/04	10/05/04	12/13/96	12/13/96	12/13/96	12/13/96
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	9.6	7	35	2.9	280	23	1,500	110

Location ID:	UFP2-L3	UFP2-L3				
Sample ID:	UFP2-L3	UFP2-L3	Maximum	95% Upper	Revised	Constituent Exceeds
Sample Depth(Feet):	0-0.5	0.5-1	Sample	Confidence	EPA	Comparison Criteria?
Parameter / Date Collected:	12/11/96	12/11/96	Result	Limit (UCL)	PRG	(see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)	***1.00***	1,100	1,500	297	400	No

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample ID:	RAA10-E-AAA30	RAA10-E-BBB25	RAA10-E-BBB28	RAA10-E-DDD27	RAA10-E-KK13	RAA10-E-LL12	RAA10-E-LL12.5	RAA10-E-LL14
Sample Depth(Feet):	0-1	0-1	1-3	0-1	0-1	1-3	0-1	0-1
Parameter / Date Collected:	07/15/04	01/12/05	12/18/08	12/18/08	03/10/05	09/23/04	06/08/07	01/10/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.7	76	0.94	46	160	0.99	490	***1.00***

TABLE C-9C
POST-APPENDIX IX+3 AND PCB REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-MM13	RAA10-E-NNOO14	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP12	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP20
Sample ID:	RAA10-E-MM13	RAA10-E-NNOO14	RAA10-E-OO11	RAA10-E-OO18	RAA10-E-PP12	RAA10-E-PP14	RAA10-E-PP20	RAA10-E-PP20
Sample Depth(Feet):	0-1	0-1	0-1	0-1	1-3	0-1	0-1	1-3
Parameter / Date Collected:	08/05/04	06/08/07	08/03/04	01/10/05	08/02/04	08/02/04	01/07/05	01/07/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	70	51	4.8	1,400	3.2	2.8	46	15

Location ID:	RAA10-E-PP24	RAA10-E-PP24b	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14	RAA10-E-RR14	RAA10-E-RR16	RAA10-E-RR24b
Sample ID:	RAA10-E-PP24	RAA10-E-PP24b	RAA10-E-PP26	RAA10-E-QQ18	RAA10-E-RR14	RAA10-E-RR14	RAA10-E-RR16	RAA10-E-RR24b
Sample Depth(Feet):	0-1	1-3	0-1	0-1	0-1	1-3	0-1	1-3
Parameter / Date Collected:	03/08/05	04/05/05	01/05/05	01/11/05	08/06/04	08/06/04	09/23/04	04/05/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	26	3	14	3.9	8.6	0.66	22	1.4

Location ID:	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT24	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV22
Sample ID:	RAA10-E-RR25	RAA10-E-SS21	RAA10-E-TT16	RAA10-E-TT24	RAA10-E-TT26	RAA10-E-UU19	RAA10-E-VV22	RAA10-E-VV22
Sample Depth(Feet):	0-1	0-1	0-1	1-3	0-1	0-1	0-1	1-3
Parameter / Date Collected:	07/14/04	01/17/05	08/06/04	01/18/05	01/05/05	09/23/04	03/09/05	03/09/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	60	6.1	84	2.8	6.2	590	11	16

Location ID:	RAA10-E-VV26	RAA10-E-VV27	RAA10-E-XX20	RAA10-E-XX24	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	RAA10-E-ZZ22
Sample ID:	RAA10-E-VV26	RAA10-E-VV27	RAA10-E-XX20	RAA10-E-XX24	RAA10-E-YY24	RAA10-E-YY28	RAA10-E-ZZ22	RAA10-E-ZZ22
Sample Depth(Feet):	1-3	0-1	0-1	1-3	0-1	0-1	0-1	1-3
Parameter / Date Collected:	01/06/05	07/14/04	09/22/04	01/11/05	07/15/04	07/15/04	10/05/04	10/05/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	5.5	5.2	9.6	1.2	7	35	2.9	14

Location ID:	RAA10-E-ZZ26	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1	UFP2-L3	UFP2-L3	
Sample ID:	RAA10-E-ZZ26	UFP1-L1	UFP1-L1	UFP1-R1	UFP1-R1	UFP2-L3	UFP2-L3	Maximum
Sample Depth(Feet):	1-3	0-0.5	0.5-1	0-0.5	0.5-1	0-0.5	0.5-1	Sample
Parameter / Date Collected:	01/11/05	12/13/96	12/13/96	12/13/96	12/13/96	12/11/96	12/11/96	Result
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	32	280	23	1,500	110	2,300	1,100	2,300

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans			
Total TEQs (EPA 2010 TEFs)	297	400	No

TABLE C-9C
POST-APPENDIX IX+3 AND PCB REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-11
SCENARIO: RECREATIONAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-BBB26 / RAA10-E-BBB26 / 6-15 / 12/18/08	RAA10-E-LL14 / RAA10-E-LL14 / 3-6 / 01/10/05	RAA10-E-LL14 / RAA10-E-LL14 / 6-15 / 01/10/05	RAA10-E-NN14 / RAA10-E-NN14 / 6-15 / 08/03/04	RAA10-E-PP16 / RAA10-E-PP16 / 6-15 / 09/23/04	RAA10-E-PP24b / RAA10-E-PP24b / 3-6 / 04/05/05	RAA10-E-PP24b / RAA10-E-PP24b / 6-15 / 04/05/05	RAA10-E-RR22 / RAA10-E-RR22 / 3-6 / 01/17/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	4.3	150	130	0.67	1.5	2.3	1.1	0.83

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-RR22 / RAA10-E-RR22 / 6-15 / 01/17/05	RAA10-E-RR24b / RAA10-E-RR24b / 3-6 / 04/05/05	RAA10-E-RR24b / RAA10-E-RR24b / 6-15 / 04/05/05	RAA10-E-TT16 / RAA10-E-TT16 / 3-6 / 08/06/04	RAA10-E-TT24 / RAA10-E-TT24 / 6-15 / 01/18/05	RAA10-E-TT26 / RAA10-E-TT26 / 3-6 / 01/05/05	RAA10-E-VV20 / RAA10-E-VV20 / 3-6 / 09/21/04	RAA10-E-VV26 / RAA10-E-VV26 / 3-6 / 01/06/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	0.76	1.6	0.92	0.58	0.7	1.3	11	1.1

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	RAA10-E-XX20 / RAA10-E-XX20 / 6-12 / 09/22/04	RAA10-E-XX26 / RAA10-E-XX26 / 3-6 / 01/11/05	RAA10-E-ZZ26 / RAA10-E-ZZ26 / 6-15 / 01/11/05	RAA10-E-ZZ28 / RAA10-E-ZZ28 / 3-6 / 01/11/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	18	1.1	0.96	1.1	150	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.

TABLE C-10A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-12
SCENARIO: COMMERCIAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BB13 0-1 02/23/05	RAA10-E-EE12 0-1 02/23/05	RAA10-E-GG13 0-1 02/22/05	RAA10-E-JJ11 0-1 02/21/05	RAA10-E-LL10 0-1 02/11/05	RAA10-E-P14 0-1 02/24/05	RAA10-E-Q13 0-1 10/06/04	RAA10-E-T13 0-1 10/07/04	RAA10-E-T14 0-1 02/24/05
Dioxins/Furans										
Total TEQs (EPA 2010 TEFs)		47	60	110	16	78	200	28	920	12,000

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-V14 0-1 02/23/05	RAA10-E-W13 0-1 10/11/04	RAA10-E-Y13 0-1 10/12/04	RAA10-E-Z14 0-1 02/22/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		160	3.2	110	460	12,000	2,716	3,000	No

0- TO 3-FOOT DEPTH INCREMENT:

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BB13 0-1 02/23/05	RAA10-E-EE12 0-1 02/23/05	RAA10-E-GG13 0-1 02/22/05	RAA10-E-JJ11 0-1 02/21/05	RAA10-E-LL10 0-1 02/11/05	RAA10-E-LL10 1-3 02/11/05	RAA10-E-P14 0-1 02/24/05	RAA10-E-Q13 0-1 10/06/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		47	60	110	16	78	120	200	28

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-R13 1-3 10/06/04	RAA10-E-T13 0-1 10/07/04	RAA10-E-T14 0-1 02/24/05	RAA10-E-V14 0-1 02/23/05	RAA10-E-W13 0-1 10/11/04	RAA10-E-Y13 0-1 10/12/04	RAA10-E-Z14 1-3 02/22/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		110	920	12,000	160	3.2	110	760

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		12,000	2,373	3,000	No

TABLE C-10A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L11-4-12
SCENARIO: COMMERCIAL WITHOUT ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

3- TO 15-FOOT DEPTH INCREMENT:

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BB14 6-15 02/22/05	RAA10-E-LL10 3-6 02/11/05	RAA10-E-LL10 6-15 02/11/05	RAA10-E-R13 3-6 10/06/04	RAA10-E-R14 3-7 10/07/04	RAA10-E-T14 6-15 02/24/05	RAA10-E-Z14 3-6 02/22/05
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	1	11	0.93	140	141	2.7	580

Parameter / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	580	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 201(based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG

TABLE C-11A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-1-4
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-AA6 0-1 10/13/04	RAA10-E-AA12 0-1 10/15/04	RAA10-E-BB10 0-1 10/14/04	RAA10-E-CC10 0-1 10/19/04	RAA10-E-DD10 0-1 02/09/05	RAA10-E-Y9 0-1 02/25/05	RAA10-E-Z10 0-1 10/04/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		28	24	39	17	5.9	0.41	0.99

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-Z12 0-1 10/13/04	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)		560	560	--	3,000	No

1- TO 15-FOOT DEPTH INCREMENT:

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BB10 1-3 10/14/04	RAA10-E-BB10 3-6 10/14/04	RAA10-E-BB10 6-15 10/14/04	RAA10-E-DD10 1-3 02/09/05	RAA10-E-Z6 1-3 10/13/04	RAA10-E-Z6 3-6 10/13/04	RAA10-E-Z12 1-3 10/13/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		600	60	1.5	4.7	1.6	100	130

Parameter	Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		600	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-12A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-1-5
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter / Sample ID:	Sample Depth(Feet):	Date Collected:	RAA10-E-S12	RAA10-E-U10	RAA10-E-U12	RAA10-E-W9	RAA10-E-W11	RAA10-E-X10	RAA10-E-X12
			0-1	0-1	0-1	0-1	0-1	0-1	0-1
			10/07/04	10/11/04	10/07/04	10/11/04	10/11/04	09/30/04	09/30/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)			230	520	39	12	6.1	1,400	14

Parameter / Sample ID:	Sample Depth(Feet):	Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans						
Total TEQs (EPA 2010 TEFs)			1,400	--	3,000	No

1- TO 15-FOOT DEPTH INCREMENT:

Parameter / Sample ID:	Sample Depth(Feet):	Date Collected:	RAA10-E-T12	RAA10-E-T12	RAA10-E-T12	RAA10-E-X10	RAA10-E-X10	RAA10-E-X12
			1-3	3-6	6-15	3-6	6-15	1-3
			10/06/04	10/06/04	10/06/04	09/30/04	09/30/04	09/30/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)			1,400	3,100	1,700	21	40	140

Parameter / Sample ID:	Sample Depth(Feet):	Date Collected:	RAA10-E-X12	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
			6-15				
			09/30/04				
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)			6.4	3,100	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEF developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytica detection limit was used to calculate the TEQ concentrations
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG

TABLE C-13A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-1-101
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-CC6 / RAA10-E-CC6 / 0-1 / 10/19/04	RAA10-E-DD5 / RAA10-E-DD5 / 0-1 / 10/19/04	RAA10-E-DD8 / RAA10-E-DD8 / 0-1 / 02/09/05	RAA10-E-EE4 / RAA10-E-EE4 / 0-1 / 02/16/05	RAA10-E-EE6 / RAA10-E-EE6 / 0-1 / 10/19/04	RAA10-E-FF10 / RAA10-E-FF10 / 0-1 / 02/09/05	RAA10-E-GG6 / RAA10-E-GG6 / 0-1 / 02/18/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		20	160	14	0.75	52	50	2.5

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-GG9 / RAA10-E-GG9 / 0-1 / 02/09/05	RAA10-E-GG11 / RAA10-E-GG11 / 0-1 / 02/23/05	RAA10-E-HH5 / RAA10-E-HH5 / 0-1 / 02/17/05	RAA10-E-II6 / RAA10-E-II6 / 0-1 / 02/17/05	RAA10-E-II10 / RAA10-E-II10 / 0-1 / 02/10/05	RAA10-E-KK8 / RAA10-E-KK8 / 0-1 / 02/11/05	RAA10-E-KK10 / RAA10-E-KK10 / 0-1 / 02/10/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		0.44	66	8.7	8.3	96	14	20

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-LL9 / RAA10-E-LL9 / 0-1 / 02/10/05	RAA10-E-MM9 / RAA10-E-MM9 / 0-1 / 02/11/05	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		12	3.1	160	--	3,000	No

1- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-DD6 / RAA10-E-DD6 / 1-3 / 02/15/05	RAA10-E-DD6 / RAA10-E-DD6 / 6-15 / 02/15/05	RAA10-E-FF4 / RAA10-E-FF4 / 1-3 / 02/15/05	RAA10-E-FF4 / RAA10-E-FF4 / 3-6 / 02/15/05	RAA10-E-FF4 / RAA10-E-FF4 / 6-15 / 02/15/05	RAA10-E-FF8 / RAA10-E-FF8 / 3-6 / 02/16/05	RAA10-E-FF10 / RAA10-E-FF10 / 3-6 / 02/09/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		19	0.35	4.7	0.69	0.17	0.28	0.4

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-FF10 / RAA10-E-FF10 / 6-15 / 02/09/05	RAA10-E-HH4 / RAA10-E-HH4 / 1-3 / 02/17/05	RAA10-E-HH4 / RAA10-E-HH4 / 3-6 / 02/17/05	RAA10-E-HH6 / RAA10-E-HH6 / 1-3 / 02/17/05	RAA10-E-HH6 / RAA10-E-HH6 / 6-15 / 02/17/05	RAA10-E-HH11 / RAA10-E-HH11 / 3-6 / 02/24/05	RAA10-E-JJ8 / RAA10-E-JJ8 / 3-6 / 02/11/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		1,200	2.1	0.93	10	0.48	110	800

TABLE C-13A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-1-101
SCENARIO: COMMERCIAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:						
	Location ID:	RAA10-E-LL8	RAA10-E-LL8	RAA10-E-LL8	RAA10-E-LL9	RAA10-E-LL9	RAA10-E-LL9
	Sample ID:	RAA10-E-LL8	RAA10-E-LL8	RAA10-E-LL8	RAA10-E-LL9	RAA10-E-LL9	RAA10-E-LL9
	Sample Depth(Feet):	1-3	3-6	6-15	1-3	3-6	6-15
Parameter	Date Collected:	02/10/05	02/10/05	02/10/05	02/10/05	02/10/05	02/10/05
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)		7	2.9	0.44	0.59	8.9	0.56

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		1,200	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs is compared to the appropriate revised EPA PRG.

TABLE C-14A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-1
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-BB18	RAA10-E-CC22	RAA10-E-DD14	RAA10-E-DD16	RAA10-E-DD22	RAA10-E-FF14	RAA10-E-FF18	RAA10-E-FF22
	Sample ID:	RAA10-E-BB18	RAA10-E-CC22	RAA10-E-DD14	RAA10-E-DD16	RAA10-E-DD22	RAA10-E-FF14	RAA10-E-FF18	RAA10-E-FF22
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	06/22/04	06/07/04	02/22/05	07/27/04	09/07/04	09/08/04	09/08/04	09/08/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		2.9	43	30	4.1	8.4	1.8	0.89	2.6

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-HH16	RAA10-E-HH20	RAA10-E-HH26	RAA10-E-II13	RAA10-E-JJ14	RAA10-E-JJ16	RAA10-E-JJ18	RAA10-E-JJ22
	Sample ID:	RAA10-E-HH16	RAA10-E-HH20	RAA10-E-HH26	RAA10-E-II13	RAA10-E-JJ14	RAA10-E-JJ16	RAA10-E-JJ18	RAA10-E-JJ22
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	09/09/04	12/15/04	12/28/04	03/10/05	03/08/05	03/08/05	01/03/05	12/29/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		3.9	4.9	36	24	420	31	4.7	3.3

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-JJ24	RAA10-E-JJ26	RAA10-E-LL17	RAA10-E-LL18	RAA10-E-LL24	RAA10-E-MM18	RAA10-E-MM20	RAA10-E-NN22
	Sample ID:	RAA10-E-JJ24	RAA10-E-JJ26	RAA10-E-LL17	RAA10-E-LL18	RAA10-E-LL24	RAA10-E-MM18	RAA10-E-MM20	RAA10-E-NN22
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	12/29/04	12/29/04	06/08/07	03/08/05	01/03/05	06/08/07	07/12/04	01/18/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		4.7	30	140	210	5.3	320	17	11

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:								
	Location ID:	RAA10-E-NN26	RAA10-E-OO23	RAA10-E-T18	RAA10-E-V16	RAA10-E-V19	RAA10-E-X18	RAA10-E-Z14	RAA10-E-Z16
	Sample ID:	RAA10-E-NN26	RAA10-E-OO23	RAA10-E-T18	RAA10-E-V16	RAA10-E-V19	RAA10-E-X18	RAA10-E-Z14	RAA10-E-Z16
	Sample Depth(Feet):	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Parameter	Date Collected:	01/04/05	07/13/04	06/11/04	06/15/04	06/04/04	06/16/04	02/22/05	06/21/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		15	4.3	2.7	1.4	2.6	2.1	460	6.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:							
	Location ID:	RAA10-E-Z20	UFP2-R1	UFP2-R1				
	Sample ID:	RAA10-E-Z20	UFP2-R1	UFP2-R1	Maximum	95% Upper	Revised	Constituent Exceeds
	Sample Depth(Feet):	0-1	0-0.5	0.5-1	Sample	Confidence	EPA	Comparison Criteria?
Parameter	Date Collected:	06/21/04	12/16/96	12/16/96	Result	Limit (UCL)	PRG	(see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		2.5	290,000	370	290,000	22,364	400	**Yes**

TABLE C-14A
EXISTING CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-1
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 3-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-DD16 / RAA10-E-DD16 / 1-3 / 07/27/04	RAA10-E-DD20 / RAA10-E-DD20 / 1-3 / 06/22/04	RAA10-E-FF14 / RAA10-E-FF14 / 1-3 / 09/08/04	RAA10-E-KKLL19.5 / RAA10-E-KKLL19.5 / 1-3 / 03/31/05	RAA10-E-LL24 / RAA10-E-LL24 / 1-3 / 01/03/05	RAA10-E-NN26 / RAA10-E-NN26 / 1-3 / 01/04/05	RAA10-E-X16 / RAA10-E-X16 / 1-3 / 06/15/04	RAA10-E-Z14 / RAA10-E-Z14 / 1-3 / 02/22/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.36	0.9	0.5	1.4	0.97	1.1	0.73	760

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans					
Total TEQs (EPA 2010 TEFs)		760	276	600	No

3- TO 15-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-DD16 / RAA10-E-DD16 / 6-15 / 07/27/04	RAA10-E-DD20 / RAA10-E-DD20 / 3-6 / 06/22/04	RAA10-E-FF14 / RAA10-E-FF14 / 3-6 / 09/08/04	RAA10-E-FF18 / RAA10-E-FF18 / 3-6 / 09/08/04	RAA10-E-FF18 / RAA10-E-FF18 / 6-15 / 09/08/04	RAA10-E-HH24 / RAA10-E-HH24 / 3-6 / 12/28/04	RAA10-E-HH24 / RAA10-E-HH24 / 6-15 / 12/28/04	RAA10-E-KKLL19.5 / RAA10-E-KKLL19.5 / 3-6 / 03/31/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		0.23	0.81	0.26	0.16	0.15	0.89	1.1	1.6

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-KKLL19.5 / RAA10-E-KKLL19.5 / 6-15 / 03/31/05	RAA10-E-LL24 / RAA10-E-LL24 / 6-15 / 01/03/05	RAA10-E-NN26 / RAA10-E-NN26 / 3-6 / 01/04/05	RAA10-E-T16 / RAA10-E-T16 / 6-15 / 06/18/04	RAA10-E-X15 / RAA10-E-X15 / 6-15 / 07/27/04	RAA10-E-X16 / RAA10-E-X16 / 3-6 / 06/15/04	RAA10-E-X18 / RAA10-E-X18 / 3-6 / 06/16/04	RAA10-E-X18 / RAA10-E-X18 / 6-15 / 06/16/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		1	1.1	0.99	1.3	0.42	1	0.68	0.73

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-Z14 / RAA10-E-Z14 / 3-6 / 02/22/05	RAA10-E-Z16 / RAA10-E-Z16 / 6-15 / 06/21/04	RAA10-E-Z20 / RAA10-E-Z20 / 6-15 / 06/21/04	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		580	0.73	0.64	580	--	20,000	No

Notes:

1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.

TABLE C-14B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-1
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

0- TO 1-FOOT DEPTH INCREMENT:

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-BB18 / RAA10-E-BB18 / 0-1 / 06/22/04	RAA10-E-CC22 / RAA10-E-CC22 / 0-1 / 06/07/04	RAA10-E-DD14 / RAA10-E-DD14 / 0-1 / 02/22/05	RAA10-E-DD16 / RAA10-E-DD16 / 0-1 / 07/27/04	RAA10-E-DD22 / RAA10-E-DD22 / 0-1 / 09/07/04	RAA10-E-FF14 / RAA10-E-FF14 / 0-1 / 09/08/04	RAA10-E-FF18 / RAA10-E-FF18 / 0-1 / 09/08/04	RAA10-E-FF22 / RAA10-E-FF22 / 0-1 / 09/08/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		2.9	43	30	4.1	8.4	1.8	0.89	2.6

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-HH16 / RAA10-E-HH16 / 0-1 / 09/09/04	RAA10-E-HH20 / RAA10-E-HH20 / 0-1 / 12/15/04	RAA10-E-HH26 / RAA10-E-HH26 / 0-1 / 12/28/04	RAA10-E-II13 / RAA10-E-II13 / 0-1 / 03/10/05	RAA10-E-JJ14 / RAA10-E-JJ14 / 0-1 / 03/08/05	RAA10-E-JJ16 / RAA10-E-JJ16 / 0-1 / 03/08/05	RAA10-E-JJ18 / RAA10-E-JJ18 / 0-1 / 01/03/05	RAA10-E-JJ22 / RAA10-E-JJ22 / 0-1 / 12/29/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		3.9	4.9	36	24	420	31	4.7	3.3

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-JJ24 / RAA10-E-JJ24 / 0-1 / 12/29/04	RAA10-E-JJ26 / RAA10-E-JJ26 / 0-1 / 12/29/04	RAA10-E-LL17 / RAA10-E-LL17 / 0-1 / 06/08/07	RAA10-E-LL18 / RAA10-E-LL18 / 0-1 / 03/08/05	RAA10-E-LL24 / RAA10-E-LL24 / 0-1 / 01/03/05	RAA10-E-MM18 / RAA10-E-MM18 / 0-1 / 06/08/07	RAA10-E-MM20 / RAA10-E-MM20 / 0-1 / 07/12/04	RAA10-E-NN22 / RAA10-E-NN22 / 0-1 / 01/18/05
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		4.7	30	140	210	5.3	320	17	11

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-NN26 / RAA10-E-NN26 / 0-1 / 01/04/05	RAA10-E-OO23 / RAA10-E-OO23 / 0-1 / 07/13/04	RAA10-E-T18 / RAA10-E-T18 / 0-1 / 06/11/04	RAA10-E-V16 / RAA10-E-V16 / 0-1 / 06/15/04	RAA10-E-V19 / RAA10-E-V19 / 0-1 / 06/04/04	RAA10-E-X18 / RAA10-E-X18 / 0-1 / 06/16/04	RAA10-E-Z14 / RAA10-E-Z14 / 0-1 / 02/22/05	RAA10-E-Z16 / RAA10-E-Z16 / 0-1 / 06/21/04
Dioxins/Furans									
Total TEQs (EPA 2010 TEFs)		15	4.3	2.7	1.4	2.6	2.1	460	6.1

Parameter	Location ID: / Sample ID: / Sample Depth(Feet): / Date Collected:	RAA10-E-Z20 / RAA10-E-Z20 / 0-1 / 06/21/04	UFP2-R1 / UFP2-R1 / 0-0.5 / 12/16/96	UFP2-R1 / UFP2-R1 / 0.5-1 / 12/16/96	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)		2.5	***1.00***	370	460	100	400	No

TABLE C-14B
POST-REMEDIATION CONDITIONS - COMPARISON OF DIOXIN/FURAN TEQs TO REVISED EPA PRGs
AVERAGING AREA L12-2-1
SCENARIO: RECREATIONAL WITH ERE

UNKAMET BROOK AREA
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per trillion, ppt)

1- TO 3-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-DD16	RAA10-E-DD20	RAA10-E-FF14	RAA10-E-KKLL19.5	RAA10-E-LL24	RAA10-E-NN26	RAA10-E-X16	RAA10-E-Z14
Sample ID:	RAA10-E-DD16	RAA10-E-DD20	RAA10-E-FF14	RAA10-E-KKLL19.5	RAA10-E-LL24	RAA10-E-NN26	RAA10-E-X16	RAA10-E-Z14
Sample Depth(Feet):	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3
Parameter / Date Collected:	07/27/04	06/22/04	09/08/04	03/31/05	01/03/05	01/04/05	06/15/04	02/22/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	0.36	0.9	0.5	1.4	0.97	1.1	0.73	760

Location ID: / Sample ID: / Sample Depth(Feet): / Parameter / Date Collected:	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Dioxins/Furans				
Total TEQs (EPA 2010 TEFs)	760	276	600	No

3- TO 15-FOOT DEPTH INCREMENT:

Location ID:	RAA10-E-DD16	RAA10-E-DD20	RAA10-E-FF14	RAA10-E-FF18	RAA10-E-FF18	RAA10-E-HH24	RAA10-E-HH24	RAA10-E-KKLL19.5
Sample ID:	RAA10-E-DD16	RAA10-E-DD20	RAA10-E-FF14	RAA10-E-FF18	RAA10-E-FF18	RAA10-E-HH24	RAA10-E-HH24	RAA10-E-KKLL19.5
Sample Depth(Feet):	6-15	3-6	3-6	3-6	6-15	3-6	6-15	3-6
Parameter / Date Collected:	07/27/04	06/22/04	09/08/04	09/08/04	09/08/04	12/28/04	12/28/04	03/31/05
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	0.23	0.81	0.26	0.16	0.15	0.89	1.1	1.6

Location ID:	RAA10-E-KKLL19.5	RAA10-E-LL24	RAA10-E-NN26	RAA10-E-T16	RAA10-E-X15	RAA10-E-X16	RAA10-E-X18	RAA10-E-X18
Sample ID:	RAA10-E-KKLL19.5	RAA10-E-LL24	RAA10-E-NN26	RAA10-E-T16	RAA10-E-X15	RAA10-E-X16	RAA10-E-X18	RAA10-E-X18
Sample Depth(Feet):	6-15	6-15	3-6	6-15	6-15	3-6	3-6	6-15
Parameter / Date Collected:	03/31/05	01/03/05	01/04/05	06/18/04	07/27/04	06/15/04	06/16/04	06/16/04
Dioxins/Furans								
Total TEQs (EPA 2010 TEFs)	1	1.1	0.99	1.3	0.42	1	0.68	0.73

Location ID:	RAA10-E-Z14	RAA10-E-Z16	RAA10-E-Z20	Maximum Sample Result	95% Upper Confidence Limit (UCL)	Revised EPA PRG	Constituent Exceeds Comparison Criteria? (see Note 2)
Sample ID:	RAA10-E-Z14	RAA10-E-Z16	RAA10-E-Z20				
Sample Depth(Feet):	3-6	6-15	6-15				
Parameter / Date Collected:	02/22/05	06/21/04	06/21/04				
Dioxins/Furans							
Total TEQs (EPA 2010 TEFs)	580	0.73	0.64	580	--	20,000	No

Notes:
1. Total 2,3,7,8-TCDD toxicity equivalency quotients (TEQs) were calculated using the Toxicity Equivalency Factors (TEFs) issued by EPA in 2010, based on the revised TEFs developed by the World Health Organization (WHO) in 2005, for all PCDD/PCDF compounds. Where individual compounds were not detected, a value of one-half the analytical detection limit was used to calculate the TEQ concentrations.
2. The maximum concentration for dioxin/furan TEQs or, if lower, the 95% Upper Confidence Limit (95% UCL) on the mean of the TEQ data is compared to the appropriate revised EPA PRG.
3. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of remedial actions.The backfill concentrations correspond to the average concentrations of such constituents as presented in the CD Sites Backfill Data Set.

ARCADIS

Figures

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
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XREFS:
40190X01
40190WST
40190X02

IMAGES:

PROJECTNAME: ----

LEGEND:

- PORTION OF UNKAMET BROOK AREA – WEST SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- K12–9–1 PROPERTY IDENTIFICATION
- WOOD FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- BUILDING
- PAVED AREA
- GE–OWNED INDUSTRIAL PROPERTY (UNPAVED PORTION)
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–CX101–M(REV 9–5–07) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. SAMPLE LOCATIONS ARE APPROXIMATE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPERTIES LOCATED EAST OF PLASTICS AVENUE - DIOXIN/FURAN SOIL SAMPLING LOCATIONS

ARCADIS

FIGURE
C-1A

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190P02.dwg LAYOUT: C-1B SAVED: 4/1/2014 9:03 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 9:03 AM BY: SARTORI, KATHERINE

XREFS: IMAGES: PROJECTNAME: ----
40190X01
40190WST
40190X02

LEGEND:

- PORTION OF UNKAMET BROOK AREA – WEST SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- K12–9–1 PROPERTY IDENTIFICATION
- WOOD FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- BUILDING
- PAVED AREA
- GE–OWNED INDUSTRIAL PROPERTY (UNPAVED PORTION)
- NON–GE OWNED COMMERCIAL/INDUSTRIAL PROPERTY (UNPAVED PORTION)
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–003–CX101(REV 8–1–07) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINE INFORMATION SHOWN HEREON WAS PROVIDED BY FORESIGHT LAND SERVICES AND IS NOT THE RESULT OF A RETRACEMENT SURVEY PREPARED BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC.
4. BUILDINGS OP–1 AND OP–2 MAKE–UP PARCEL K11–7–46 WHILE THE LAND THESE BUILDINGS ARE CONSTRUCTED ON IS PART OF PARCEL K11–7–2.
5. SAMPLE LOCATIONS ARE APPROXIMATE.



GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPERTIES LOCATED WEST OF PLASTICS AVE. - DIOXIN/FURAN SOIL SAMPLING LOCATIONS

ARCADIS

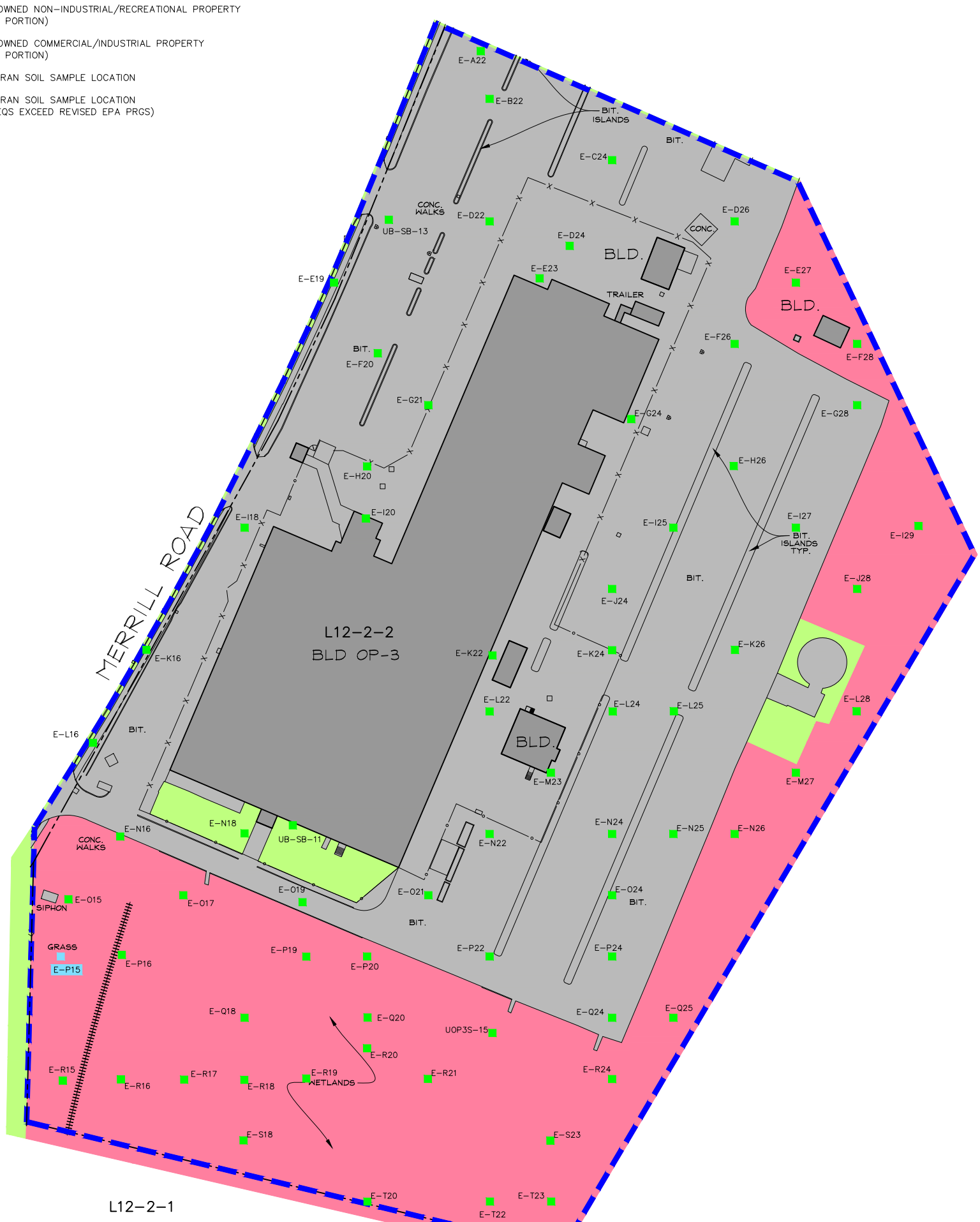
FIGURE
C-1B

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
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XREFS: IMAGES: PROJECTNAME: ----
40190X01
40190WST
40190X02

LEGEND:

- PORTION OF UNKAMET BROOK AREA – WEST SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- K12–9–1 PROPERTY IDENTIFICATION
- WOOD FENCE
- FENCE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- BUILDING
- PAVED AREA
- NON–GE OWNED NON–INDUSTRIAL/RECREATIONAL PROPERTY (UNPAVED PORTION)
- NON–GE OWNED COMMERCIAL/INDUSTRIAL PROPERTY (UNPAVED PORTION)
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION (TOTAL TEQS EXCEED REVISED EPA PRGS)



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–CX101–M(REV 9–5–07) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12–2–2 AND L12–2–1 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

0 50' 100'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPERTIES LOCATED SOUTH OF MERRILL ROAD - DIOXIN/FURAN SOIL SAMPLING LOCATIONS

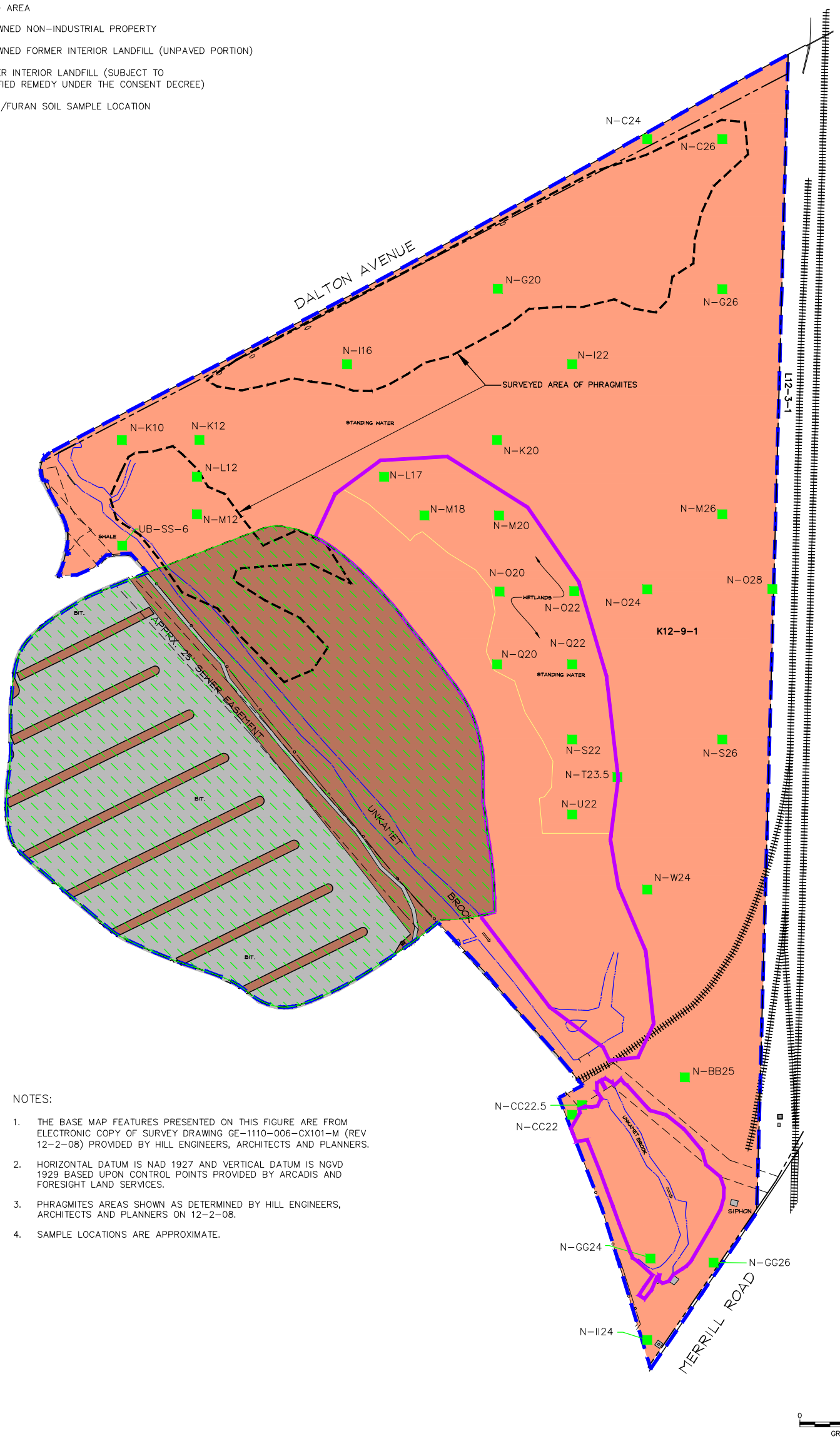
ARCADIS

FIGURE
C-1C

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
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LEGEND:

- PORTION OF UNKAMET BROOK AREA – REMAINDER SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- K12–9–1 PROPERTY IDENTIFICATION
- RAILROAD TRACKS
- EDGE OF WATER
- PAVED AREA
- GE–OWNED NON–INDUSTRIAL PROPERTY
- GE–OWNED FORMER INTERIOR LANDFILL (UNPAVED PORTION)
- FORMER INTERIOR LANDFILL (SUBJECT TO SPECIFIED REMEDY UNDER THE CONSENT DECREE)
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–006–CX101–M (REV 12–2–08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 1927 AND VERTICAL DATUM IS NGVD 1929 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. PHRAGMITES AREAS SHOWN AS DETERMINED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS ON 12–2–08.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

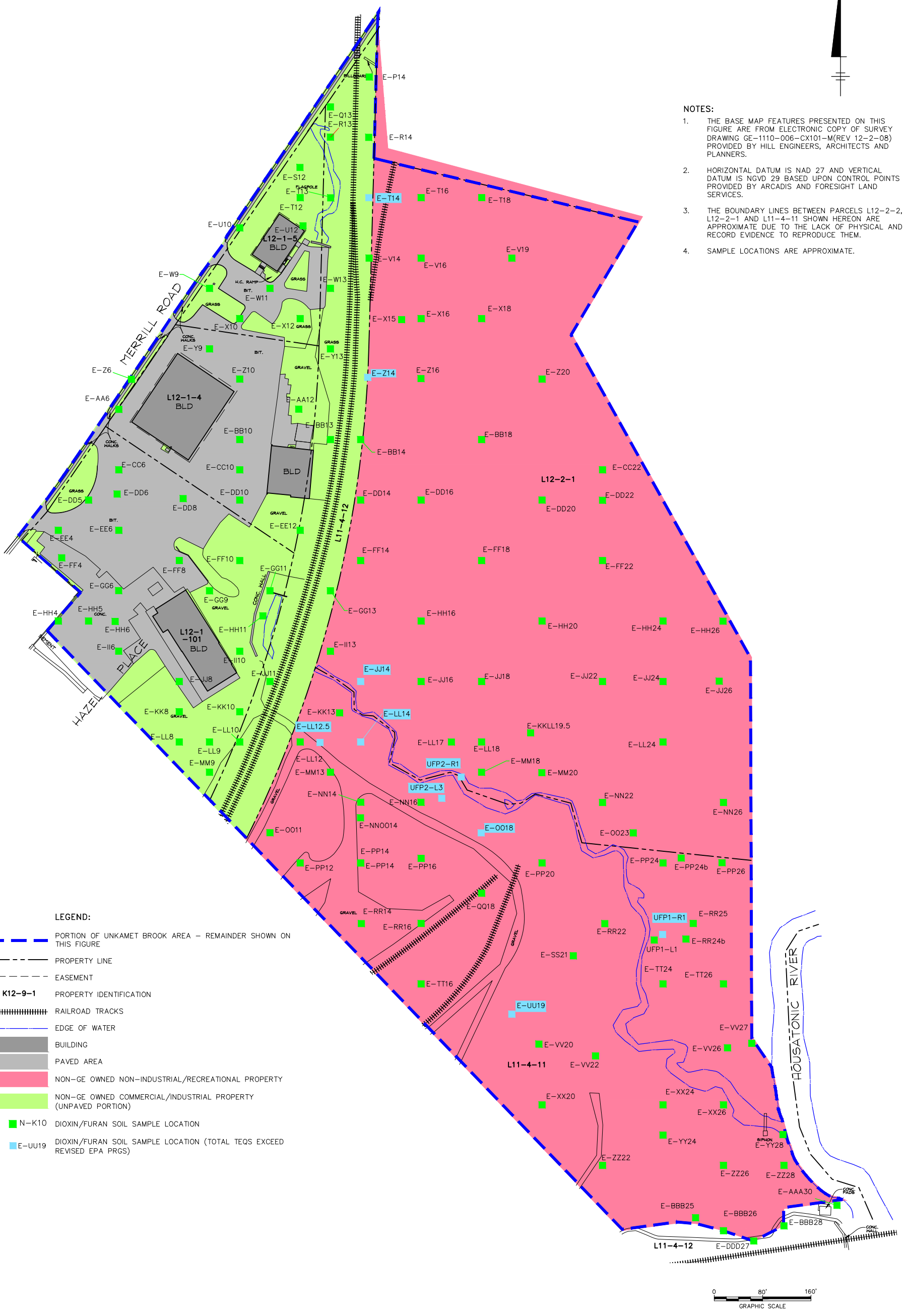
PROPERTIES LOCATED NORTH OF MERRILL ROAD - DIOXIN/FURAN SAMPLING LOCATIONS

ARCADIS

FIGURE
C-1D

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
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XREFS: IMAGES: PROJECTNAME: ----
40190X01
40190REM
40190X02



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

LEGEND:

- PORTION OF UNKAMET BROOK AREA – REMAINDER SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- K12-9-1 PROPERTY IDENTIFICATION
- RAILROAD TRACKS
- EDGE OF WATER
- BUILDING
- PAVED AREA
- NON-GE OWNED NON-INDUSTRIAL/RECREATIONAL PROPERTY
- NON-GE OWNED COMMERCIAL/INDUSTRIAL PROPERTY (UNPAVED PORTION)
- N-K10 DIOXIN/FURAN SOIL SAMPLE LOCATION
- E-UU19 DIOXIN/FURAN SOIL SAMPLE LOCATION (TOTAL TEQS EXCEED REVISED EPA PRGS)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPERTIES LOCATED SOUTH OF MERRILL ROAD - DIOXIN/FURAN SOIL SAMPLING LOCATIONS

ARCADIS

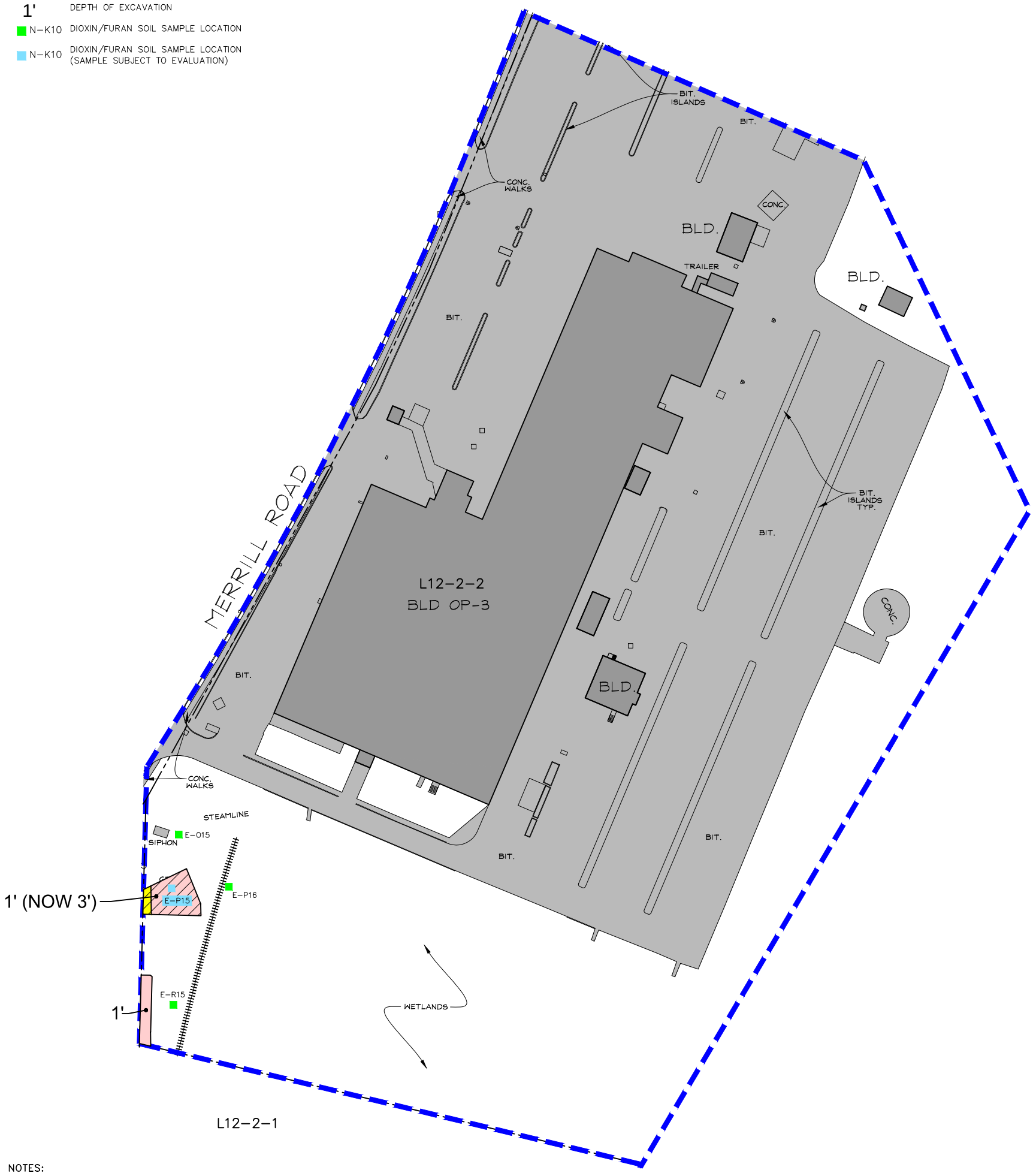
FIGURE
C-1E

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW KLS DMW PM: C. AVERILL TM: M. DALEY
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XREFS: IMAGES: PROJECTNAME: ----
40190X01
40190WST

LEGEND:

- PORTION OF UNKAMET BROOK AREA – WEST SHOWN ON THIS FIGURE
- PROPERTY LINE
- K12–9–1 PROPERTY IDENTIFICATION
- RAILROAD TRACKS
- EDGE OF WATER
- BUILDING
- PAVED AREA
- AREA PROPOSED FOR PCB SOIL REMOVAL
- AREA OF HORIZONTALLY EXPANDED SOIL REMOVAL
- AREA SUBJECT TO ADDITIONAL SOIL REMOVAL TO A DEPTH OF 3 FEET
- 1' DEPTH OF EXCAVATION
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION
- N–K10 DIOXIN/FURAN SOIL SAMPLE LOCATION (SAMPLE SUBJECT TO EVALUATION)



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE–1110–CX101–M(REV 9–5–07) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12–2–2 AND L12–2–1 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

0 50' 100'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

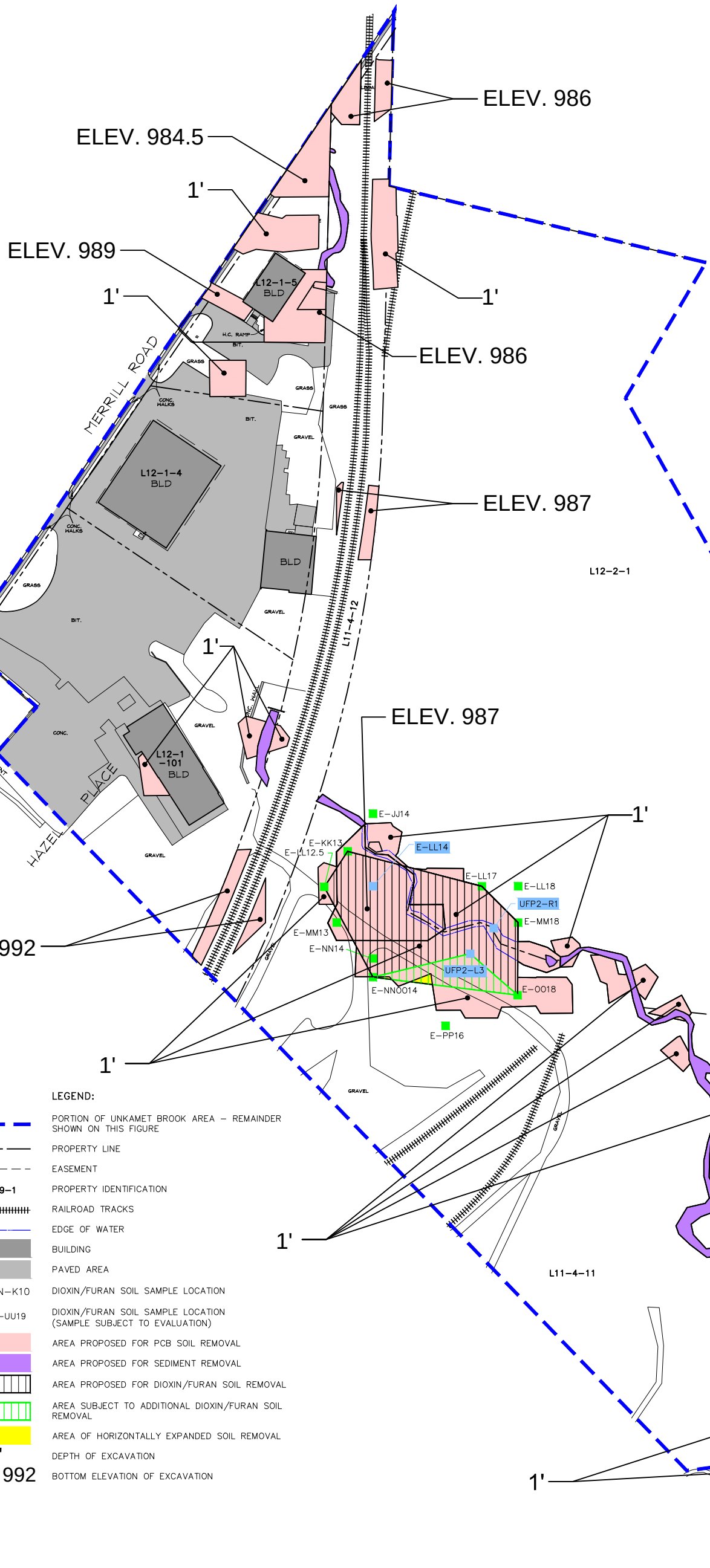
PROPERTIES LOCATED SOUTH OF MERRILL ROAD - DIOXIN/FURAN TEQ EXCEEDANCES SUBJECT TO EVALUATION

ARCADIS

FIGURE
C-2A

CITY: SYRACUSE, NY DIV/GROUP: ENV/141 DB: DMW K.SARTORI PM: C. AVERILL TM: M. DALEY
V:\ENVCAD\SYRACUSE\ACT\N\B0040190\0002\00006\DWG\FINAL-REMAINDER\40190P07.dwg LAYOUT: C-2B SAVED: 4/1/2014 9:00 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2014 9:01 AM BY: SARTORI, KATHERINE

XREFS: IMAGES: PROJECTNAME: ----
40190X01
40190REM



NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

LEGEND:

- PORTION OF UNKAMET BROOK AREA – REMAINDER SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- K12-9-1 — PROPERTY IDENTIFICATION
- RAILROAD TRACKS
- EDGE OF WATER
- BUILDING
- PAVED AREA
- N-K10 — DIOXIN/FURAN SOIL SAMPLE LOCATION
- E-UU19 — DIOXIN/FURAN SOIL SAMPLE LOCATION (SAMPLE SUBJECT TO EVALUATION)
- AREA PROPOSED FOR PCB SOIL REMOVAL
- AREA PROPOSED FOR SEDIMENT REMOVAL
- AREA PROPOSED FOR DIOXIN/FURAN SOIL REMOVAL
- AREA SUBJECT TO ADDITIONAL DIOXIN/FURAN SOIL REMOVAL
- AREA OF HORIZONTALLY EXPANDED SOIL REMOVAL
- 1' — DEPTH OF EXCAVATION
- ELEV. 992 — BOTTOM ELEVATION OF EXCAVATION

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD-RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PROPERTIES LOCATED SOUTH OF MERRILL ROAD - DIOXIN/FURAN TEQ EXCEEDANCES SUBJECT TO EVALUATIONS

ARCADIS

FIGURE
C-2B

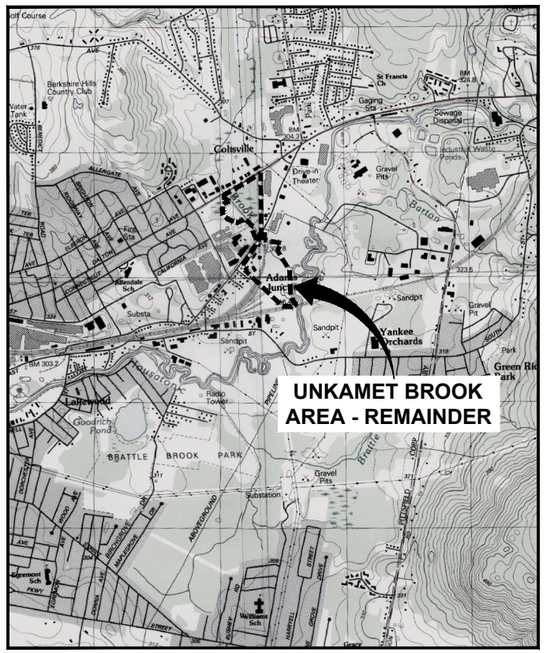
Appendix D

Technical Drawings

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ,K.SARTORI PM: C.AVERILL TM: M.DALEY
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TECHNICAL DRAWINGS

UNKAMET BROOK AREA - REMAINDER REVISED FINAL REMOVAL DESIGN/ REMOVAL ACTION WORK PLAN



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., PITTSFIELD WEST, MASS-NEW YORK AND PITTSFIELD EAST, MASS., 1973.

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE

AREA LOCATION

MASSACHUSETTS

APRIL 2014

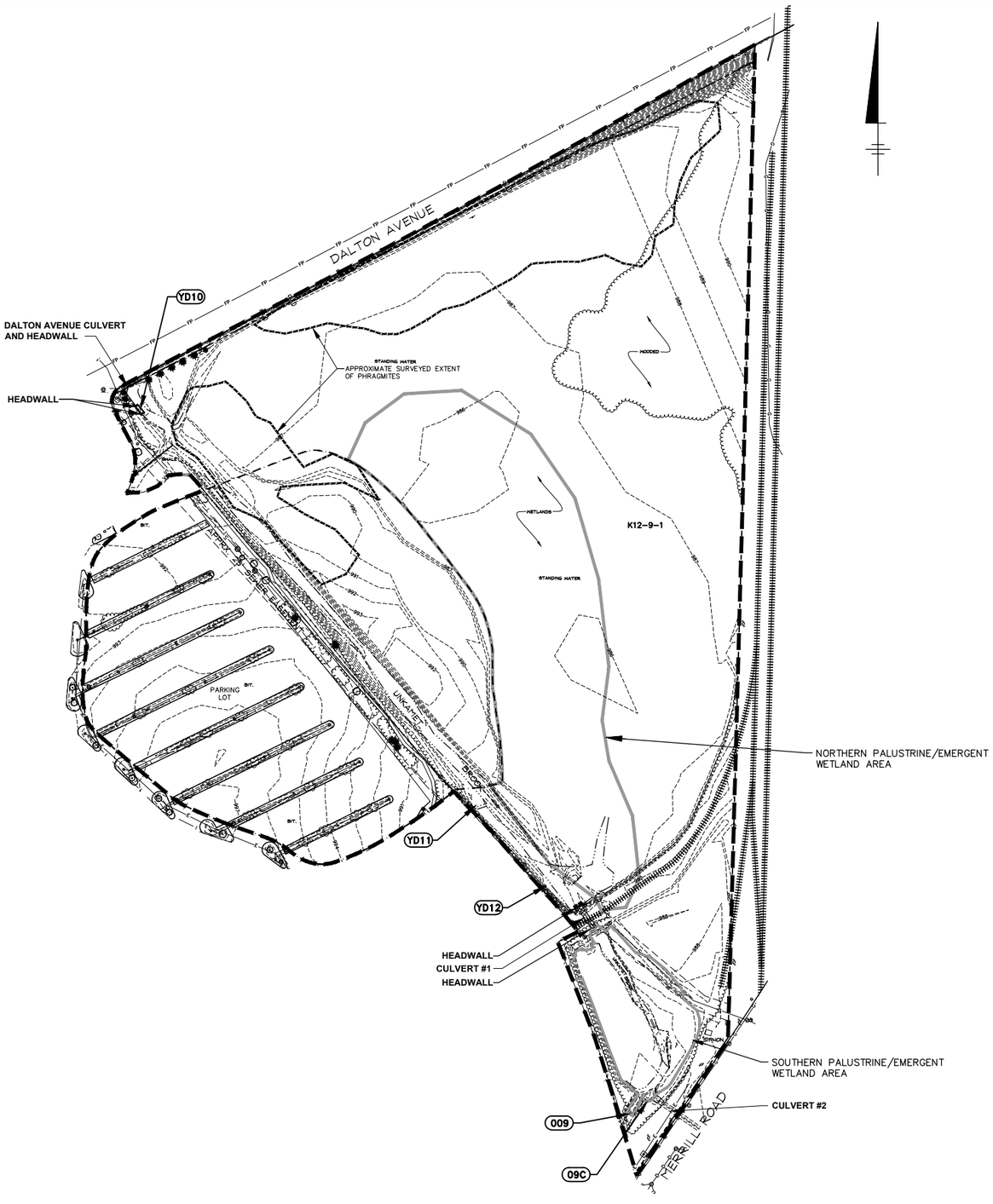
General Electric Company
Pittsfield, Massachusetts

ARCADIS

ARCADIS U.S., INC.

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LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- APPROXIMATE PHRAGMITES AREA BOUNDARY
- LIMITS OF FORMER INTERIOR LANDFILL
- K12-9-1 PROPERTY IDENTIFICATION
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- E ELECTRIC SERVICE
- G GAS SERVICE
- S SANITARY SEWER
- STORM DRAIN
- FP FIRE PROTECTION WATER
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- 009 APPROXIMATE EXITING OUTFALL LOCATION
- APPROXIMATE EXISTING UNKAMET BROOK CULVERT

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-CX101-M(REV 10-23-07), GE-1110-009-CX101(REVISED 1-8-09) AND GE-1110-006-CX101-M(REVISED 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.
4. ACCORDING TO FLOOD INSURANCE RATE MAP (FIRM), COMMUNITY PANEL 250037 0010 C, REVISION DATED FEBRUARY 19, 1982, THE 100-YEAR FLOOD PLAIN ELEVATION IN THE PROJECT VICINITY IS 995 FEET ABOVE MEAN SEA LEVEL.
5. PHRAGMITES AREA SHOWN FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REVISED 12/2/08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
6. PER COMMENT #6 OF EPA'S DECEMBER 16, 2009 CONDITIONAL APPROVAL LETTER REGARDING THE UNKAMET BROOK AREA – REMAINDER CONCEPTUAL WORK PLAN, PARCEL L12-3-1 HAS BEEN EXCLUDED FROM THE LIMITS OF THE UNKAMET BROOK AREA REMOVAL ACTION AREA.
7. ALL LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
8. NOT ALL PHYSICAL FEATURES SHOWN.

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Professional Engineer's No.

State	Date Signed	Project Mgr.
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Designed by	Drawn by	Checked by
THL	BKD	MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - EXISTING SITE PLAN

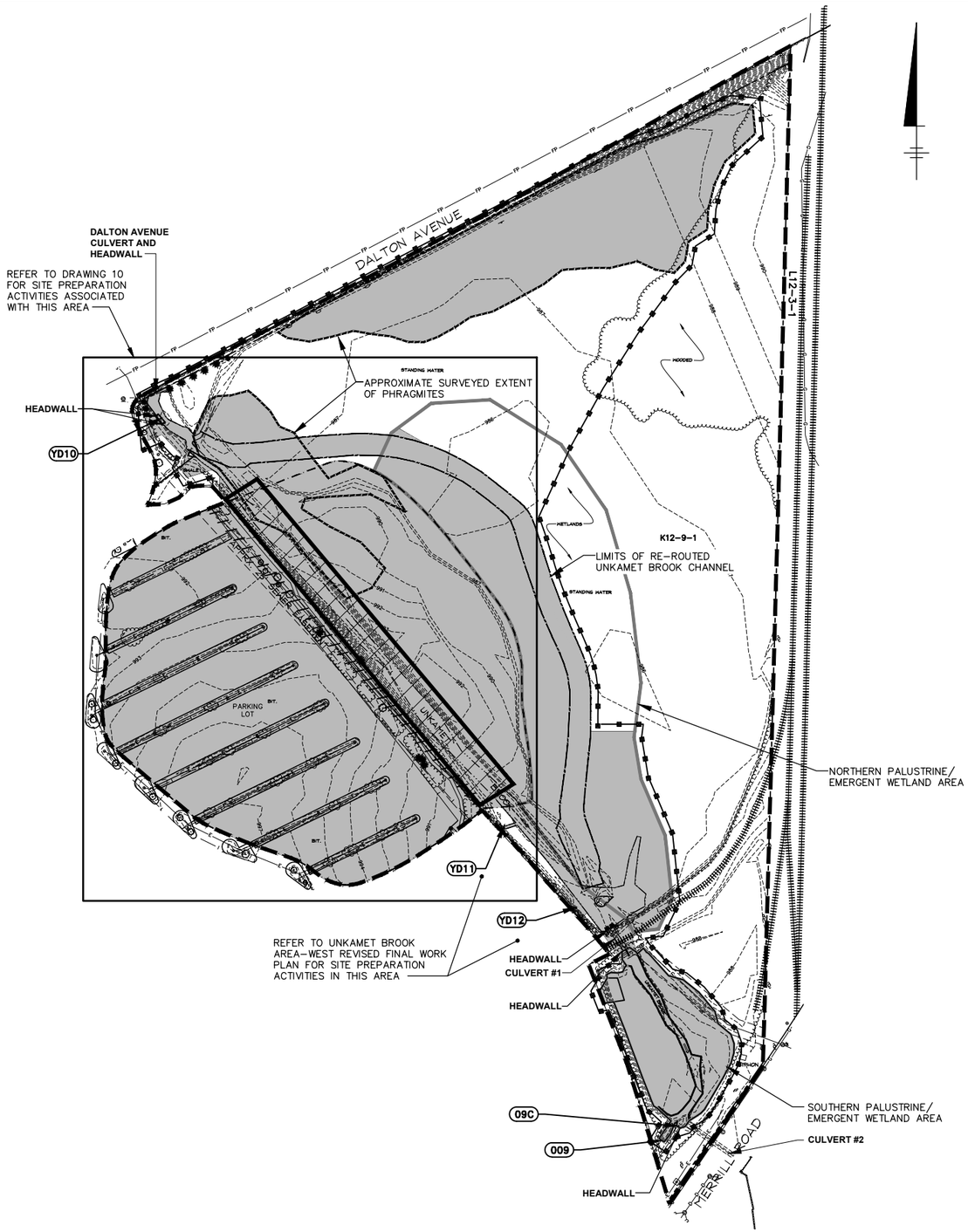
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1



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
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- RAILROAD TRACKS
- GUARDRAIL
- ELECTRIC SERVICE
- GAS SERVICE
- SANITARY SEWER
- SANITARY SEWER SUBJECT TO RE-ALIGNMENT (SEE DRAWINGS 14 AND 15)
- STORM DRAIN
- FP FIRE PROTECTION WATER
- IRRIGATION (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- ELECTRIC SERVICE (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- LIMITS OF GRADING FOR RE-ROUTED BROOK CHANNEL
- HAY BALE/SILT FENCE (2/40)
- LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION
- SECTION OF UNKAMET BROOK SUBJECT TO RE-ROUTING (SEE DRAWINGS 5 AND 6)
- 009 APPROXIMATE EXISTING OUTFALL LOCATION
- APPROXIMATE EXISTING UNKAMET BROOK CULVERT

NOTES:

1. REFER TO DRAWINGS 1 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROLS TO THE LIMITS SHOWN PRIOR TO DISTURBING EXISTING SITE SOILS, PAVEMENT, AND/OR VEGETATION. THE DISTANCE OF HAY BALES/SILT FENCING FROM THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION IS EXAGGERATED ON THIS DRAWING FOR CLARITY PURPOSES. THE CONTRACTOR SHALL INSTALL HAY BALES/SILT FENCING WITHIN 3 TO 5 FEET OF THE LIMITS OF SOIL/SEDIMENT REMOVAL AND SUBGRADE PREPARATION. WITHIN THE EXISTING PARKING LOT, THE CONTRACTOR SHALL PLACE HAY BALES AROUND ACTIVE MATERIALS HANDLING AREAS (e.g., AROUND THE TEMPORARY DEWATERING STOCKPILE, ETC.) AND MAINTAIN THROUGHOUT THE PERFORMANCE OF THE ASSOCIATED ACTIVITIES.
3. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
4. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL REMOVE AND REPLACE (WITH NEW), ALL SITE FEATURES LOCATED WITHIN THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION. BELOW GRADE PORTIONS OF SUCH FEATURES TO BE REUSED WILL BE SUBJECT TO CLEANING AS NECESSARY. ALL FEATURES DEEMED NON-REUSABLE BY GE/GE'S REPRESENTATIVE SHALL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE OFF-SITE FACILITY.
5. THE CONTRACTOR MAY REMOVE FOR DISPOSAL OTHER SITE FEATURES, VEGETATION, AND DEBRIS NOT SPECIFICALLY IDENTIFIED HEREON AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. HOWEVER, SUCH REMOVAL SHALL NOT BE PERFORMED WITHOUT THE APPROVAL OF GE/GE'S REPRESENTATIVE AND MUST BE REPLACED AT NO ADDITIONAL COST TO GE.
6. ABOVE-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION THAT DO NOT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS WILL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE GE-APPROVED OFF-SITE DISPOSAL FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING CLEARED DEBRIS/VEGETATION AS REQUIRED BY THE DISPOSAL FACILITY. BELOW-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION (AND PORTIONS THAT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS) WILL BE MANAGED AND DISPOSED OF ALONG WITH EXCAVATED SOILS.
7. THE CONTRACTOR SHALL PROTECT ALL STRUCTURES/FEATURES IN AREAS THAT WILL NOT BE SUBJECT TO THE REMEDIATION ACTIVITIES. IN PARTICULAR, THE CONTRACTOR SHALL PROTECT THE ADJACENT WETLANDS AND BROOK DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY IMPACTS TO THESE AREAS/ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
8. THE CONTRACTOR SHALL PROTECT ALL ABOVE-GROUND AND UNDERGROUND UTILITIES INCLUDING ASSOCIATED STRUCTURES/COMPONENTS (e.g., POLES, MANHOLES, CATCH BASINS, ETC.) NOT SUBJECT TO ABANDONMENT DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY UTILITIES OR ASSOCIATED STRUCTURES/COMPONENTS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
9. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER-RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
10. THE LOCATION OF TEMPORARY ACCESS ROADS AND MATERIALS STAGING AREAS (NOT SHOWN) SHALL BE IDENTIFIED BY THE CONTRACTOR FOR REVIEW AND APPROVAL BY GE/GE'S REPRESENTATIVE PRIOR TO INSTALLATION.
11. THE CONTRACTOR SHALL PROTECT THE EXISTING OUTFALLS AND MANAGE ANY ASSOCIATED FLOWS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES.

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-		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
-		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - SITE PREPARATION PLAN

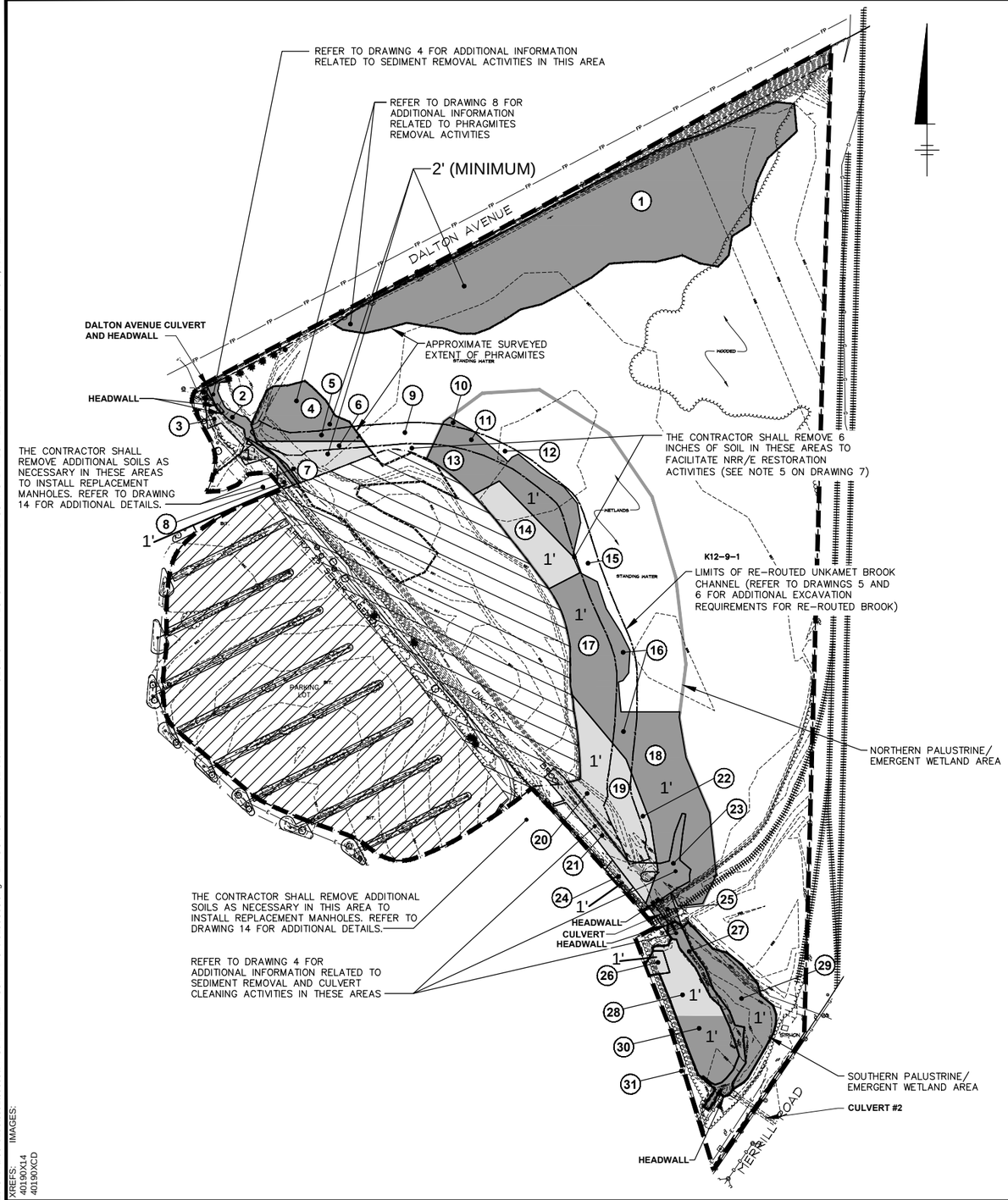
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2



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- LIMITS OF SUBGRADE PREPARATION FOR 2 FOOT THICK ABOVE-GRADE VEGETATIVE ENGINEERED BARRIER
- LIMITS OF SUBGRADE PREPARATION FOR 1 FOOT THICK ABOVE-GRADE ASPHALT-COVERED ENGINEERED BARRIER
- LIMITS OF NON-TSCA REMOVAL
- LIMITS OF TSCA REMOVAL
- (1) EXCAVATION CELL ID
- 1' TARGET DEPTH OF EXCAVATION

NOTES:

1. REFER TO DRAWINGS 1, 2 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
3. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED EXCAVATION DEPTHS/ELEVATIONS PRIOR TO INITIATING BACKFILLING ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL RD/RA WORK PLAN.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING ALL REMOVED MATERIALS AS REQUIRED BY THE DISPOSAL FACILITY. UNLESS OTHERWISE NOTED, NON-SOIL MATERIALS WILL BE MANAGED AND DISPOSED OF ALONG WITH ADJACENT/UNDERLYING EXCAVATED SOILS.
5. THE CONTRACTOR SHALL MANAGE ALL EXCAVATED MATERIALS ACCORDING TO THE TSCA AND NON-TSCA DESIGNATIONS SPECIFIED ON THIS DRAWING. THE CONTRACTOR SHALL COORDINATE WITH GE/GE'S REPRESENTATIVE FOR THE TRANSPORTATION OF EXCAVATED MATERIALS TO THE APPROPRIATE OFF-SITE DISPOSAL FACILITY (BY OTHERS).
6. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF UTILITIES NOT SUBJECT TO ABANDONMENT WITHIN/ADJACENT TO EXCAVATION AREAS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES NOT SUBJECT TO ABANDONMENT. ANY DAMAGE TO ANY UTILITY SHALL BE REPLACED/REPAIRED AT NO ADDITIONAL COST TO GE. AS SHOWN ON DRAWINGS 14 AND 15, A PORTION OF THE SEWER LINE LOCATED WITHIN THE FORMER INTERIOR LANDFILL WILL BE SUBJECT TO REALIGNMENT.
7. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER-RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
8. THE CONTRACTOR SHALL PROTECT ALL VEGETATION AND STRUCTURES NOT CLEARED DURING SITE PREPARATION ACTIVITIES. ANY DAMAGE TO THESE ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
9. REMOVAL DEPTHS DESIGNATED AS 1' WILL BE SUBJECT TO EXCAVATION TO A DEPTH OF 1' BELOW EXISTING GROUND SURFACE. EXCAVATION IN THE PHRAGMITES REMOVAL AREAS SHALL BE A MINIMUM OF 2' BELOW EXISTING GROUND SURFACE OR 1' BELOW THE SHALLOW GROUNDWATER ELEVATION AS DETERMINED DURING THE MONTH OF MAY BY GE (WHICHEVER IS LOWER), SEE ALSO NOTE 3 ON DRAWING 8. THE CONTRACTOR SHALL CONFIRM THAT HERBICIDE TREATMENT OF PHRAGMITES AREA WAS PERFORMED AT LEAST THREE WEEKS PRIOR TO INITIATION OF EXCAVATION ACTIVITIES IN PHRAGMITES REMOVAL AREAS.
10. THE CONTRACTOR SHALL APPROPRIATELY DEWATER/STABILIZE SOILS AND SEDIMENTS TO MAKE SUITABLE FOR TRANSPORT (I.E., MATERIALS SUBJECT TO TRANSPORT SHALL PASS A PAINT FILTER TEST). EXCAVATED MATERIALS REQUIRING DEWATERING SHALL BE DEWATERED OVER THE ACTIVE EXCAVATION AREAS AND/OR TRANSPORTED TO A DEWATERING STOCKPILE CONSTRUCTED IN THE PARKING LOT OVER THE FORMER INTERIOR LANDFILL (FOLLOWING THE SITE PREPARATION ACTIVITIES DESCRIBED ON DRAWING 10) OR AT AN ALTERNATE LOCATION ON GE PROPERTY. UPON PASSING THE PAINT FILTER TEST THE CONTRACTOR MAY STABILIZE EXCAVATED MATERIAL BY GRAVITY DEWATERING, MIXING WITH DRIER EXCAVATED MATERIALS OF A SIMILAR WASTE CHARACTERIZATION (WITH APPROVAL BY GE), OR DRYING AGENTS (SUBJECT TO THE REQUIREMENTS OF SECTION 7.5.4 OF THE REVISED FINAL RD/RA WORK PLAN).
11. AS INDICATED BY NOTES 4 THROUGH 8 ON DRAWING 4, THE CONTRACTOR SHALL INSTALL WATER DIVERSION AND EXCAVATION BYPASS PUMPING CONTROLS PRIOR TO THE EXCAVATION OF SOILS/SEDIMENTS.
12. LIQUIDS GENERATED DURING REMEDIATION ACTIVITIES (E.G., EXCAVATION DEWATERING, EQUIPMENT DECONTAMINATION, ETC.) SHALL BE COLLECTED AND TRANSPORTED BY THE CONTRACTOR TO GE'S BUILDING 64G WATER TREATMENT FACILITY (SUBJECT TO REVIEW AND APPROVAL BY GE) FOR TREATMENT AND DISCHARGE BY GE. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO LIMIT THE GENERATION AND COLLECTION OF WATER THAT WILL REQUIRE TREATMENT.

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1"=100' (100' 0 100' 200')

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: -
Professional Engineer's No.:

State	Date Signed	Project Mgr.
-		CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - EXCAVATION LIMITS

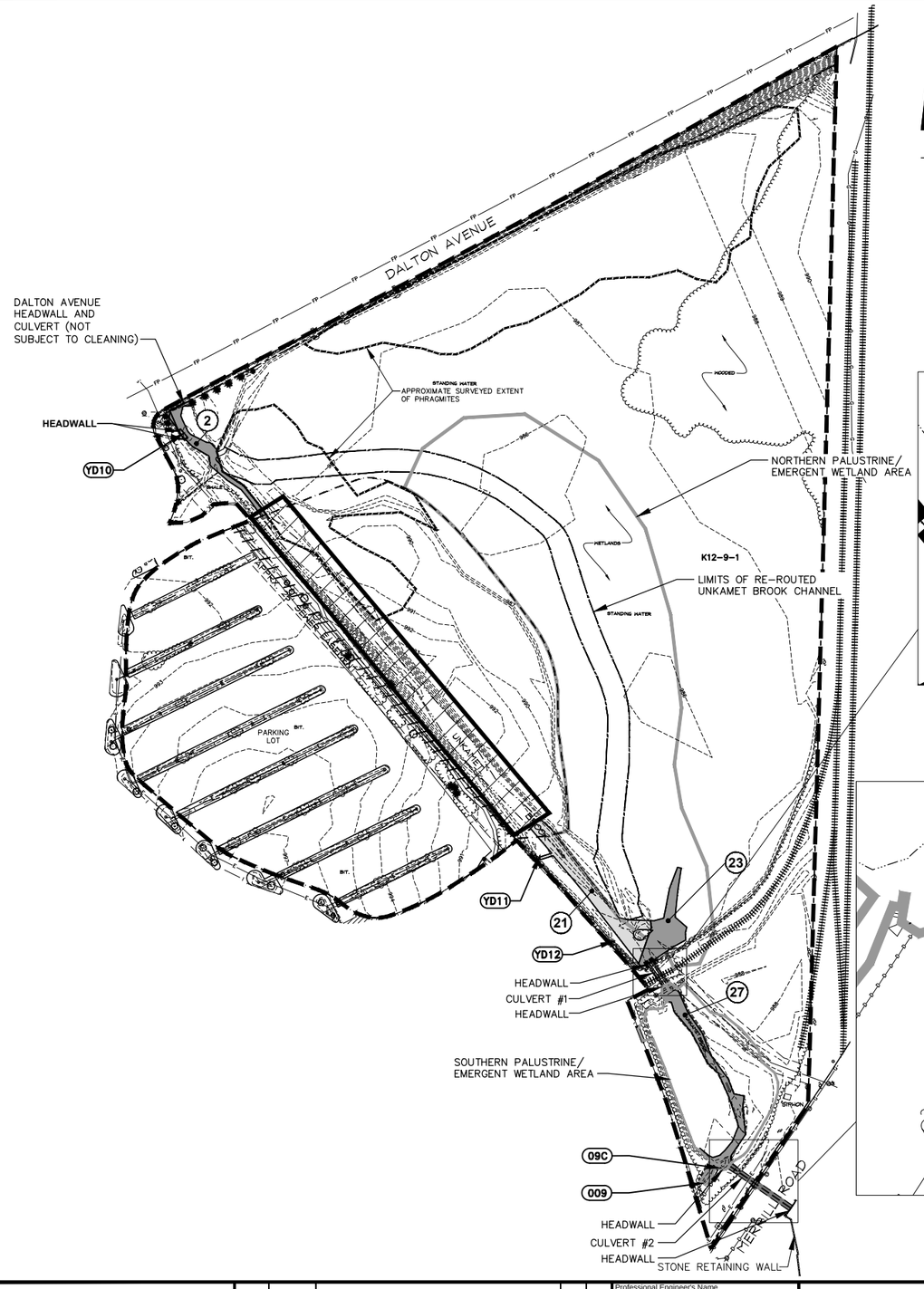
TECHNICAL DRAWINGS

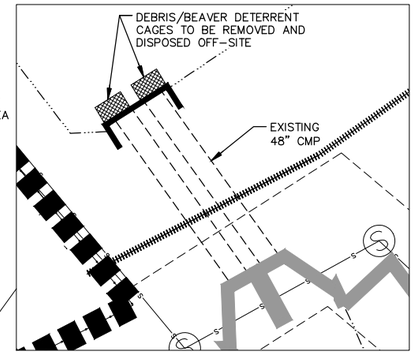
ARCADIS Project No. B0040190.0002.00006

Date APRIL 2014

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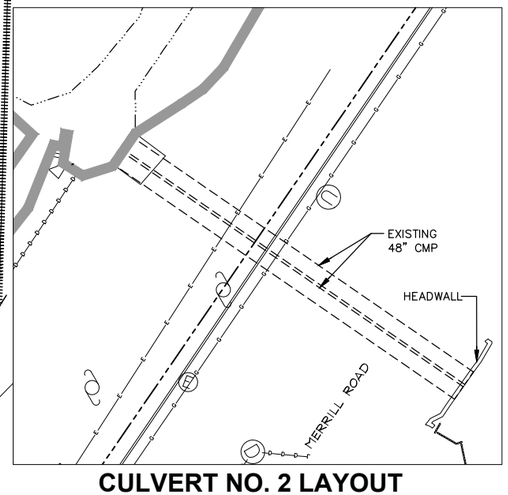
3





CULVERT NO. 1 LAYOUT

0 15' 30'
SCALE: 1"=15'



CULVERT NO. 2 LAYOUT

0 20' 40'
SCALE: 1"=20'

LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR (992)
- APPROXIMATE PHRAGMITES AREA BOUNDARY
- LIMITS OF FORMER INTERIOR LANDFILL
- K12-9-1 PARCEL IDENTIFICATION
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- G GAS SERVICE
- S SANITARY SEWER
- SANITARY SEWER SUBJECT TO REALIGNMENT (SEE DRAWING 14)
- STORM DRAIN
- FP FIRE PROTECTION WATER
- I IRRIGATION (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- E ELECTRIC SERVICE (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- LIMITS OF GRADING FOR RE-ROUTED BROOK CHANNEL
- SECTION OF UNKAMET BROOK SUBJECT TO RE-ROUTING (SEE DRAWINGS 5 AND 6)
- LIMITS OF NON-TSCA SEDIMENT REMOVAL
- LIMITS OF TSCA SEDIMENT REMOVAL
- 1' TARGET DEPTH OF EXCAVATION
- 009 APPROXIMATE EXISTING OUTFALL LOCATION
- EXISTING UNKAMET BROOK CULVERT SUBJECT TO CLEANING OF INTERIOR SURFACES (SEE NOTE 12)
- 1 EXCAVATION CELL ID

NOTES:

1. REFER TO DRAWINGS 1 THROUGH 3 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED EXCAVATION DEPTHS/ELEVATIONS PRIOR TO INITIATING BACKFILLING ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL RD/RA WORK PLAN. AS NOTED THEREIN, THE CONTRACTOR'S LICENSED SURVEYOR IS REQUIRED TO ESTABLISH SURVEY TRANSECTS EVERY 50 FEET ALONG THE EXISTING AND RE-ROUTED BROOK FOR THE PURPOSES OF MAINTAINING SURVEY CONTROL.
3. ALL SEDIMENT REMOVAL/CULVERT CLEANING ACTIVITIES ARE TO PROCEED IN AN UPSTREAM TO DOWNSTREAM DIRECTION TO AVOID IMPACTING PREVIOUSLY REMEDIATED/CLEANED AREAS. IN ADDITION, EXCAVATION OF AREAS SUBJECT TO REMEDIATION THAT ABUT THE BROOK CHANNEL MUST BE COMPLETED PRIOR TO RESTORATION OF THE BROOK CHANNEL OR CONSTRUCTION OF THE RE-ROUTED BROOK CHANNEL.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION OF A WATER DIVERSION/BYPASS PUMPING SYSTEM TO FACILITATE SEDIMENT REMOVAL "IN THE DRY". IN CERTAIN INSTANCES, WITH GE APPROVAL, SEDIMENT REMOVAL MAY BE PERFORMED THROUGH THE WATER COLUMN BASED ON FIELD CONDITIONS. BYPASS PUMPING AT THE DALTON AVENUE CULVERT OR CULVERT #2 WILL BE COMPLETED BY EITHER, 1) ROUTING BYPASS PIPES THROUGH ONE OF THE EXISTING CULVERT PIPES OR, 2) INSTALLATION OF A TEMPORARY WATER FLOW BARRIER ALLOWING WATER TO TEMPORARILY ACCUMULATE IN THE UPSTREAM WETLAND. CULVERT CLEANING SHOULD BE SCHEDULED DURING A PERIOD OF LOW FLOW, TO THE EXTENT POSSIBLE. ALSO, THE WATER DIVERSION STRUCTURE/FLOW BARRIERS SHOULD BE INSTALLED JUST PRIOR TO CULVERT CLEANING AND MUST BE CONSTRUCTED TO ALLOW WATER TO ACCUMULATE IN THE UPSTREAM WETLAND AREAS. WATER DIVERSION STRUCTURES/FLOW BARRIERS SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF CULVERT CLEANING ACTIVITIES.
5. UPSTREAM AND BACKFLOW DAMS ASSOCIATED WITH THE DIVERSION/RE-ROUTING SYSTEM WILL BE INSTALLED PRIOR TO INITIATION OF SEDIMENT REMOVAL AND CULVERT CLEANING ACTIVITIES. THE CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLATION LOCATION AND ELEVATION DETAILS. WATER DIVERSION STRUCTURES SHALL BE INSTALLED TO A MINIMUM ELEVATION OF THE APPROXIMATE TOP OF BANK AT THE RESPECTIVE CHANNEL LOCATIONS.
6. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE DESIGN DETAILS RELATED TO THE BROOK DIVERSION/RE-ROUTING STRUCTURES AND BYPASS PUMPING ASSOCIATED WITH THE DIVERSION/RE-ROUTING SYSTEM. THE CONTRACTOR WILL PROVIDE (FOR GE AND EPA APPROVAL) DETAILED DESIGN SPECIFICATIONS SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS. THE CONTRACTOR IS REQUIRED TO OPERATE THE BYPASS PUMPING SYSTEM 24 HOURS A DAY, 7 DAYS A WEEK FOR THE DURATION OF THE SEDIMENT REMOVAL/CULVERT CLEANING ACTIVITIES. THE CONTRACTOR WILL SELECT APPROPRIATE PUMP SIZES, CAPACITIES, AND/OR ASSOCIATED CONVEYANCE PIPES TO ACCOMMODATE ANTICIPATED BROOK FLOW ASSOCIATED WITH THE ESTIMATED 2-YEAR STORM EVENT (APPROXIMATELY 57 CFS). THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MANAGING FLOWS THAT ENTER THE BROOK CHANNEL FROM OUTFALLS LOCATED ALONG UNKAMET BROOK. THE CONTRACTOR SHALL DESIGN AND INSTALL APPROPRIATE PROTECTION MEASURES FOR THE OUTLET(S) OF THE BYPASS CONVEYANCE PIPING TO PREVENT THE CONVEYED WATERS FROM CAUSING EROSION/SCOUR AT THE DOWNSTREAM DISCHARGE POINT.
7. FOLLOWING CONSTRUCTION OF THE WATER FLOW BARRIERS AND BYPASS CONVEYANCE SYSTEM AND PRIOR TO COMMENCING SEDIMENT REMOVAL ACTIVITIES, ANY SURFACE WATER INITIALLY TRAPPED BETWEEN THE BARRIERS WILL BE PUMPED OVER THE DOWNSTREAM WATER FLOW BARRIER BY A PUMP SUSPENDED A MINIMUM OF SIX INCHES ABOVE THE BROOK BOTTOM (I.E. UNTIL THE TOTAL WATER DEPTH IS SIX INCHES). THE CONTRACTOR SHALL COLLECT THE REMAINING WATERS AND COORDINATE WITH GE FOR TRANSPORTATION TO THE BUILDING 64G WTF FOR TREATMENT AND DISCHARGE. WATER THAT ACCUMULATES IN PORTIONS OF THE CHANNEL THAT HAVE BEEN RESTORED OR HAVE YET TO BE EXCAVATED MAY BE PUMPED OVER THE DOWNSTREAM WATER FLOW BARRIER ON AN EVENT-SPECIFIC BASIS.
8. THE CONTRACTOR SHALL INSTALL A FLOATING SILT CURTAIN DOWNSTREAM OF THE SEDIMENT REMOVAL/CULVERT CLEANING AREAS PER DETAIL 1 ON DRAWING 30. SILT CURTAIN TO BE RELOCATED, AS NECESSARY, AS SEDIMENT REMOVAL PROGRESSES IN A DOWNSTREAM DIRECTION. CONTRACTOR SHALL ALSO ENSURE THAT TWO OTHER FLOATING SILT CURTAINS ARE INSTALLED JUST UPSTREAM OF THE CONFLUENCE OF UNKAMET BROOK WITH THE HOUSATONIC RIVER PRIOR TO THE INITIATION OF SEDIMENT REMOVAL.
9. ALL IN-STREAM EXCAVATION AREAS MUST BE BACKFILLED AND/OR TEMPORARILY PROTECTED AT THE END OF EACH DAY IF SIGNIFICANT PRECIPITATION IS ANTICIPATED OR FORECASTED. DAILY ACTIVITIES SHALL BE LIMITED TO THE MAXIMUM VOLUME THAT CAN BE REMOVED AND BACKFILLED WITHIN THE DAY UNLESS EXPRESS PERMISSION HAS BEEN GRANTED BY GE.
10. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST FOR PRECIPITATION EVENTS. IN THE EVENT OF PRECIPITATION GREATER THAN A 2-YEAR STORM EVENT AND/OR IN THE EVENT OF OVERTOPPING OF THE WATER DIVERSION STRUCTURE, ALL IN-STREAM ACTIVITIES MUST BE IMMEDIATELY HALTED, ALL ASSOCIATED MACHINERY REMOVED FROM THE CHANNEL, AND A LAYER OF GEOTEXTILE PLACED (AND SECURED) OVER ANY AREAS WHERE REMEDIATION IS IN PROGRESS AND/OR HAS NOT BEEN COMPLETED.
11. GE WILL PERFORM CONTINUOUS TURBIDITY MONITORING AT LOCATIONS UP- AND DOWNSTREAM OF THE WORK AREA. DAILY ACTIVITIES WILL BE COORDINATED WITH GE AND WILL BE CONTINGENT UPON MAINTENANCE OF TURBIDITY LEVELS BELOW CERTAIN ACTION LEVELS. IF EXCEEDANCES ARE RECORDED, THE CONTRACTOR WILL STOP WORK AND DISCUSS WITH GE TO DETERMINE THE NEED, IF ANY, FOR MODIFICATIONS TO THE REMEDIATION APPROACH.
12. ACCUMULATED SEDIMENT AND DEBRIS WITHIN THE CULVERTS SUBJECT TO CLEANING WILL BE REMOVED. SHOULD THE CONTRACTOR DETERMINE THAT PERSONNEL ARE REQUIRED TO ENTER THE CULVERTS TO PERFORM THE SEDIMENT/OBSTRUCTION REMOVAL ACTIVITIES, SUCH WORK SHALL BE PERFORMED AS CONFINED SPACE ENTRY AND ALL APPLICABLE PERSONNEL SHALL HAVE THE APPROPRIATE OSHA CERTIFICATIONS.
13. FOLLOWING CULVERT CLEANING ACTIVITIES, THE CONTRACTOR WILL CONDUCT VIDEO INSPECTIONS OF EACH CULVERT PIPE. THIS INSPECTION SHALL INCLUDE CONTINUOUS COLOR VHS VIDEOTAPE/DVD AND LOGGING OVER THE PIPE INTERIOR'S ENTIRE LENGTH. PIPES SHALL BE INSPECTED IN THE DIRECTION OF FLOWS. THE INSPECTION SHALL BE MADE IN THE PRESENCE OF GE/GE'S REPRESENTATIVE AND A VIDEOTAPE/DVD SUBMITTED TO GE/GE'S REPRESENTATIVE. THE COLOR VIDEOTAPE/DVD SHALL BE PROPERLY IDENTIFIED, NARRATED AS NECESSARY AND ACCOMPANIED BY A WRITTEN RECORD OF EACH TELEVISED RUN.
14. THE CONTRACTOR SHALL PERFORM ADDITIONAL SOIL/SEDIMENT REMOVAL AS NECESSARY TO INSTALL RIPRAP APRON FOR EROSION/SCOUR PROTECTION AT ALL IDENTIFIED CULVERTS/OUTFALLS (SEE DRAWING 30).

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1"=100'

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Professional Engineer's Name:

Professional Engineer's No.:

State	Date Signed	Project Mgr.
		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - SEDIMENT REMOVAL AND CULVERT CLEANING

TECHNICAL DRAWINGS

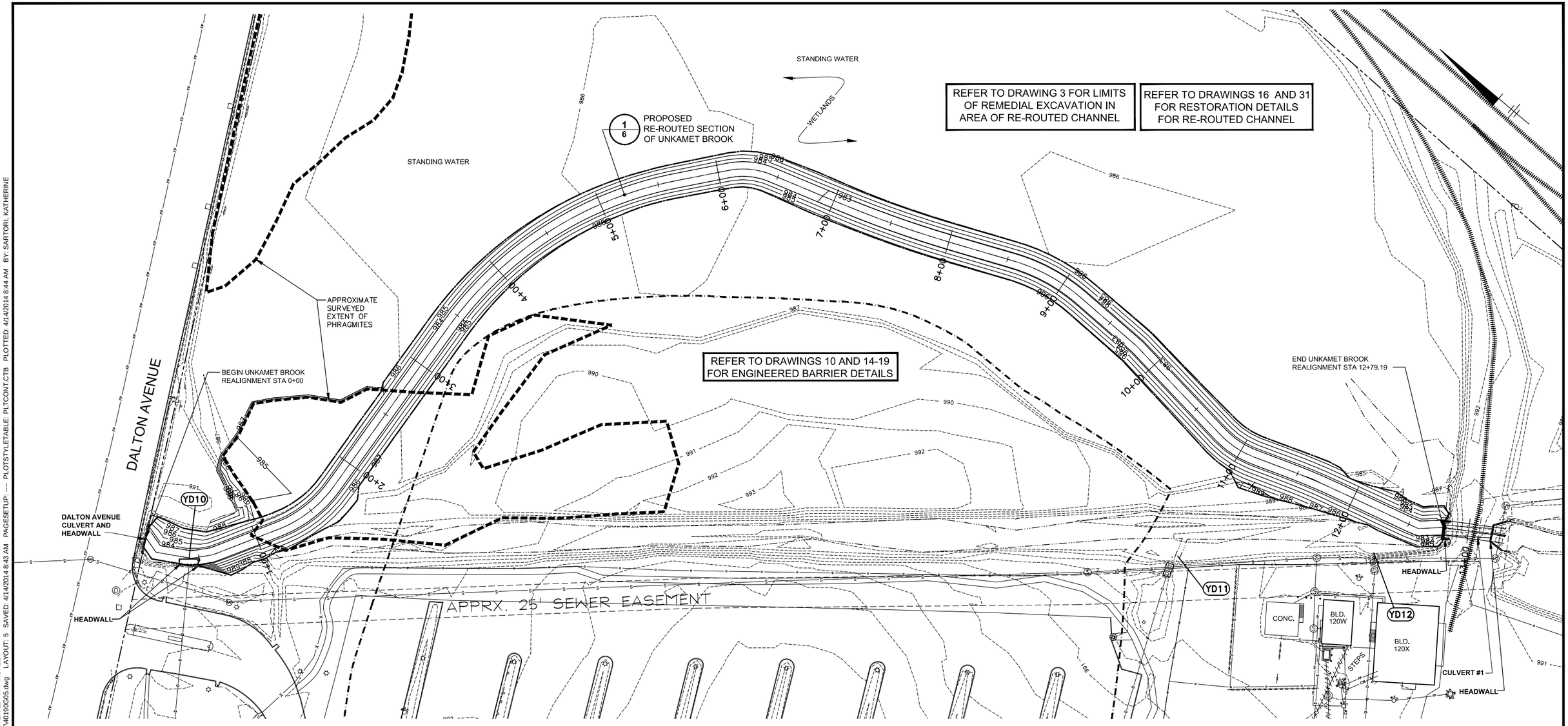
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4

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LEGEND:

- EASEMENT
- 982 EXISTING CONTOUR
- 984 PROPOSED CONTOURS
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- SANITARY MANHOLE
- DRAIN MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- METAL FENCE
- ELECTRIC SERVICE
- STORM DRAIN
- FIRE PROTECTION WATER
- EXISTING SANITARY SEWER LINE
- GUARDRAIL
- EDGE OF WATER
- LIMITS OF FORMER INTERIOR LANDFILL
- APPROXIMATE PHRAGMITES AREA BOUNDARY
- LIMITS OF GRADING FOR REALIGNED BROOK CHANNEL
- APPROXIMATE EXISTING UNKAMET BROOK CULVERT

NOTES:

1. REFER TO DRAWINGS 1, 2, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY EARTHEN DAMS ON UPSTREAM AND DOWNSTREAM ENDS OF RE-ROUTED BROOK. THE DAMS SHALL BE REMOVED UPON COMPLETION OF THE BROOK RE-ROUTING ACTIVITIES AND UPSTREAM SEDIMENT REMOVAL ACTIVITIES IN EXISTING CHANNEL, INCLUDING ALL ASSOCIATED SURVEY DOCUMENTATION. REFER TO NOTES 4 THROUGH 8 ON DRAWING 4 FOR REQUIREMENTS REGARDING CONSTRUCTION, MAINTENANCE, AND OPERATION OF WATER DIVERSION/BYPASS PUMPING EQUIPMENT DURING BROOK RE-ROUTING ACTIVITIES.
3. THE CONTRACTOR SHALL PLACE ALL NON-REMEDIAL SOILS/SEDIMENTS EXCAVATED AS PART OF BROOK RE-ROUTING IN A TEMPORARY STOCKPILE FOR CHARACTERIZATION BY GE AND POTENTIAL FUTURE REUSE AS SUBSURFACE BACKFILL MATERIALS.
4. REFER TO TECHNICAL DRAWING 3 FOR DETAILS REGARDING THE LIMITS OF REMEDIAL EXCAVATION IN THE VICINITY OF THE REALIGNED BROOK CHANNEL. UPON SURVEY VERIFICATION OF THE LIMITS OF REMEDIAL EXCAVATION, THE CONTRACTOR SHALL PERFORM ADDITIONAL EXCAVATION ACTIVITIES AS NECESSARY TO CONSTRUCT THE RE-ROUTED BROOK CHANNEL AS SHOWN. REFER TO DRAWINGS 6, 16, AND 31 FOR PROFILE AND CROSS-SECTION DETAILS OF RE-ROUTED BROOK CHANNEL. THE CONTRACTOR SHALL REMOVE 12 TO 18 INCHES OF MATERIAL BENEATH THE FINAL DESIGN ELEVATION OF THE RE-ROUTED BROOK CHANNEL TO SUPPORT INSTALLATION OF THE REQUIRED 6-INCH SILTY SAND LAYER AND TYPE I OR TYPE II RIPRAP. FOR SECTIONS OF RE-ROUTED BROOK WHICH PASS THROUGH TSCA-DESIGNATED REMOVAL AREAS (SEE DRAWINGS 3 AND 4), THE CONTRACTOR SHALL PLACE NON-WOVEN GEOTEXTILE PRIOR TO PLACEMENT OF 6-INCH SILTY SAND LAYER.
5. THE CONTRACTOR SHALL PLACE THE SAME SILTY SAND MATERIAL USED TO RESTORE THE BROOK CHANNEL WITHIN THE VOIDS OF THE TYPE I OR TYPE II RIPRAP FOR THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS, ONLY IN PORTIONS OF RE-ROUTED/RESTORED CHANNEL WITH A FLAT BOTTOM. (SEE DETAIL 1 ON DRAWING 31).

1"=40' 40' 0 40' 80'

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Professional Engineer's Name		
-		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
-		CRA
Designed by	Drawn by	Checked by
JEM/PB	BKD	MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - UNKAMET BROOK RE-ROUTING PLAN

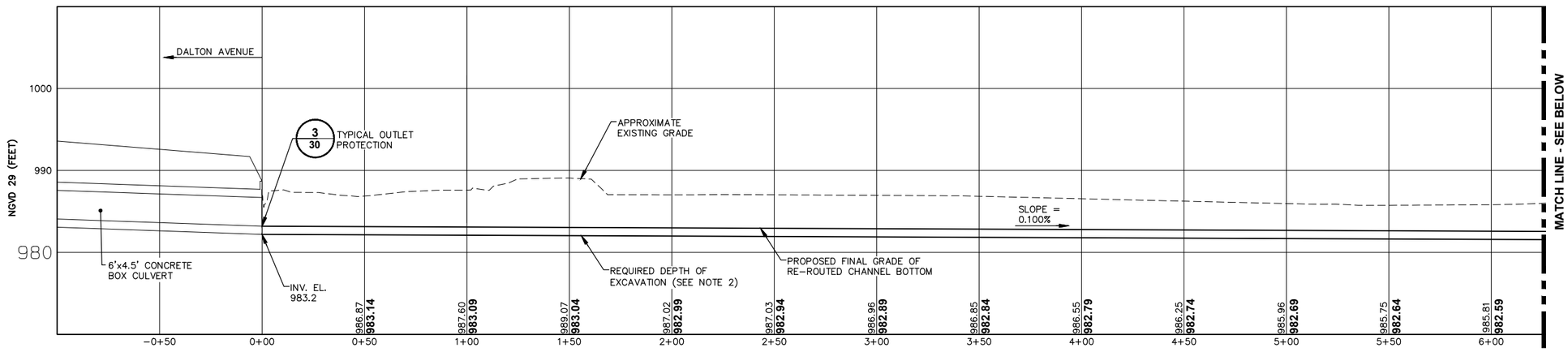
TECHNICAL DRAWINGS

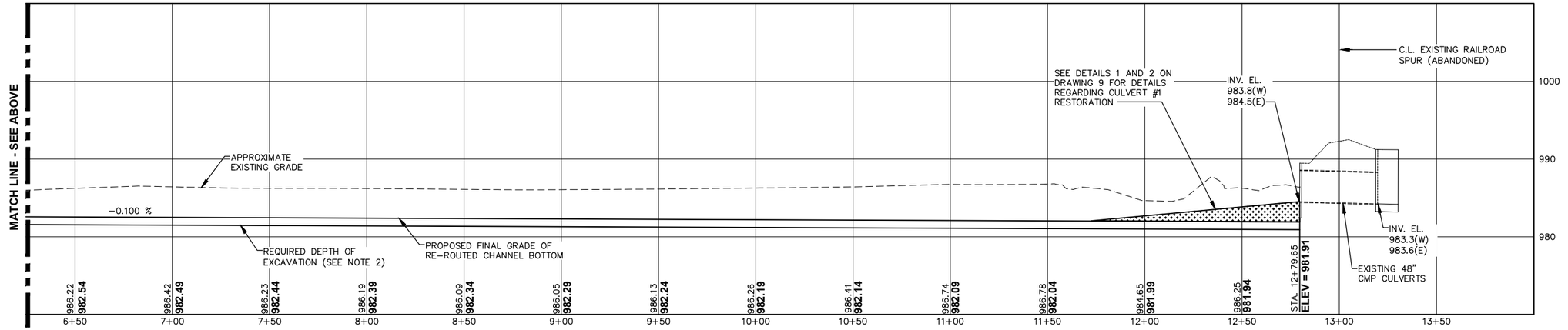
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5





NOTES:

986.23 – PROPOSED FINAL ELEVATION

982.44 – EXISTING ELEVATION

CMP – CORRUGATED METAL PIPE

UNKAMET BROOK RE-ROUTING PROFILE (1)

0 30' 60'
HORIZONTAL SCALE: 1"=30'

0 6' 12'
VERTICAL SCALE: 1"=6'

NOTES:

1. REFER TO DRAWINGS 1, 2, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. REFER TO TECHNICAL DRAWING 3 FOR DETAILS REGARDING THE LIMITS OF REMEDIAL EXCAVATION IN THE VICINITY OF THE RE-ROUTED BROOK CHANNEL. UPON SURVEY VERIFICATION OF THE LIMITS OF REMEDIAL EXCAVATION, THE CONTRACTOR SHALL PERFORM ADDITIONAL EXCAVATION ACTIVITIES AS NECESSARY TO CONSTRUCT THE RE-ROUTED BROOK CHANNEL AS SHOWN. REFER TO DRAWINGS 6, 16, AND 31 FOR PROFILE AND CROSS-SECTION DETAILS OF RE-ROUTED BROOK CHANNEL. AS SHOWN ON DETAIL 1 OF DRAWING 31, THE CONTRACTOR SHALL REMOVE A MINIMUM OF ONE FOOT OF MATERIAL BENEATH THE DESIGN ELEVATION OF THE RE-ROUTED BROOK CHANNEL TO SUPPORT INSTALLATION OF THE REQUIRED 6-INCH SILTY SAND LAYER AND 6-INCH LAYER OF TYPE I RIPRAP. FOR SECTIONS OF RE-ROUTED/RESTORED BROOK WHICH PASS THROUGH TSCA-DESIGNATED REMOVAL AREAS (SEE DRAWINGS 3 AND 4), THE CONTRACTOR SHALL PLACE NON-WOVEN GEOTEXTILE PRIOR TO PLACEMENT OF 6-INCH SILTY SAND LAYER.

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Professional Engineer's No.		
State	Date Signed	Project Mgr. CRA
Designed by TAS	Drawn by BKD	Checked by MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - UNKAMET BROOK RE-ROUTING PROFILE

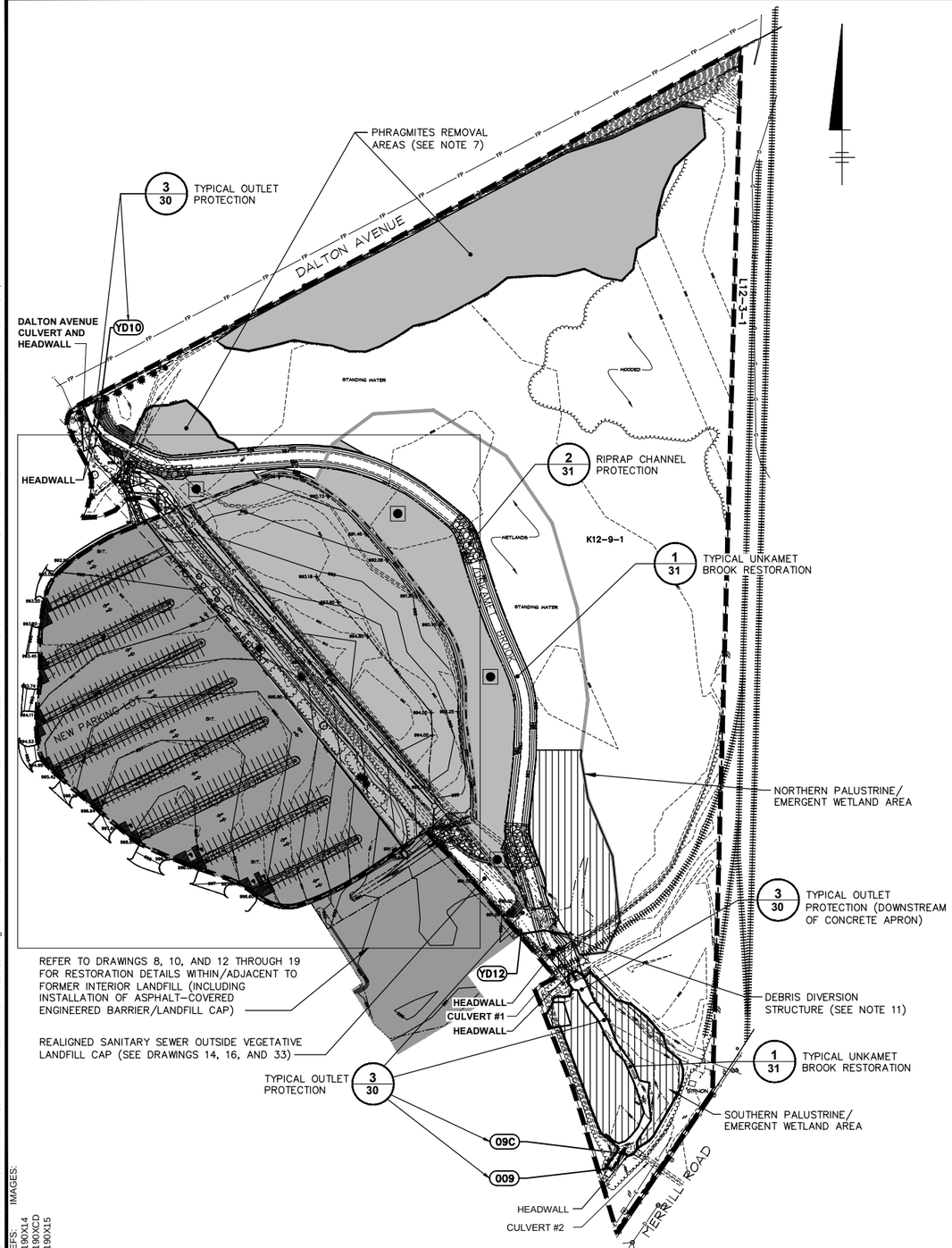
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Date APRIL 2014

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6



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- 984 PROPOSED CONTOUR
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- K12-9-1 PROPERTY IDENTIFICATION
- DECIDUOUS TREE
- CONIFEROUS TREE
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- E ELECTRIC SERVICE
- G GAS SERVICE
- S SANITARY SEWER
- S REALIGNED SANITARY SEWER
- D STORM DRAIN
- FP FIRE PROTECTION WATER
- EDGE OF BUSHES/HEDGE
- EDGE OF WATER
- LIMITS OF VEGETATIVE ENGINEERED BARRIER
- LIMITS OF GRADING FOR RE-ROUTED BROOK CHANNEL
- LIMITS OF VEGETATIVE RESTORATION (SEE NOTES 3 AND 4)
- AREA SUBJECT TO INSTALLATION OF NRR/E MEASURES (SEE NOTES 5 AND 7)
- AREA SUBJECT TO INSTALLATION OF ASPHALT-COVERED ENGINEER BARRIER
- NEW BLUEBIRD BOX 3 / 40

NOTES:

1. REFER TO DRAWINGS 1, 2, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND ADDITIONAL CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL NOT INITIATE RESTORATION ACTIVITIES UNTIL THE LIMITS OF EXCAVATION AND/OR SUBGRADE PREPARATION HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVES. FOLLOWING SURVEY DOCUMENTATION OF THE COMPLETION OF THE EXCAVATION ACTIVITIES, THOSE AREAS WILL BE RESTORED TO PRE-CONSTRUCTION GRADES, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOT INITIATE PLANTING OR SEEDING ACTIVITIES UNTIL THE POST-RESTORATION GRADES HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVE. ANY DEVIATIONS FROM THE SPECIFIED RESTORATION GRADES THAT ARE UNACCEPTABLE TO GE/GE'S REPRESENTATIVE MAY REQUIRE REWORK/REPAIR BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
3. ALL 1-FOOT SOIL EXCAVATION AREAS SUBJECT TO VEGETATIVE RESTORATION SHALL BE RESTORED WITH 12-INCHES OF CLEAN TOPSOIL MATERIAL ONLY. WITH THE EXCEPTION OF THE PHRAGMITES REMOVAL AREAS, ALL DEEPER EXCAVATION AREAS WILL BE RESTORED TO WITHIN 6 INCHES OF FINAL GRADE AND FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL AND APPLICATION OF A SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. THE PORTION OF THE NORTHERN WETLAND LOCATED EAST OF THE RE-ROUTED CHANNEL AND THE SOUTHERN WETLAND WILL BE RESTORED WITH 1-FOOT OF TOPSOIL PLACED IN AN UNCOMPACTED STATE TO SIMULATE A TYPICAL WETLAND ENVIRONMENT. PER THE TECHNICAL SPECIFICATIONS, VEGETATIVE RESTORATION IN DRY AREAS SHALL CONSIST OF NEW ENGLAND CONSERVATION/WILDLIFE MIX, WHILE PERIODICALLY INUNDATED AREAS SHALL CONSIST OF THE WETLAND SEED MIX (NEW ENGLAND WETMIX) AND INUNDATED AREAS SHALL CONSIST OF PLUGS OR LIVE MATS OF WETLAND SPECIES.
5. EXCAVATION AREAS SUBJECT TO INSTALLATION OF NRR/E MEASURES SHALL BE RESTORED TO WITHIN 6 INCHES OF FINAL RESTORATION GRADE WITH CLEAN BACKFILL MATERIAL. FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL FOLLOWED BY APPLICATION OF NRR/E SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. SEE DRAWINGS 14 THROUGH 17 FOR ADDITIONAL REQUIREMENTS REGARDING CONSTRUCTION OF VEGETATIVE LANDFILL CAP.
6. THE CONTRACTOR SHALL RESTORE THE RE-ROUTED AND REMEDIATED BROOK CHANNEL IN ACCORDANCE WITH THE REQUIREMENTS OF DETAILS 1 THROUGH 3 ON TECHNICAL DRAWING 31 AND THE APPLICABLE TECHNICAL SPECIFICATIONS. THE RESTORATION ACTIVITIES FOR THE RE-ROUTED/RESTORED BROOK CHANNEL REQUIRE THE PLACEMENT OF THE SILTY-SAND MIXTURE (ALSO USED TO RESTORE THE BOTTOM 6 INCHES OF THE RE-ROUTED/RESTORED BROOK CHANNEL) WITHIN THE VOIDS OF THE TYPE I RIPRAP IN THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS ONLY IN THOSE SECTIONS OF THE BROOK THAT HAVE A FLAT CHANNEL BOTTOM.
7. IN GENERAL, LIMITED RESTORATION ACTIVITIES WILL BE PERFORMED IN THE PHRAGMITES REMOVAL AREAS EAST OF THE RE-ROUTED BROOK. THE REMOVAL AREAS WILL BE RESTORED WITH THE STEEPEST BANKS POSSIBLE TO DISCOURAGE RE-ESTABLISHMENT OF PHRAGMITES. THE NORTHERN SLOPE OF THE REMOVAL AREA ALONG DALTON AVENUE WILL BE RESTORED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 1 ON DRAWING 8 TO PROVIDE STABILIZATION FOR THE ROADWAY EMBANKMENT.
8. THE CONTRACTOR SHALL RESTORE ALL TREES/SHRUBS REMOVED DURING SITE PREPARATION AND/OR THE SOIL/SEDIMENT REMOVAL ACTIVITIES IN ACCORDANCE WITH A TREE/SHRUB INVENTORY (TO BE PERFORMED BY OTHERS), THE TREE/SHRUB PLANTING PLAN (TO BE PERFORMED BY OTHERS), AND/OR AT LOCATIONS DESIGNATED BY GE.
9. THE CONTRACTOR SHALL PLACE BIODEGRADEABLE EROSION CONTROL MATTING AND STAKES ALONG DRAINAGE PATHWAYS WITH STEEP (4H:1V OR GREATER) EMBANKMENTS. IN ADDITION, EROSION CONTROL MATTING AND STAKES SHALL BE PLACED ALONG THE ENTIRE BANKS AND BOTTOM OF THE VEGETATIVE LANDFILL CAP DRAINAGE SWALE (NON-GRAVEL PORTIONS).
10. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS (e.g., HAYBALES/SILT FENCE SEE DRAWING 2) UPON REQUEST BY GE/GE'S REPRESENTATIVE, ONCE THE RESTORED VEGETATION IS ESTABLISHED.
11. THE CONTRACTOR SHALL INSTALL A FLOATING DEBRIS DIVERSION BOOM AT AN ANGLE ACROSS THE RESTORED/RELOCATED BROOK CHANNEL AND UPSTREAM OF THE BEAVER DETERRENT MEASURES ILLUSTRATED ON DRAWING 9.

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1"=100' (100' 0 100' 200')

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State	Date Signed	Project Mgr.
-		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - SITE RESTORATION PLAN

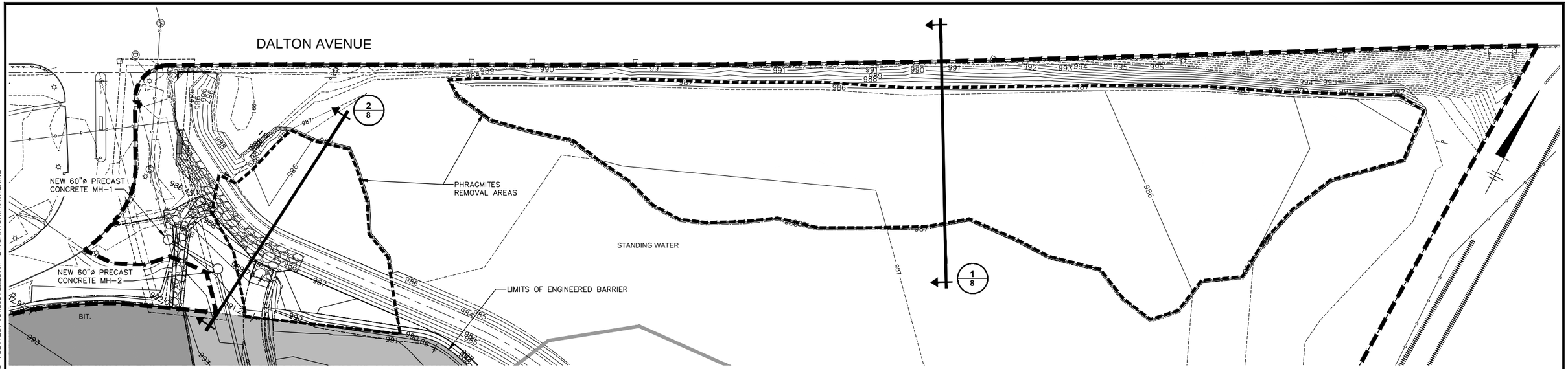
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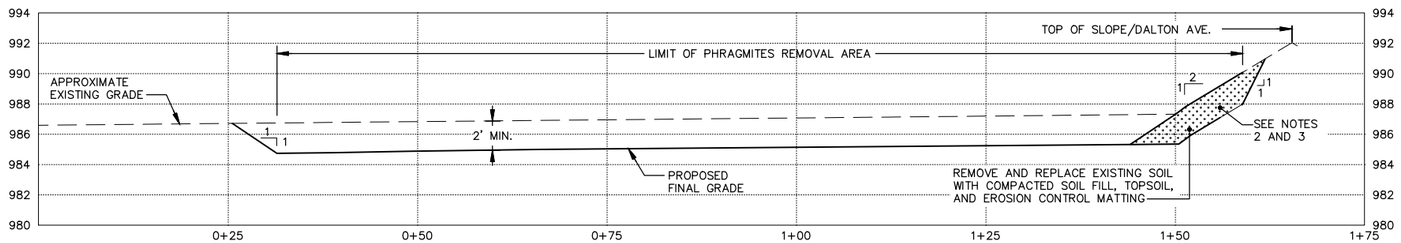


LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- EASEMENT
- 992 EXISTING CONTOUR
- 986 FINAL GRADING CONTOURS (SEE NOTE 2)
- SIGN
- LIGHT POLE
- DRAIN MANHOLE
- SANITARY MANHOLE
- METAL FENCE
- PROPOSED LIMIT OF GRADING
- PHRAGMITES REMOVAL AREA
- STORM DRAIN
- GAS SERVICE
- SANITARY SEWER
- EDGE OF WATER
- EDGE OF BUSHES/HEDGE
- LIMITS OF FORMER INTERIOR LANDFILL

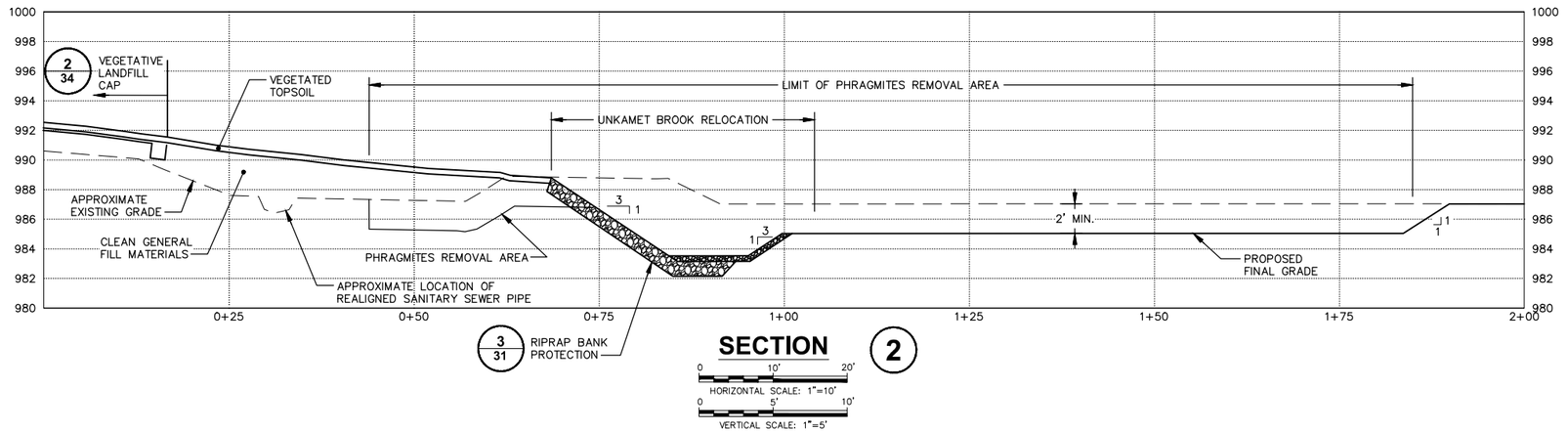
NOTES:

1. REFER TO DRAWINGS 1, 2, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. FINAL GRADING CONTOURS WITHIN/ADJACENT TO PHRAGMITES REMOVAL AREAS ARE APPROXIMATE AS THE REMOVAL DEPTH IN THESE AREAS ARE DESIGNATED IN ATTACHMENT I OF THE SOW TO BE 1 FOOT BELOW SHALLOW GROUNDWATER, AS DETERMINED DURING THE MONTH OF MAY (TOTAL EXCAVATION DEPTH OF A MINIMUM OF 2 FEET DEPENDING ON THE NATURE AND QUALITY OF THE SOIL). SOIL/PHRAGMITES REMOVAL SHALL BE PERFORMED AT LEAST 3 WEEKS AFTER HERBICIDAL TREATMENT. THE SLOPES ALONG THE EDGE OF THE PHRAGMITES REMOVAL AREAS EAST OF THE RE-ROUTED BROOK WILL BE RESTORED WITH THE STEEPEST BANKS POSSIBLE TO DISCOURAGE RE-ESTABLISHMENT OF PHRAGMITES. THE NORTHERN SLOPE OF THE REMOVAL AREA ALONG DALTON AVENUE WILL BE RESTORED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 1.
3. THE REMEDIATION CONTRACTOR SHALL REVIEW THE APPLICABLE MASS DOT REQUIREMENTS/SPECIFICATIONS FOR EXCAVATIONS ADJACENT TO STATE HIGHWAYS AND IMPLEMENT THE REMEDIATION ACTIVITIES (INCLUDING ANY SPECIFIED SETBACKS OR RESTRICTIONS ON THE DEPTH OF EXCAVATION ADJACENT TO SUCH ROADWAYS) IN ACCORDANCE WITH THE REQUIREMENTS OF THOSE REGULATIONS.



SECTION 1

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'



SECTION 2

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'

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40' 0 40' 80'
1"=40'

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*		CRA
Designed by	Drawn by	Checked by
TAS	BKD	MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - FINAL GRADING PLANS AND CROSS SECTIONS FOR PHRAGMITES AREAS

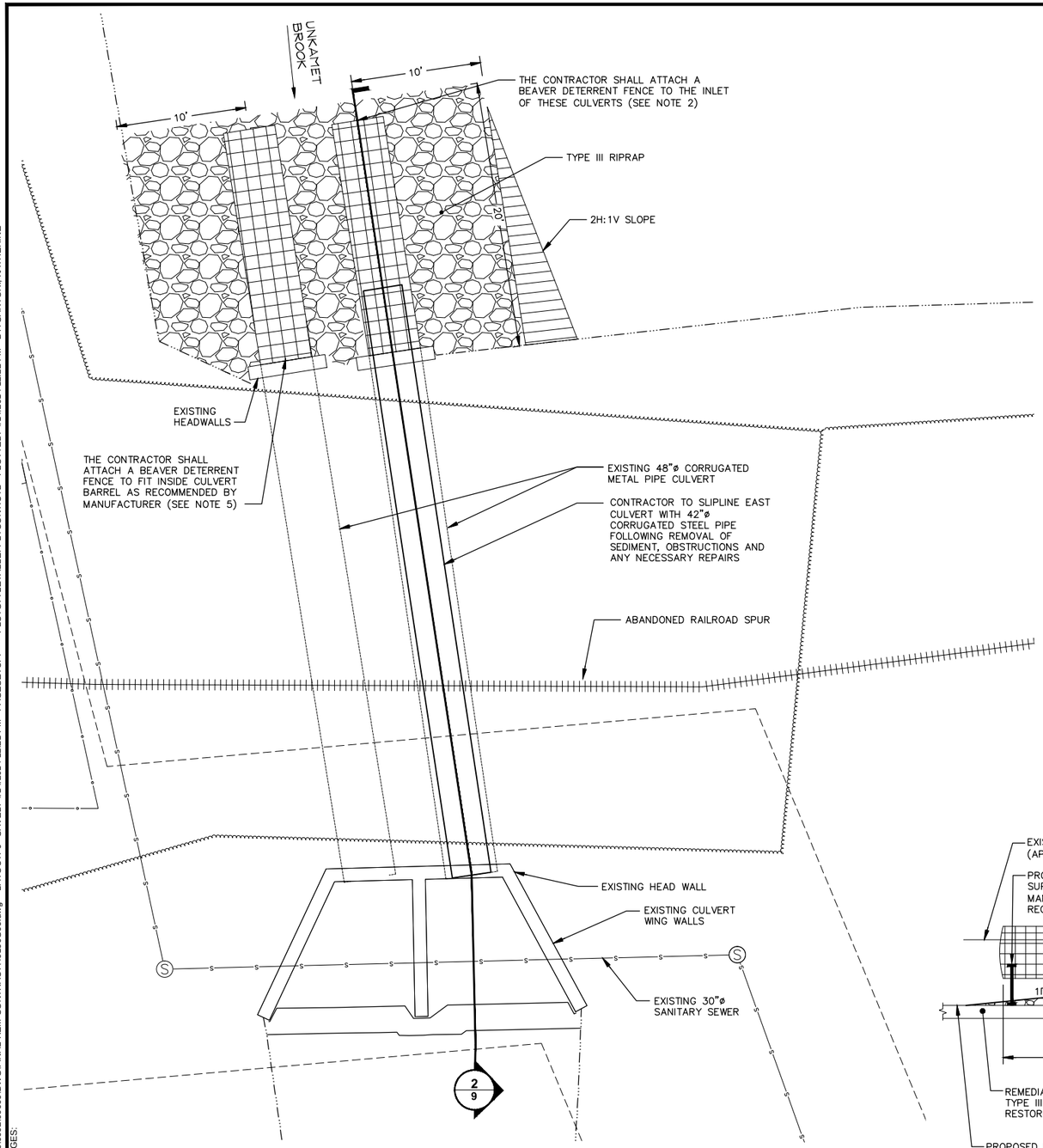
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8



CULVERT NO. 1 PLAN (1)

0 5' 10'

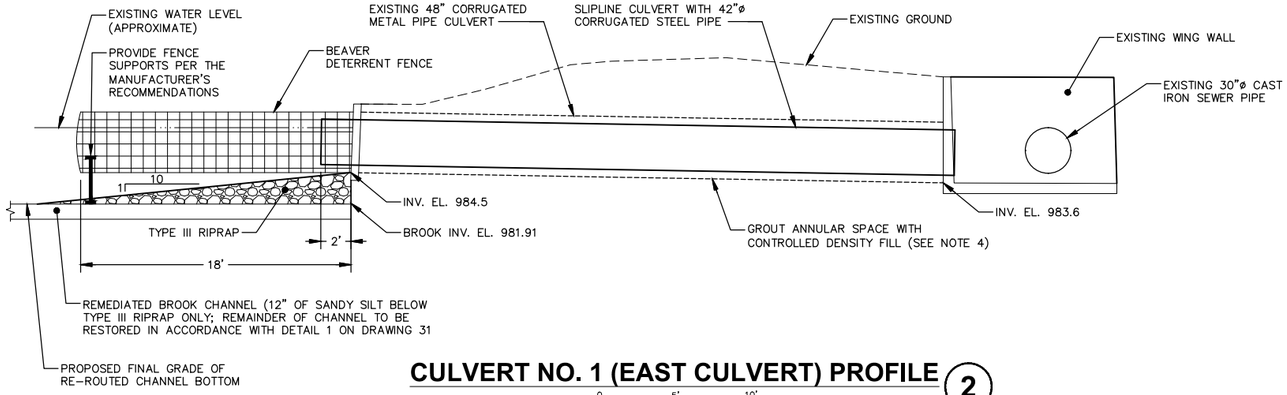
SCALE: 1"=5'

LEGEND:

- SANITARY SEWER EASEMENT
- CHAIN LINK FENCE
- RAILROAD TRACKS
- SANITARY SEWER
- EDGE OF BUSHES/HEDGE
- EDGE OF WATER

NOTES:

1. REFER TO DRAWINGS 1, 2, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. BEAVER DETERRENT FENCE SHALL BE BEAVERSTOP® MANUFACTURED BY CANADA CULVERT OR EQUAL, SUBJECT TO APPROVAL BY GE. FENCE SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND ONLY UPON COMPLETION AND DOCUMENTATION OF CULVERT CLEANING ACTIVITIES.
3. CORRUGATED STEEL PIPE SHALL BE ULTRA-FLO®STORM SEWER PIPE AS MANUFACTURED BY CONTECH ENGINEERED SOLUTION, LLC. THE PIPE MATERIAL SHALL BE 16 GAUGE GALVANIZED STEEL WITH A POLYMER COATING.
4. CONTROLLED DENSITY FILL USED TO GROUT ANNULAR SPACE OF SLIPLINED CULVERT SHALL BE TYPE 1, AS SPECIFIED IN SECTOIN M4.08.0 OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
5. UNCONVENTIONAL BEAVER STOP®INSTALLATION:
   1) BEAVER STOP®CANNOT BE INSTALLED USING CULVERT CLAMPS:
      - A) IN SITUATIONS WHERE THE UNIT CANNOT BE ATTACHED TO THE CULVERT UTILIZING THE CULVERT CLAMPS, THE MESH CAN BE CUT AND BENT INWARD TO FIT INSIDE THE CULVERT.
      - B) THE UPSTREAM MAIN CYLINDER IS THEN PUSHED INSIDE THE CULVERT. THREE OR FOUR CUTS, EVENLY SPACED AROUND THE CIRCUMFERENCE IS RECOMMENDED FOR BEST RESULTS.
      - C) IT IS SUGGESTED THAT HOLES BE DRILLED THROUGH THE TOP PORTION OF THE CULVERT AND 12 GAUGE WIRE BE USED TO SECURE THE BEAVER STOP®TO THE CULVERT.
      - D) REPEAT ABOVE STEPS FOR DOWNSTREAM END CAP (AS NECESSARY).



CULVERT NO. 1 (EAST CULVERT) PROFILE (2)

0 5' 10'

SCALE: 1"=5'

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1"=5'

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Professional Engineer's No.		
State	Date Signed	Project Mgr. CRA
Designed by TAS	Drawn by BKD	Checked by MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

NORTH OF MERRILL ROAD - CULVERT #1 RESTORATION PLAN

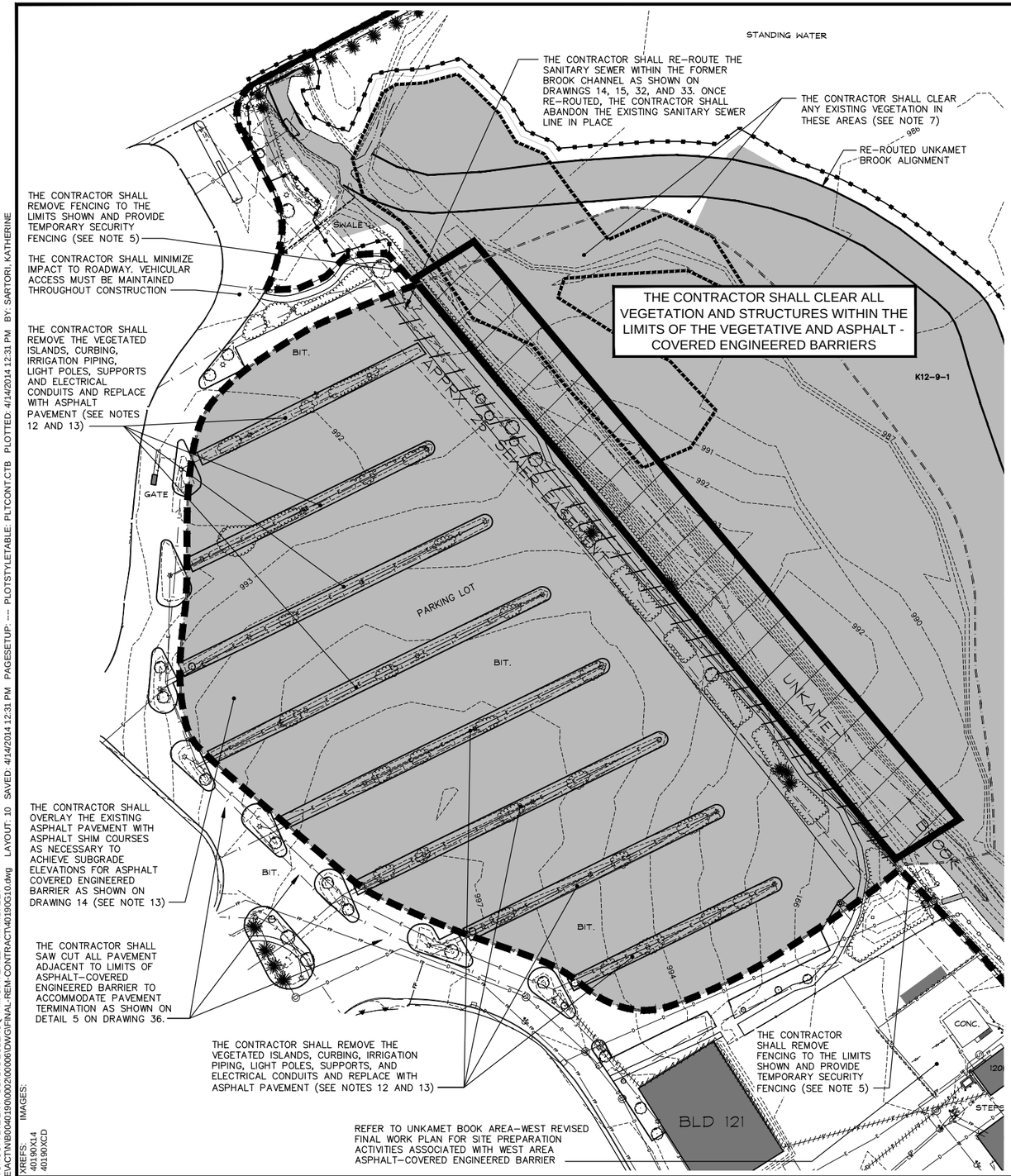
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9



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- APPROXIMATE PHRAGMITES AREA BOUNDARY (SEE NOTE 7)
- K12-9-1 PARCEL IDENTIFICATION
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- GUARDRAIL
- SANITARY SEWER
- SANITARY SEWER SUBJECT TO REALIGNMENT (SEE DRAWINGS 13 AND 14)
- STORM DRAIN
- FP FIRE PROTECTION WATER
- IRRIGATION (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- E ELECTRIC SERVICE (TO BE DECOMMISSIONED WITHIN FORMER INTERIOR LANDFILL)
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- LIMITS OF FORMER INTERIOR LANDFILL
- HAY BALE (1/40)
- HAY BALE/SILT FENCE (2/40)
- LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION
- SECTION OF UNKAMET BROOK SUBJECT TO REROUTING (SEE DRAWINGS 5 AND 6)

NOTES:

1. REFER TO DRAWINGS 1 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. REFER TO DRAWING 2 FOR ADDITIONAL INFORMATION REGARDING SITE PREPARATION ACTIVITIES OUTSIDE LIMITS OF FORMER INTERIOR LANDFILL.
3. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROLS TO THE LIMITS SHOWN PRIOR TO DISTURBING EXISTING SITE SOILS, PAVEMENT, AND/OR VEGETATION. THE DISTANCE OF HAY BALES/SILT FENCING FROM THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION IS EXAGGERATED ON THIS DRAWING FOR CLARITY PURPOSES. THE CONTRACTOR SHALL INSTALL HAY BALES/SILT FENCING WITHIN 3 TO 5 FEET OF THE LIMITS OF SOIL/SEDIMENT REMOVAL AND SUBGRADE PREPARATION. WITHIN THE EXISTING PARKING LOT, THE CONTRACTOR SHALL PLACE HAY BALES AROUND ACTIVE MATERIALS HANDLING AREAS (E.G., AROUND THE TEMPORARY DEWATERING STOCKPILE, ETC.) AND MAINTAIN THROUGHOUT THE PERFORMANCE OF THE ASSOCIATED ACTIVITIES.
4. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
5. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL REMOVE AND REPLACE (WITH NEW), ALL SITE FEATURES LOCATED WITHIN THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION. BELOW GRADE PORTIONS OF SUCH FEATURES TO BE REUSED WILL BE SUBJECT TO CLEANING AS NECESSARY. ALL FEATURES DEEMED NON-REUSABLE BY GE/GE'S REPRESENTATIVE SHALL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE OFF-SITE FACILITY.
6. THE CONTRACTOR MAY REMOVE FOR DISPOSAL OTHER SITE FEATURES, VEGETATION, AND DEBRIS NOT SPECIFICALLY IDENTIFIED HEREON AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. HOWEVER, SUCH REMOVAL SHALL NOT BE PERFORMED WITHOUT THE APPROVAL OF GE/GE'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL ONLY CLEAR THE ABOVE-GRADE PORTIONS OF EXISTING VEGETATION/STRUCTURES WITHIN THE FORMER INTERIOR LANDFILL AS NEEDED TO FACILITATE CONSTRUCTION ACTIVITIES (AND IN CONSULTATION WITH GE/GE'S REPRESENTATIVE). SUCH REMOVAL INCLUDES THE ABOVE-GRADE PORTIONS OF THE PHRAGMITES LOCATED WITHIN THE LIMITS OF THE FORMER INTERIOR LANDFILL AT LEAST THREE WEEKS FOLLOWING HERBICIDE APPLICATION.
8. ABOVE-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION THAT DO NOT COME INTO CONTACT WITH SITE SOILS WILL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE GE-APPROVED OFF-SITE FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING CLEARED DEBRIS/VEGETATION AS REQUIRED BY THE DISPOSAL FACILITY. BELOW-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION (AND PORTIONS THAT COME INTO CONTACT WITH SITE SOILS) WILL BE MANAGED AND DISPOSED OF ALONG WITH EXCAVATED SOILS.
9. THE CONTRACTOR SHALL PROTECT ALL STRUCTURES/FEATURES IN AREAS THAT WILL NOT BE SUBJECT TO THE REMEDIATION ACTIVITIES. IN PARTICULAR, THE CONTRACTOR SHALL PROTECT THE ADJACENT WETLANDS AND BROOK DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY IMPACTS TO THESE AREAS/ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
10. THE CONTRACTOR SHALL PROTECT ALL ABOVE-GROUND AND UNDERGROUND UTILITIES INCLUDING ASSOCIATED STRUCTURES/COMPONENTS (E.G., POLES, MANHOLES, CATCH BASINS, ETC.) NOT SUBJECT TO ABANDONMENT DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY UTILITIES OR ASSOCIATED STRUCTURES/COMPONENTS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
11. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED SOILS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER-RELATED STRUCTURES (I.E., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAYBALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
12. THE CONTRACTOR SHALL REMOVE THE VEGETATED ISLANDS AND APPROXIMATELY 3 INCHES OF UNDERLYING SOIL MATERIAL TO FACILITATE INSTALLATION OF ASPHALT SHIMS AS DESCRIBED IN NOTE 13 AND DETAIL 1 OF DRAWING 36. THE CONTRACTOR SHALL REMOVE THE EXISTING LIGHT POLES FOR OFFSITE RECYCLING OR DISPOSAL. ANY POTENTIALLY HAZARDOUS MATERIALS [e.g. MERCURY-CONTAINING BULBS] SHALL BE SEGREGATED AND DISPOSED OF IN COORDINATION WITH GE AT AN APPROPRIATE OFF-SITE DISPOSAL FACILITY. THE REMAINING LIGHTING COMPONENTS WILL BE RECYCLED OR DISPOSED OF APPROPRIATELY OFF-SITE. THE CONTRACTOR WILL ALSO DECOMMISSION THE EXISTING IRRIGATION AND ELECTRICAL UTILITY LINES PRIOR TO REMOVAL. ALL NON-SOIL MATERIALS (e.g., CONDUIT, ASPHALT CURBS, VEGETATION, WOOD CHIPS) SHALL BE SEGREGATED AS NECESSARY AND DISPOSED OF OFF-SITE AS NON-TSCA MATERIALS. ALL SOIL MATERIALS ASSOCIATED WITH THE VEGETATED ISLANDS WILL BE STOCKPILED FOR CHARACTERIZATION (BY GE) AND POTENTIAL FUTURE REUSE AS SUBSURFACE BACKFILL.
13. FOLLOWING REMOVAL OF THE VEGETATED ISLANDS AND INSTALLATION OF ASPHALT SHIMS (AS DESCRIBED IN NOTE 12), THIS AREA MAY BE USED TO STAGE MATERIALS GENERATED DURING PHRAGMITES REMOVAL OR OTHER SATURATED MATERIALS FOR DEWATERING PRIOR TO TRANSPORTATION TO AN APPROPRIATE OFFSITE DISPOSAL FACILITY. THE TEMPORARY STOCKPILE SHALL BE CONSTRUCTED UNDER THE FOLLOWING REQUIREMENTS:
14. DEWATERING STOCKPILES SHALL BE UNDERLAIN WITH HDPE SHEETING THAT EXTENDS OVER PERIMETER BERMS.
15. 30-MIL HDPE SHEETING WITH WELDED SEAMS SHALL BE DURABLE ENOUGH TO WITHSTAND EQUIPMENT TRAFFIC (i.e. DUMP TRUCKS AND LOADERS) WITHOUT COMPROMISING IT'S INTEGRITY OR ABILITY TO CAPTURE WATER THAT DRAINS FROM STOCKPILED MATERIALS.
16. THE CONTRACTOR SHALL COLLECT ANY WATER GENERATED FROM THE DEWATERING STOCKPILE AND COORDINATE WITH GE FOR TRANSPORTATION TO THE BUILDING 64G WTF FOR TREATMENT AND DISCHARGE.
17. THE STOCKPILES WILL BE COVERED AT THE END OF EACH WORK DAY AND ANYTIME WHEN ACTIVE STOCKPILING IS NOT OCCURRING WITH TARPS THAT MEET REQUIREMENTS OF 40 CFR 761.65 (C)(9).
18. UPON COMPLETION OF THE OFFSITE TRANSPORTATION OF THE STOCKPILED MATERIALS, THE AREA SUBJECT TO PLACEMENT OF THE ASPHALT-COVERED BARRIER SHALL BE MECHANICALLY CLEANED (e.g., SWEEPER) AND THE CONTRACTOR SHALL PLACE ASPHALT SHIMS/PATCHES AS NECESSARY TO ACHIEVE THE LINER SUBGRADE ELEVATIONS SPECIFIED ON DRAWING 14. THESE ASPHALT SHIMS CAN ALSO BE PLACED PRIOR TO CONSTRUCTION OF THE TEMPORARY DEWATERING STOCKPILE.

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1"=50' (50' 0 50' 100')

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Professional Engineer's No.:

State	Date Signed	Project Mgr.
		CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - SITE PREPARATION PLAN

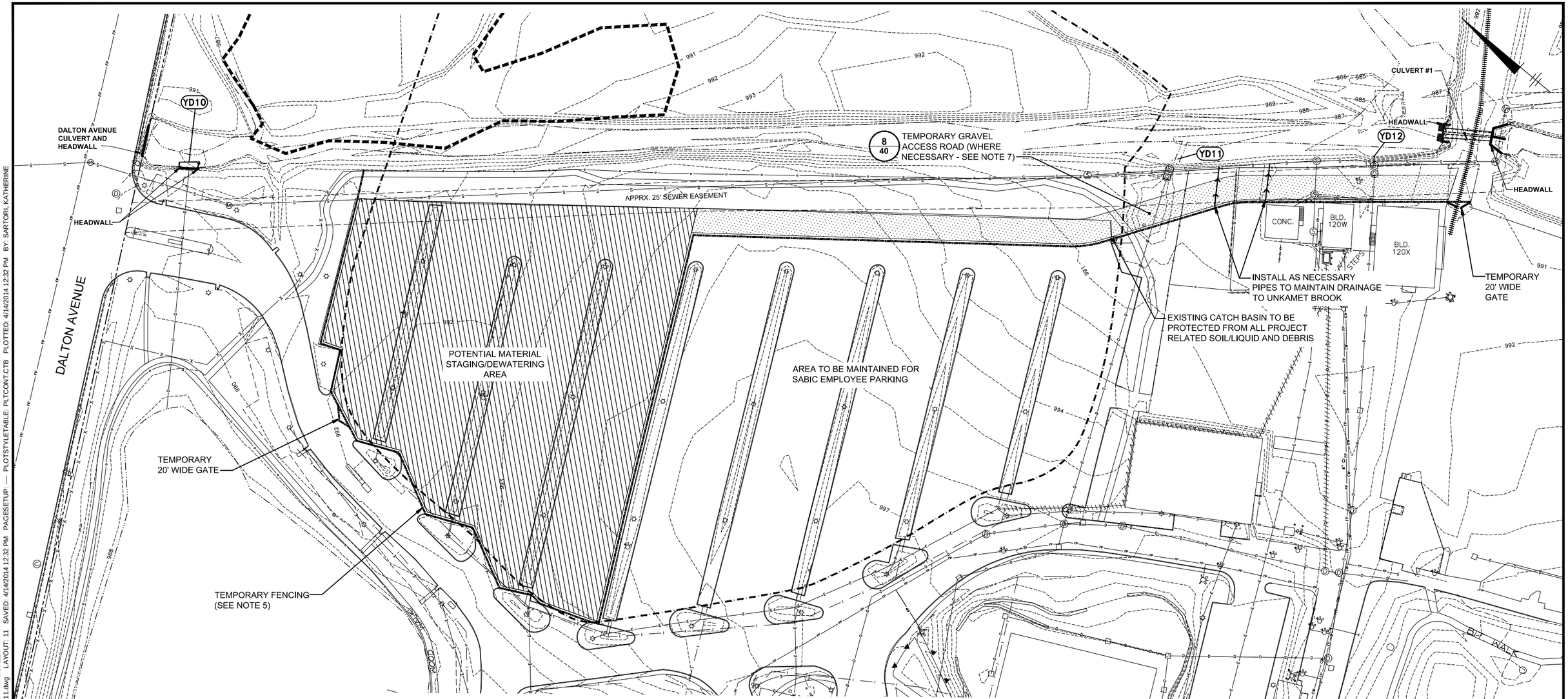
TECHNICAL DRAWINGS

ARCADIS Project No.
B0040190.0002.00006

Date
APRIL 2014

ARCADIS
6723 TOWPATH ROAD
PO BOX 66
SYRACUSE, NY 13214
TEL. 315.446.9120

10



LEGEND:

- EASEMENT
- 982 EXISTING CONTOUR
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- SANITARY MANHOLE
- POTENTIAL MATERIAL STAGING/DEWATERING AREA
- DRAIN MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- METAL FENCE
- ELECTRIC SERVICE
- STORM DRAIN
- EXISTING SANITARY SEWER LINE
- FIRE PROTECTION WATER
- GUARDRAIL
- EDGE OF WATER
- LIMITS OF FORMER INTERIOR LANDFILL
- APPROXIMATE PHRAGMITES AREA
- TEMPORARY FENCING
- PROPOSED DRAINAGE PIPES
- APPROXIMATE EXISTING UNKAMET BROOK CULVERT

NOTES:

1. REFER TO DRAWINGS 1, 10, AND 41 FOR ADDITIONAL BASE MAP AND SITE PREPARATION INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE MATERIAL STAGING/DEWATERING AREA SHOWN IS DESIGNATED FOR THE CONTRACTOR'S USE FOR STAGING MATERIALS/EQUIPMENT OR STOCKPILING, DEWATERING, AND STABILIZATION SOIL AND SEDIMENT FROM EXCAVATION AND SEDIMENT REMOVAL AREAS PRIOR TO LOADING INTO TRUCKS FOR OFF-SITE TRANSPORTATION.
3. THE CONTRACTOR'S OPERATIONS PLAN SHALL INCLUDE A DEWATERING PLAN SHOWING THE LAYOUT AND DETAILS OF DEWATERING PADS, DEWATERING SUMPS, AND CONTAINMENT SYSTEMS WITHIN THE POTENTIAL MATERIAL STAGING/DEWATERING AREA AND SHALL ALSO INCLUDE A DESCRIPTION OF THE PROCEDURES FOR DEWATERING EXCAVATED SOILS TO MAKE THEM READY FOR OFF-SITE TRANSPORTATION, PER SECTION 7.5.4 OF THE FINAL RD/RA WORK PLAN.
4. ACCESS TO THE SABIC EMPLOYEE PARKING AREA IS TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
5. WITH GREEN PRIVACY FABRIC (ENVIRO SCREEN 88, OR APPROVED ALTERNATE). GREEN PRIVACY FABRIC SHALL BE KNITTED HIGH DENSITY POLYETHYLENE WITH BRASS GROMMETS SPACED AT 24" AND ATTACHED TO THE CONSTRUCTION FENCE WITH FENCE SCREEN TIES OR HOG RINGS.
6. TEMPORARY CONSTRUCTION FENCING SHALL CONSIST OF PORTABLE CHAIN LINK FENCE PANELS MOUNTED ON STANDS. FENCE SHALL BE 6 FEET HIGH WITH 11 GAUGE GALVANIZED FENCE FABRIC, 2-1/4" MESH, AND FRAME CONSTRUCTED OF 1-3/8" DIAMETER, 0.065" GALVANIZED TUBING WITH GREEN PRIVACY FABRIC (ENVIRO SCREEN 88, OR APPROVED ALTERNATE). GREEN PRIVACY FABRIC SHALL BE KNITTED HIGH DENSITY POLYETHYLENE WITH BRASS GROMMETS SPACED AT 24" AND ATTACHED TO THE CONSTRUCTION FENCE WITH FENCE SCREEN TIES OR HOG RINGS. LOCATION OF TEMPORARY CONSTRUCTION FENCE AND GATES IS APPROXIMATE AND MAY REQUIRE MODIFICATIONS TO FACILITATE INSTALLATION AND CONSTRUCTION ACCESS.
6. FOLLOWING COMPLETION OF THE DEWATERING ACTIVITIES, THE MATERIAL STAGING/DEWATERING AREA SHALL BE CLEANED AND PREPARED FOR CONSTRUCTION OF THE ASPHALT-COVERED ENGINEERED BARRIER AS SPECIFIED ON DRAWINGS 10, 12 THROUGH 14 AND 16.
7. THE CONTRACTOR SHALL INSTALL A TEMPORARY GRAVEL ACCESS ROAD AND APPROPRIATE TRANSITIONS TO ADJACENT PAVEMENT IN UNPAVED AREAS. NO GRAVEL ROAD MATERIALS ARE REQUIRED OVER PAVEMENT SUBJECT TO SUBSEQUENT REMOVAL AND/OR CONSTRUCTION OF ASPHALT-COVERED ENGINEERED BARRIERS.

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ, K.SARTORI PM: C.AVERILL TM: M.DALEY
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40' 0 40' 80'
1"=40'

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Professional Engineer's No.: -

State	Date Signed	Project Mgr.
		CRA
Designed by	Drawn by	Checked by
JEM/PB	BKD	MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - POTENTIAL MATERIAL STAGING/DEWATERING AREA

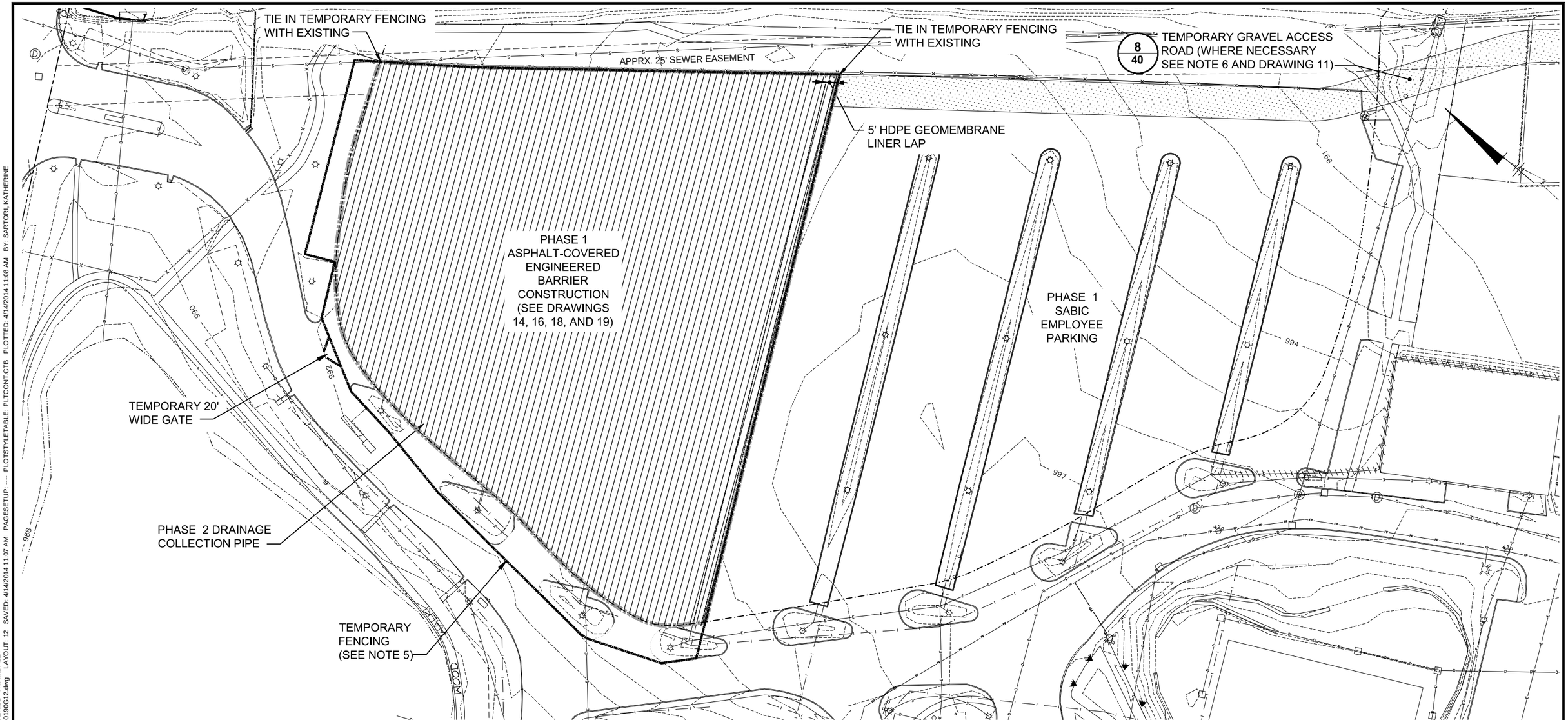
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11



LEGEND:

- EASEMENT
- 982 EXISTING CONTOUR
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- SANITARY MANHOLE
- DRAIN MANHOLE
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- METAL FENCE
- ELECTRIC SERVICE
- STORM DRAIN
- FIRE PROTECTION WATER
- EXISTING SANITARY SEWER LINE
- GUARDRAIL
- EDGE OF WATER
- LIMITS OF ENGINEERED BARRIER
- BUILDING/STRUCTURE
- PHASE I CONSTRUCTION AREA
- ACCESS ROAD
- LIMITS OF PHASE I ASPHALT-COVERED BARRIER
- HDPE GEOMEMBRANE LINER LAP
- TEMPORARY FENCING

NOTES:

1. REFER TO DRAWINGS 10, 14, 16, 18, AND 19, FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS FOR CONSTRUCTION OF THE ASPHALT-COVERED ENGINEERED BARRIER DURING EACH PHASE OF CONSTRUCTION.
2. ACCESS TO THE SABIC EMPLOYEE PARKING AREA IS TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
3. GEOMEMBRANE LAP SEAM SHALL BE CONSTRUCTED SO THAT THE PHASE 1 GEOMEMBRANE OVERLAPS THE TOP OF THE PHASE 2 GEOMEMBRANE.
4. LIGHTING FOR NIGHT TIME OPERATION OF THE SABIC EMPLOYEE PARKING AREA SHALL BE PROVIDED DURING CONSTRUCTION.
5. TEMPORARY CONSTRUCTION FENCING SHALL CONSIST OF PORTABLE CHAIN LINK FENCE PANELS MOUNTED ON STANDS. FENCE SHALL BE 6 FEET HIGH WITH 11 GAUGE GALVANIZED FENCE FABRIC, 2-1/4" MESH, AND FRAME CONSTRUCTED OF 1-3/8" DIAMETER, 0.065" GALVANIZED TUBING WITH GREEN PRIVACY FABRIC (ENVIRO SCREEN 88, OR APPROVED ALTERNATE). GREEN PRIVACY FABRIC SHALL BE KNITTED HIGH DENSITY POLYETHYLENE WITH BRASS GROMMETS SPACED AT 24" AND ATTACHED TO THE CONSTRUCTION FENCE WITH FENCE SCREEN TIES OR HOG RINGS. LOCATION OF TEMPORARY CONSTRUCTION FENCE AND GATES IS APPROXIMATE AND MAY REQUIRE MODIFICATIONS TO FACILITATE INSTALLATION AND CONSTRUCTION ACCESS.
6. THE CONTRACTOR SHALL INSTALL A TEMPORARY GRAVEL ACCESS ROAD AND APPROPRIATE TRANSITIONS TO ADJACENT PAVEMENT IN UNPAVED AREAS. NO GRAVEL ROAD MATERIALS ARE REQUIRED OVER PAVEMENT SUBJECT TO SUBSEQUENT REMOVAL AND/OR CONSTRUCTION OF ASPHALT-COVERED ENGINEERED BARRIERS.

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1"=30'

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Professional Engineer's No.: -		
State	Date Signed	Project Mgr. CRA
Designed by JEM	Drawn by BGD	Checked by PB

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - PHASE I OF ASPHALT-COVERED ENGINEERED BARRIER CONSTRUCTION

TECHNICAL DRAWINGS

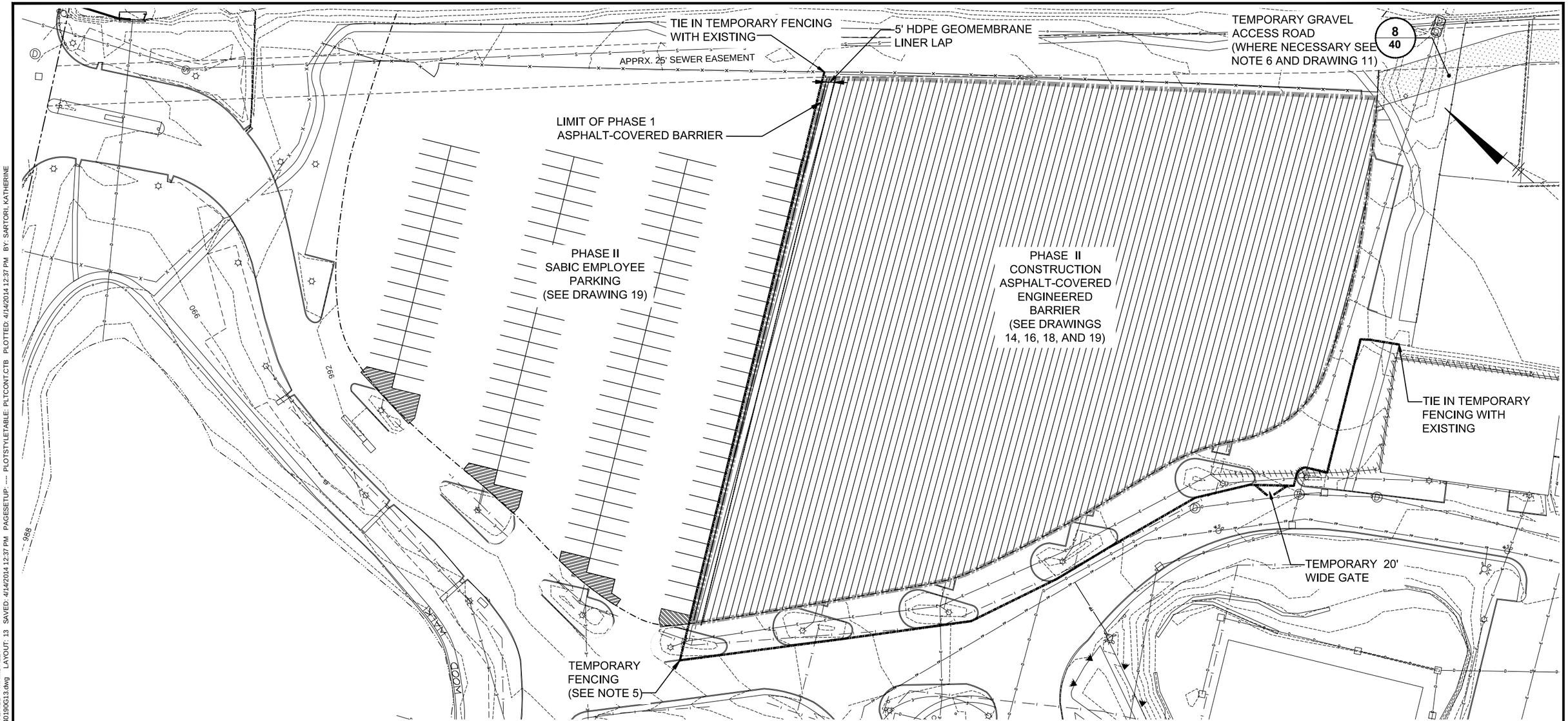
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LEGEND:

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- SANITARY MANHOLE
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- FIRE PROTECTION WATER
- EXISTING SANITARY SEWER LINE
- GUARDRAIL
- EDGE OF WATER
- LIMITS OF ENGINEERED BARRIER
- BUILDING/STRUCTURE
- PHASE II CONSTRUCTION AREA
- ACCESS ROAD
- LIMITS OF PHASE II ASPHALT-COVERED BARRIER
- TEMPORARY FENCING (SEE NOTE 5)
- HDPE GEOMEMBRANE LINER LAP

NOTES:

1. REFER TO DRAWINGS 10, 14, 16, 18, AND 19, FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS FOR CONSTRUCTION OF THE ASPHALT-COVERED ENGINEERED BARRIER DURING EACH PHASE OF CONSTRUCTION.
2. ACCESS TO THE SABIC EMPLOYEE PARKING AREA IS TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
3. GEOMEMBRANE LAP SEAM SHALL BE CONSTRUCTED SO THAT THE PHASE I GEOMEMBRANE OVERLAPS THE TOP OF THE PHASE II GEOMEMBRANE.
4. LIGHTING FOR NIGHT TIME OPERATION OF THE SABIC EMPLOYEE PARKING AREA SHALL BE PROVIDED DURING CONSTRUCTION.
5. TEMPORARY CONSTRUCTION FENCING SHALL CONSIST OF PORTABLE CHAIN LINK FENCE PANELS MOUNTED ON STANDS. FENCE SHALL BE 6 FEET HIGH WITH 11 GAUGE GALVANIZED FENCE FABRIC, 2-1/4" MESH, AND FRAME CONSTRUCTED OF 1-3/8" DIAMETER, 0.065" GALVANIZED TUBING WITH GREEN PRIVACY FABRIC (ENVIRO SCREEN 88, OR APPROVED ALTERNATE). GREEN PRIVACY FABRIC SHALL BE KNITTED HIGH DENSITY POLYETHYLENE WITH BRASS GROMMETS SPACED AT 24" AND ATTACHED TO THE CONSTRUCTION FENCE WITH FENCE SCREEN TIES OR HOG RINGS. LOCATION OF TEMPORARY CONSTRUCTION FENCE AND GATES IS APPROXIMATE AND MAY REQUIRE MODIFICATIONS TO FACILITATE INSTALLATION AND CONSTRUCTION ACCESS.
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1"=30'

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Professional Engineer's Name: -
Professional Engineer's No.: -

State	Date Signed	Project Mgr.
		CRA
Designed by	Drawn by	Checked by
JEM	BGD	PB

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - PHASE II OF ASPHALT-COVERED ENGINEERED BARRIER CONSTRUCTION

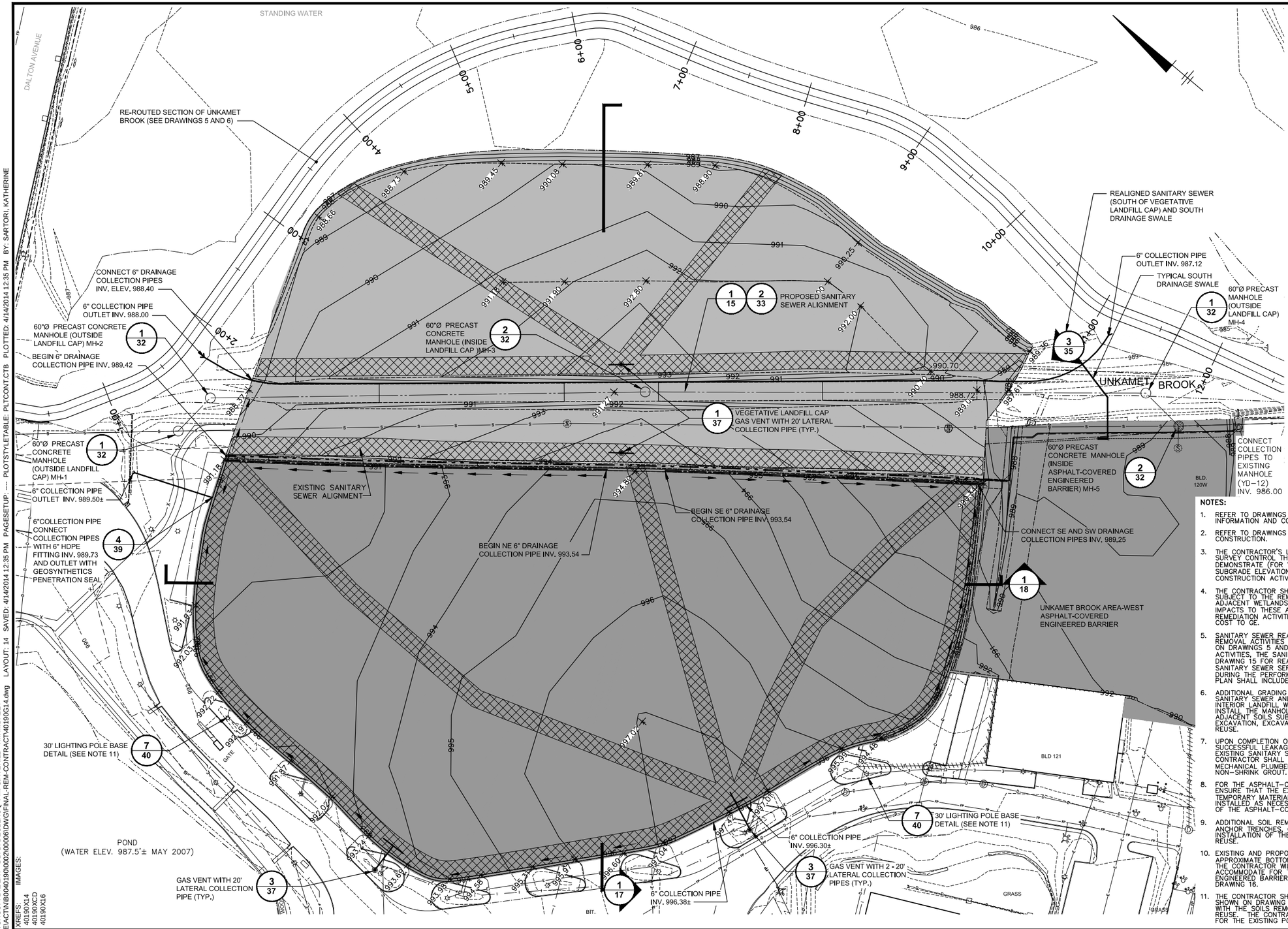
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LEGEND:

- EASEMENT
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- HYDRANT
- METAL FENCE
- CHAIN LINK FENCE
- ELECTRIC SERVICE
- STORM DRAIN
- FIRE PROTECTION WATER
- EXISTING SANITARY SEWER LINE
- EXISTING CONTOUR
- EDGE OF WATER
- VEGETATIVE LANDFILL CAP (2/34)
- ASPHALT-COVERED ENGINEERED BARRIER (1/34)
- PROPOSED LIMIT OF GRADING
- PROPOSED GRADE BREAK LINE
- PROPOSED CONTOUR
- 990.03 x PROPOSED SPOT ELEVATION
- PROPOSED BARRIER COLLECTION PIPE (SEE NOTE 8)
- INV. 979.5 PROPOSED BARRIER COLLECTION PIPE INVERT ELEVATION
- PROPOSED DRAINAGE ANCHOR TRENCH COLLECTION PIPE AND FLOW DIRECTION
- GEOCOMPOSITE GAS VENTING STRIPS
- PROPOSED GAS VENT LOCATION

NOTES:

1. REFER TO DRAWINGS 1 THROUGH 3, 10 THROUGH 13, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. REFER TO DRAWINGS 12 AND 13 FOR PHASING OF ASPHALT-OCOVERED ENGINEERED BARRIER CONSTRUCTION.
3. THE CONTRACTOR'S LICENSED SURVEYOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED SUBGRADE ELEVATIONS AND PIPING INVERTS PRIOR TO INITIATING ENGINEERED BARRIER/LANDFILL CAP CONSTRUCTION ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL RD/RA WORK PLAN.
4. THE CONTRACTOR SHALL PROTECT ALL STRUCTURES/FEATURES IN AREAS THAT WILL NOT BE SUBJECT TO THE REMEDIATION ACTIVITIES. IN PARTICULAR, THE CONTRACTOR SHALL PROTECT THE ADJACENT WETLANDS AND BROOK DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY IMPACTS TO THESE AREAS/ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
5. SANITARY SEWER REALIGNMENT ACTIVITIES SHALL NOT BE PERFORMED UNTIL THE SOIL/SEDIMENT REMOVAL ACTIVITIES SHOWN ON DRAWINGS 3 AND 4 AND THE BROOK RE-ROUTING ACTIVITIES SHOWN ON DRAWINGS 5 AND 6 HAVE BEEN COMPLETED. UPON COMPLETION OF THE BROOK RE-ROUTING ACTIVITIES, THE SANITARY SEWER WILL BE REALIGNED WITHIN THE FORMER BROOK CHANNEL (SEE DRAWING 15 FOR REALIGNMENT PROFILE). THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SANITARY SEWER SERVICE (INCLUDING ANY BYPASS PUMPING) 24 HOURS A DAY, 7 DAYS A WEEK DURING THE PERFORMANCE OF THE SEWER REALIGNMENT ACTIVITIES. THE CONTRACTOR'S OPERATIONS PLAN SHALL INCLUDE A BYPASS PUMPING PLAN, INCLUDING EQUIPMENT SPECIFICATIONS.
6. ADDITIONAL GRADING WILL BE REQUIRED TO ACHIEVE THE SPECIFIED ELEVATIONS FOR THE REALIGNED SANITARY SEWER AND MANHOLE 3. ADDITIONAL SOIL REMOVAL OUTSIDE THE LIMITS OF THE FORMER INTERIOR LANDFILL WILL BE REQUIRED TO INSTALL MANHOLES 1, 2, 4, AND 5. SOIL GENERATED TO INSTALL THE MANHOLES WITHIN REMEDIAL EXCAVATION AREAS SHALL BE MANAGED ALONG WITH THE ADJACENT SOILS SUBJECT TO EXCAVATION. FOR MANHOLES OUTSIDE THE LIMITS OF REMEDIAL EXCAVATION, EXCAVATED SOILS SHALL BE STOCKPILED FOR CHARACTERIZATION AND POTENTIAL REUSE.
7. UPON COMPLETION OF THE SANITARY SEWER REALIGNMENT ACTIVITIES, DEMONSTRATION OF THE SUCCESSFUL LEAKAGE TESTS, AND PRIOR TO CONNECTING THE REALIGNED SANITARY SEWER, THE EXISTING SANITARY SEWER LINE WILL BE FLUSHED TO REMOVE ACCUMULATED GRIT. FINALLY, THE CONTRACTOR SHALL REMOVE THE BYPASSED SANITARY SEWER LINE FROM SERVICE BY INSTALLING MECHANICAL PLUMBER'S PLUGS AND GROUTING THE BYPASSED SEWER LINE AND MANHOLES WITH NON-SHRINK GROUT.
8. FOR THE ASPHALT-COVERED PORTION OF THE ENGINEERED BARRIER, THE CONTRACTOR SHALL ENSURE THAT THE EXISTING PARKING SURFACE HAS BEEN CLEANED FOLLOWING THE REMOVAL OF THE TEMPORARY MATERIAL STAGING/DEWATERING STOCKPILE AND THAT ASPHALT SHIMS HAVE BEEN INSTALLED AS NECESSARY TO ACHIEVE THE LINER SUBGRADE ELEVATIONS PRIOR TO CONSTRUCTION OF THE ASPHALT-COVERED ENGINEERED BARRIER.
9. ADDITIONAL SOIL REMOVAL WILL BE REQUIRED TO INSTALL CERTAIN GEOSYNTHETIC COMPONENTS (e.g., ANCHOR TRENCHES, COLLECTION PIPES, ETC.). ALL EXCAVATED SOILS ASSOCIATED WITH THE INSTALLATION OF THESE COMPONENTS SHALL BE STOCKPILED FOR CHARACTERIZATION AND POTENTIAL REUSE.
10. EXISTING AND PROPOSED CONTOUR INTERVAL EQUALS 1 FOOT. PROPOSED GRADES REPRESENT THE APPROXIMATE BOTTOM OF SUBBASE COURSE (I.E., TOP OF ENGINEERED BARRIER GEOSYNTHETICS). THE CONTRACTOR WILL BE REQUIRED TO OBTAIN THE SUBGRADE ELEVATIONS NECESSARY TO ACCOMMODATE FOR THE ENGINEERED BARRIER GEOSYNTHETICS AND WHICH WILL RESULT IN FINAL ENGINEERED BARRIER SURFACE ELEVATIONS THAT DO NOT EXCEED THE GRADES DEPICTED ON DRAWING 16.
11. THE CONTRACTOR SHALL INSTALL NEW LIGHTING POLE BASES ON EIGHT PERIMETER ISLANDS, AS SHOWN ON DRAWING 19. ANY SOILS GENERATED TO INSTALL THE POLE BASES WILL BE STOCKPILED WITH THE SOILS REMOVED FROM THE VEGETATED ISLANDS FOR CHARACTERIZATION AND POTENTIAL REUSE. THE CONTRACTOR SHALL ALSO RE-ROUTE ELECTRICAL SERVICE FROM THE JUNCTION BOXES FOR THE EXISTING POLES, THEN REMOVE THE EXISTING POLE FOUNDATIONS IN THEIR ENTIRETY.

1"=40' (40' 0 40' 80')

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Professional Engineer's Name: -

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State	Date Signed	Project Mgr.
-		CRA
Designed by	Drawn by	Checked by
JEM/PB	BKD	MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - SUBGRADE GRADING AND SANITARY SEWER REALIGNMENT PLAN

TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006

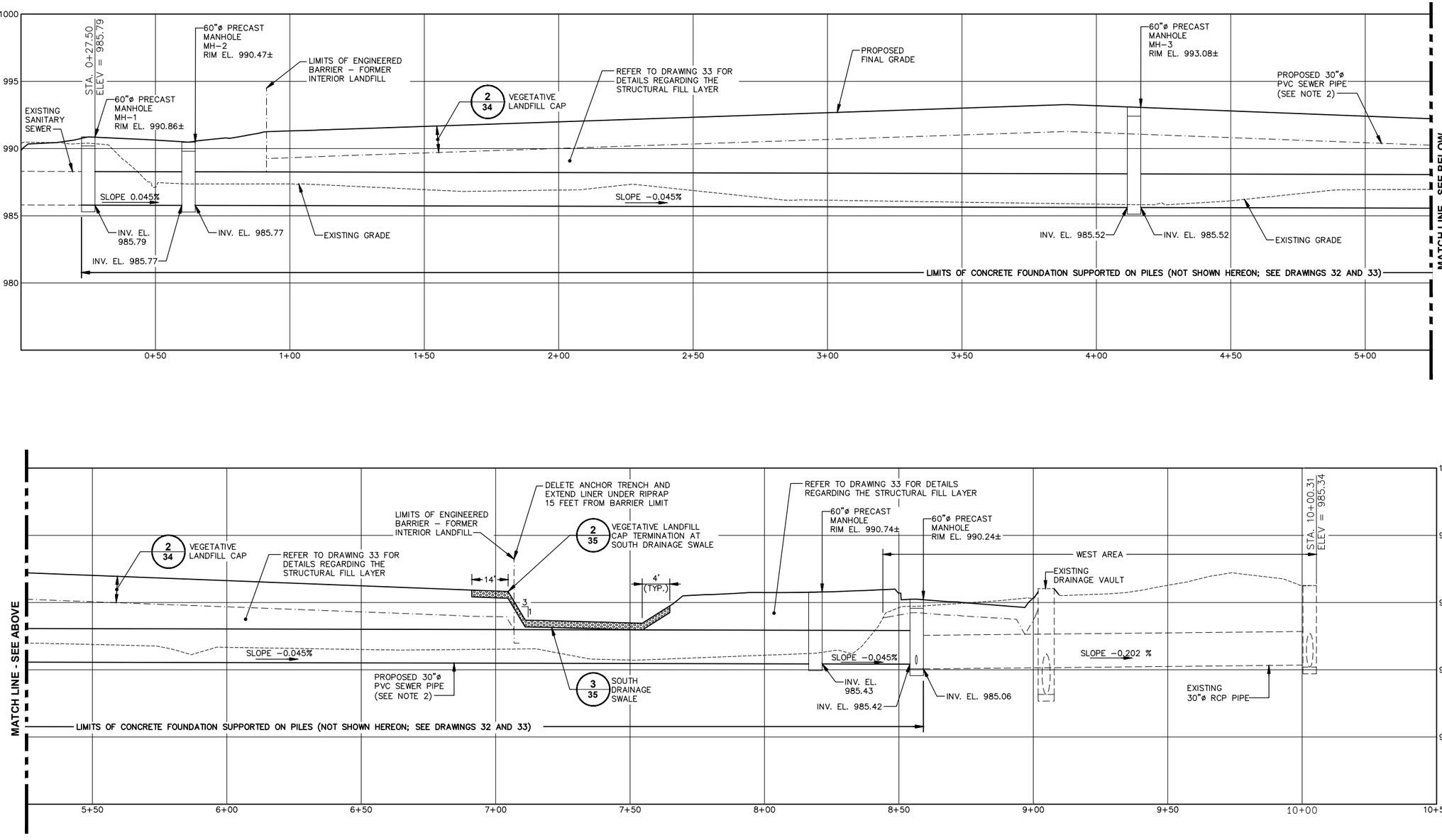
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14

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SANITARY SEWER PROFILE 1

0 20' 40'
HORIZONTAL SCALE: 1"=20'
0 4' 8'
VERTICAL SCALE: 1"=4'

NOTES:

1. ALL EXISTING PIPE INVERT ELEVATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF PROPOSED SEWER MANHOLES WITH FIELD VERIFIED INVERTS TO GE FOR APPROVAL.
2. PROPOSED PVC SEWER PIPE SHALL MEET THE REQUIREMENTS OF ASTM F949 AND SHALL BE A–2000 PVC PIPE AS MANUFACTURED BY CONTECH OR APPROVED EQUAL.
3. SANITARY SEWER REALIGNMENT ACTIVITIES SHALL NOT BE PERFORMED UNTIL THE SOIL/SEDIMENT REMOVAL ACTIVITIES SHOWN ON DRAWINGS 3 AND 4 AND THE BROOK RE–ROUTING ACTIVITIES SHOWN ON DRAWINGS 5 AND 6 HAVE BEEN COMPLETED. UPON COMPLETION OF THE BROOK RE–ROUTING ACTIVITIES, THE SANITARY SEWER WILL BE REALIGNED WITHIN THE FORMER BROOK CHANNEL (SEE DRAWING 14 FOR PLAN VIEW). THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SANITARY SEWER SERVICE (INCLUDING ANY BYPASS PUMPING) 24 HOURS A DAY, 7 DAYS A WEEK DURING THE PERFORMANCE OF THE SEWER REALIGNMENT ACTIVITIES. THE CONTRACTOR'S OPERATIONS PLAN SHALL INCLUDE A BYPASS PUMPING PLAN, INCLUDING EQUIPMENT SPECIFICATIONS.
4. ADDITIONAL GRADING WILL BE REQUIRED TO ACHIEVE THE SPECIFIED ELEVATIONS FOR THE REALIGNED SANITARY SEWER AND MANHOLE 3. ADDITIONAL SOIL REMOVAL OUTSIDE THE LIMITS OF THE FORMER INTERIOR LANDFILL WILL BE REQUIRED TO INSTALL MANHOLES 1, 2, 4, AND 5. SOIL GENERATED TO INSTALL THE MANHOLES WITHIN REMEDIAL EXCAVATION AREAS (MANHOLE 5 ONLY) SHALL BE MANAGED ALONG WITH THE ADJACENT SOILS SUBJECT TO EXCAVATION. SOILS GENERATED OUTSIDE THE LIMITS OF REMEDIATION SHALL BE STOCKPILED FOR CHARACTERIZATION AND POTENTIAL REUSE.
5. REFER TO DRAWINGS 32 AND 33 FOR SANITARY SEWER CONCRETE FOUNDATION DETAILS.

ABBREVIATIONS:

PVC – POLYVINYL CHLORIDE PIPE

RCP – REINFORCED CONCRETE PIPE.

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Professional Engineer's No.: -

State	Date Signed	Project Mgr.
-		CRA
Designed by: TAS	Drawn by: BKD	Checked by: MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - SANITARY SEWER REALIGNMENT PROFILE

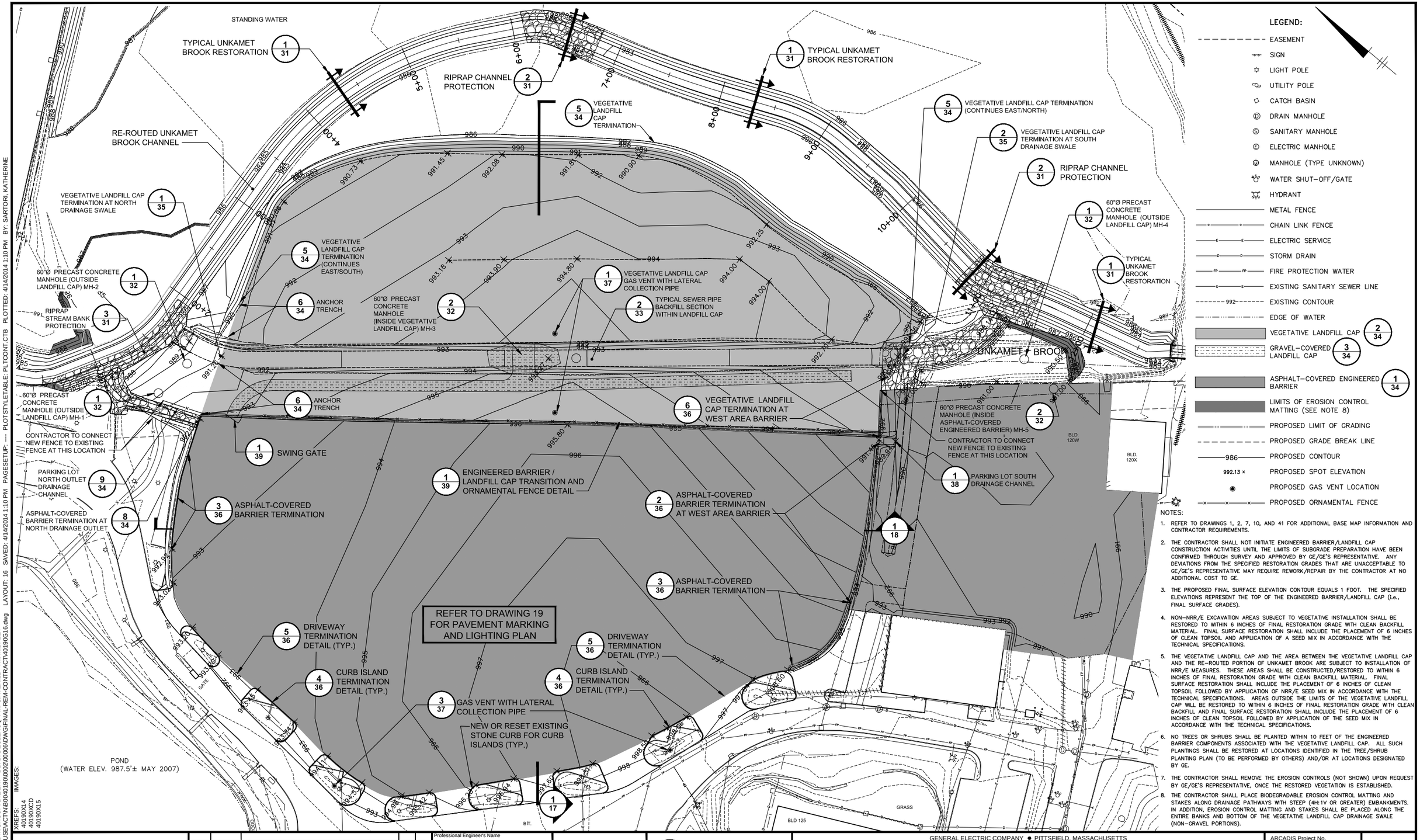
TECHNICAL DRAWINGS

ARCADIS Project No.
B0040190.0002.00006

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15



LEGEND:

- EASEMENT
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- HYDRANT
- METAL FENCE
- CHAIN LINK FENCE
- ELECTRIC SERVICE
- STORM DRAIN
- FIRE PROTECTION WATER
- EXISTING SANITARY SEWER LINE
- 992 EXISTING CONTOUR
- EDGE OF WATER
- VEGETATIVE LANDFILL CAP 2/34
- GRAVEL-COVERED LANDFILL CAP 3/34
- ASPHALT-COVERED ENGINEERED BARRIER 1/34
- LIMITS OF EROSION CONTROL MATTING (SEE NOTE 8)
- PROPOSED LIMIT OF GRADING
- PROPOSED GRADE BREAK LINE
- 986 PROPOSED CONTOUR
- 992.13 × PROPOSED SPOT ELEVATION
- PROPOSED GAS VENT LOCATION
- PROPOSED ORNAMENTAL FENCE

NOTES:

1. REFER TO DRAWINGS 1, 2, 7, 10, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL NOT INITIATE ENGINEERED BARRIER/LANDFILL CAP CONSTRUCTION ACTIVITIES UNTIL THE LIMITS OF SUBGRADE PREPARATION HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVE. ANY DEVIATIONS FROM THE SPECIFIED RESTORATION GRADES THAT ARE UNACCEPTABLE TO GE/GE'S REPRESENTATIVE MAY REQUIRE REWORK/REPAIR BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
3. THE PROPOSED FINAL SURFACE ELEVATION CONTOUR EQUALS 1 FOOT. THE SPECIFIED ELEVATIONS REPRESENT THE TOP OF THE ENGINEERED BARRIER/LANDFILL CAP (i.e., FINAL SURFACE GRADES).
4. NON-NRR/E EXCAVATION AREAS SUBJECT TO VEGETATIVE INSTALLATION SHALL BE RESTORED TO WITHIN 6 INCHES OF FINAL RESTORATION GRADE WITH CLEAN BACKFILL MATERIAL. FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL AND APPLICATION OF A SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
5. THE VEGETATIVE LANDFILL CAP AND THE AREA BETWEEN THE VEGETATIVE LANDFILL CAP AND THE RE-ROUTED PORTION OF UNKAMET BROOK ARE SUBJECT TO INSTALLATION OF NRR/E MEASURES. THESE AREAS SHALL BE CONSTRUCTED/RESTORED TO WITHIN 6 INCHES OF FINAL RESTORATION GRADE WITH CLEAN BACKFILL MATERIAL. FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL FOLLOWED BY APPLICATION OF NRR/E SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. AREAS OUTSIDE THE LIMITS OF THE VEGETATIVE LANDFILL CAP WILL BE RESTORED TO WITHIN 6 INCHES OF FINAL RESTORATION GRADE WITH CLEAN BACKFILL AND FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL FOLLOWED BY APPLICATION OF THE SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. NO TREES OR SHRUBS SHALL BE PLANTED WITHIN 10 FEET OF THE ENGINEERED BARRIER COMPONENTS ASSOCIATED WITH THE VEGETATIVE LANDFILL CAP. ALL SUCH PLANTINGS SHALL BE RESTORED AT LOCATIONS IDENTIFIED IN THE TREE/SHRUB PLANTING PLAN (TO BE PERFORMED BY OTHERS) AND/OR AT LOCATIONS DESIGNATED BY GE.
7. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS (NOT SHOWN) UPON REQUEST BY GE/GE'S REPRESENTATIVE, ONCE THE RESTORED VEGETATION IS ESTABLISHED.
8. THE CONTRACTOR SHALL PLACE BIODEGRADABLE EROSION CONTROL MATTING AND STAKES ALONG DRAINAGE PATHWAYS WITH STEEP (4H:1V OR GREATER) EMBANKMENTS. IN ADDITION, EROSION CONTROL MATTING AND STAKES SHALL BE PLACED ALONG THE ENTIRE BANKS AND BOTTOM OF THE VEGETATIVE LANDFILL CAP DRAINAGE SWALE (NON-GRAVEL PORTIONS).

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1"=40' (40' 0 40' 80')

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Professional Engineer's No.:

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-		CRA
Designed by	Drawn by	Checked by
JEM/PB	BKD	MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - FINAL GRADING PLAN & RE-ROUTED BROOK RESTORATION DETAILS

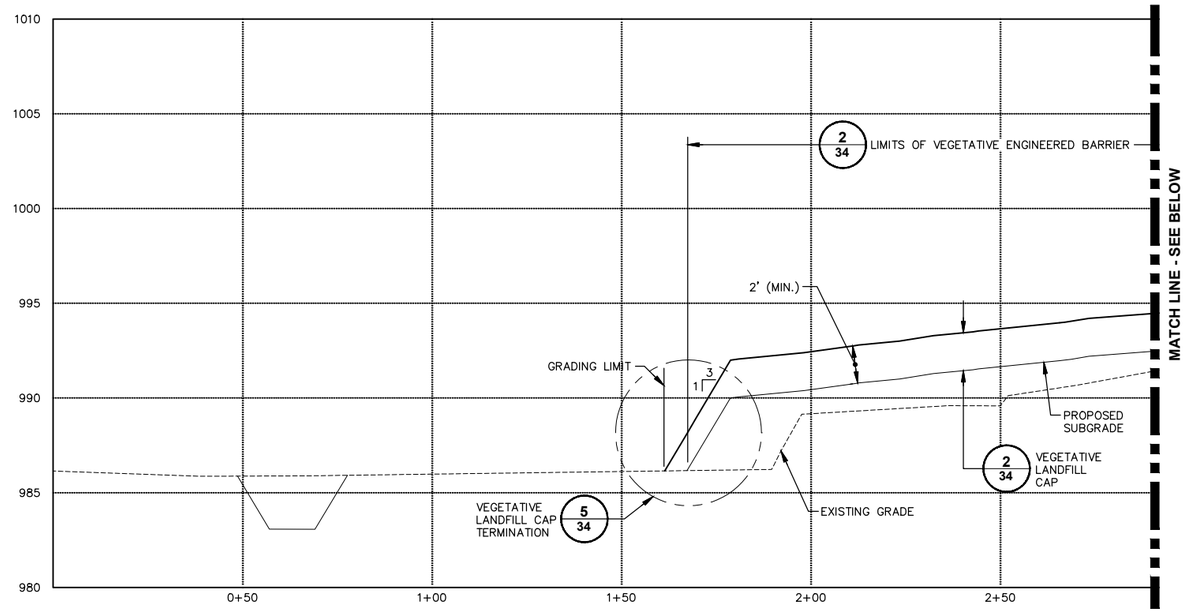
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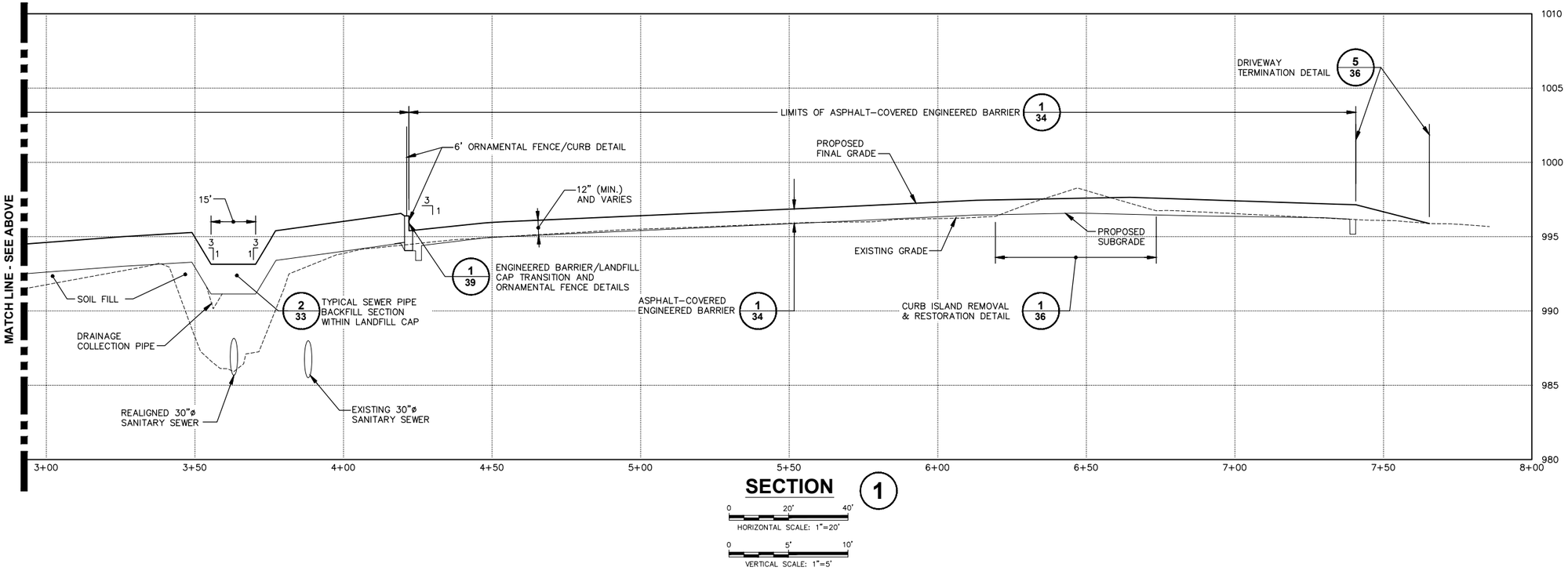
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16





SECTION 1

0 20' 40'
HORIZONTAL SCALE: 1"=20'

0 5' 10'
VERTICAL SCALE: 1"=5'

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Professional Engineer's No.: .		
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Designed by THL	Drawn by BKD	Checked by MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - LANDFILL CAP/ENGINEERED BARRIER CROSS SECTIONS

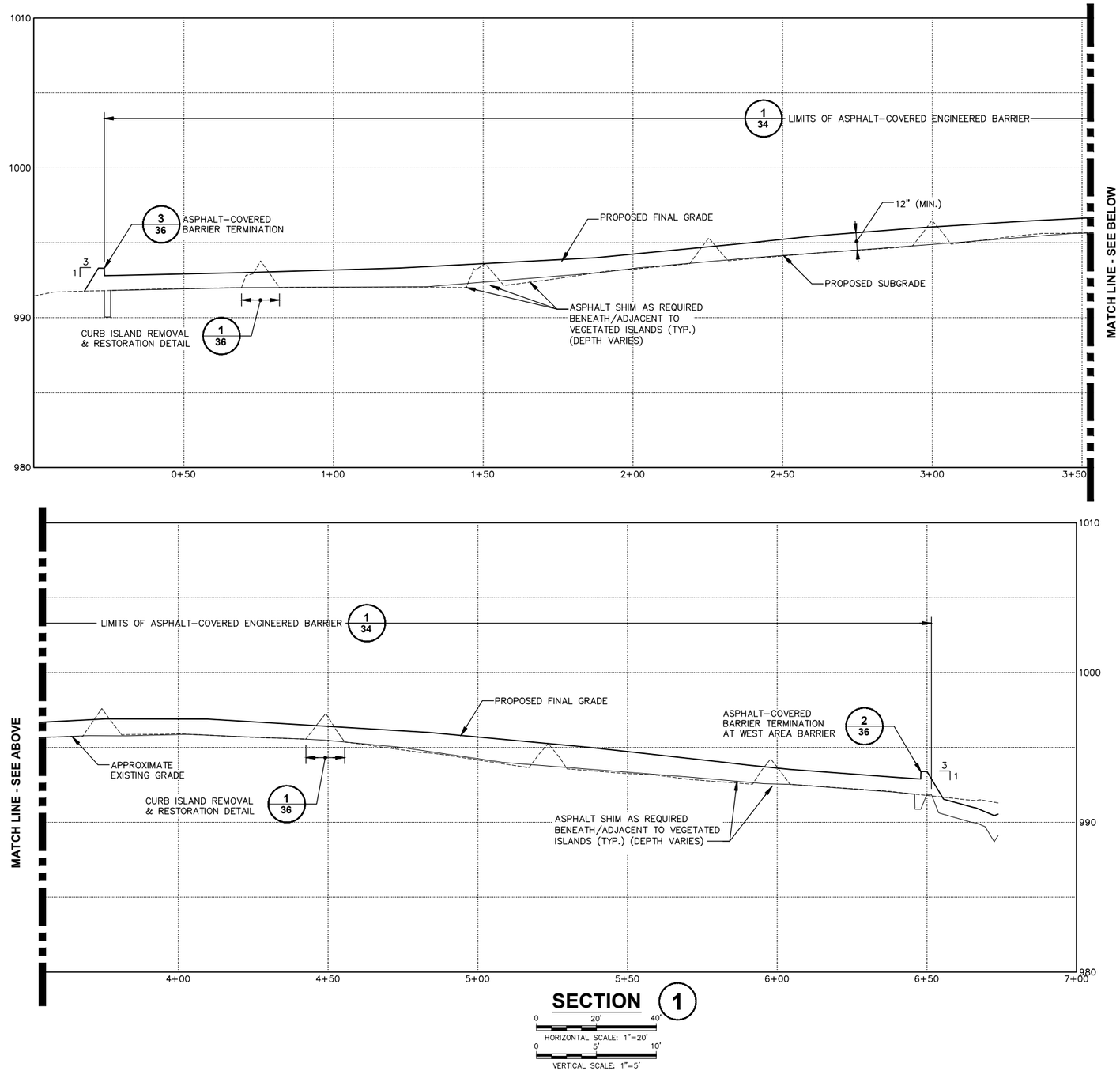
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17



SECTION 1

0 20' 40'
HORIZONTAL SCALE: 1"=20'
0 5' 10'
VERTICAL SCALE: 1"=5'

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Professional Engineer's Name
Professional Engineer's No.

State	Date Signed	Project Mgr.
		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - ASPHALT-COVERED ENGINEERED BARRIER CROSS SECTION

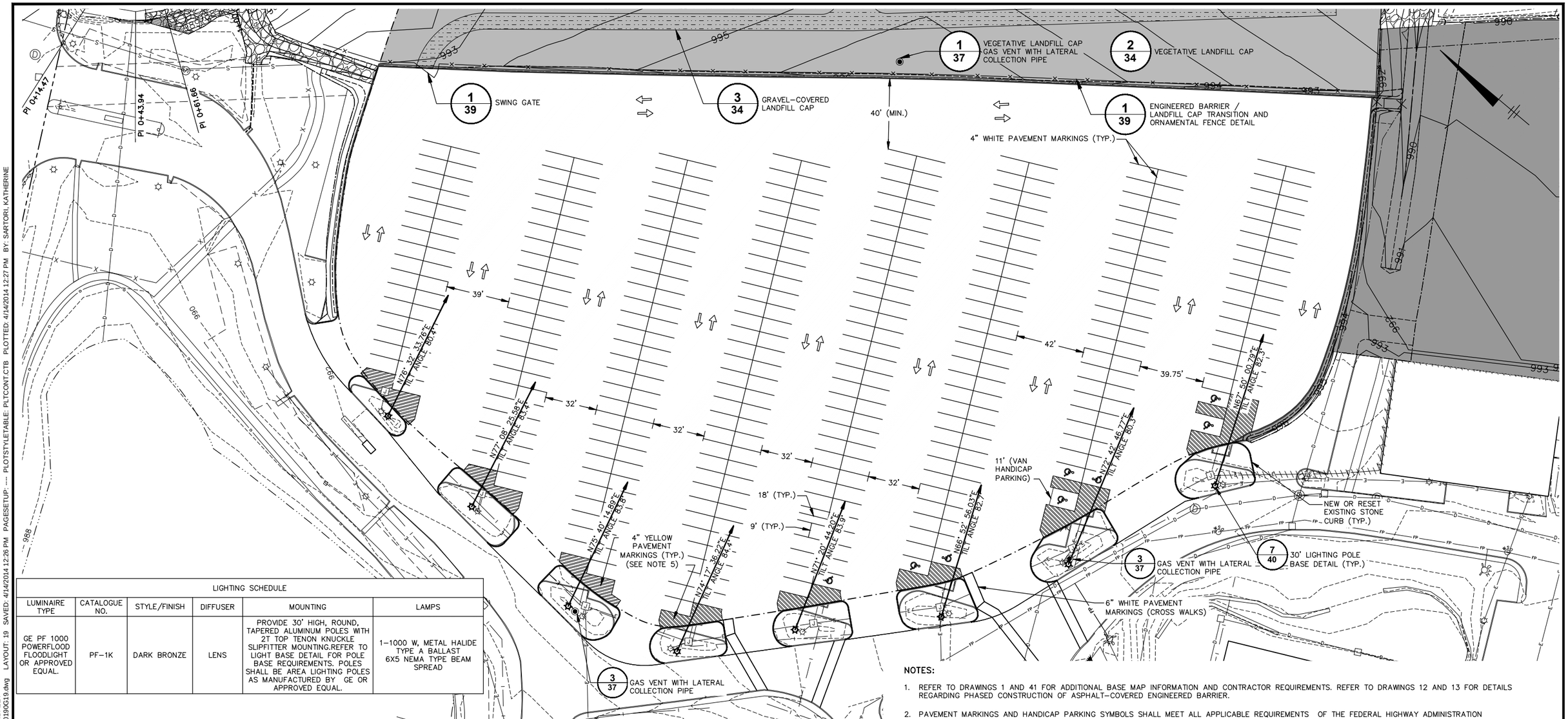
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LIGHTING SCHEDULE					
LUMINAIRE TYPE	CATALOGUE NO.	STYLE/FINISH	DIFFUSER	MOUNTING	LAMPS
GE PF 1000 POWERFLOOD FLOODLIGHT OR APPROVED EQUAL.	PF–1K	DARK BRONZE	LENS	PROVIDE 30' HIGH, ROUND, TAPERED ALUMINUM POLES WITH 2T TOP TENON KNUCKLE SLIPFITTER MOUNTING.REFER TO LIGHT BASE DETAIL FOR POLE BASE REQUIREMENTS. POLES SHALL BE AREA LIGHTING POLES AS MANUFACTURED BY GE OR APPROVED EQUAL.	1–1000 W, METAL HALIDE TYPE A BALLAST 6X5 NEMA TYPE BEAM SPREAD

LEGEND:

- EASEMENT
- 982 EXISTING CONTOUR
- 984 FINAL CONTOUR FOR REALIGNED CHANNEL
- EDGE OF CHANNEL BOTTOM
- SIGN
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- SANITARY MANHOLE
- JUNCTION BOX
- DRAIN MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT–OFF/GATE
- N75° 40' 14.89"E PROPOSED LIGHT POLE AND LIGHT ORIENTATION (SEE NOTE 8)
- TRAFFIC FLOW DIRECTION
- CHAIN LINK FENCE
- METAL FENCE
- E ELECTRIC SERVICE
- D D STORM DRAIN
- FP FIRE PROTECTION WATER
- S EXISTING SANITARY SEWER LINE
- GUARDRAIL
- EDGE OF WATER
- LIMITS OF ENGINEERED BARRIER
- BUILDING/STRUCTURE

NOTES:

1. REFER TO DRAWINGS 1 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS. REFER TO DRAWINGS 12 AND 13 FOR DETAILS REGARDING PHASED CONSTRUCTION OF ASPHALT–COVERED ENGINEERED BARRIER.
2. PAVEMENT MARKINGS AND HANDICAP PARKING SYMBOLS SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE FEDERAL HIGHWAY ADMINISTRATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO PLACING PAVEMENT MARKINGS OR SYMBOLS AND REPORT ANY DISCREPANCIES TO GE/GE'S REPRESENTATIVE PRIOR TO START OF WORK. WHEN THE MARKINGS SHOWN ON THE PLANS ARE IN CONFLICT WITH ACTUAL SITE CONDITIONS, PROPOSED PAVEMENT MARKINGS MAY BE ADJUSTED, SUBJECT TO APPROVAL BY GE/GE'S REPRESENTATIVE.
4. THE CONTRACTOR SHALL REMOVE ANY CONFLICTING EXISTING MARKINGS WHERE THE PROPOSED PAVEMENT CROSS WALK MARKINGS ARE SHOWN IN THE AREA OF EXISTING PAVEMENT CROSS WALK MARKINGS.
5. GORE AREA MARKINGS SHALL BE 8" WIDE SOLID YELLOW CROSS HATCH LINES PLACED 5 FEET ON CENTER AT 45 DEGREES.
6. THE CONTRACTOR SHALL RE–ROUTE ELECTRICAL SERVICE FROM THE EXISTING JUNCTION BOXES TO THE NEW POLES. THE CONTRACTOR SHALL RELOCATE JUNCTION BOXES WITHIN ISLANDS AND OUTSIDE BARRIER LIMITS, IF NECESSARY. NEW CONDUIT FROM EXISTING JUNCTION BOXES TO NEW POLES SHALL BE 1" PVC AND SHALL CONTAIN 2#10, 1#10 GROUND.
7. HOLES FOR NEW LIGHTING POLE FOUNDATIONS SHALL BE DRILLED AND SURROUNDING SOIL SHALL BE COMPACTED AROUND NEW FOUNDATIONS, IF POSSIBLE. ANY EXTRA SOILS SHALL BE STOCKPILED WITH SOILS GENERATED DURING REMOVAL OF THE VEGETATED ISLANDS FOR CHARACTERIZATION AND POTENTIAL FUTURE REUSE IF POSSIBLE.
8. THE CONTRACTOR SHALL ATTACH NEW ALUMINUM LIGHT POLES AND LAMPS PER THE LIGHTING SCHEDULE SHOWN ON THIS DRAWING. IN ADDITION, THE VERTICAL VENT PIPES FOR THE ASPHALT–COVERED ENGINEERED BARRIER WILL BE ATTACHED TO THE ADJACENT LIGHTING POLES AND SHALL MATCH THE FINISH COLOR OF LIGHT POLES. FINALLY, THE CONTRACTOR SHALL REMOVE THE EXISTING POLE FOUNDATIONS IN THEIR ENTIRETY.

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IMAGES:

30' 0 30' 60'
1"=30'

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		CRA
Designed by	Drawn by	Checked by
JEM	BGD	PB

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

FORMER INTERIOR LANDFILL - PARKING LOT PAVEMENT MARKING AND LIGHTING PLAN

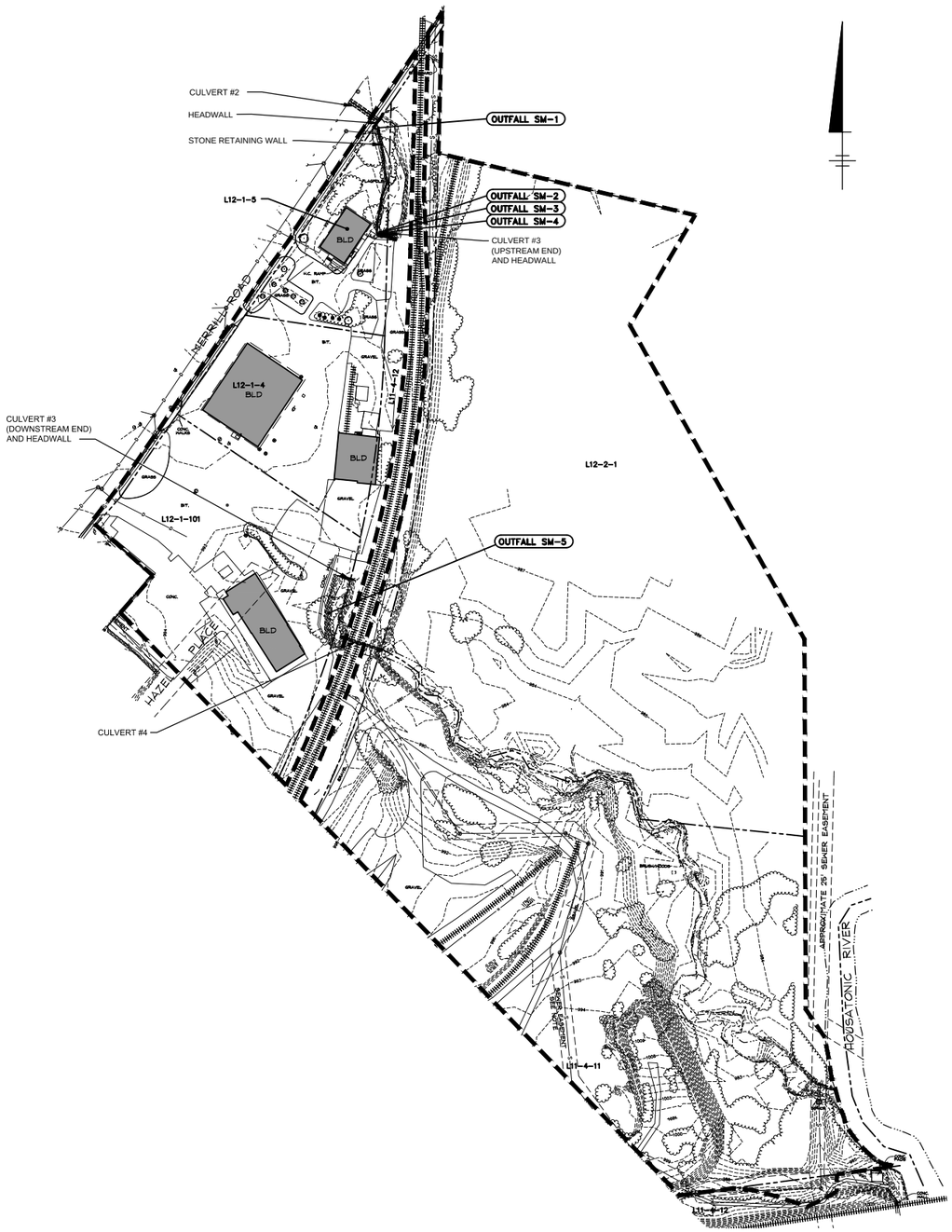
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LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR
- L12-2-1 PROPERTY IDENTIFICATION
- BOLLARD
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- TELEPHONE MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- EXISTING BUILDING/STRUCTURE

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWING GE-1110-006-CX101-M(REV 12-2-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. ACCORDING TO FLOOD INSURANCE RATE MAP (FIRM), COMMUNITY PANEL 250037 0010 C, REVISION DATED FEBRUARY 19, 1982, THE 100-YEAR FLOOD PLAIN ELEVATION IN THE PROJECT VICINITY IS 995 FEET ABOVE MEAN SEA LEVEL.
5. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.
6. SEWER EASEMENT AND SANITARY SEWER LINE/MANHOLES SHOWN (FROM PARCEL L11-4-12 ACROSS L11-4-11) ARE BASED ON CITY OF PITTSFIELD SEWER MAP #650 (DATED 1960) AND ELECTRONIC COPY OF SURVEY DRAWING GE-1110-CX101-M(REV 8-27-08) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS. THE LOCATIONS OF THE SEWER EASEMENT, LINES, AND SOME MANHOLES SHOULD BE CONSIDERED APPROXIMATE.
7. PER COMMENT #9 OF EPA'S DECEMBER 16, 2009 CONDITIONAL APPROVAL LETTER REGARDING THE UNKAMET BROOK AREA – REMAINDER CONCEPTUAL WORK PLAN, A PORTION OF PARCEL L11-4-12 HAS BEEN EXCLUDED FROM THE LIMITS OF THE UNKAMET BROOK AREA REMOVAL ACTION AREA.
8. ALL LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
9. NOT ALL PHYSICAL FEATURES SHOWN.

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State	Date Signed	Project Mgr. CRA
Designed by THL	Drawn by BKD	Checked by MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

SOUTH OF MERRILL ROAD - EXISTING SITE PLAN

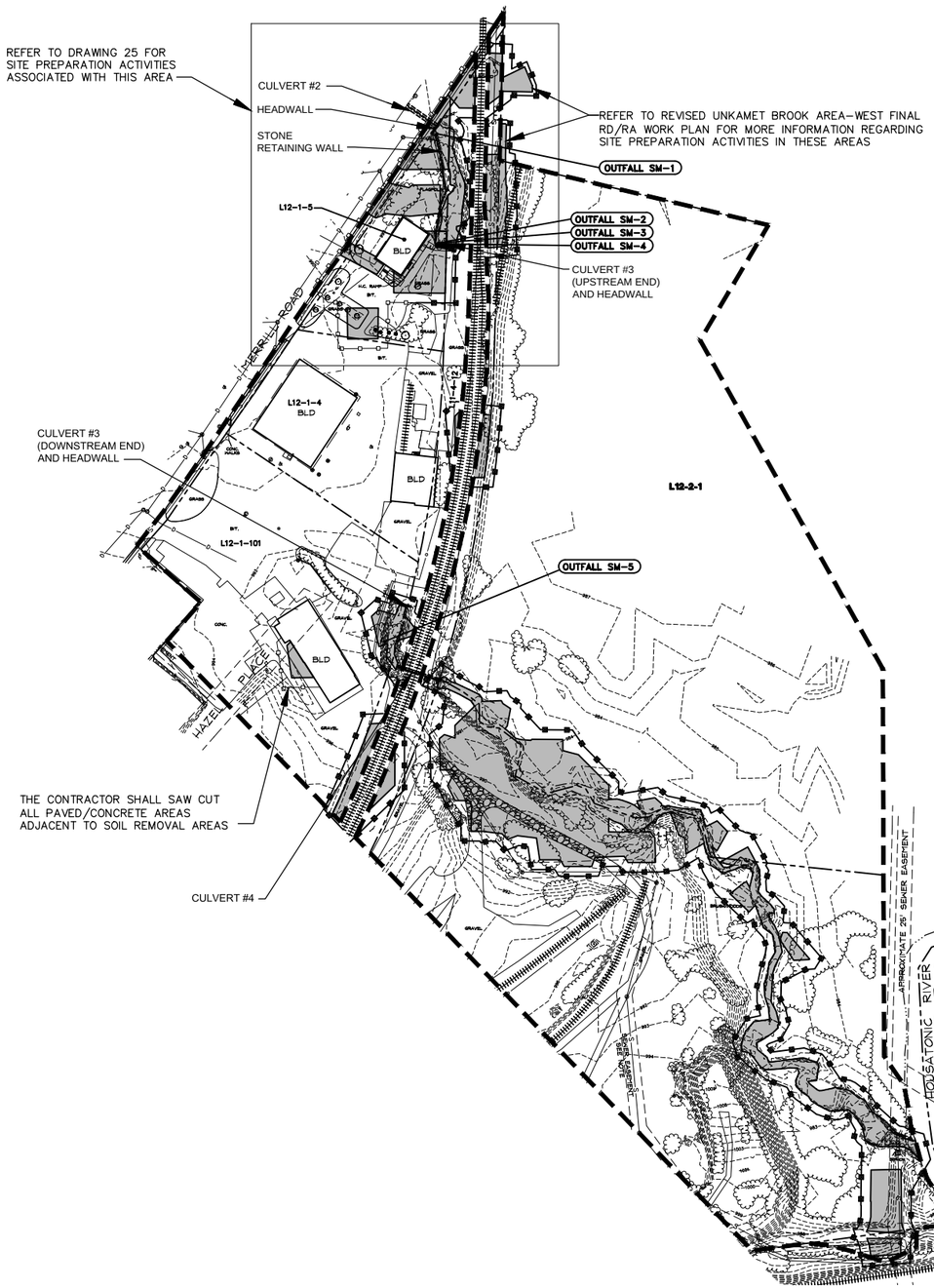
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LEGEND:

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- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR
- L12–2–1 PROPERTY IDENTIFICATION
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- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- HAY BALE (1/40)
- HAY BALE/SILT FENCE (2/40)
- LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION
- TEMPORARY ROAD COVER MATERIALS INSTALLED IN 2013 (SEE NOTE 13)

NOTES:

1. REFER TO DRAWINGS 20 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROLS TO THE LIMITS SHOWN PRIOR TO DISTURBING EXISTING SITE SOILS, PAVEMENT, AND/OR VEGETATION. THE DISTANCE OF HAY BALES/SILT FENCING FROM THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION IS EXAGGERATED ON THIS DRAWING FOR CLARITY PURPOSES. THE CONTRACTOR SHALL INSTALL HAY BALES/SILT FENCING WITHIN 3 TO 5 FEET OF THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION.
3. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
4. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL REMOVE AND REPLACE (WITH NEW), ALL SITE FEATURES LOCATED WITHIN THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION. BELOW GRADE PORTIONS OF SUCH FEATURES TO BE REUSED WILL BE SUBJECT TO CLEANING AS NECESSARY. ALL FEATURES DEEMED NON–REUSABLE BY GE/GE'S REPRESENTATIVE SHALL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE OFF–SITE FACILITY.
5. THE CONTRACTOR MAY REMOVE FOR DISPOSAL OTHER SITE FEATURES, VEGETATION, AND DEBRIS NOT SPECIFICALLY IDENTIFIED HEREON AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. HOWEVER, SUCH REMOVAL SHALL NOT BE PERFORMED WITHOUT THE APPROVAL OF GE/GE'S REPRESENTATIVE AND MUST BE REPLACED AT NO ADDITIONAL COST TO GE.
6. ABOVE–GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION THAT DO NOT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS WILL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE GE–APPROVED OFF–SITE DISPOSAL FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING CLEARED DEBRIS/VEGETATION AS REQUIRED BY THE DISPOSAL FACILITY. BELOW–GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION (AND PORTIONS THAT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS) WILL BE MANAGED AND DISPOSED OF ALONG WITH EXCAVATED SOILS.
7. THE CONTRACTOR SHALL PROTECT ALL STRUCTURES/FEATURES IN AREAS THAT WILL NOT BE SUBJECT TO THE REMEDIATION ACTIVITIES. IN PARTICULAR, THE CONTRACTOR SHALL PROTECT THE ADJACENT WETLANDS AND BROOK DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY IMPACTS TO THESE AREAS/ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
8. THE CONTRACTOR SHALL PROTECT ALL ABOVE–GROUND AND UNDERGROUND UTILITIES INCLUDING ASSOCIATED STRUCTURES/COMPONENTS (E.G., POLES, MANHOLES, CATCH BASINS, ETC.) NOT SUBJECT TO ABANDONMENT DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY UTILITIES OR ASSOCIATED STRUCTURES/COMPONENTS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
9. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION–RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER–RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS (WITH THE EXCEPTION OF CATCH BASINS ALONG MERRILL ROAD) AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
10. THE LOCATION OF TEMPORARY ACCESS ROADS AND/OR MATERIALS STAGING AREAS (NOT SHOWN) SHALL BE IDENTIFIED BY THE CONTRACTOR FOR REVIEW AND APPROVAL BY GE/GE'S REPRESENTATIVE PRIOR TO INSTALLATION.
11. THE CONTRACTOR SHALL COORDINATE WITH GE TO PROVIDE ADVANCE NOTIFICATION TO CSX TRANSPORTATION IN ACCORDANCE WITHIN THE REQUIREMENTS OF GE'S REMEDIATION ACCESS AGREEMENT WITH CSX WHEN PERFORMING REMEDIATION ACTIVITIES ADJACENT TO THE RAILROAD TRACKS. SUCH COORDINATION WILL INCLUDE SCHEDULING FLAGMEN FOR WORK ADJACENT TO RAIL LINES.
12. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN FOR EXCAVATIONS ALONG MERRILL ROAD FOR REVIEW AND APPROVAL BY GE/GE'S REPRESENTATIVE. THE CONTRACTOR, ALONG WITH GE/GE'S REPRESENTATIVE, SHALL BE RESPONSIBLE FOR COORDINATING WITH THE APPROPRIATE CITY OF PITTSFIELD PERSONNEL FOR IMPLEMENTING AND MAINTAINING THE TRAFFIC CONTROL PLAN PRIOR TO AND THROUGHOUT THE REMEDIATION ACTIVITIES PERFORMED ADJACENT TO MERRILL ROAD.
13. PRIOR TO INITIATION OF EXCAVATION ACTIVITIES, THE CONTRACTOR SHALL REMOVE THE GRAVEL ROADWAY MATERIALS ON PARCEL L11–4–11 AND STOCKPILE FOR SAMPLING AND POTENTIAL REUSE AS SUBSURFACE BACKFILL. IF MATERIALS ARE DEEMED UNSUITABLE FOR REUSE, THE CONTRACTOR SHALL APPROPRIATE DISPOSE OF THEM OFF–SITE ALONG WITH THE GEOTEXTILE AND UNDERLYING SOILS.
14. THE CONTRACTOR SHALL PROTECT THE EXISTING OUTFALLS AND MANAGE ANY ASSOCIATED FLOWS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES.

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1"=120' (120' 0 120' 240')

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Professional Engineer's No.:		
State: -	Date Signed:	Project Mgr.: CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

SOUTH OF MERRILL ROAD - SITE PREPARATION PLAN

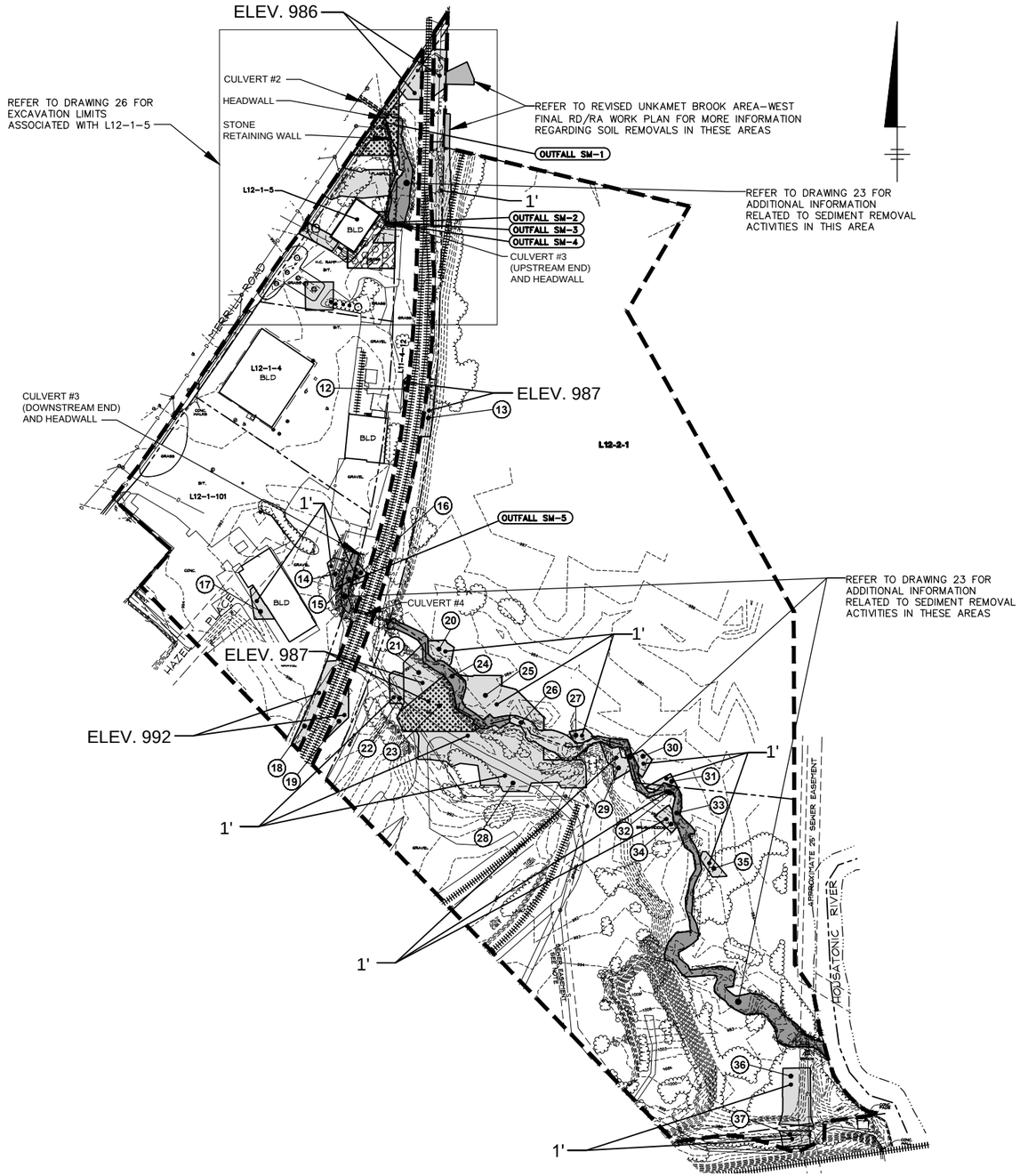
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21



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR
- L12-2-1 PROPERTY IDENTIFICATION
- BOLLARD
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- TELEPHONE MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- SANITARY SEWER
- STORM DRAIN
- GAS SERVICE
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- LIMITS OF NON-TSCA REMOVAL
- LIMITS OF TSCA REMOVAL
- DENOTES NON-TSCA EXCAVATION 0-3 FOOT. REMAINING EXCAVATION (I.E. > 3 FOOT) IS TSCA TO BOTTOM OF EXCAVATION
- TSCA/RCRA SOILS (> 1' ON PARCEL L11-4-11, > 3' ON PARCEL L12-1-5)
- LIMITS OF SUBGRADE PREPARATION FOR ENGINEERED BARRIER
- 1' DEPTH OF EXCAVATION
- ELEV. 987 BOTTOM ELEVATION OF EXCAVATION
- (22) EXCAVATION CELL ID

NOTES:

1. REFER TO DRAWINGS 20, 21, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
3. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF UTILITIES WITHIN/ADJACENT TO EXCAVATION AREAS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. ANY DAMAGE TO ANY UTILITY SHALL BE REPLACED/REPAIRED AT NO ADDITIONAL COST TO GE.
4. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER-RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS (WITH THE EXCEPTION OF CATCH BASINS ALONG MERRILL ROAD) AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
5. AS INDICATED BY NOTES 4 THROUGH 8 ON DRAWING 23, THE CONTRACTOR SHALL INSTALL WATER DIVERSION AND EXCAVATION BYPASS PUMPING CONTROLS (AS NEEDED) PRIOR TO THE EXCAVATION OF SOILS/SEDIMENTS.
6. THE CONTRACTOR SHALL PROTECT ALL VEGETATION AND STRUCTURES NOT CLEARED DURING SITE PREPARATION ACTIVITIES. ANY DAMAGE TO THESE ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
7. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED EXCAVATION DEPTHS/ELEVATIONS PRIOR TO INITIATING BACKFILLING ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL WORK RD/RA PLAN.
8. REMOVAL DEPTHS DESIGNATED AS 1' WILL BE SUBJECT TO EXCAVATION TO A DEPTH OF 1 FOOT BELOW EXISTING GROUND SURFACE. FOR REMOVAL DEPTHS GREATER THAN 1 FOOT, EXCAVATIONS SHALL EXTEND TO THE SPECIFIED ELEVATION; HOWEVER, A MINIMUM OF 1' OF SOIL REMOVAL SHALL BE PERFORMED FOR EXCAVATIONS THAT DAYLIGHT ALONG AN EMBANKMENT PRIOR TO ACHIEVING THE HORIZONTAL LIMITS OF REMOVAL ILLUSTRATED ON THIS DRAWING.
9. CERTAIN EXCAVATIONS WILL REQUIRE THE USE OF EXCAVATION SUPPORTS. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF APPROPRIATE EXCAVATION SUPPORTS IN ACCORDANCE WITH APPLICABLE OSHA REGULATIONS. SUCH A DESIGN SHALL CONSIDER THE REQUIRED DEPTH OF EXCAVATION, NATURE AND CONDITION OF THE STRUCTURES REQUIRING SUPPORT, AND THE POSSIBILITY THAT CONTRACTOR PERSONNEL MAY BE REQUIRED TO ENTER THE EXCAVATIONS IN ORDER TO PROVIDE SURVEY DOCUMENTATION OF THE ACHIEVEMENT OF THE LIMITS OF REMOVAL. THE CONTRACTOR SHALL PROVIDE ONE OR MORE SUPPORT OF EXCAVATION DESIGNS STAMPED AND SIGNED BY A LICENSED MASSACHUSETTS P.E. TO GE FOR REVIEW AND APPROVAL.
10. PER 520 CMR 14.00, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING AT LEAST 6 FEET IN HEIGHT WITH OPENINGS OF 4 INCHES OR LESS BETWEEN SUPPORTS AROUND UNATTENDED OPEN EXCAVATIONS GREATER THAN OR EQUAL TO 3 FEET IN DEPTH WITH 15 FEET OR LESS BETWEEN OPPOSING WALLS.
11. THE CONTRACTOR SHALL PERFORM THE DEEPER EXCAVATIONS ADJACENT TO MERRILL ROAD AND THE BUILDING/CULVERT HEADWALL PRIOR TO THE PERFORMANCE OF THE REMEDIATION ACTIVITIES ELSEWHERE ON PARCEL L12-1-5. THE CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE LIMITS OF SOIL REMOVAL FOR THOSE EXCAVATIONS FOR APPROVAL BY GE/GE'S REPRESENTATIVE AND EPA PRIOR TO PERFORMING REMEDIATION ACTIVITIES ELSEWHERE ON PARCEL L12-1-5. ADDITIONAL REMEDIATION ACTIVITIES MAY BE REQUIRED ELSEWHERE ON THIS PROPERTY, DEPENDING ON WHETHER THE LIMITS OF HORIZONTAL AND VERTICAL LIMITS OF SOIL REMOVAL ARE SUCCESSFULLY ACHIEVED FOR THE SUBJECT EXCAVATIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING ALL REMOVED MATERIALS AS REQUIRED BY THE DISPOSAL FACILITY. UNLESS OTHERWISE NOTED, NON-SOIL MATERIALS WILL BE MANAGED AND DISPOSED OF ALONG WITH ADJACENT/UNDERLYING EXCAVATED SOILS.
13. THE CONTRACTOR SHALL APPROPRIATELY DEWATER/STABILIZE SOILS AND SEDIMENTS TO MAKE SUITABLE FOR TRANSPORT (I.E., MATERIALS SUBJECT TO TRANSPORT SHALL PASS A PAINT FILTER TEST). EXCAVATED MATERIALS REQUIRING DEWATERING SHALL BE DEWATERED OVER THE ACTIVE EXCAVATION AREAS AND/OR TRANSPORTED TO A DEWATERING STOCKPILE CONSTRUCTED IN THE PARKING LOT OVER THE FORMER INTERIOR LANDFILL (FOLLOWING THE SITE PREPARATION ACTIVITIES DESCRIBED ON DRAWING 10) OR AT AN ALTERNATE LOCATION ON GE PROPERTY. UPON PASSING THE PAINT FILTER TEST THE CONTRACTOR MAY STABILIZE EXCAVATED MATERIAL BY GRAVITY DEWATERING, MIXING WITH DRIER EXCAVATED MATERIALS OF A SIMILAR WASTE CHARACTERIZATION (WITH APPROVAL BY GE), OR DRYING AGENTS (SUBJECT TO THE REQUIREMENTS OF SECTION 7.5.4 OF THE REVISED FINAL RD/RA WORK PLAN).
14. LIQUIDS GENERATED DURING REMEDIATION ACTIVITIES (E.G., EXCAVATION DEWATERING, EQUIPMENT DECONTAMINATION, ETC.) SHALL BE TRANSPORTED BY THE CONTRACTOR TO GE'S BUILDING 64G WATER TREATMENT FACILITY (SUBJECT TO REVIEW AND APPROVAL BY GE) FOR TREATMENT AND DISCHARGE BY GE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONARY MEASURES TO LIMIT THE GENERATION AND COLLECTION OF WATER THAT WILL REQUIRE TREATMENT.
15. THE CONTRACTOR SHALL MANAGE ALL EXCAVATED MATERIALS ACCORDING TO THE NON-TSCA, TSCA AND/OR RCRA DESIGNATIONS SPECIFIED ON THIS DRAWING. THE CONTRACTOR SHALL COORDINATE WITH GE/GE'S REPRESENTATIVE FOR THE TRANSPORTATION OF EXCAVATED MATERIALS TO THE APPROPRIATE OFF-SITE DISPOSAL FACILITY (BY OTHERS).

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120' 0 120' 240'
1"=120'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

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Professional Engineer's Name		
*		
Professional Engineer's No.		
State	Date Signed	Project Mgr. CRA
Designed by THL	Drawn by BKD	Checked by MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

SOUTH OF MERRILL ROAD - EXCAVATION LIMITS

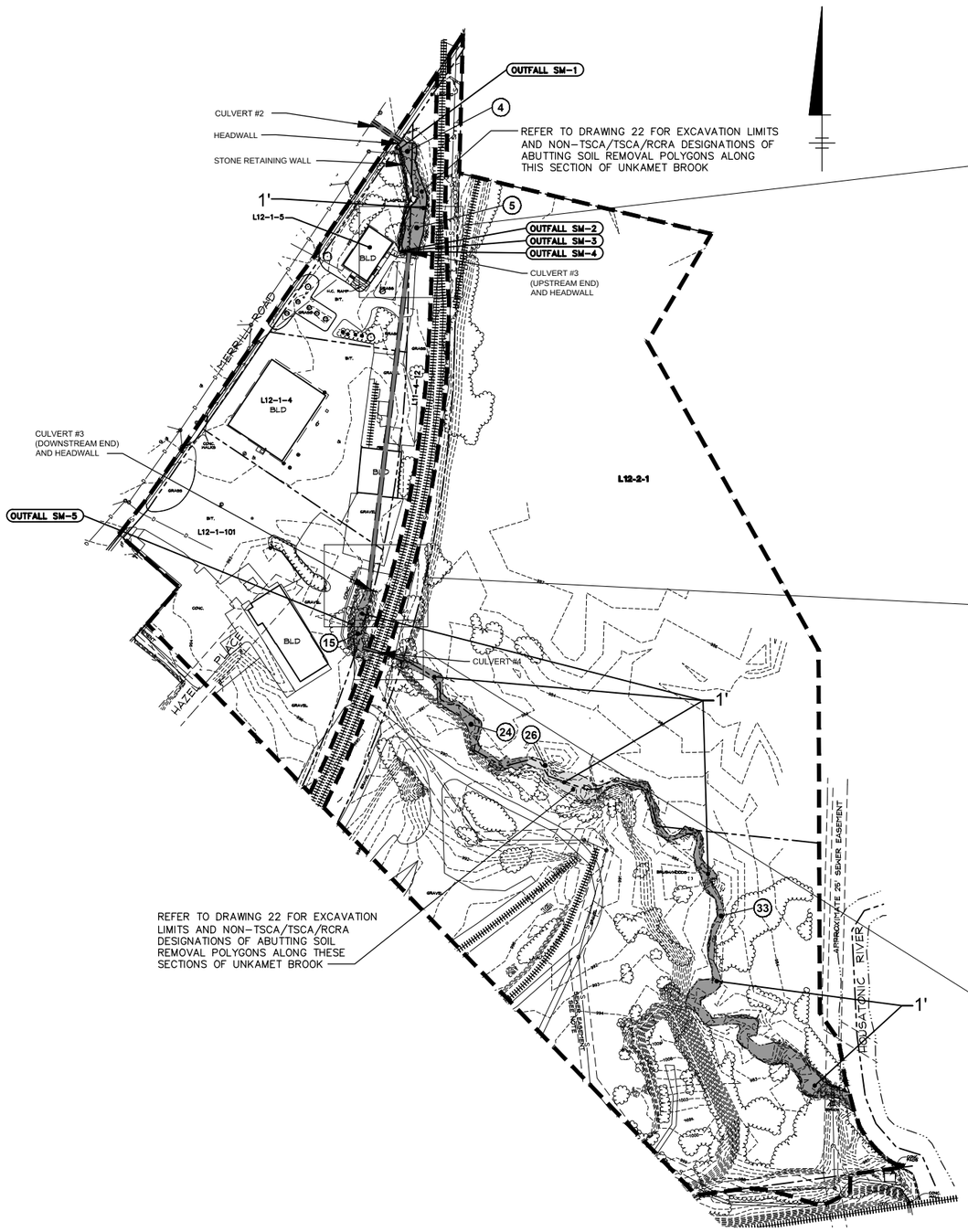
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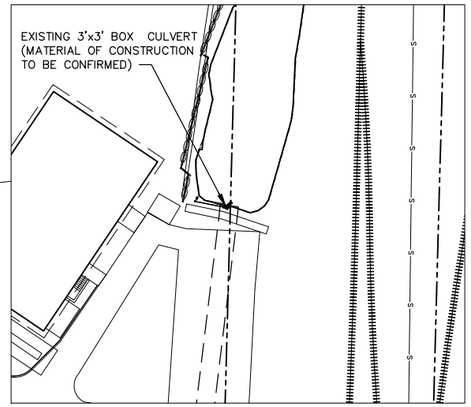
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Date APRIL 2014

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22

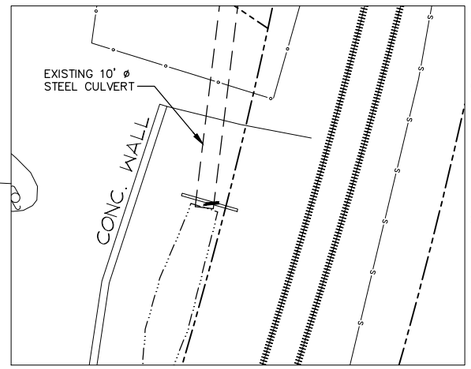




CULVERT NO. 3 LAYOUT

0 30' 60'

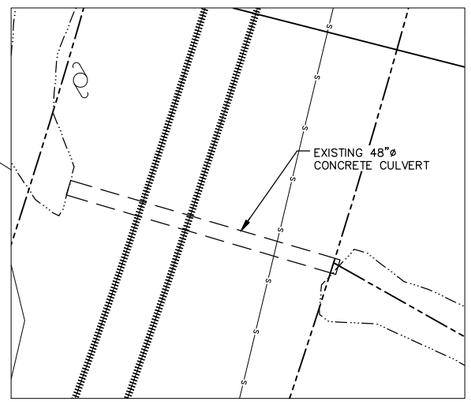
SCALE: 1"=30'



CULVERT NO. 3 LAYOUT

0 30' 60'

SCALE: 1"=30'



CULVERT NO. 4 LAYOUT

0 20' 40'

SCALE: 1"=20'

LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR
- L12-2-1 PROPERTY IDENTIFICATION
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EDGE OF WATER
- LIMITS OF NON-TSCA REMOVAL
- LIMITS OF TSCA REMOVAL
- 1' DEPTH OF EXCAVATION
- APPROXIMATE EXISTING UNKAMET BROOK CULVERT
- EXISTING UNKAMET BROOK CULVERT SUBJECT TO CLEANING OF INTERIOR SURFACES
- 009 APPROXIMATE EXISTING OUTFALL LOCATION
- 22 EXCAVATION CELL ID

NOTES:

1. REFER TO DRAWINGS 20 THROUGH 22 AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED EXCAVATION DEPTHS/ELEVATIONS PRIOR TO INITIATING BACKFILLING ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL WORK RD/RA PLAN.
3. ALL SEDIMENT REMOVAL/CULVERT CLEANING ACTIVITIES ARE TO PROCEED IN AN UPSTREAM TO DOWNSTREAM DIRECTION TO AVOID IMPACTING PREVIOUSLY REMEDIATED/CLEANED AREAS. IN ADDITION, EXCAVATION OF AREAS SUBJECT TO REMEDIATION THAT ABUT THE BROOK CHANNEL MUST BE COMPLETED PRIOR TO RESTORATION OF THE BROOK CHANNEL.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION OF A WATER DIVERSION/RE-ROUTING SYSTEM TO FACILITATE SEDIMENT REMOVAL "IN THE DRY". IN CERTAIN INSTANCES, WITH GE APPROVAL, SEDIMENT REMOVAL MAY BE PERFORMED THROUGH THE WATER COLUMN BASED ON FIELD CONDITIONS.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION OF A WATER DIVERSION/BYPASS PUMPING SYSTEM TO FACILITATE SEDIMENT REMOVAL "IN THE DRY". IN CERTAIN INSTANCES, WITH GE APPROVAL, SEDIMENT REMOVAL MAY BE PERFORMED THROUGH THE WATER COLUMN BASED ON FIELD CONDITIONS. BYPASS PUMPING AT CULVERT #2 WILL BE COMPLETED BY EITHER: 1) ROUTING BYPASS PIPES THROUGH ONE OF THE EXISTING CULVERT PIPES OR, 2) INSTALLATION OF A TEMPORARY WATER FLOW BARRIER ALLOWING WATER TO TEMPORARILY ACCUMULATE IN THE UPSTREAM WETLAND. CULVERT CLEANING SHOULD BE SCHEDULED DURING A PERIOD OF LOW FLOW, TO THE EXTENT POSSIBLE. ALSO, THE WATER DIVERSION STRUCTURE/FLOW BARRIERS SHOULD BE INSTALLED JUST PRIOR TO CULVERT CLEANING AND MUST BE CONSTRUCTED TO ALLOW WATER TO ACCUMULATE IN THE UPSTREAM WETLAND AREAS. WATER DIVERSION STRUCTURES/FLOW BARRIERS SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF CULVERT CLEANING ACTIVITIES.
6. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE DESIGN DETAILS RELATED TO THE BROOK DIVERSION/RE-ROUTING STRUCTURES AND BYPASS PUMPING ASSOCIATED WITH THE DIVERSION/RE-ROUTING SYSTEM. THE CONTRACTOR WILL PROVIDE (FOR GE AND EPA APPROVAL) DETAILED DESIGN SPECIFICATIONS SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS. THE CONTRACTOR IS REQUIRED TO OPERATE THE BYPASS PUMPING SYSTEM 24 HOURS A DAY, 7 DAYS A WEEK FOR THE DURATION OF THE SEDIMENT REMOVAL/CULVERT CLEANING ACTIVITIES. THE CONTRACTOR WILL SELECT APPROPRIATE PUMP SIZES, CAPACITIES, AND/OR ASSOCIATED CONVEYANCE PIPES TO ACCOMMODATE ANTICIPATED BROOK FLOW ASSOCIATED WITH THE ESTIMATED 2-YEAR STORM EVENT (APPROXIMATELY 57 CFS). THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MANAGING STORM WATER FLOWS FROM ADJACENT CITY STREETS THAT ENTER UNKAMET BROOK (E.G., THE OUTFALLS THAT DISCHARGE STORMWATER INTO UNKAMET BROOK BETWEEN CULVERTS #2 AND #3 AND CULVERTS #3 AND #4. THE CONTRACTOR SHALL DESIGN AND INSTALL APPROPRIATE PROTECTION MEASURES FOR THE OUTLET(S) OF THE BYPASS CONVEYANCE PIPING TO PREVENT THE CONVEYED WATERS FROM CAUSING EROSION/SCOUR AT THE DOWNSTREAM DISCHARGE POINT.
7. FOLLOWING CONSTRUCTION OF THE WATER FLOW BARRIERS AND BYPASS CONVEYANCE SYSTEM AND PRIOR TO COMMENCING SEDIMENT REMOVAL ACTIVITIES, ANY SURFACE WATER INITIALLY TRAPPED BETWEEN THE BARRIERS WILL BE PUMPED OVER THE DOWNSTREAM WATER FLOW BARRIER BY A PUMP SUSPENDED A MINIMUM OF SIX INCHES ABOVE THE BROOK BOTTOM (I.E. UNTIL THE TOTAL WATER DEPTH IS SIX INCHES). THE CONTRACTOR SHALL COLLECT THE REMAINING WATERS AND COORDINATE WITH GE FOR TRANSPORTATION TO THE BUILDING 64G WTF FOR TREATMENT AND DISCHARGE. WATER THAT ACCUMULATES IN PORTIONS OF THE CHANNEL THAT HAVE BEEN RESTORED OR HAVE YET TO BE EXCAVATED MAY BE PUMPED OVER THE DOWNSTREAM WATER FLOW BARRIER ON AN EVENT-SPECIFIC BASIS.
8. THE CONTRACTOR SHALL INSTALL A FLOATING SILT CURTAIN DOWNSTREAM OF THE SEDIMENT REMOVAL/CULVERT CLEANING AREAS PER DETAIL 1 ON DRAWING 30. SILT CURTAIN TO BE RELOCATED, AS NECESSARY, AS SEDIMENT REMOVAL PROGRESSES IN A DOWNSTREAM DIRECTION. THE CONTRACTOR SHALL ALSO ENSURE THAT TWO OTHER FLOATING SILT CURTAINS ARE INSTALLED JUST UPSTREAM OF THE CONFLUENCE OF UNKAMET BROOK WITH THE HOUSATONIC RIVER PRIOR TO THE INITIATION OF SEDIMENT REMOVAL.
9. ALL IN-STREAM EXCAVATION AREAS MUST BE BACKFILLED AND/OR TEMPORARILY PROTECTED AT THE END OF EACH DAY IF SIGNIFICANT PRECIPITATION IS ANTICIPATED OR FORECASTED. DAILY ACTIVITIES SHALL BE LIMITED TO THE MAXIMUM VOLUME THAT CAN BE REMOVED AND BACKFILLED WITHIN THE DAY UNLESS EXPRESS PERMISSION HAS BEEN GRANTED BY GE.
10. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST FOR PRECIPITATION EVENTS. IN THE EVENT OF PRECIPITATION GREATER THAN A 2-YEAR STORM EVENT AND/OR OVERTOPPING OF THE WATER DIVERSION STRUCTURE, ALL IN-STREAM ACTIVITIES MUST BE IMMEDIATELY HALTED, ALL ASSOCIATED MACHINERY REMOVED FROM THE CHANNEL, AND A LAYER OF GEOTEXTILE PLACED (AND SECURED) OVER ANY AREAS WHERE REMEDIATION IS IN PROGRESS AND/OR HAS NOT BEEN COMPLETED.
11. GE WILL PERFORM CONTINUOUS TURBIDITY MONITORING AT LOCATIONS UP- AND DOWNSTREAM OF THE WORK AREA. DAILY ACTIVITIES WILL BE COORDINATED WITH GE AND WILL BE CONTINGENT UPON MAINTENANCE OF TURBIDITY LEVELS BELOW CERTAIN ACTION LEVELS. IF EXCEEDANCES ARE RECORDED, THE CONTRACTOR WILL STOP WORK AND DISCUSS WITH GE TO DETERMINE THE NEED, IF ANY, FOR MODIFICATIONS TO THE REMEDIATION APPROACH.
12. ACCUMULATED SEDIMENT AND DEBRIS WITHIN THE CULVERTS SUBJECT TO CLEANING WILL BE REMOVED. SHOULD THE CONTRACTOR DETERMINE THAT PERSONNEL ARE REQUIRED TO ENTER THE CULVERTS TO PERFORM THE SEDIMENT REMOVAL ACTIVITIES, SUCH WORK SHALL BE PERFORMED AS CONFINED SPACE ENTRY AND ALL APPLICABLE PERSONNEL SHALL HAVE THE APPROPRIATE OSHA CERTIFICATIONS.
13. FOLLOWING CULVERT CLEANING ACTIVITIES, THE CONTRACTOR WILL CONDUCT VIDEO INSPECTIONS OF EACH CULVERT PIPE. THIS INSPECTION SHALL INCLUDE CONTINUOUS COLOR VHS VIDEOTAPE/DVD AND LOGGING OVER THE PIPE INTERIOR'S ENTIRE LENGTH. PIPES SHALL BE INSPECTED IN THE DIRECTION OF FLOWS. THE INSPECTION SHALL BE MADE IN THE PRESENCE OF GE/GE'S REPRESENTATIVE AND A VIDEOTAPE/DVD SUBMITTED TO GE/GE'S REPRESENTATIVE. THE COLOR VIDEOTAPE/DVD SHALL BE PROPERLY IDENTIFIED, NARRATED AS NECESSARY AND ACCOMPANIED BY A WRITTEN RECORD OF EACH TELEVISED RUN.
14. THE CONTRACTOR SHALL PERFORM ADDITIONAL SOIL/SEDIMENT REMOVAL AS NECESSARY TO INSTALL RIPRAP APRON FOR EROSION/SCOUR PROTECTION AT ALL IDENTIFIED CULVERTS/OUTFALLS (SEE DRAWING 30).

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Professional Engineer's Name
-
Professional Engineer's No.
-

State	Date Signed	Project Mgr.
		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

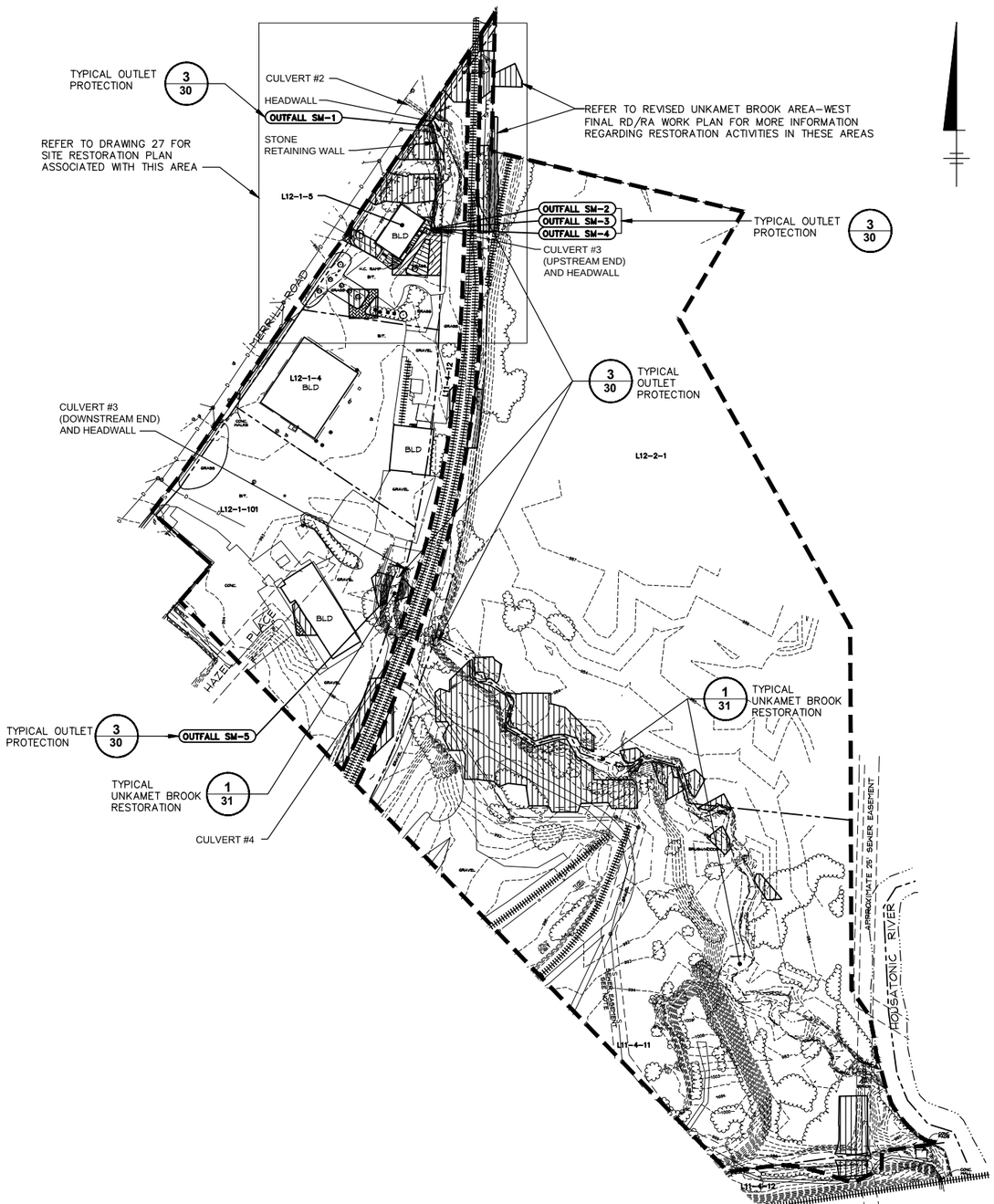
SOUTH OF MERRILL ROAD - SEDIMENT REMOVAL AND CULVERT CLEANING

TECHNICAL DRAWINGS

ARCADIS Project No.
B0040190.0002.00006

Date
APRIL 2014

ARCADIS
6723 TOWPATH ROAD
PO BOX 66
SYRACUSE, NY 13214
TEL. 315.446.9120



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- EXISTING CONTOUR
- L12-2-1 PROPERTY IDENTIFICATION
- DECIDUOUS TREE
- CONIFEROUS TREE
- BOLLARD
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- CATCH BASIN – ROUND
- DRAIN MANHOLE
- SANITARY MANHOLE
- TELEPHONE MANHOLE
- MANHOLE (TYPE UNKNOWN)
- WATER SHUT-OFF/GATE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- GUARDRAIL
- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- EDGE OF WATER
- VEGETATIVE ENGINEERED BARRIER (4/34)
- ASPHALT-COVERED ENGINEERED BARRIER (1/34)
- LIMITS OF VEGETATIVE RESTORATION (SEE NOTE 3) (5/40)
- LIMITS OF ASPHALT PAVEMENT RESTORATION (4/40)
- LIMITS OF EROSION CONTROL MATTING

NOTES:

1. REFER TO DRAWINGS 20, 21, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL NOT INITIATE RESTORATION ACTIVITIES UNTIL THE LIMITS OF EXCAVATION AND/OR SUBGRADE PREPARATION HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVES. FOLLOWING SURVEY DOCUMENTATION OF THE COMPLETION OF THE EXCAVATION ACTIVITIES, THOSE AREAS WILL BE RESTORED TO PRE-CONSTRUCTION GRADES, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOT INITIATE PLANTING OR SEEDING ACTIVITIES UNTIL THE POST-RESTORATION GRADES HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVE. ANY DEVIATIONS FROM THE SPECIFIED RESTORATION GRADES THAT ARE UNACCEPTABLE TO GE/GE'S REPRESENTATIVE MAY REQUIRE REWORK/REPAIR BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
3. ALL 1-FOOT SOIL EXCAVATION AREAS SUBJECT TO VEGETATIVE RESTORATION SHALL BE RESTORED WITH 12-INCHES OF CLEAN TOPSOIL MATERIAL ONLY. ALL DEEPER EXCAVATION AREAS WILL BE RESTORED TO WITHIN 6 INCHES OF FINAL GRADE AND FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL AND APPLICATION OF A SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. THE CONTRACTOR SHALL RESTORE THE REMEDIATED BROOK CHANNEL IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 1 ON TECHNICAL DRAWING 31 AND THE APPLICABLE TECHNICAL SPECIFICATIONS. THE RESTORATION ACTIVITIES FOR THE BROOK CHANNEL REQUIRE PLACEMENT OF SILTY-SAND (ALSO USED TO RESTORE THE BOTTOM 6 INCHES OF THE BROOK CHANNEL) WITHIN THE VOIDS OF THE TYPE I RIPRAP IN THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS ONLY IN THOSE SECTIONS OF THE BROOK THAT HAVE A FLAT CHANNEL BOTTOM.
5. THE CONTRACTOR SHALL RESTORE ALL TREES/SHRUBS REMOVED DURING SITE PREPARATION AND/OR THE SOIL/SEDIMENT REMOVAL ACTIVITIES IN ACCORDANCE WITH A TREE/SHRUB INVENTORY (TO BE PERFORMED BY OTHERS), THE TREE/SHRUB PLANTING PLAN (TO BE PERFORMED BY OTHERS), AND/OR AT LOCATIONS DESIGNATED BY GE.
6. THE CONTRACTOR SHALL PLACE BIODEGRADEABLE EROSION CONTROL MATTING AND STAKES ALONG DRAINAGE PATHWAYS WITH STEEP (4H:1V OR GREATER) EMBANKMENTS.
7. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS (E.G., HAYBALES/SILT FENCE AND FLOATING SILT CURTAINS SEE DRAWING 21) UPON REQUEST BY GE/GE'S REPRESENTATIVE, ONCE THE RESTORED VEGETATION IS ESTABLISHED.

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Professional Engineer's Name: -
Professional Engineer's No.:

State	Date Signed	Project Mgr.
-		CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

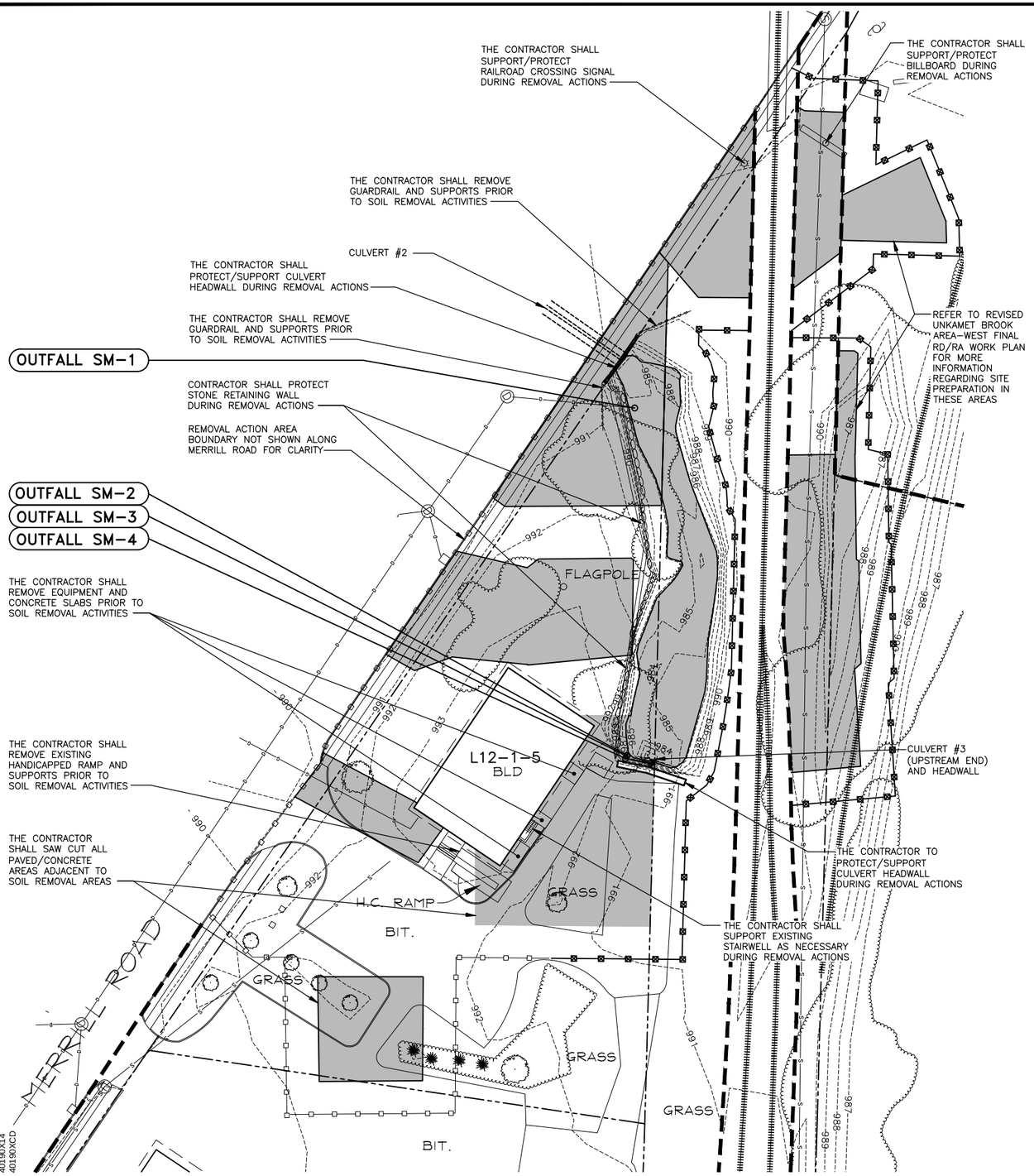
SOUTH OF MERRILL ROAD - SITE RESTORATION PLAN

TECHNICAL DRAWINGS

ARCADIS Project No. B0040190.0002.00006

Date APRIL 2014

ARCADIS
6723 TOWPATH ROAD
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SYRACUSE, NY 13214
TEL. 315.446.9120



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- L12-1-5 PROPERTY IDENTIFICATION
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- SANITARY MANHOLE
- MANHOLE (TYPE UNKNOWN)
- RAILROAD TRACKS
- GUARDRAIL
- SANITARY SEWER
- STORM DRAIN
- GAS SERVICE
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- HAY BALE (1/40)
- HAY BALE/SILT FENCE (2/40)
- LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION

NOTES:

1. REFER TO DRAWINGS 20, 21, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROLS TO THE LIMITS SHOWN PRIOR TO DISTURBING EXISTING SITE SOILS, PAVEMENT, AND/OR VEGETATION. THE DISTANCE OF HAY BALES/SILT FENCING FROM THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION IS EXAGGERATED ON THIS DRAWING FOR CLARITY PURPOSES. THE CONTRACTOR SHALL INSTALL HAY BALES/SILT FENCING WITHIN 3 TO 5 FEET OF THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION.
3. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
4. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL REMOVE AND REPLACE (WITH NEW), ALL SITE FEATURES LOCATED WITHIN THE LIMITS OF SOIL/SEDIMENT REMOVAL/SUBGRADE PREPARATION. BELOW GRADE PORTIONS OF SUCH FEATURES TO BE REUSED WILL BE SUBJECT TO DECONTAMINATION AS NECESSARY. ALL FEATURES DEEMED NON-REUSABLE BY GE/GE'S REPRESENTATIVE SHALL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE OFF-SITE FACILITY.
5. THE CONTRACTOR MAY REMOVE FOR DISPOSAL OTHER SITE FEATURES, VEGETATION, AND DEBRIS NOT SPECIFICALLY IDENTIFIED HEREON AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. HOWEVER, SUCH REMOVAL SHALL NOT BE PERFORMED WITHOUT THE APPROVAL OF GE/GE'S REPRESENTATIVE AND MUST BE REPLACED AT NO ADDITIONAL COST TO GE.
6. ABOVE-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION THAT DO NOT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS WILL BE SUBJECT TO DISPOSAL AT AN APPROPRIATE GE-APPROVED OFF-SITE DISPOSAL FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING CLEARED DEBRIS/VEGETATION AS REQUIRED BY THE DISPOSAL FACILITY. BELOW-GRADE PORTIONS OF CLEARED DEBRIS/VEGETATION (AND PORTIONS THAT COME INTO CONTACT WITH SITE SOILS/SEDIMENTS) WILL BE MANAGED AND DISPOSED OF ALONG WITH EXCAVATED SOILS.
7. THE CONTRACTOR SHALL PROTECT ALL FEATURES IN AREAS THAT WILL NOT BE SUBJECT TO THE REMEDIATION ACTIVITIES. IN PARTICULAR, THE CONTRACTOR SHALL PROTECT THE ADJACENT BROOK DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY IMPACTS TO THESE AREAS/ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
8. THE CONTRACTOR SHALL PROTECT ALL ABOVE-GROUND AND UNDERGROUND UTILITIES INCLUDING ASSOCIATED STRUCTURES/COMPONENTS (E.G., POLES, MANHOLES, CATCH BASINS, ETC.) DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY UTILITIES OR ASSOCIATED STRUCTURES/COMPONENTS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
9. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER-RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS (WITH THE EXCEPTION OF CATCH BASINS ALONG MERRILL ROAD) AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
10. THE CONTRACTOR SHALL COORDINATE WITH GE TO AND PROVIDE ADVANCE NOTIFICATION TO CSX TRANSPORTATION IN ACCORDANCE WITHIN THE REQUIREMENTS OF GE'S REMEDIATION ACCESS AGREEMENT WITH CSX WHEN PERFORMING REMEDIATION ACTIVITIES ADJACENT TO THE RAILROAD TRACKS. SUCH COORDINATION WILL INCLUDE SCHEDULING FLAGMEN FOR WORK ADJACENT TO RAIL LINES.
11. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN FOR EXCAVATIONS ALONG MERRILL ROAD FOR REVIEW AND APPROVAL BY GE/GE'S REPRESENTATIVE. THE CONTRACTOR, ALONG WITH GE/GE'S REPRESENTATIVE, SHALL BE RESPONSIBLE FOR COORDINATING WITH THE APPROPRIATE CITY OF PITTSFIELD PERSONNEL FOR IMPLEMENTING AND MAINTAINING THE TRAFFIC CONTROL PLAN PRIOR TO AND THROUGHOUT THE REMEDIATION ACTIVITIES PERFORMED ADJACENT TO MERRILL ROAD.
12. THE CONTRACTOR SHALL PROTECT THE EXISTING OUTFALLS AND MANAGE ANY ASSOCIATED FLOWS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES.
13. THE CONTRACTOR SHALL PERFORM A VIDEO INSPECTION OF THE STRUCTURE ON PARCEL L12-1-5 IN CONJUNCTION WITH GE TO DOCUMENT THE CONDITION OF THE STRUCTURE PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES. DEPENDING ON THE RESULTS OF THAT INSPECTION, GE MAY REQUIRE VIBRATION MONITORING DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. A SECOND INSPECTION SHALL BE PERFORMED UPON COMPLETION OF THE REMEDIATION ACTIVITIES TO DOCUMENT THAT THE REMEDIATION ACTIVITIES DID NOT HAVE AN IMPACT THE STRUCTURE. ANY DAMAGE TO THE BUILDING CAUSED BY THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED AT NO ADDITIONAL COST TO GE.

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ, K.SARTORI PM: C.AVERILL TM: M.DALEY
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Professional Engineer's Name: -		
Professional Engineer's No.: -		
State: -	Date Signed:	Project Mgr.: CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - SITE PREPARATION PLAN

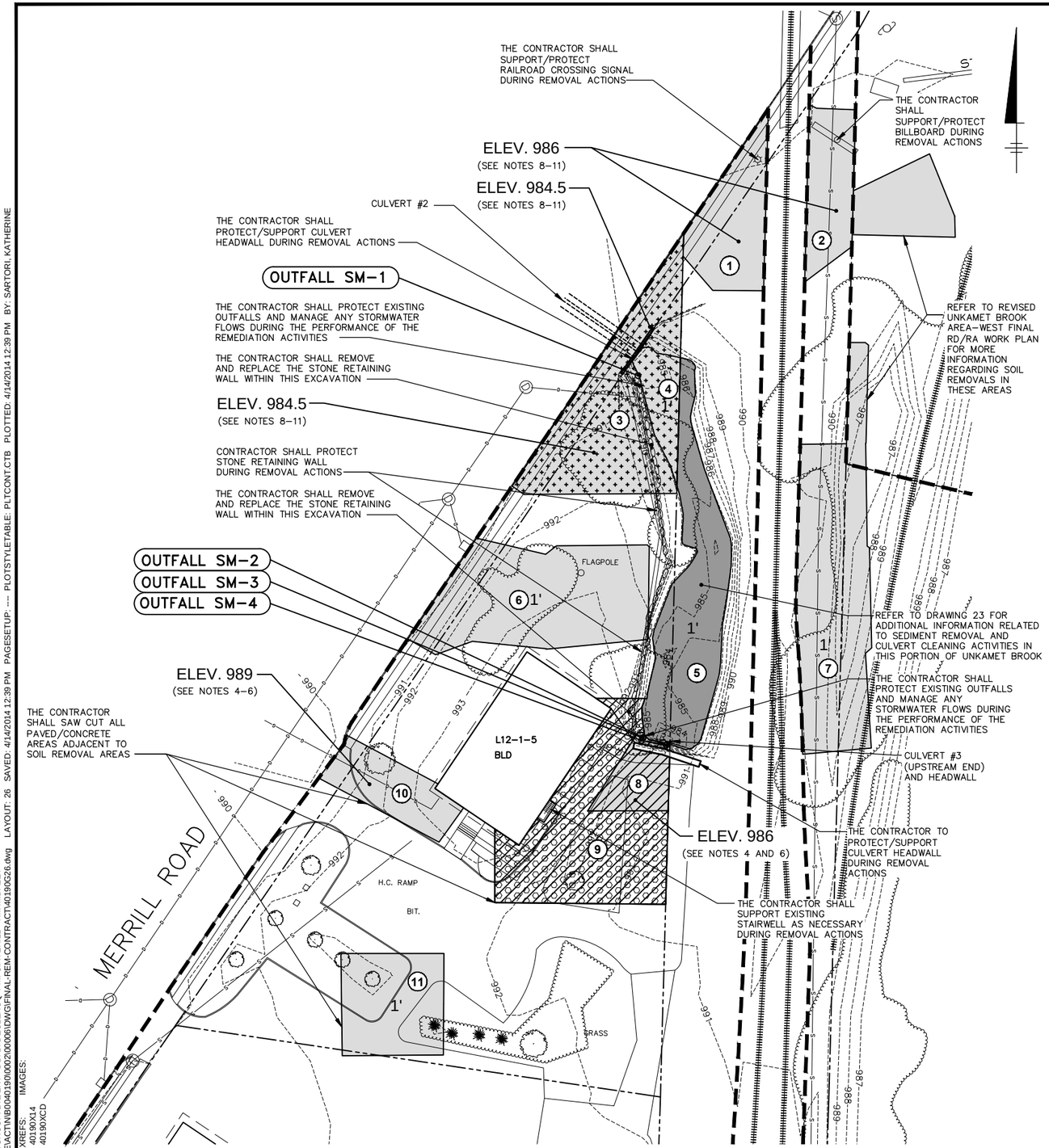
TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006

Date: APRIL 2014

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6723 TOWPATH ROAD
PO BOX 66
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TEL. 315.446.9120

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LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- L12–1–5 PROPERTY IDENTIFICATION
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- GUARDRAIL
- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- CONIFEROUS TREE
- LIMITS OF SUBGRADE PREPARATION FOR ENGINEERED BARRIER
- TSCA/RDRA SOILS > 3'
- DENOTES NON–TSCA EXCAVATION 0–3 FOOT. REMAINING EXCAVATION (I.E. > 3 FOOT) IS TSCA TO BOTTOM OF EXCAVATION
- LIMITS OF NON–TSCA REMOVAL
- LIMITS OF TSCA REMOVAL
- 1' DEPTH OF EXCAVATION
- ELEV. 984.5 BOTTOM ELEVATION OF EXCAVATION
- (22) EXCAVATION CELL ID

NOTES:

1. REFER TO DRAWINGS 20, 21, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL CLEARLY MARK, MAINTAIN, AND PROTECT ALL EXISTING MONITORING WELLS DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES. ANY WELLS DAMAGED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE. REFER TO GMA 3 MONITORING WELL DECOMMISSIONING METHODS PROPOSAL FOR WELLS SUBJECT TO DECOMMISSIONING. ALL MONITORING WELLS WILL BE INSPECTED BY GE/GE'S REPRESENTATIVE PRIOR TO AND FOLLOWING THE REMEDIATION ACTIVITIES. ANY WELLS SUBJECT TO DECOMMISSIONING DURING REMEDIATION SHALL BE DECOMMISSIONED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN APPENDIX GG OF THE FSP/QAPP.
3. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF UTILITIES WITHIN/ADJACENT TO EXCAVATION AREAS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. ANY DAMAGE TO ANY UTILITY SHALL BE REPLACED/REPAIRED AT THE CONTRACTORS EXPENSE.
4. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT THE MIGRATION OF CONSTRUCTION–RELATED SOILS, SEDIMENTS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, OR ANY OTHER POLLUTANT BEYOND THE WORK AREA. IN PARTICULAR, THE CONTRACTOR SHALL PREVENT SUCH POLLUTANTS FROM ENTERING ANY AND ALL STORM WATER–RELATED STRUCTURES (E.G., CATCH BASINS AND MANHOLES). SPECIFICALLY, THE CONTRACTOR SHALL INSTALL (PRIOR TO THE INITIATION OF THE REMEDIATION ACTIVITIES) AND MAINTAIN (FOR THE DURATION OF THE REMEDIATION ACTIVITIES) FILTER FABRIC BETWEEN THE FRAME AND COVER OF THESE STRUCTURES. EXISTING CATCH BASINS WITH THE EXCEPTION OF CATCH BASINS ALONG MERRILL ROAD AND MANHOLES SHALL BE FURTHER PROTECTED WITH HAY BALES (PLACED IN A RING AROUND THE STRUCTURES) DURING THE REMEDIATION ACTIVITIES.
5. AS INDICATED BY NOTES 4 THROUGH 8 ON DRAWING 23, THE CONTRACTOR SHALL INSTALL WATER DIVERSION AND EXCAVATION BYPASS PUMPING CONTROLS PRIOR TO THE EXCAVATION OF SEDIMENTS AND ADJACENT SOILS.
6. THE CONTRACTOR SHALL PROTECT ALL VEGETATION AND STRUCTURES NOT CLEARED DURING SITE PREPARATION ACTIVITIES. ANY DAMAGE TO THESE ITEMS BY THE CONTRACTOR DURING THE PERFORMANCE OF THE REMEDIATION ACTIVITIES SHALL BE REPAIRED/REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
7. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS THROUGHOUT THE PERFORMANCE OF THE REMEDIATION ACTIVITIES AND MUST DEMONSTRATE (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) THE ACHIEVEMENT OF THE SPECIFIED EXCAVATION DEPTHS/ELEVATIONS PRIOR TO INITIATING BACKFILLING ACTIVITIES, AS NOTED IN SECTION 7.4.6 OF THE REVISED FINAL RD/RA WORK PLAN WORK PLAN.
8. REMOVAL DEPTHS DESIGNATED AS 1' WILL BE SUBJECT TO EXCAVATION TO A DEPTH OF 1 FOOT BELOW EXISTING GROUND SURFACE. FOR REMOVAL DEPTHS GREATER THAN 1 FOOT, EXCAVATIONS SHALL EXTEND TO THE SPECIFIED ELEVATION; HOWEVER, A MINIMUM OF 1' OF SOIL REMOVAL SHALL BE PERFORMED FOR EXCAVATIONS THAT DAYLIGHT ALONG AN EMBANKMENT PRIOR TO ACHIEVING THE HORIZONTAL LIMITS OF REMOVAL ILLUSTRATED ON THIS DRAWING.
9. CERTAIN EXCAVATIONS WILL REQUIRE THE USE OF EXCAVATION SUPPORTS. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF APPROPRIATE EXCAVATION SUPPORTS IN ACCORDANCE WITH APPLICABLE OSHA REGULATIONS. THAT DESIGN SHALL CONSIDER THE REQUIRED DEPTH OF EXCAVATION, NATURE AND CONDITION OF THE STRUCTURES REQUIRING SUPPORT, AND THE POSSIBILITY THAT CONTRACTOR PERSONNEL MAY BE REQUIRED TO ENTER THE EXCAVATIONS IN ORDER TO PROVIDE SURVEY DOCUMENTATION OF THE ACHIEVEMENT OF THE LIMITS OF REMOVAL. THE CONTRACTOR SHALL PROVIDE ONE OR MORE SUPPORT OF EXCAVATION DESIGNS STAMPED AND SIGNED BY A LICENSED MASSACHUSETTS P.E. TO GE FOR REVIEW AND APPROVAL. IN ADDITION, EXCAVATIONS ALONG THE RAIL LINES SHALL BE DESIGNED IN ACCORDANCE WITH THE RELEVANT REQUIREMENTS OF THE AREMA MANUAL FOR RAILWAY ENGINEERED AND WILL BE SUBJECT TO REVIEW AND APPROVAL BY CSX.
10. PER 520 CMR 14.00, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING AT LEAST 6 FEET IN HEIGHT WITH OPENINGS OF 4 INCHES OR LESS BETWEEN SUPPORTS AROUND UNATTENDED OPEN EXCAVATIONS GREATER THAN OR EQUAL TO 3 FEET IN DEPTH WITH 15 FEET OR LESS BETWEEN OPPOSING WALLS.
11. THE CONTRACTOR SHALL PERFORM THE DEEPER EXCAVATIONS ADJACENT TO MERRILL ROAD AND THE BUILDING/CULVERT HEADWALL PRIOR TO THE PERFORMANCE OF THE REMEDIATION ACTIVITIES ELSEWHERE ON PARCEL L12–1–5. THE CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE LIMITS OF SOIL REMOVAL FOR THOSE EXCAVATIONS FOR APPROVAL BY GE/GE'S REPRESENTATIVE AND EPA PRIOR TO PERFORMING REMEDIATION ACTIVITIES ELSEWHERE ON PARCEL L12–1–5. ADDITIONAL REMEDIATION ACTIVITIES MAY BE REQUIRED ELSEWHERE ON THIS PROPERTY, DEPENDING ON WHETHER THE LIMITS OF HORIZONTAL AND VERTICAL LIMITS OF SOIL REMOVAL ARE SUCCESSFULLY ACHIEVED FOR THE SUBJECT EXCAVATIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING/DOWNSIZING ALL REMOVED MATERIALS AS REQUIRED BY THE DISPOSAL FACILITY. UNLESS OTHERWISE NOTED, NON–SOIL MATERIALS WILL BE MANAGED AND DISPOSED OF ALONG WITH ADJACENT/UNDERLYING EXCAVATED SOILS.
13. THE CONTRACTOR SHALL APPROPRIATELY DEWATER/STABILIZE SOILS AND SEDIMENTS TO MAKE SUITABLE FOR TRANSPORT (I.E., MATERIALS SUBJECT TO TRANSPORT SHALL PASS A PAINT FILTER TEST). EXCAVATED MATERIALS REQUIRING DEWATERING SHALL BE DEWATERED OVER THE ACTIVE EXCAVATION AREAS AND/OR TRANSPORTED TO A DEWATERING STOCKPILE CONSTRUCTED IN THE PARKING LOT OVER THE FORMER INTERIOR LANDFILL (FOLLOWING THE SITE PREPARATION ACTIVITIES DESCRIBED ON DRAWING 10) OR AT AN ALTERNATE LOCATION ON GE PROPERTY. UPON PASSING THE PAINT FILTER TEST THE CONTRACTOR MAY STABILIZE EXCAVATED MATERIAL BY GRAVITY DEWATERING, MIXING WITH DRIER EXCAVATED MATERIALS OF A SIMILAR WASTE CHARACTERIZATION (WITH APPROVAL BY GE), OR DRYING AGENTS (SUBJECT TO THE REQUIREMENTS OF SECTION 7.5.4 OF THE REVISED FINAL RD/RA WORK PLAN).
14. LIQUIDS GENERATED DURING REMEDIATION ACTIVITIES (E.G., EXCAVATION DEWATERING, EQUIPMENT DECONTAMINATION, ETC.) SHALL BE TRANSPORTED BY THE CONTRACTOR TO GE'S BUILDING 64G WATER TREATMENT FACILITY (SUBJECT TO REVIEW AND APPROVAL BY GE) FOR TREATMENT AND DISCHARGE BY GE. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO LIMIT THE GENERATION AND COLLECTION OF WATER THAT WILL REQUIRE TREATMENT.
15. THE CONTRACTOR SHALL MANAGE ALL EXCAVATED MATERIALS ACCORDING TO THE NON–TSCA, TSCA, AND/OR RCRA DESIGNATIONS SPECIFIED ON THIS DRAWING. THE CONTRACTOR SHALL COORDINATE WITH GE/GE'S REPRESENTATIVE FOR THE TRANSPORTATION OF EXCAVATED MATERIALS TO THE APPROPRIATE OFF–SITE DISPOSAL FACILITY (BY OTHERS).

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Designed by: THL	Drawn by: BKD	Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

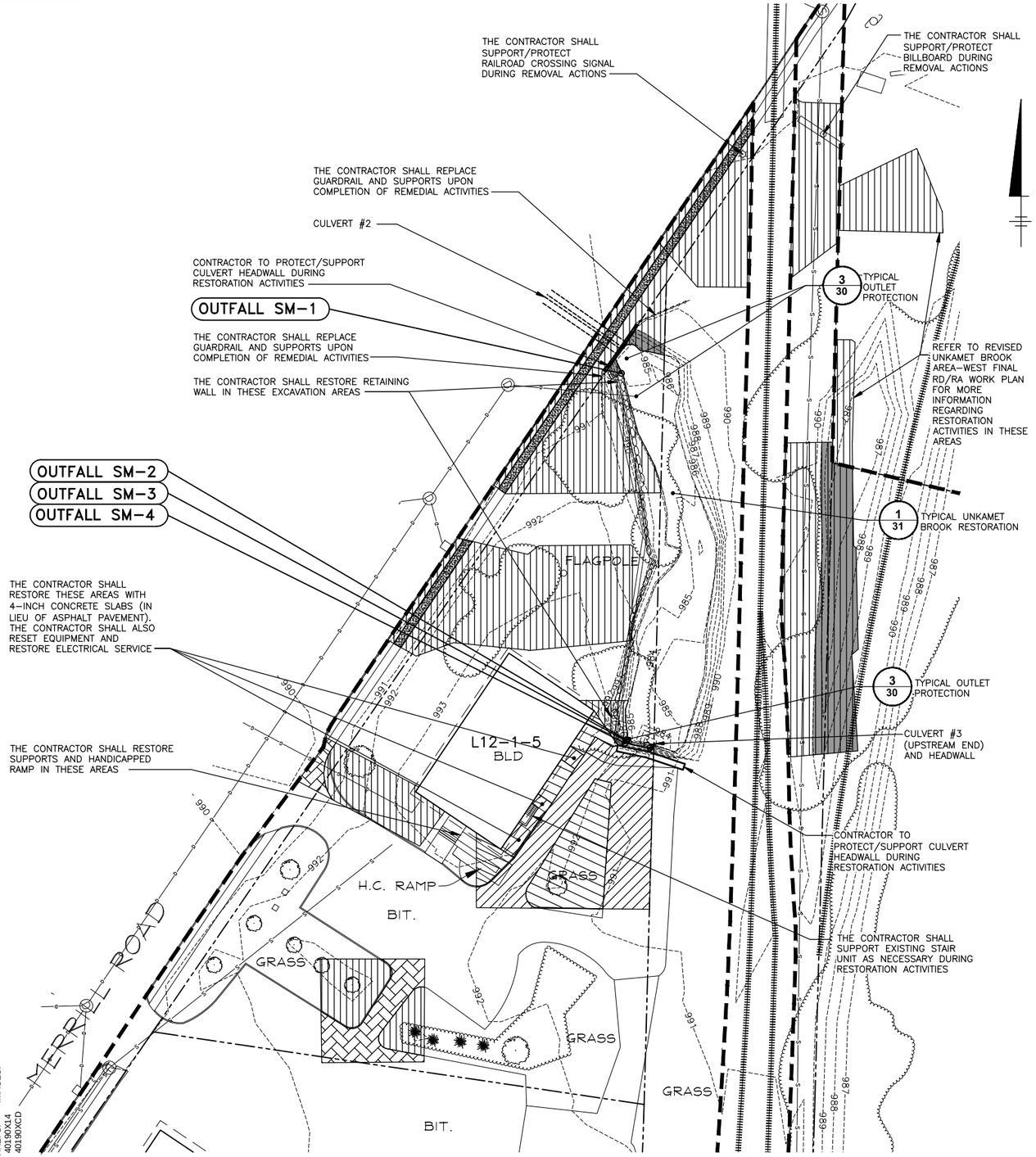
PARCEL L12-1-5 - EXCAVATION LIMITS

TECHNICAL DRAWINGS

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26



LEGEND:

- PORTION OF REMOVAL ACTION AREA SHOWN ON THIS FIGURE
- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- L12-1-5 PROPERTY IDENTIFICATION
- LIGHT POLE
- UTILITY POLE
- CATCH BASIN
- DRAIN MANHOLE
- SANITARY MANHOLE
- MANHOLE (TYPE UNKNOWN)
- RAILROAD TRACKS
- GUARDRAIL
- GAS SERVICE
- SANITARY SEWER
- STORM DRAIN
- EDGE OF BUSHES/HEDGE
- EDGE OF WATER
- DECIDUOUS TREE
- CONIFEROUS TREE
- VEGETATIVE ENGINEERED BARRIER (4/34)
- ASPHALT-COVERED ENGINEERED BARRIER (1/34)
- LIMITS OF VEGETATIVE RESTORATION (5/40) (SEE NOTE 3)
- LIMITS OF ASPHALT PAVEMENT RESTORATION (4/40)
- LIMITS OF CONCRETE SIDEWALK RESTORATION (6/40)
- LIMITS OF EROSION CONTROL MATTING

NOTES:

1. REFER TO DRAWINGS 20, 21, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL NOT INITIATE RESTORATION ACTIVITIES UNTIL THE LIMITS OF EXCAVATION AND/OR SUBGRADE PREPARATION HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVES. FOLLOWING SURVEY DOCUMENTATION OF THE COMPLETION OF THE EXCAVATION ACTIVITIES, THOSE AREAS WILL BE RESTORED TO PRE-CONSTRUCTION GRADES, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOT INITIATE PLANTING OR SEEDING ACTIVITIES UNTIL THE POST-RESTORATION GRADES HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVE. ANY DEVIATIONS FROM THE SPECIFIED RESTORATION GRADES THAT ARE UNACCEPTABLE TO GE/GE'S REPRESENTATIVE MAY REQUIRE REWORK/REPAIR BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
3. ALL 1-FOOT SOIL EXCAVATION AREAS SUBJECT TO VEGETATIVE RESTORATION SHALL BE RESTORED WITH 12-INCHES OF CLEAN TOPSOIL MATERIAL ONLY. ALL DEEPER EXCAVATION AREAS WILL BE RESTORED TO WITHIN 6 INCHES OF FINAL GRADE AND FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 6 INCHES OF CLEAN TOPSOIL AND APPLICATION OF A SEED MIX IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. EXCAVATION AREAS SUBJECT TO ASPHALT PAVEMENT RESTORATION SHALL BE RESTORED TO WITHIN 1 FOOT OF FINAL RESTORATION GRADE WITH CLEAN BACKFILL MATERIAL. FINAL SURFACE RESTORATION SHALL INCLUDE THE PLACEMENT OF 9 INCHES OF GRAVEL SUBBASE MATERIAL, FOLLOWED BY PLACEMENT OF A 2 INCH BASE COURSE AND 1 INCH WEARING COURSE OF BITUMINOUS ASPHALT PAVEMENT IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
5. THE CONTRACTOR SHALL RESTORE THE REMEDIATED BROOK CHANNEL IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 1 ON TECHNICAL DRAWING 31 AND THE APPLICABLE TECHNICAL SPECIFICATIONS. THE RESTORATION ACTIVITIES FOR THE RE-ROUTED/RESTORED BROOK CHANNEL REQUIRE THE PLACEMENT OF THE SILTY-SAND MIXTURE (ALSO USED TO RESTORE THE BOTTOM 6 INCHES OF THE RE-ROUTED/RESTORED BROOK CHANNEL) WITHIN THE VOIDS OF THE TYPE I RIPRAP IN THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS ONLY IN THOSE SECTIONS OF THE BROOK THAT HAVE A FLAT CHANNEL BOTTOM.
6. THE CONTRACTOR SHALL RESTORE ALL TREES/SHRUBS REMOVED DURING SITE PREPARATION AND/OR THE SOIL/SEDIMENT REMOVAL ACTIVITIES IN ACCORDANCE WITH A TREE/SHRUB INVENTORY (TO BE PERFORMED BY OTHERS), THE TREE/SHRUB PLANTING PLAN (TO BE PERFORMED BY OTHERS), AND/OR AT LOCATIONS DESIGNATED BY GE.
7. THE CONTRACTOR SHALL PLACE BIODEGRADEABLE EROSION CONTROL MATTING AND STAKES ALONG DRAINAGE PATHWAYS WITH STEEP (4H:1V OR GREATER) EMBANKMENTS.
8. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS (e.g., HAYBALES/SILT FENCE SEE DRAWINGS 21 AND 25) UPON REQUEST BY GE/GE'S REPRESENTATIVE, ONCE THE RESTORED VEGETATION IS ESTABLISHED.

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Professional Engineer's No.

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-		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - SITE RESTORATION PLAN

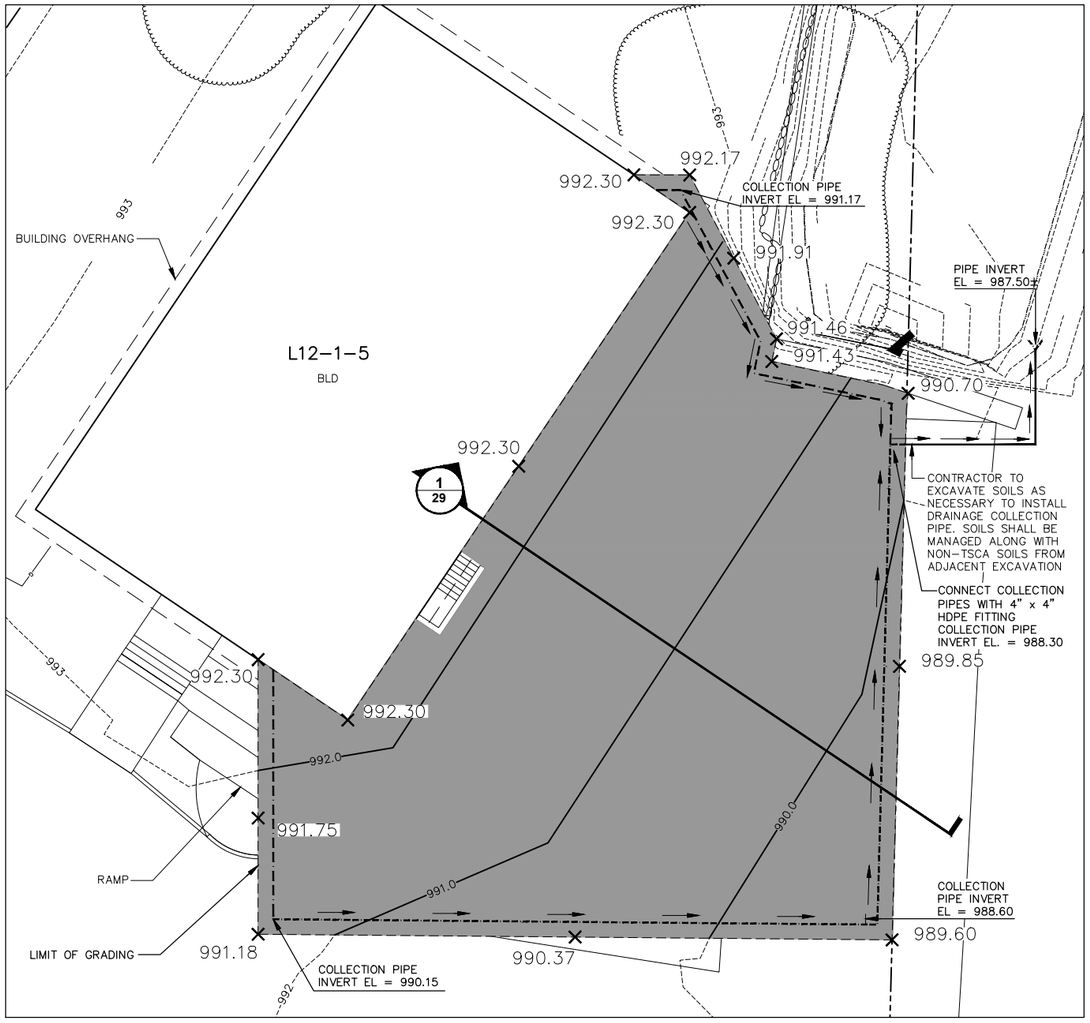
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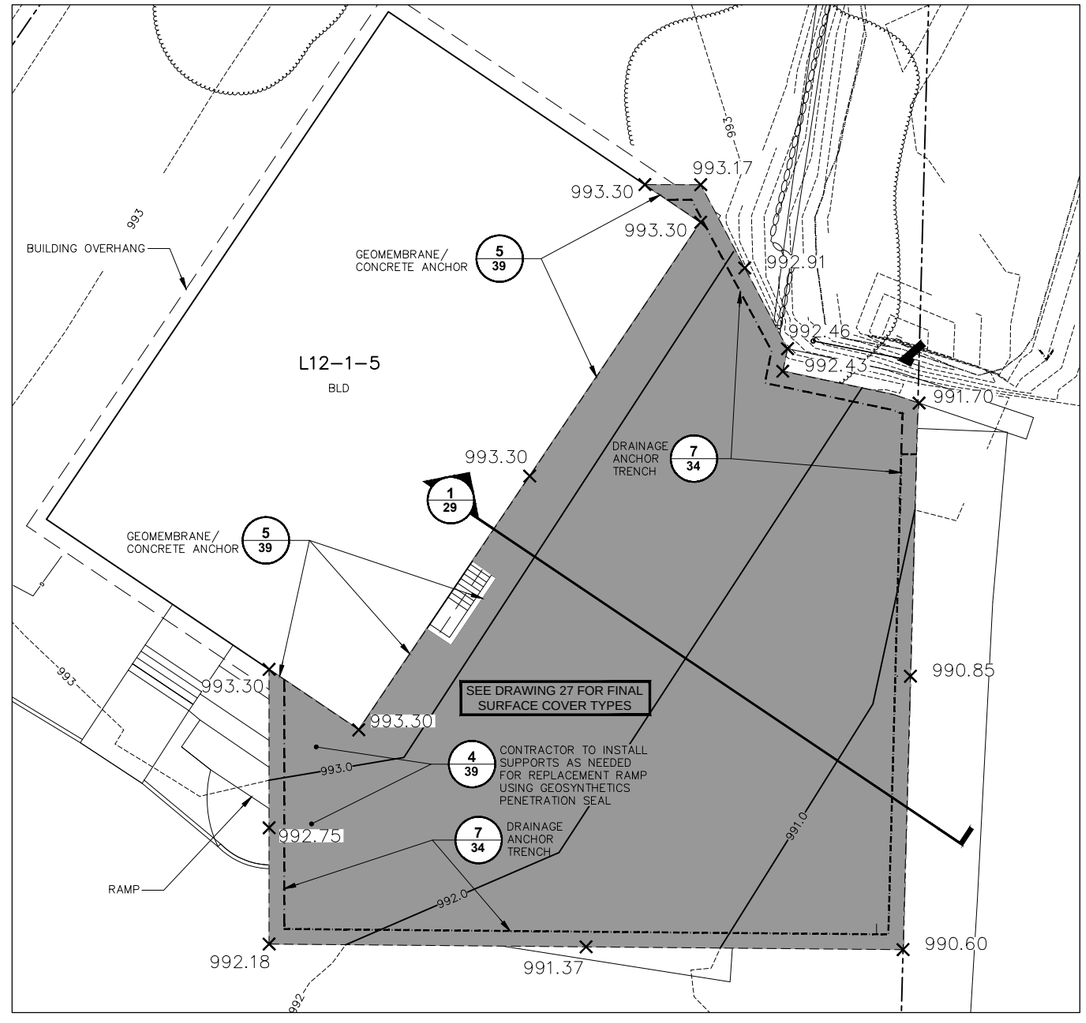
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SUBGRADE GRADING PLAN



FINAL GRADING PLAN

LEGEND:

- PROPERTY LINE
- EASEMENT
- 992 EXISTING CONTOUR
- L12–1–5 PROPERTY IDENTIFICATION
- S S SANITARY SEWER
- G G G GAS SERVICE
- EDGE OF BUSHES/HEDGE
- DECIDUOUS TREE
- EDGE OF WATER
- HORIZONTAL EXTENT OF ENGINEERED BARRIER AREA
- 991.0 PROPOSED CONTOUR
- PROPOSED DRAINAGE ANCHOR TRENCH
- PROPOSED DRAINAGE COLLECTION PIPE (SEE NOTE 6)
- 987.27 PROPOSED SPOT ELEVATION

NOTES:

1. REFER TO DRAWINGS 20, 25, AND 41 FOR ADDITIONAL BASE MAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. THE CONTRACTOR SHALL NOT INITIATE ENGINEERED BARRIER/LANDFILL CAP CONSTRUCTION ACTIVITIES UNTIL THE LIMITS OF SUBGRADE PREPARATION HAVE BEEN CONFIRMED THROUGH SURVEY AND APPROVED BY GE/GE'S REPRESENTATIVE. ANY DEVIATIONS FROM THE SPECIFIED RESTORATION GRADES THAT ARE UNACCEPTABLE TO GE/GE'S REPRESENTATIVE MAY REQUIRE REWORK/REPAIR BY THE CONTRACTOR AT NO ADDITIONAL COST TO GE.
3. THE PROPOSED SUBGRADE AND FINAL SURFACE ELEVATION CONTOUR INTERVALS EQUAL 1 FOOT. THE SPECIFIED SUBGRADE ELEVATIONS REPRESENT THE TOP OF THE GEOSYNTHETIC COMPONENTS, WHILE THE SPECIFIED FINAL GRADE ELEVATIONS REPRESENT THE TOP OF THE ENGINEERED BARRIER (i.e., FINAL SURFACE GRADES).
4. NO REPLACEMENT TREES OR SHRUBS SHALL BE PLANTED WITHIN 10 FEET OF THE ENGINEERED BARRIER COMPONENTS. ALL SUCH PLANTINGS SHALL BE RESTORED AT LOCATIONS IDENTIFIED IN THE TREE/SHRUB PLANTING PLAN (TO BE PERFORMED BY OTHERS) AND/OR AT LOCATIONS DESIGNATED BY GE.
5. THE CONTRACTOR SHALL REMOVE THE EROSION CONTROLS (NOT SHOWN) UPON REQUEST BY GE/GE'S REPRESENTATIVE, ONCE THE RESTORED VEGETATION IS ESTABLISHED.
6. THE PORTION OF ENGINEERED BARRIER DRAINAGE COLLECTION PIPE LOCATED OUTSIDE THE BARRIER AREA SHALL BE THE SAME CONSTRUCTION AS DRAINAGE ANCHOR TRENCH (DETAIL 7, DRAWING 34) WITHOUT FLEXIBLE MEMBRANE LINER AND GEOCOMPOSITE DRAINAGE NET.

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PARCEL L12-1-5 - SUBGRADE AND FINAL GRADING PLAN

TECHNICAL DRAWINGS

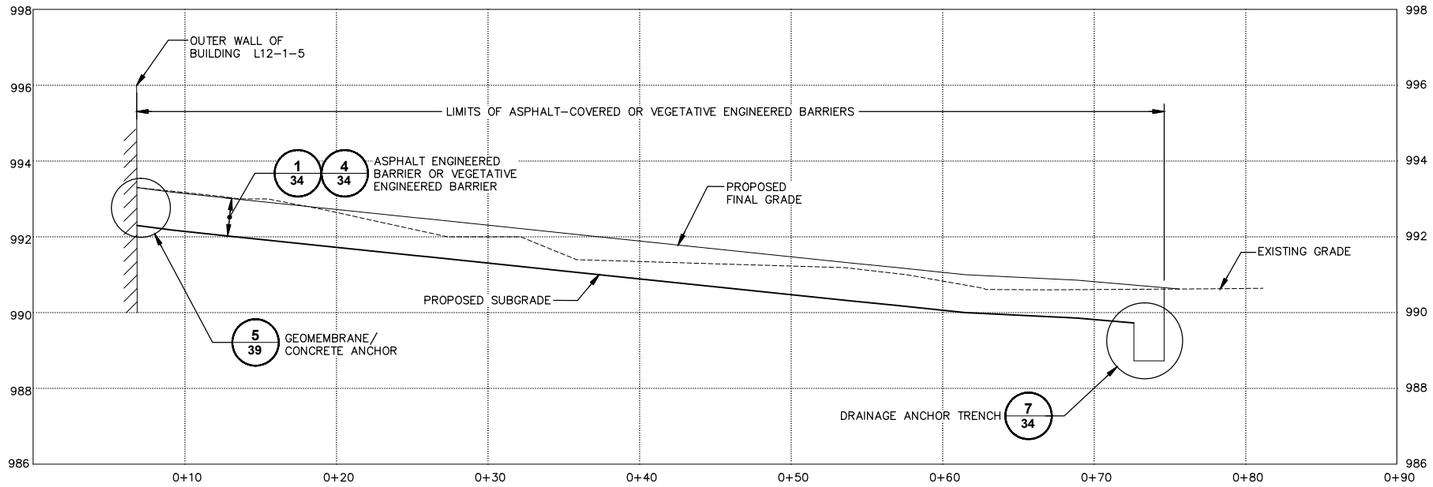
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SECTION 1

0 5' 10'
HORIZONTAL SCALE: 1"=5'

0 2' 4'
VERTICAL SCALE: 1"=2'

SCALE AS INDICATED

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Designed by: TAS	Drawn by: BKD	Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

PARCEL L12-1-5 - CROSS SECTION

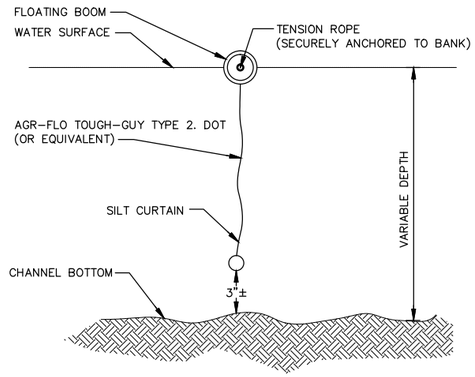
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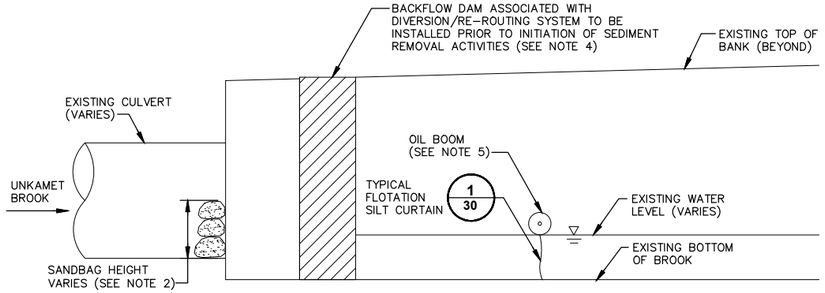


NOTES:

1. TWO SILT CURTAINS SHALL BE INSTALLED UPSTREAM OF THE CONFLUENCE WITH THE HOUSATONIC RIVER PRIOR TO COMMENCING THE REMEDIATION ACTIVITIES AND MAINTAINED THROUGHOUT THOSE ACTIVITIES. THESE SILT CURTAINS SHALL REMAIN IN PLACE UNTIL GE APPROVES THEIR REMOVAL.
2. ADDITIONAL SILT CURTAINS SHALL BE INSTALLED DOWNSTREAM OF INDIVIDUAL SEDIMENT REMOVAL OR CULVERT CLEANING AREAS, AND MOVED OR REINSTALLED AS SEDIMENT REMOVAL PROGRESSES DOWNSTREAM. ANY ACCUMULATED MATERIAL SHALL BE REMOVED AND HANDLED ALONG WITH EXCAVATED SEDIMENT.
3. CONTRACTOR SHALL INSPECT SILT CURTAINS ON A DAILY BASIS FOR DAMAGE, APPROPRIATE FUNCTION, AND PRESENCE OF DEBRIS.

TYPICAL FLOTATION SILT CURTAIN 1

NOT TO SCALE



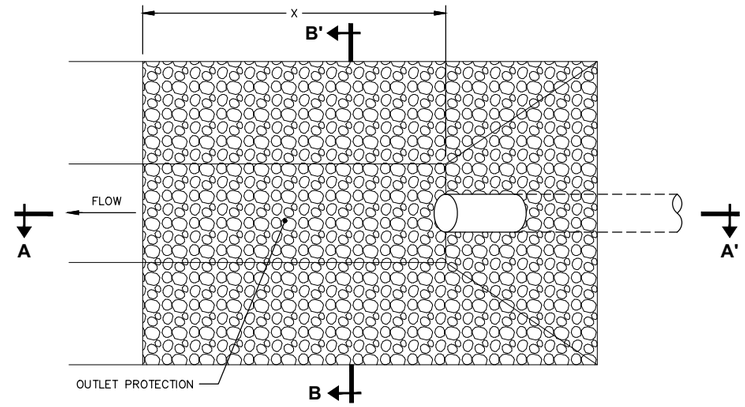
TYPICAL SECTION

NOTES:

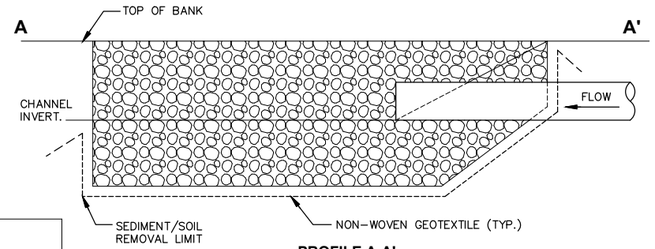
1. FIELD CONDITIONS MAY DIFFER FROM THE INFORMATION PROVIDED HEREON. THE CONTRACTOR SHALL PERFORM THE NECESSARY SITE RECONNAISSANCE TO UNDERSTAND FIELD CONDITIONS AT EACH CULVERT LOCATION.
2. SANDBAGS SHALL BE INSTALLED ACROSS THE CULVERT OPENING TO FACILITATE THE COLLECTION OF WASH WATER FROM CLEANING ACTIVITIES. REFER TO TABLE FOR CULVERT SPECIFICATIONS. NOTE THAT SANDBAGS WILL BE AS HIGH AS POSSIBLE, DEPENDING ON DIMENSIONS OF EXISTING CULVERTS.
3. THE CONTRACTOR SHALL ENSURE THAT DURING THE PERFORMANCE OF CULVERT CLEANING ACTIVITIES, FLOW DOES NOT OVERTOP SANDBAGS AT CULVERT OUTLET AND THAT ALL WATER IS CAPTURED.
4. THE REMEDIATION CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION, LOCATION, AND ELEVATION OF THE BACKFLOW DAMS.
5. AN OIL BOOM/SILT CURTAIN SHALL BE INSTALLED DOWNSTREAM OF THE BACKFLOW DAM PRIOR TO THE START OF CLEANING ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING THE OIL BOOM/SILT CURTAIN ACROSS THE FULL WIDTH OF THE BROOK. THIS OIL BOOM/SILT CURTAIN SHALL ALSO BE LOCATED DOWNSTREAM OF THE BYPASS PUMPING SYSTEM OUTLET.

CULVERT OUTLET CLEANING DETAIL 2

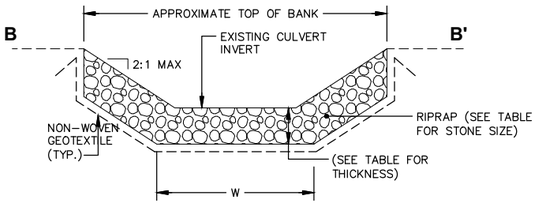
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PLAN



PROFILE A-A'



SECTION B-B'

NOTE:

1. SEE TABLE FOR APRON AND STONE SIZES.

TYPICAL OUTLET PROTECTION DETAIL 3

NOT TO SCALE

CULVERT PROTECTION SCHEDULE

ITEM NO.	CULVERT DESCRIPTION	LENGTH	UPSTREAM INVERT ELEV. (FEET)	DOWNSTREAM INVERT ELEV. (FEET)	D50 (INCHES)	T (INCHES)	A (FEET)	L (FEET)	W (FEET)
DALTON AVENUE	'6 X 4.5 BOX CULVERT, CONCRETE	295	985.9	983.2	3.0	7	18	19	25
CULVERT #1	4' CIRCULAR PIPE, CMP	40	984.5	983.6	2.4	6	12	17	21
	4' CIRCULAR PIPE, CMP	40	983.8	983.3	2.4	6			
CULVERT #2	4' CIRCULAR PIPE, CMP	110	983.6	983.4	2.4	6	12	17	21
	4' CIRCULAR PIPE, CMP	100	983.6	983.4	2.4	6			
CULVERT #3	(SEE NOTE 2)	575	983.5	983.4	2.4	6	12	17	21
CULVERT #4	4' CIRCULAR PIPE, CONCRETE	60	983.0	982.0	2.4	6	12	17	21

NOTES:

1. CULVERT AND OUTFALL LOCATIONS SHOWN ON TECHNICAL DRAWINGS 4 (NORTH OF MERRILL ROAD) AND 23 (SOUTH OF MERRILL ROAD).
2. THE INLET OF CULVERT #3 WAS OBSERVED TO BE A BOX CULVERT MEASURING 3 FEET BY 3 FEET. THE OUTLET FOR CULVERT #3 WAS OBSERVED TO BE A MEASURED DIAMETER OF APPROXIMATELY 10 FEET IN DIAMETER AND STEEL CONSTRUCTION.
3. ALL EXISTING CULVERT INVERT ELEVATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. SIMILARLY, ALL OUTFALL LOCATIONS/OPERATIONAL STATUS ARE ESTIMATED AND SHALL ALSO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
4. TYPICAL APRON CONSTRUCTION SHOWN ON DETAIL 3. RIPRAP APRONS FOR CULVERTS SHALL EXTEND FROM TOP OF BANK TO 20P OF BANK FOR ENTIRE LENGTH OF APRON.
5. APRON CONSTRUCTION FOR ALL OUTFALLS SHALL BE EXTENDED IF NECESSARY TO MEET EDGE OF FILL/RESTORATION MATERIAL IN UNKAMET BROOK CHANNEL.
6. APRON CONSTRUCTION FOR ADJACENT CULVERTS/OUTFALLS SHALL BE BLENDED TOGETHER IF DESIGNS OVERLAP.
7. OUTFALL PROTECTION DETERMINATIONS BASED ON FLOWS CALCULATED USING GUIDANCE PROVIDED IN THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL (AUGUST 2005). FLOW CALCULATIONS ARE BASED ON FIELD OBSERVATIONS (I.E., PIPE DIMENSION AND INVERT ELEVATION) AND ASSUMPTIONS RELATED TO PIPE SLOPE AND CONDITION.

OUTFALL PROTECTION SCHEDULE

ITEM NO.	OUTFALL DESCRIPTION	ASSUMED SLOPE	D50 (INCHES)	T (INCHES)	A (FEET)	L (FEET)	W (FEET)
OUTFALL YD10	18" CIRCULAR PIPE, CONCRETE	0.015	2.4	6	4.5	20	22
	18" CIRCULAR PIPE, CONCRETE	0.015	2.4	6	4.5	20	22
	18" CIRCULAR PIPE, CONCRETE	0.015	2.4	6	4.5	20	22
	18" CIRCULAR PIPE, CONCRETE	0.015	2.4	6	4.5	20	22
OUTFALL YD12	32" CIRCULAR PIPE, CMP	0.030	2.4	6	8.0	19	21
OUTFALL 09C	40" CIRCULAR PIPE, CONCRETE	0.006	2.4	6	10.0	20	23
OUTFALL 009	30" CIRCULAR PIPE, CONCRETE	0.008	2.4	6	7.5	21	24
OUTFALL SM-1	15" CIRCULAR PIPE, CONCRETE	0.016	2.4	6	3.8	20	21
OUTFALL SM-2	10" CIRCULAR PIPE, CMP	0.100	2.4	6	2.5	22	10
OUTFALL SM-3	6" CIRCULAR PIPE, CMP	0.100	2.4	6	1.5	22	23
OUTFALL SM-4	12" CIRCULAR PIPE, CONCRETE	0.030	2.4	6	3.0	20	21
OUTFALL SM-5	24" CIRCULAR PIPE, STEEL	0.011	2.4	6	6.0	21	23

DEFINITIONS:

D50 = MEDIAN STONE SIZE
T = THICKNESS OF APRON
A = WIDTH OF UPSTREAM END OF APRON
L = LENGTH OF APRON
W = WIDTH OF DOWNSTREAM END OF APRON (ASSUMING FULL LENGTH, AS INDICATED, IS NECESSARY)

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GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

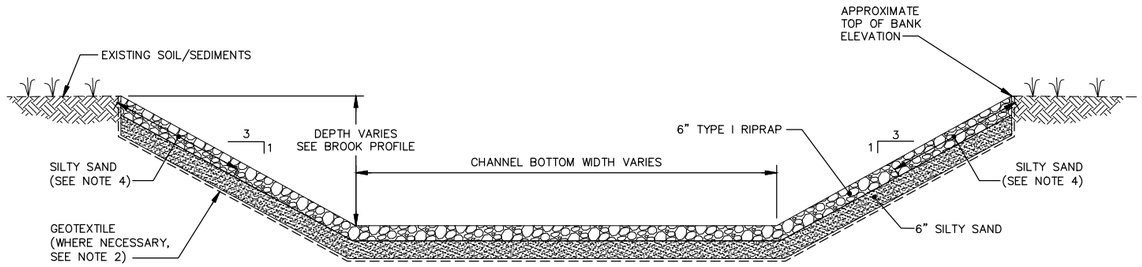
CULVERT CLEANING AND OUTLET RESTORATION DETAILS

TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006
Date: APRIL 2014
ARCADIS
6723 TOWPATH ROAD
PO BOX 66
SYRACUSE, NY 13214
TEL. 315.446.9120

30

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ PM: C.AVERILL TM: M.DALEY
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PAGESETUP: M-LD2B-PDF

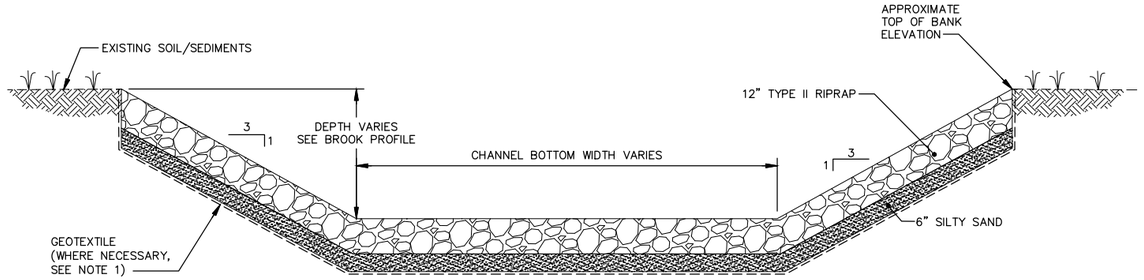


NOTES:

1. FOR SECTIONS OF EXISTING BROOK CHANNEL, THE CONTRACTOR SHALL REMOVE 1 FOOT OF SEDIMENT FROM THE CHANNEL BOTTOM AND BANKS AND RESTORE WITH A 6–INCH SILTY SAND LAYER AND A 6–INCH LAYER OF TYPE I RIPRAP.
2. FOR SPECIFIED SECTIONS OF RE–ROUTED BROOK CHANNEL, THE CONTRACTOR SHALL REMOVE 1–FOOT OF SOIL/SEDIMENT BELOW THE FINAL CHANNEL GRADES/ELEVATIONS OF THE RE–ROUTED CHANNEL SPECIFIED ON DRAWINGS 5 AND 6 AND RESTORE WITH A 6–INCH SILTY SAND LAYER AND A 6–INCH LAYER OF TYPE I RIPRAP. NOTE THAT FOR SECTIONS OF RE–ROUTED BROOK WHICH PASS THROUGH TSCA–DESIGNATED REMOVAL AREAS (AS SHOWN ON DRAWINGS 3 AND 22), CONTRACTOR SHALL PLACE NON–WOVEN GEOTEXTILE PRIOR TO PLACEMENT OF 6–INCH SILTY SAND LAYER.
3. TYPE I RIPRAP SHALL MEET THE QUALITY AND GRADATION REQUIREMENTS OF AASHTO PROCESSED AGGREGATE SIZE NO. 1.
4. SILTY SAND SHALL BE PLACED BETWEEN THE VOIDS OF THE TYPE I RIPRAP FOR THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS, ONLY IN THOSE SECTIONS OF THE BROOK THAT HAVE A FLAT CHANNEL BOTTOM.
5. SEE TECHNICAL DRAWINGS 4 AND 23 FOR EXTENT OF SEDIMENT REMOVAL AND DRAWINGS 5 AND 6 FOR BROOK RE–ROUTING ACTIVITIES. REFER TO DRAWINGS 16 AND 24 FOR BROOK CHANNEL RESTORATION DETAILS.

TYPICAL UNKAMET BROOK RESTORATION 1

NOT TO SCALE

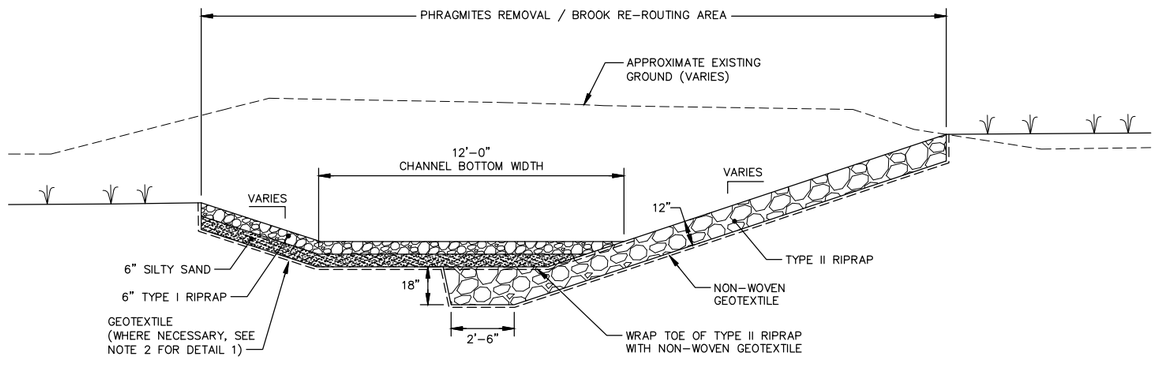


NOTES:

1. FOR SPECIFIED SECTIONS OF RE–ROUTED BROOK CHANNEL, THE CONTRACTOR SHALL REMOVE 18 INCHES OF SOIL/SEDIMENT BELOW THE FINAL CHANNEL GRADES/ELEVATIONS OF THE RE–ROUTED CHANNEL SPECIFIED ON DRAWINGS 5 AND 6 AND RESTORE WITH A 6–INCH SILTY SAND LAYER AND A 12–INCH LAYER OF TYPE II RIPRAP. NOTE THAT FOR SECTIONS OF RE–ROUTED BROOK WHICH PASS THROUGH TSCA–DESIGNATED REMOVAL AREAS (AS SHOWN ON DRAWING 3), CONTRACTOR SHALL PLACE NON–WOVEN GEOTEXTILE PRIOR TO PLACEMENT OF 6–INCH SILTY SAND LAYER.
2. TYPE II RIPRAP SHALL MEET THE QUALITY AND GRADATION REQUIREMENTS FOR MHD M2.02.4–MODIFIED ROCK FILL.
3. SILTY SAND SHALL BE PLACED BETWEEN THE VOIDS OF THE TYPE II RIPRAP FOR THE TOP THIRD TO TOP HALF OF THE RESTORED BANKS, BUT ONLY IN SECTIONS OF THE BROOK WITH A FLAT CHANNEL BOTTOM.
4. SEE TECHNICAL DRAWINGS 4 AND 23 FOR EXTENT OF SEDIMENT REMOVAL AND DRAWINGS 5 AND 6 FOR BROOK RE–ROUTING ACTIVITIES. REFER TO DRAWINGS 16 AND 24 FOR BROOK CHANNEL RESTORATION DETAILS.

RIPRAP CHANNEL PROTECTION 2

NOT TO SCALE



NOTES:

1. THE CONTRACTOR SHALL REMOVE 1 FOOT OF SOIL/SEDIMENT BELOW THE FINAL CHANNEL GRADES/ELEVATIONS OF THE RE–ROUTED BROOK CHANNEL AND RESTORE WITH A 6–INCH SILTY SAND LAYER AND A 6–INCH LAYER OF TYPE I RIPRAP.
2. TYPE I RIPRAP SHALL SHALL MEET THE QUALITY AND GRADATION REQUIREMENTS OF AASHTO PROCESSED AGGREGATE SIZE NO. 1.
3. TYPE II RIPRAP SHALL MEET THE QUALITY AND GRADATION REQUIREMENTS FOR MHD M2.02.4–MODIFIED ROCK FILL.

RIPRAP STREAM BANK PROTECTION 3

0 3' 6'

GRAPHIC SCALE

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V:\ENV\CAD\SYRACUSE\ACTIVE\B0040190\0002\00006\DWG\FINAL-REM-CONTRACT\40190G31.dwg LAYOUT: 31 SAVED: 4/14/2014 2:04 PM PAGESETUP: ---
XREFS: 40190XCD IMAGES: PROJECTNAME: ---

SCALE AS INDICATED

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Professional Engineer's Name: .		
Professional Engineer's No.: .		
State	Date Signed	Project Mgr. CRA
Designed by THL	Drawn by BKD	Checked by MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

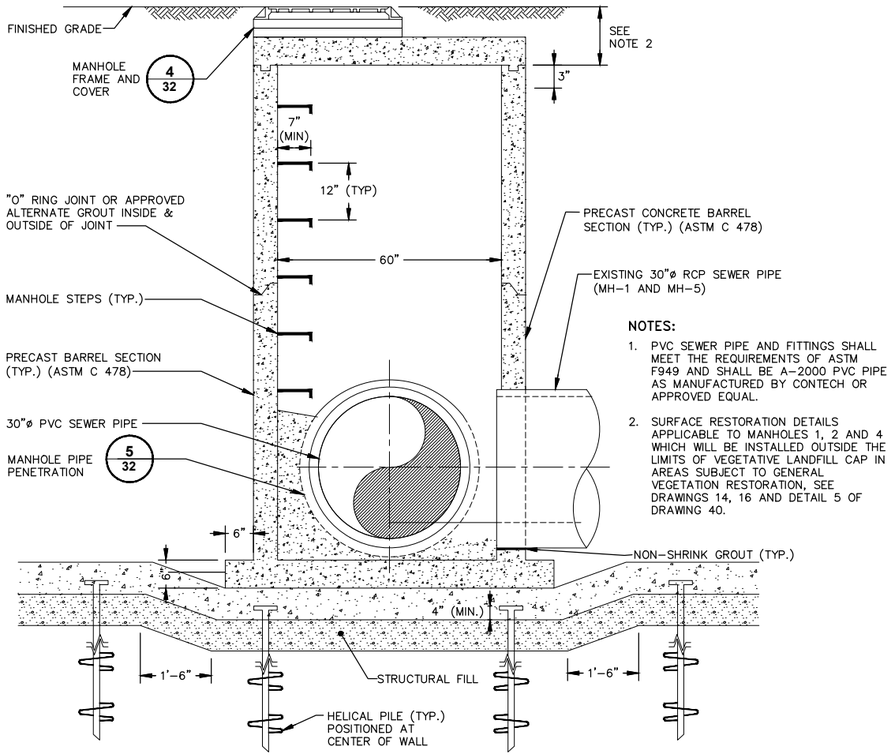
UNKAMET BROOK EXCAVATION, RE-ROUTING, AND RESTORATION DETAILS

TECHNICAL DRAWINGS

ARCADIS Project No. B0040190.0002.00006

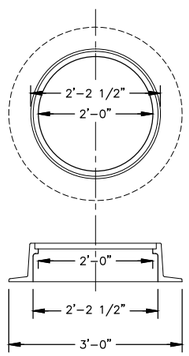
Date APRIL 2014

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60"Ø PRECAST CONCRETE MANHOLE (OUTSIDE LANDFILL CAP) 1

NOT TO SCALE



SANITARY SEWER MANHOLE TABLE					
MANHOLE NO.	STATION	NORTHING	EASTING	RIM ELEVATION (FEET)	INLET/OUTLET PIPE INVERT ELEVATION (FEET)
MH – 1	0+00	538112.17	138253.18	990.86	985.79
MH – 2	0+37.32	537843.21	138520.16	990.47	985.77
MH – 3	3+89.01	537532.44	138779.73	993.08	985.52
MH – 4	7+93.92	538109.48	138290.40	990.74	985.43
MH – 5	8+31.61	537494.90	138776.40	990.24	985.42/985.06

NOTE:

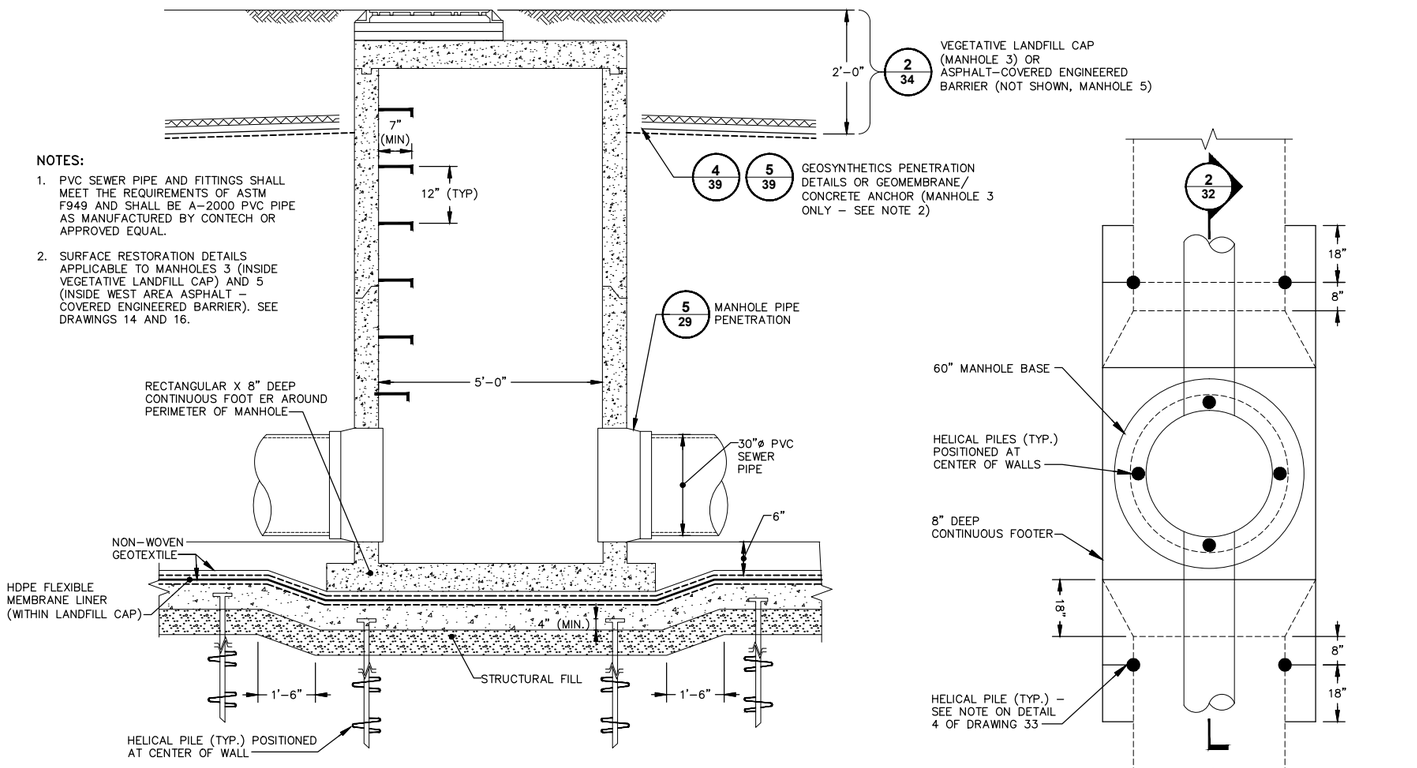
1. THE EXISTING 30" SEWER PIPE INVERT ELEVATIONS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.

NOTE:

1. MANHOLE FRAME AND COVER SHALL CONFORM TO MASSACHUSETTS HIGHWAY STANDARD SPECIFICATION SECTION 201.

MANHOLE FRAME AND COVER 4

NOT TO SCALE

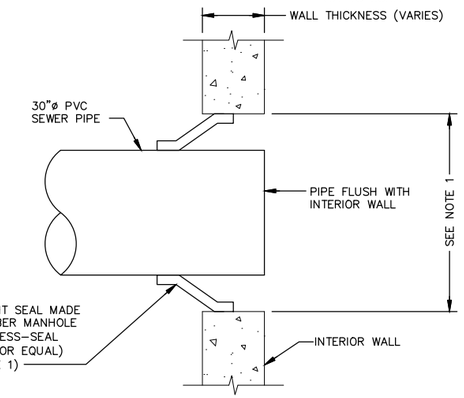


60"Ø PRECAST CONCRETE MANHOLE (INSIDE LANDFILL CAP/ASPHALT-COVERED ENGINEERED BARRIER) 2

NOT TO SCALE

TYPICAL 60"Ø MANHOLE PLAN WITH FOUNDATION 3

NOT TO SCALE

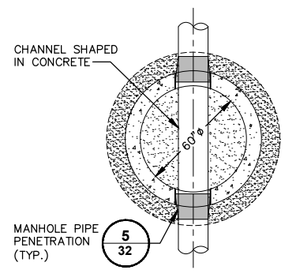


NOTE:

1. CONTRACTOR SHALL COORDINATE DIAMETER OF MANHOLE OPENINGS AND BOOT SIZE/PRODUCT NUMBER WITH MANUFACTURER'S SIZING CHARTS.

MANHOLE PIPE PENETRATION 5

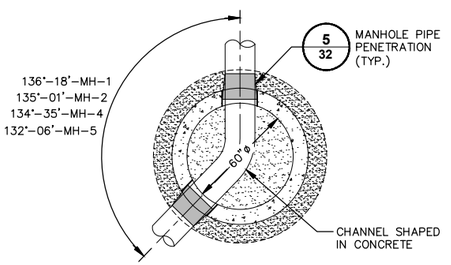
NOT TO SCALE



MH-3

MANHOLE PLAN - STRAIGHT FLOW 6

NOT TO SCALE



MH-1, MH-2, MH-4, MH-5

MANHOLE PLAN - ANGLED FLOW 7

NOT TO SCALE

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Professional Engineer's No.:
State: -
Date Signed:
Project Mgr.: CRA
Designed by: THL
Drawn by: BKD
Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

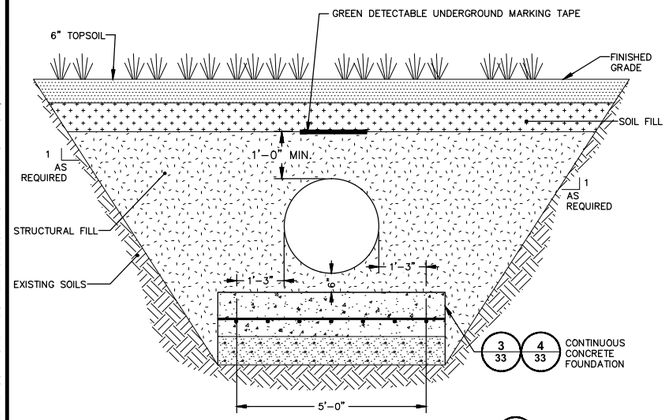
SANITARY SEWER REALIGNMENT DETAILS

TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006
Date: APRIL 2014

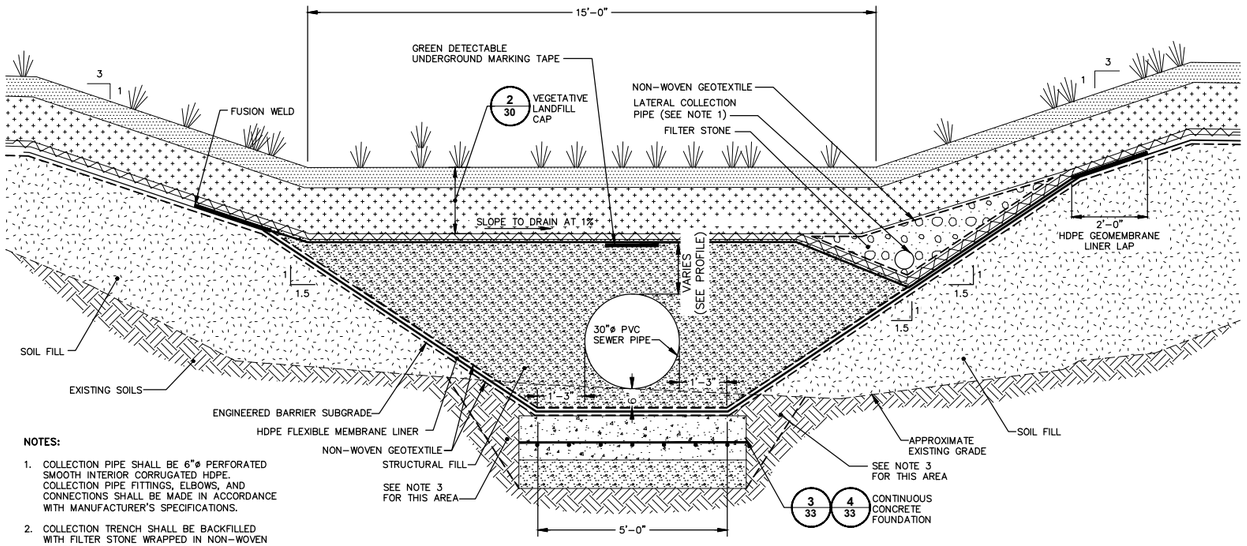
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TYPICAL SEWER PIPE BACKFILL SECTION OUTSIDE LANDFILL CAP (1)

NOT TO SCALE

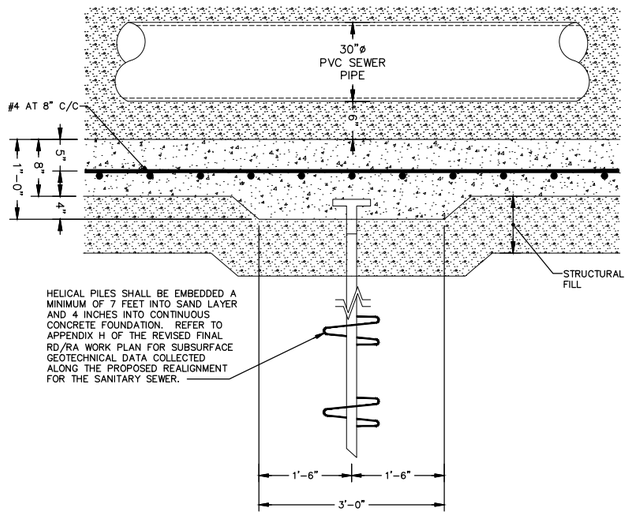


NOTES:

1. COLLECTION PIPE SHALL BE 6"ø PERFORATED SMOOTH INTERIOR CORRUGATED HDPE. COLLECTION PIPE FITTINGS, ELBOWS, AND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. COLLECTION TRENCH SHALL BE BACKFILLED WITH FILTER STONE WRAPPED IN NON-WOVEN FILTER GEOTEXTILE OVERLAPPED THE FULL WIDTH OF THE TRENCH.
3. CONTRACTOR TO REGRADE/CONDITION SOILS AS NECESSARY FOR INSTALLATION OF STRUCTURAL FILL AND CONTINUOUS CONCRETE FOUNDATION.

TYPICAL SEWER PIPE BACKFILL SECTION WITHIN LANDFILL CAP (2)

NOT TO SCALE

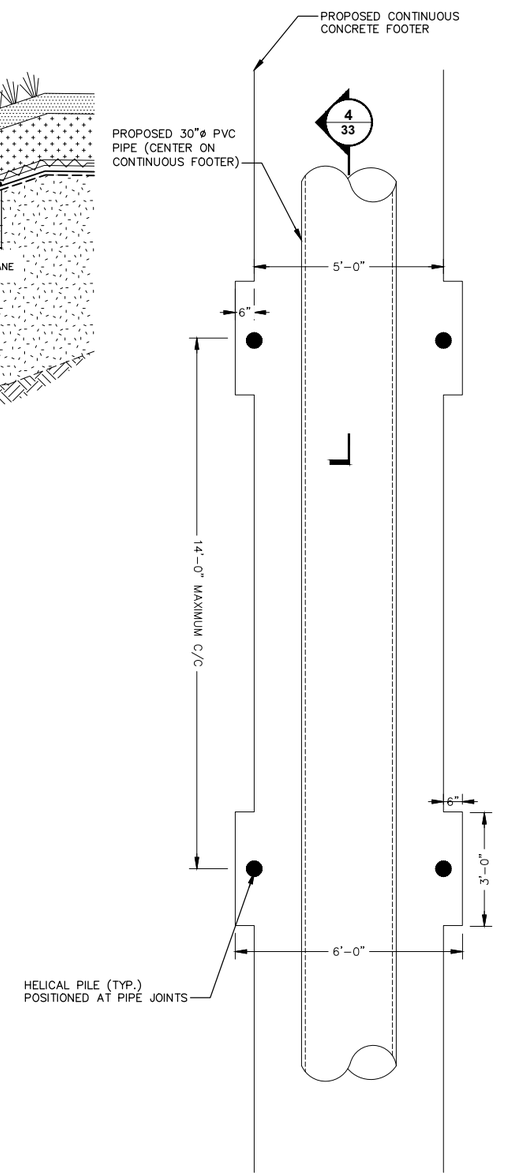


TYPICAL ELEVATION (4)

NOT TO SCALE

REINFORCING BAR LAP SPLICE DIMENSION TABLE			
BAR SIZE		TOP BARS	OTHER BARS
US	METRIC		
# 3	# 10	16"	12"
# 4	# 11	20"	16"
# 5	# 13	26"	20"
# 6	# 19	30"	24"
# 7	# 22	42"	34"
# 8	# 25	46"	38"
# 9	# 29	56"	44"
# 10	# 32	62"	50"
# 11	# 36	68"	54"

1. WHEN LAPPING TWO DIFFERENT SIZE BARS, THE SPLICE DIMENSION OF THE SMALLER BAR SHALL BE USED.
2. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS.
3. THE ABOVE TABLE IS BASED UPON 4,000 PSI CLASS I CONCRETE, UNCOATED 60 KSI STEEL, MINIMUM BAR SPACING – 5 BAR DIAMETERS AND ACI CLASS B SPLICES. WHEN THESE CONDITIONS ARE NOT MET, SPLICE LENGTH SHALL BE DETERMINED IN ACCORDANCE WITH ACI 318-08.



CONTINUOUS CONCRETE FOUNDATION DETAILS (3)

NOT TO SCALE

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Professional Engineer's No.		
State: -	Date Signed	Project Mgr.: CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

SANITARY SEWER REALIGNMENT DETAILS

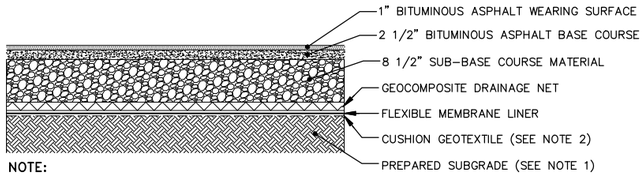
TECHNICAL DRAWINGS

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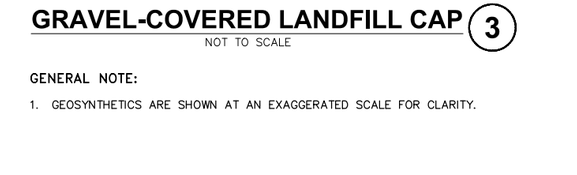


NOTE:

1. PREPARED SUBGRADE INCLUDES EXISTING ASPHALT SURFACES AND ASPHALT SHIMMED SUBGRADE.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE ENGINEERED BARRIER IS INSTALLED ABOVE EXISTING SOIL/PAVEMENT/CONCRETE.
3. THE TOTAL THICKNESS OF FILL MATERIALS ABOVE THE ENGINEERED BARRIER GEOSYNTHETICS SHALL BE A MINIMUM OF 12 INCHES. THE CONTRACTOR SHALL DEMONSTRATE (THROUGH SURVEY) THE ACHIEVEMENT OF THIS MINIMUM THICKNESS IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.

ASPHALT-COVERED ENGINEERED BARRIER 1

NOT TO SCALE

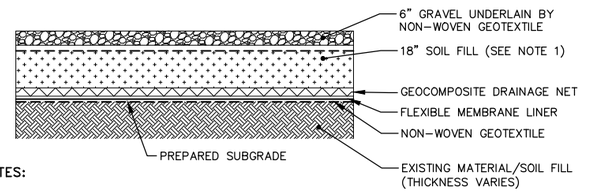


NOTES:

1. AT CONTRACTOR'S DISCRETION AND EXPENSE, SOIL FILL MAY BE REPLACED WITH TOPSOIL.
2. NRR/E SEED MIX SHALL BE APPLIED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
3. THE TOTAL THICKNESS OF FILL MATERIALS ABOVE THE ENGINEERED BARRIER GEOSYNTHETICS SHALL BE A MINIMUM OF 24 INCHES. THE CONTRACTOR SHALL DEMONSTRATE (THROUGH SURVEY) THE ACHIEVEMENT OF THIS MINIMUM THICKNESS IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.

VEGETATIVE LANDFILL CAP 2

NOT TO SCALE



NOTES:

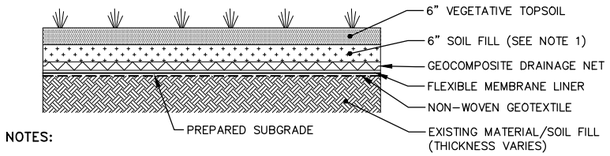
1. AT CONTRACTOR'S DISCRETION AND EXPENSE, SOIL FILL MAY BE REPLACED WITH TOPSOIL.
2. THE TOTAL THICKNESS OF FILL MATERIALS ABOVE THE ENGINEERED BARRIER GEOSYNTHETICS SHALL BE A MINIMUM OF 24 INCHES. THE CONTRACTOR SHALL DEMONSTRATE (THROUGH SURVEY) THE ACHIEVEMENT OF THIS MINIMUM THICKNESS IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.

GRAVEL-COVERED LANDFILL CAP 3

NOT TO SCALE

GENERAL NOTE:

1. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.

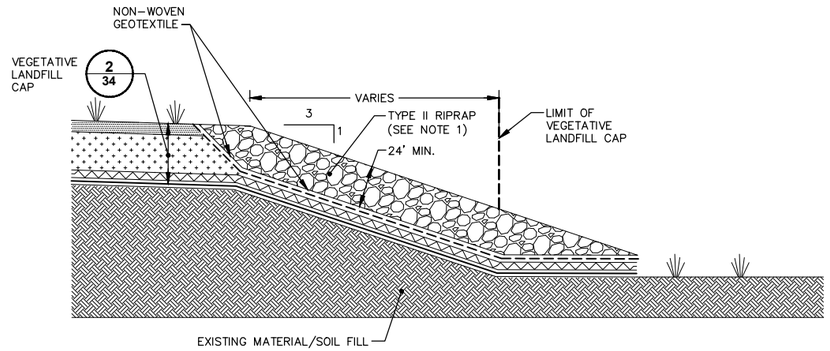


NOTES:

1. AT CONTRACTOR'S DISCRETION AND EXPENSE, SOIL FILL MAY BE REPLACED WITH TOPSOIL.
2. THE TOTAL THICKNESS OF FILL MATERIALS ABOVE THE ENGINEERED BARRIER GEOSYNTHETICS SHALL BE A MINIMUM OF 12 INCHES. THE CONTRACTOR SHALL DEMONSTRATE (THROUGH SURVEY) THE ACHIEVEMENT OF THIS MINIMUM THICKNESS IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.

VEGETATIVE ENGINEERED BARRIER-PARCEL L12-1-5 4

NOT TO SCALE

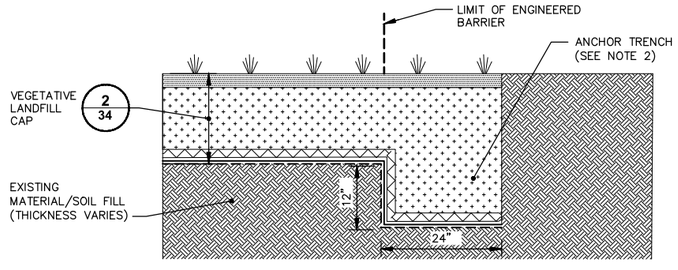


NOTE:

1. TYPE II RIPRAP SHALL MEET THE QUALITY AND GRADATION REQUIREMENTS FOR MHD M2.02.4-MODIFIED ROCK FILL.

VEGETATIVE LANDFILL CAP TERMINATION 5

NOT TO SCALE

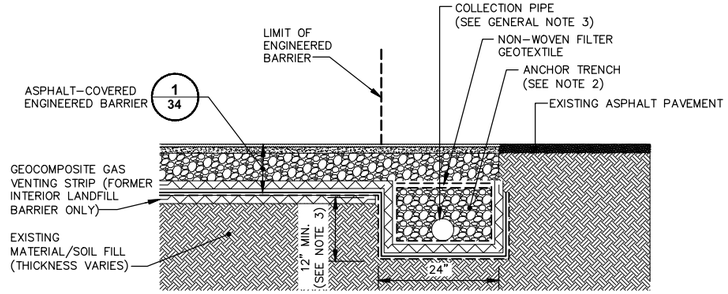


NOTES:

1. THIS DETAIL IS APPLICABLE TO AT-GRADE COVER TERMINATIONS WITHOUT COLLECTION PIPES (EXCEPT AS INDICATED IN NOTE 3).
2. ANCHOR TRENCH SHALL BE BACKFILLED WITH CLEAN SOIL FILL.
3. THE ANCHOR TRENCH AT THE NORTHWEST CORNER OF THE VEGETATIVE LANDFILL CAP (BETWEEN THE ASPHALT-COVERED ENGINEERED BARRIER AND THE DRAINAGE SWALE) SHALL INCLUDE A 6"COLLECTION PIPE PER DRAWING 14 AND DETAIL 7 ON DRAWING 34.

ANCHOR TRENCH 6

NOT TO SCALE

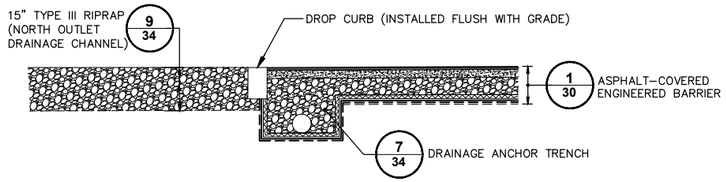


NOTES:

1. THIS DETAIL IS APPLICABLE TO COVER TERMINATIONS WITH COLLECTION PIPES.
2. ANCHOR TRENCH SHALL BE BACKFILLED WITH FILTER STONE WRAPPED IN NON-WOVEN FILTER GEOTEXTILE OVERLAPPED THE FULL WIDTH OF THE TRENCH.
3. ANCHOR TRENCH DEPTH MAY EXCEED 12-INCH MINIMUM AS NECESSARY TO ACHIEVE COLLECTION PIPE INVERTS SHOWN ON DRAWINGS 14 AND 28.
4. COLLECTION PIPE SHALL BE 6"ø PIPE FOR ANCHOR TRENCHES IN FORMER INTERIOR LANDFILL AND 4"ø PIPE FOR ANCHOR TRENCHES ON PARCEL L12-1-5. COLLECTION PIPES SHALL BE PERFORATED SMOOTH INTERIOR CORRUGATED HDPE. COLLECTION PIPE FITTINGS, ELBOWS, AND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

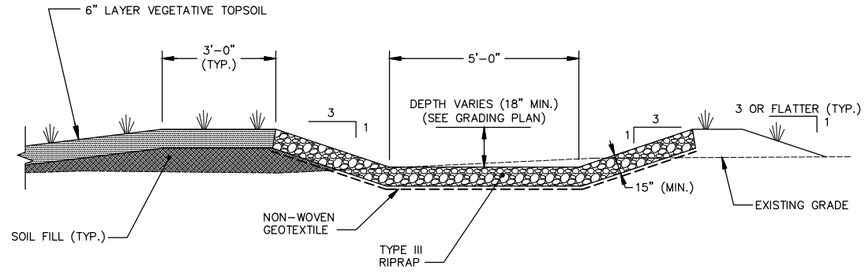
DRAINAGE ANCHOR TRENCH 7

NOT TO SCALE



ASPHALT-COVERED BARRIER TERMINATION AT NORTH DRAINAGE OUTLET 8

NOT TO SCALE



PARKING LOT NORTH OUTLET DRAINAGE CHANNEL 9

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State: -	Date Signed:	Project Mgr.: CRA
Designed by: THL	Drawn by: BKD	Checked by: MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

ENGINEERED BARRIER / LANDFILL CAP DETAILS

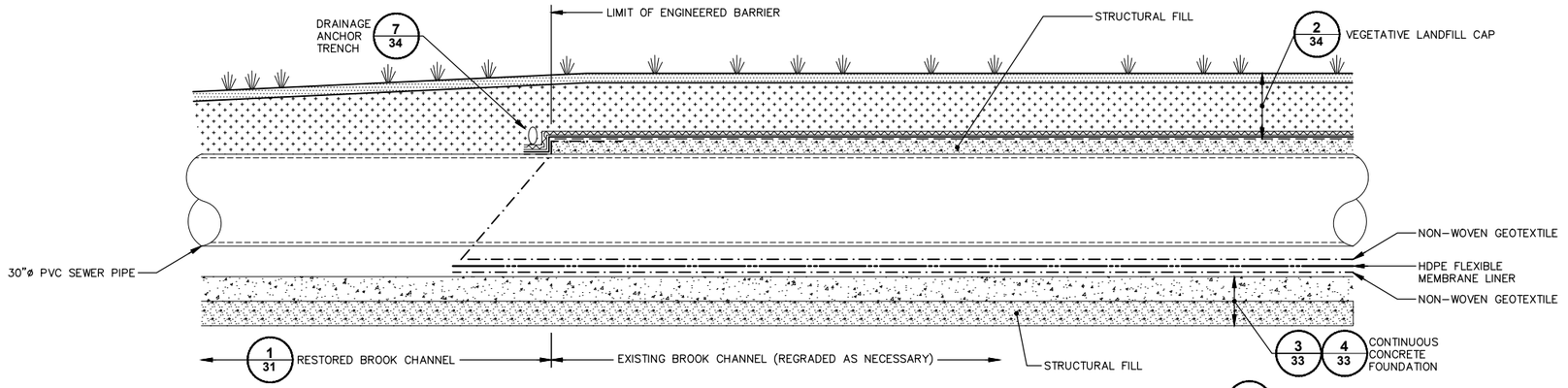
TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006

Date: APRIL 2014

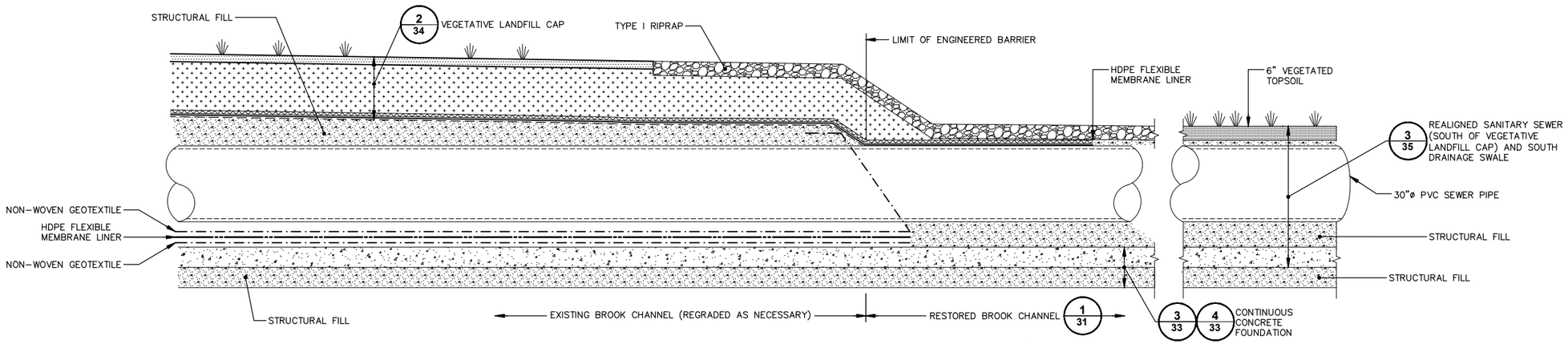
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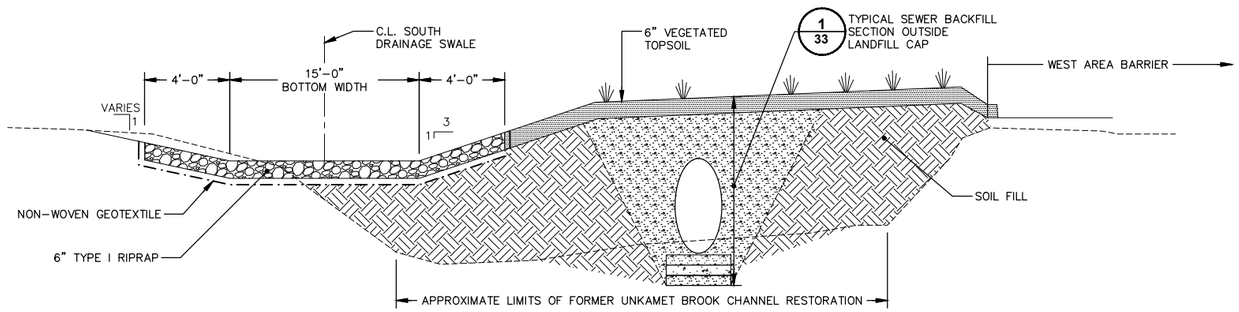
VEGETATIVE LANDFILL CAP TERMINATION AT NORTH DRAINAGE SWALE 1

NOT TO SCALE



VEGETATIVE LANDFILL CAP TERMINATION AT SOUTH DRAINAGE SWALE 2

NOT TO SCALE



REALIGNED SANITARY SEWER (SOUTH OF VEGETATIVE LANDFILL CAP) AND SOUTH DRAINAGE SWALE 3

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State: -	Date Signed	Project Mgr.: CRA
Designed by: JPM	Drawn by: BKD	Checked by: MED

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

ENGINEERED BARRIER / LANDFILL CAP DETAILS

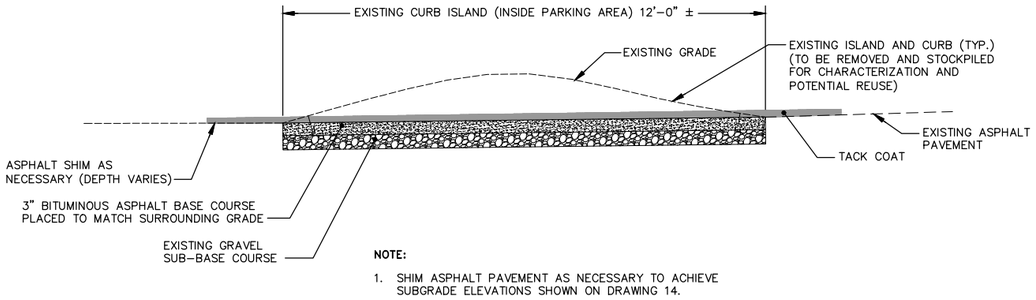
TECHNICAL DRAWINGS

ARCADIS Project No.: B0040190.0002.00006

Date: APRIL 2014

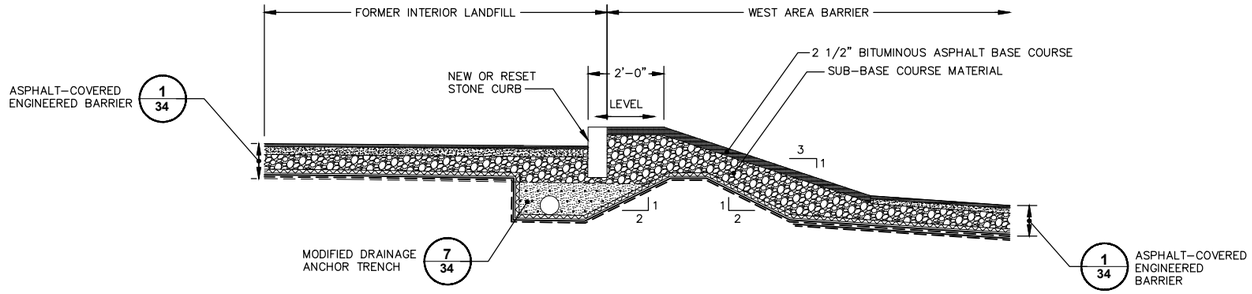
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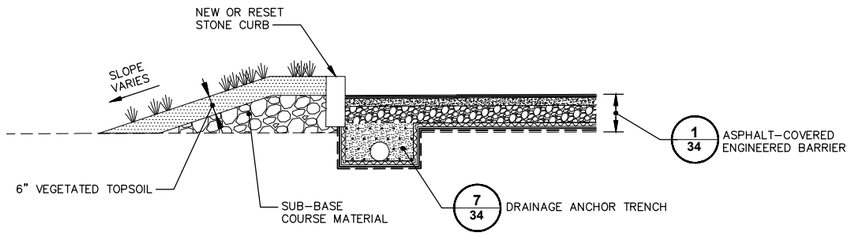
CURB ISLAND REMOVAL & RESTORATION DETAIL 1

0 2' 4'
SCALE: 1/2"=1'-0"



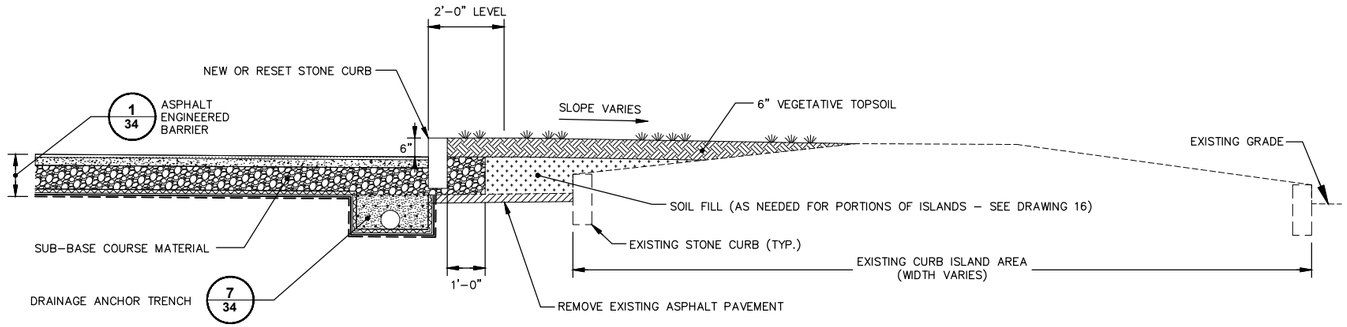
ASPHALT-COVERED BARRIER TERMINATION AT WEST AREA BARRIER 2

0 2' 4'
SCALE: 1/2"=1'-0"



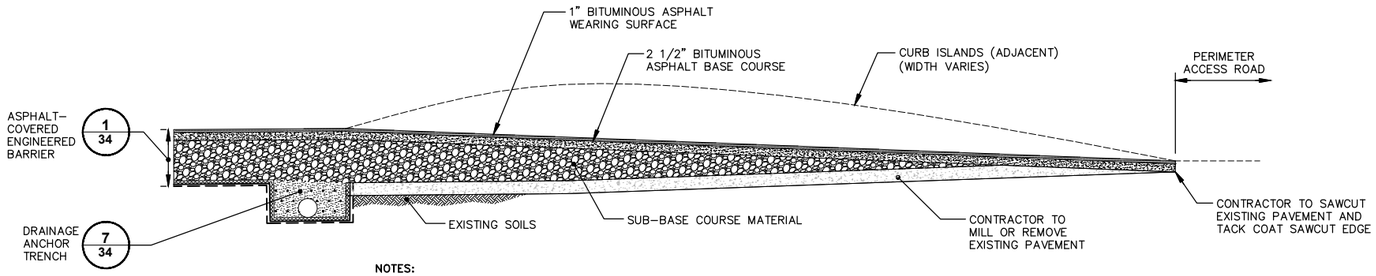
ASPHALT-COVERED BARRIER TERMINATION 3

0 2' 4'
SCALE: 1/2"=1'-0"



CURB ISLAND TERMINATION DETAIL 4

NOT TO SCALE

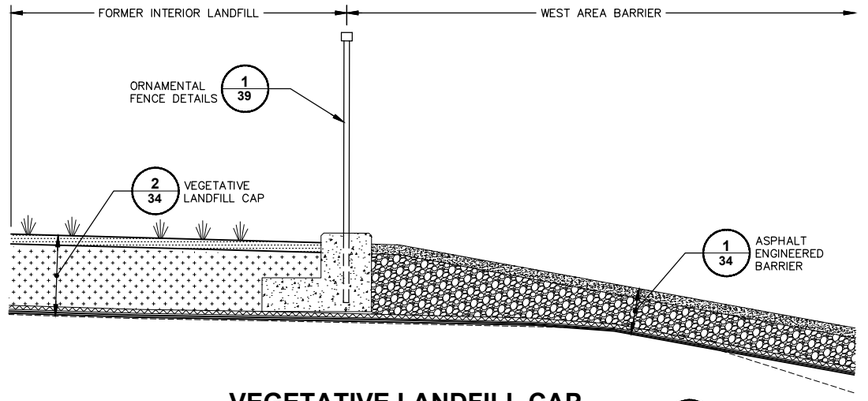


NOTES:

1. ALL SURFACES WHERE EXISTING PAVEMENT IS TO BE OVERLAYED SHALL BE CLEANED AND TACK-COATED PRIOR TO HOT MIX ASPHALT PLACEMENT.
2. FEATHER OUT USING TOP COURSE OR OTHER APPROPRIATE BITUMINOUS CONCRETE MATERIAL.

DRIVEWAY TERMINATION DETAIL 5

NOT TO SCALE



VEGETATIVE LANDFILL CAP TERMINATION AT WEST AREA BARRIER 6

NOT TO SCALE

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

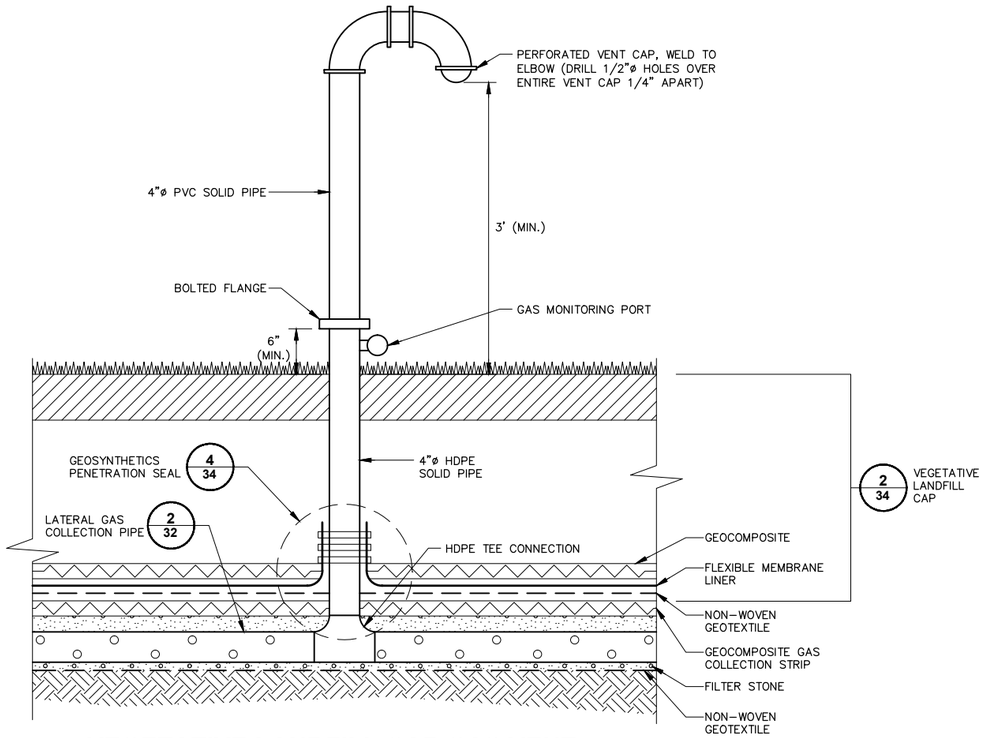
ENGINEERED BARRIER / LANDFILL CAP DETAILS

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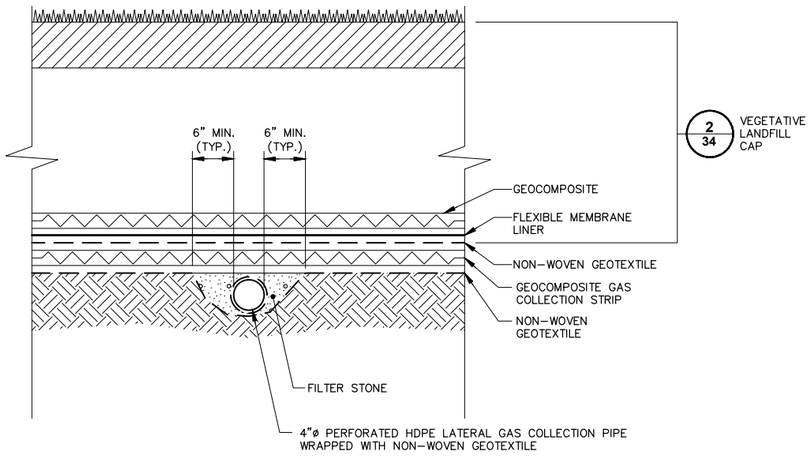
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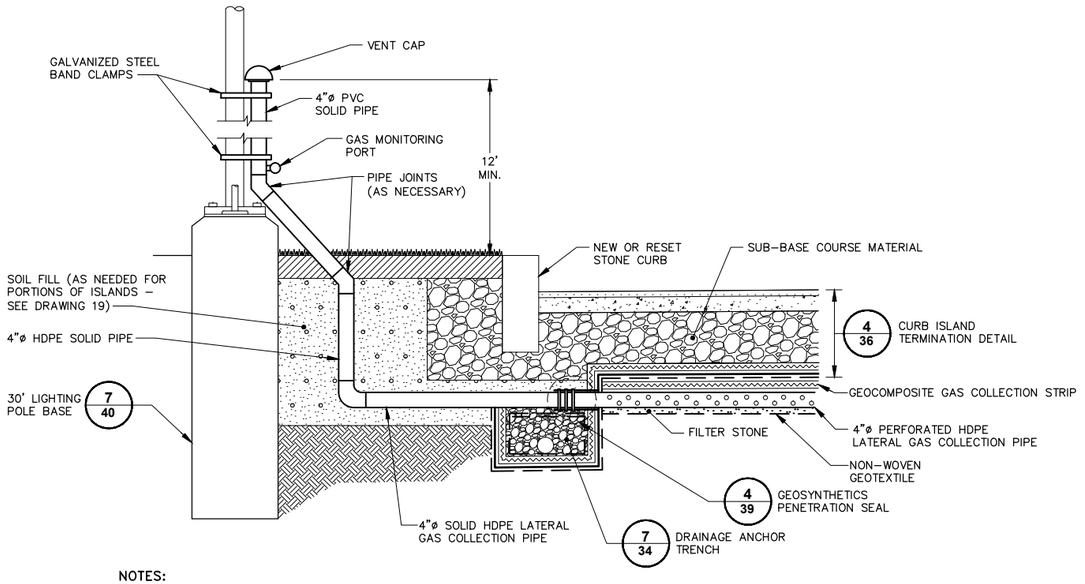
VEGETATIVE LANDFILL CAP GAS VENT WITH LATERAL COLLECTION PIPE 1

NOT TO SCALE



VEGETATIVE LANDFILL CAP GAS VENT LATERAL GAS COLLECTION PIPE 2

NOT TO SCALE

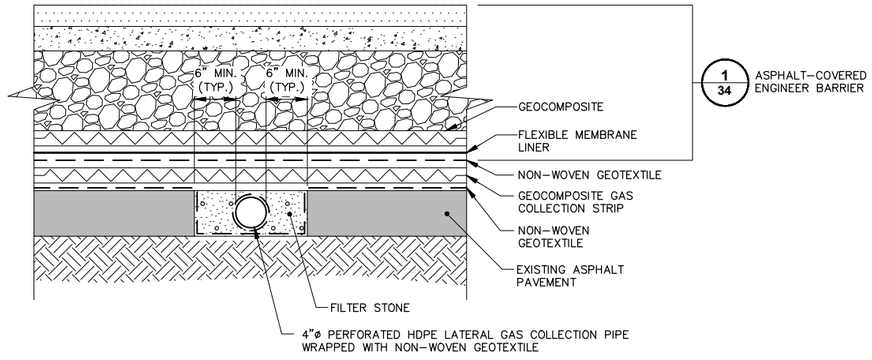


NOTES:

1. REFER TO DRAWING 14 FOR LOCATION OF GAS VENTS.
2. EXTRA GEOMEMBRANE MATERIAL SHALL BE PROVIDED AT THE VERTICAL PENETRATION TO ACCOMMODATE SETTLEMENT AND EXPANSION.
3. ABOVE GROUND GAS VENT PIPING SHALL BE PAINTED TO CLOSELY MATCH LIGHTING POLE FINISH.

GAS VENT WITH LATERAL COLLECTION PIPE 3

NOT TO SCALE



ASPHALT-COVERED ENGINEERED BARRIER GAS VENT LATERAL GAS COLLECTION PIPE 4

NOT TO SCALE

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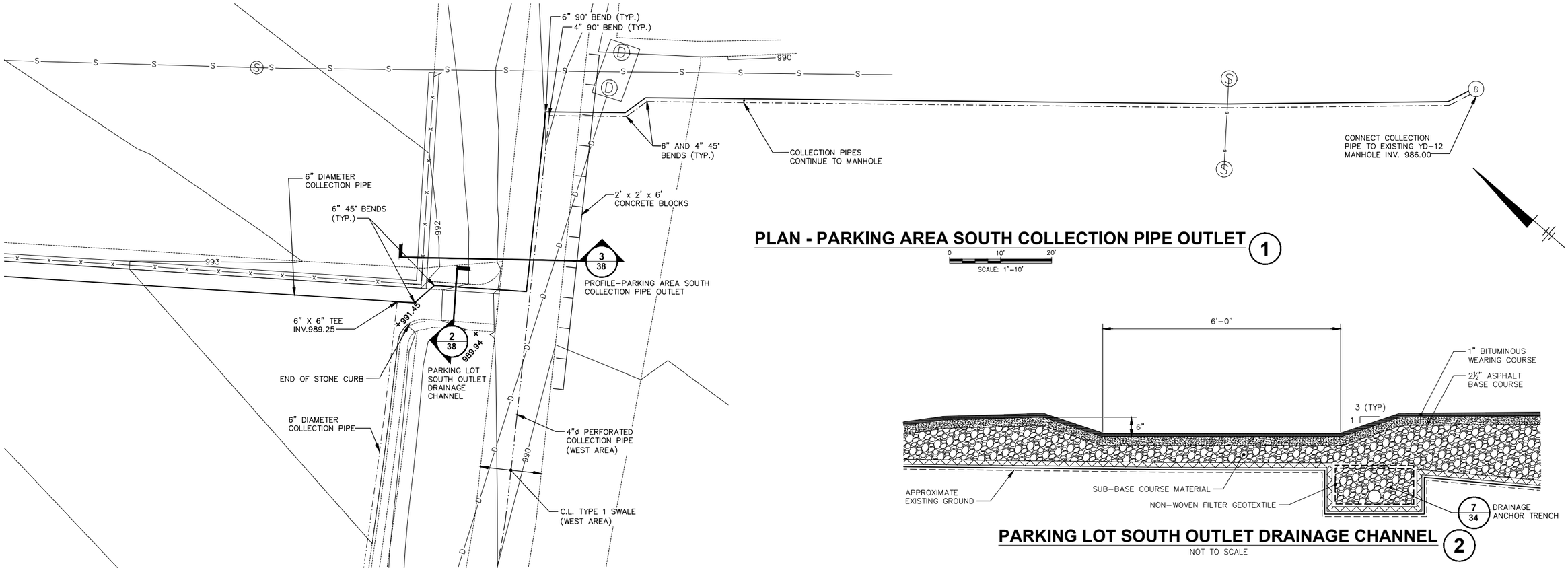
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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

ENGINEERED BARRIER / LANDFILL CAP DETAILS

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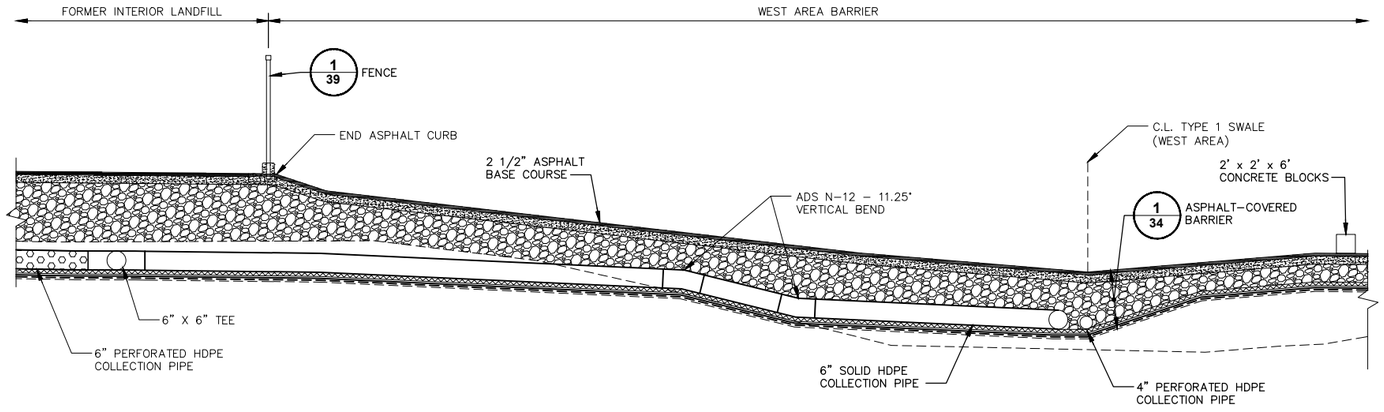


PLAN - PARKING AREA SOUTH COLLECTION PIPE OUTLET 1

0 10' 20'
SCALE: 1"=10'

PARKING LOT SOUTH OUTLET DRAINAGE CHANNEL 2

NOT TO SCALE



PROFILE-PARKING AREA SOUTH COLLECTION PIPE OUTLET 3

NOT TO SCALE

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-		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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ENGINEERED BARRIER / LANDFILL CAP DETAILS

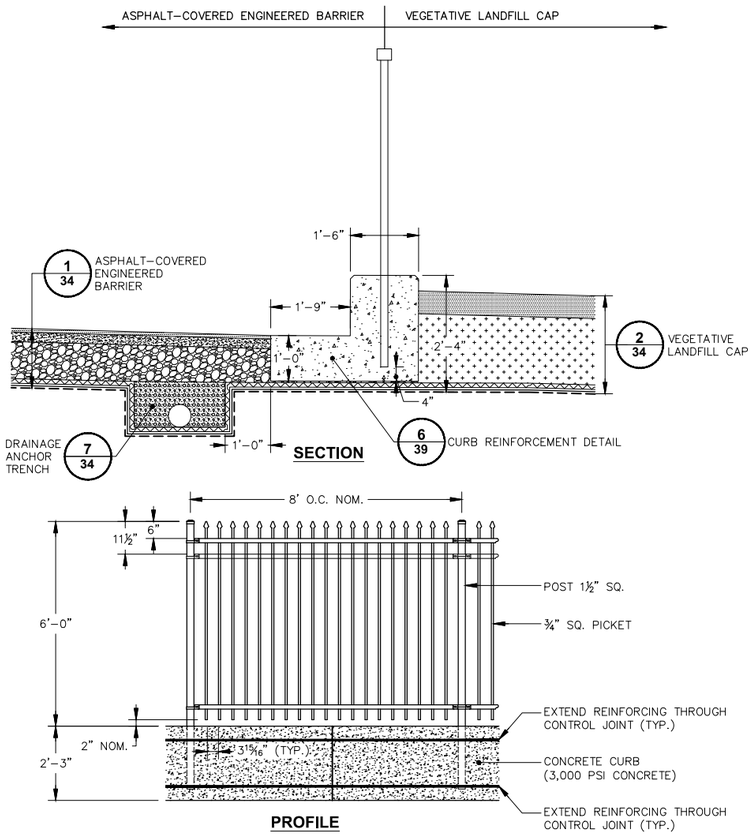
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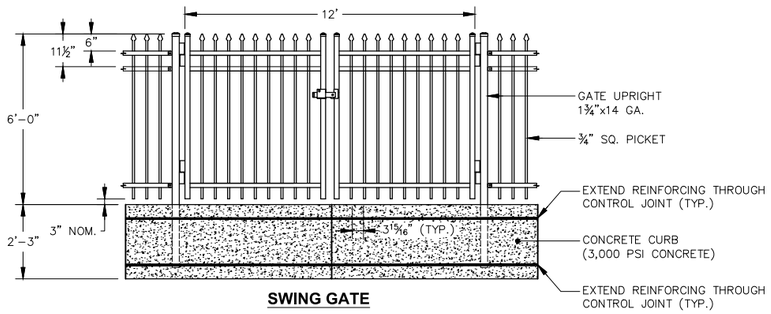
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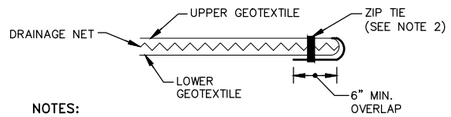


NOTES:

1. DRAINAGE COLLECTION TRENCH SHALL BE BACKFILLED WITH FILTER STONE WRAPPED IN NON–WOVEN FILTER GEOTEXTILE OVERLAPPED THE FULL WIDTH OF THE TRENCH.
2. COLLECTION PIPE SHALL BE 6"ø PIPE AND PERFORATED SMOOTH INTERIOR CORRUGATED HDPE. COLLECTION PIPE FITTINGS, ELBOWS, AND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONTROL JOINTS TO BE CENTERED BETWEEN FENCE POSTS.

ENGINEERED BARRIER/LANDFILL CAP TRANSITION AND ORNAMENTAL FENCE DETAILS 1

NOT TO SCALE

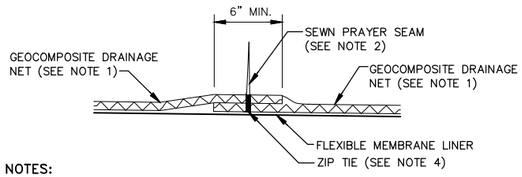


NOTES:

1. DRAINAGE NET AND LOWER GEOTEXTILE SHALL BE CUT SO THAT THE UPPER GEOTEXTILE MAY BE WRAPPED AROUND THE END OF THE GEOCOMPOSITE.
2. ZIP TIES SHALL BE PLACED EVERY 5 FEET ALONG THE EDGES OF THE GEOCOMPOSITE.

GEOCOMPOSITE TERMINATION 2

NOT TO SCALE

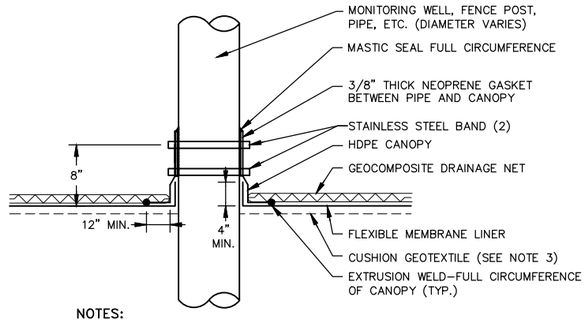


NOTES:

1. ALL GEOCOMPOSITE SHALL SHINGLE DOWNSLOPE.
2. THE UPPER GEOTEXTILE COMPONENTS OF THE GEOCOMPOSITE LAYER SHALL BE OVERLAPPED SO THAT A PRAYER SEAM MAY BE SEWN ABOVE THE GEOCOMPOSITE OVERLAP.
3. IF GEOTEXTILE IS UNABLE TO BE OVERLAPPED WITHOUT CAUSING DAMAGE, A PATCH OF GEOTEXTILE SHALL BE HEAT BONDED TO THE TOP GEOTEXTILE LAYER OVER THE SEAM.
4. ZIP TIES SHALL BE PLACED EVERY 5 FEET ALONG ADJACENT PANELS AND EVERY 6 INCHES ALONG BUTT SEAMS AND IN ANCHOR TRENCHES.

TYPICAL GEOCOMPOSITE SEAM 3

NOT TO SCALE

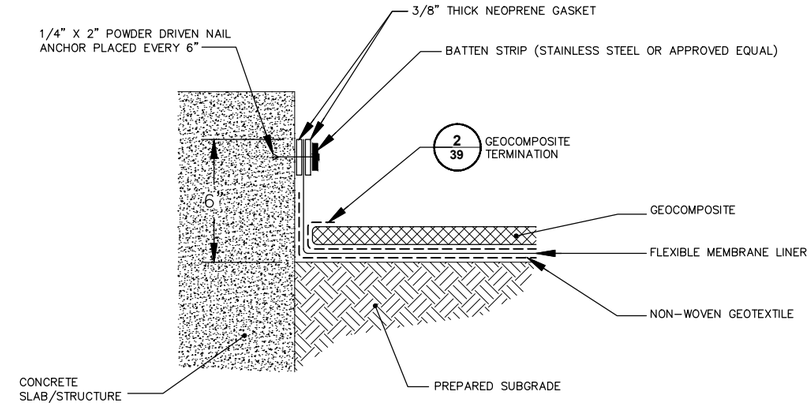


NOTES:

1. CERTAIN ENGINEERED BARRIER COVER MATERIALS (E.G., SOIL FILL, ASPHALT) NOT SHOWN FOR CLARITY.
2. DETAIL MAY BE USED FOR OTHER PENETRATIONS THROUGH THE GEOSYNTHETICS (SUBJECT TO APPROVAL BY GE/GE'S REPRESENTATIVE).
3. CUSHION GEOTEXTILE IS REQUIRED WHERE ENGINEERED BARRIER IS INSTALLED ABOVE EXISTING SOIL/PAVEMENT.

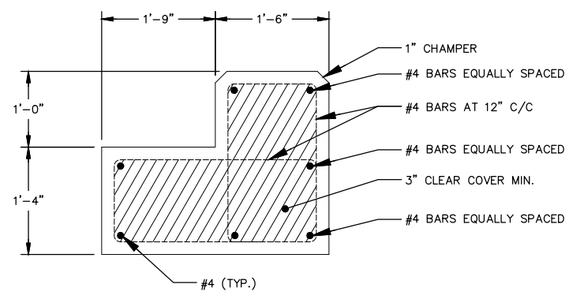
GEOSYNTHETICS PENETRATION SEAL 4

NOT TO SCALE



GEOMEMBRANE/CONCRETE ANCHOR 5

NOT TO SCALE



CURB REINFORCEMENT DETAIL 6

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		CRA
Designed by	Drawn by	Checked by
THL	BKD	MED

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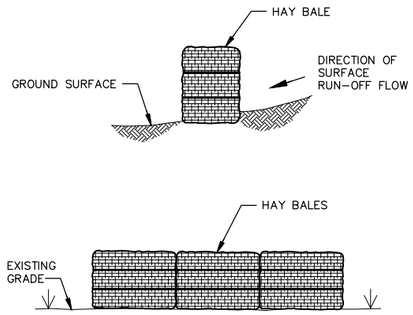
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TECHNICAL DRAWINGS

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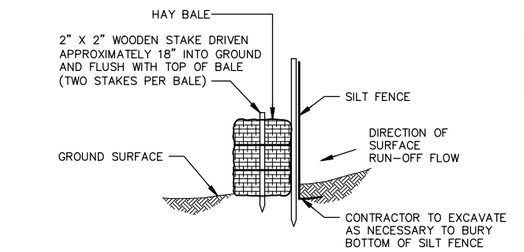
39



NOTES:

1. UNTIL SUCH TIME THAT ALL RESPONSE ACTIONS HAVE BEEN COMPLETED AND BACKFILL MATERIAL HAS BEEN PLACED IN ALL AREAS, SILT ACCUMULATIONS ADJACENT TO EROSION CONTROL MEASURES SHALL BE IMMEDIATELY REMOVED AND DISPOSED WITH SOILS SUBJECT TO TRANSPORT AND DISPOSAL.
2. THE CONTRACTOR SHALL INSPECT INSTALLATION AND REMOVE SILT AND OTHER DEBRIS AS IT ACCUMULATES AS NECESSARY TO PREVENT DAMAGE TO THE HAY BALE AND TO MAINTAIN EFFECTIVE USE.
3. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE HAY BALES UNTIL RESTORATION ACTIVITIES ARE COMPLETE (AS DETERMINED BY GE).
4. FOR HAY BALES PLACED ON ASPHALT, NO WOODEN STAKES SHALL BE USED. CLEAN FILL SHALL BE MOUNDED AGAINST THE BACKSIDE OF THE HAY BALE.
5. HAY BALES WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE/GE'S REPRESENTATIVE. CONTRACTOR SHALL RESTORE SURFACE COVER.

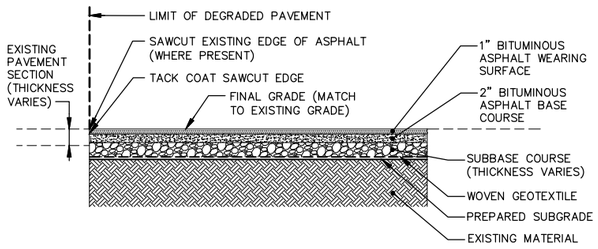
HAY BALE 1
NOT TO SCALE



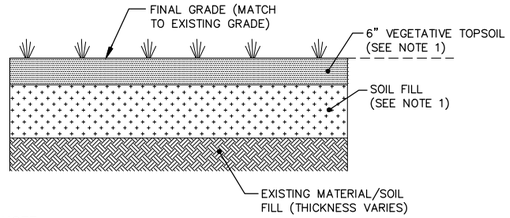
NOTES:

1. UNTIL SUCH TIME THAT ALL RESPONSE ACTIONS HAVE BEEN COMPLETED AND BACKFILL MATERIAL HAS BEEN PLACED IN ALL AREAS, SILT ACCUMULATIONS ADJACENT TO EROSION CONTROL MEASURES SHALL BE IMMEDIATELY REMOVED AND DISPOSED WITH SOILS SUBJECT TO TRANSPORT AND DISPOSAL.
2. THE CONTRACTOR SHALL INSPECT INSTALLATION AND REMOVE SILT AND OTHER DEBRIS AS IT ACCUMULATES AS NECESSARY TO PREVENT DAMAGE TO THE HAYBALE/SILT FENCE AND TO MAINTAIN EFFECTIVE USE.
3. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE HAY BALES/SILT FENCING UNTIL RESTORATION ACTIVITIES ARE COMPLETE (AS DETERMINED BY GE).
4. FOR HAY BALES PLACED ON ASPHALT, NO WOODEN STAKES SHALL BE USED. CLEAN FILL SHALL BE MOUNDED AGAINST THE BACKSIDE OF THE HAY BALE. SILT FENCE WILL NOT BE USED ON/ACROSS PAVED AREAS.
5. HAY BALES/SILT FENCING WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE/GE'S REPRESENTATIVE. CONTRACTOR SHALL RESTORE SURFACE COVER.

HAY BALE/SILT FENCE 2
NOT TO SCALE



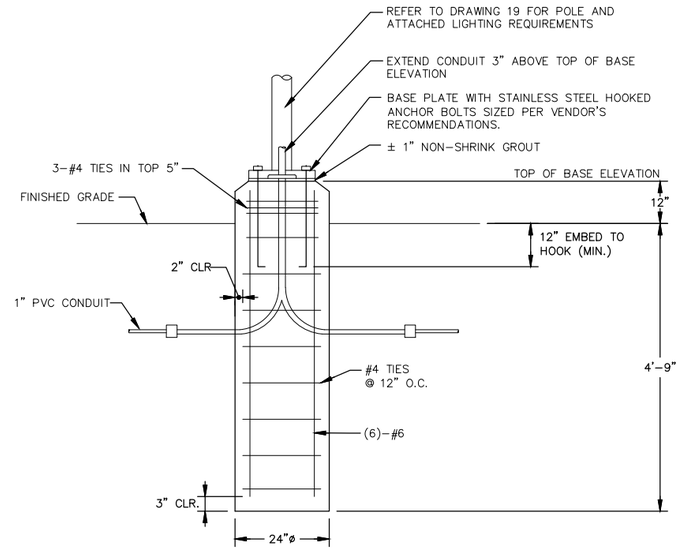
GENERAL PAVEMENT RESTORATION 4
NOT TO SCALE



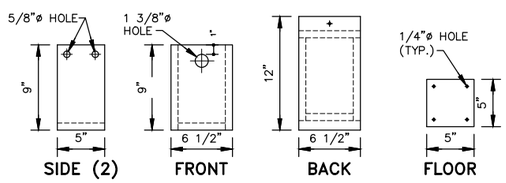
NOTE:

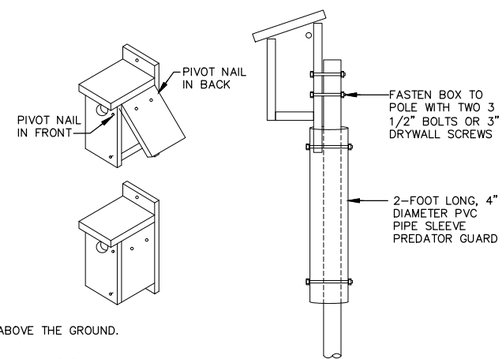
1. DETAIL IS FOR EXCAVATION GREATER THAN ONE FOOT IN DEPTH. SOIL REMOVAL AREAS THAT ARE 1-FOOT IN DEPTH SHALL BE RESTORED WITH 12 INCHES OF VEGETATED TOPSOIL ONLY.

GENERAL VEGETATIVE RESTORATION 5
NOT TO SCALE



30' LIGHTING POLE BASE DETAIL 7
NOT TO SCALE

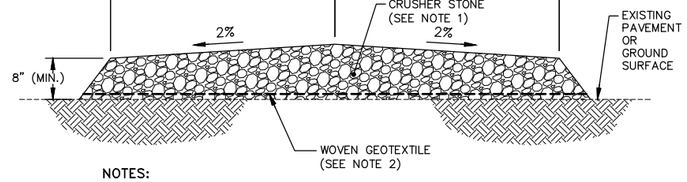




NOTES:

1. USE ONE NAIL OR SCREW AT BOTTOM TO CLOSE SIDE. NAIL OR SCREW SIDE CLOSED.
2. TWO "PIVOT" NAILS ALLOW SIDE TO SWING OUT FOR CLEANING.
3. BLUEBIRD BOX TO BE MOUNTED ON POSTS A MINIMUM OF 6 FEET (NOT TO EXCEED 15 FEET) ABOVE THE GROUND.

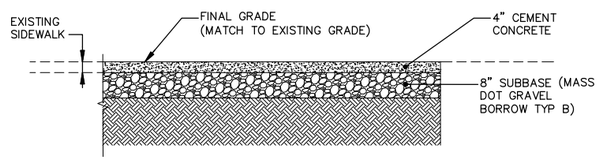
BLUEBIRD BOX AND PREDATOR GUARD DETAIL 3
NOT TO SCALE



NOTES:

1. CRUSHED STONE SHALL BE M2.01.7 DENSE GRADED CRUSHED IN ACCORDANCE WITH MASSACHUSETTS DEPARTMENT OF HIGHWAYS.
2. WOVEN GEOTEXTILE SHALL MEET AASHTO M288-05 CLASS I SURVIVABILITY REQUIREMENTS FOR SEPARATION GEOTEXTILES, SUCH AS TENCATE MIRAFI 600X OR EQUIVALENT.

TEMPORARY GRAVEL ACCESS ROAD 8
NOT TO SCALE



NOTE:

1. CONCRETE SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 701.61 OF THE MASS DOT STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES.

CONCRETE SIDEWALK RESTORATION 6
NOT TO SCALE

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ PM: C.AVERILL TM: M.DALEY
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Professional Engineer's Name		
-		
Professional Engineer's No.		
-		
State	Date Signed	Project Mgr. CRA
Designed by THL	Drawn by BKD	Checked by MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

MISCELLANEOUS DETAILS

TECHNICAL DRAWINGS

ARCADIS Project No. B0040190.0002.00006

Date APRIL 2014

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CITY: SYRACUSE DIV/GROUP: 141/ENV DB: B. DECLERCQ PM: C.AVERILL TM: M.DALEY
V:\ENVCAD\SYRACUSE\ACTIVITIES\B0040190\0002\00006\DWG\FINAL-REM-CONTRACT\40190G40-41.DWG LAYOUT: 41 SAVED: 4/14/2014 2:07 PM PAGESETUP: ---
XREFS: PROJECTNAME: ---
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GENERAL NOTES - DRAWINGS 1 THROUGH 40

1. THE SOILS AND SEDIMENTS SUBJECT TO EXCAVATION AND HANDLING POTENTIALLY CONTAIN PCBs AND OTHER HAZARDOUS CONSTITUENTS AND SHOULD BE HANDLED/TRANSPORTED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES AND SUBCONTRACTORS.

2. LOCATIONS OF UNDERGROUND UTILITIES AND STRUCTURES ARE APPROXIMATE AND NOT ALL SURFACE/SUBSURFACE SITE FEATURES MAY BE SHOWN. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL (SHOWN OR NOT SHOWN) ABOVE– AND BELOW–GROUND UTILITIES AND STRUCTURES THAT MAY EXIST WITHIN THE PROJECT LIMITS PRIOR TO COMMENCEMENT OF WORK AND PROTECT SUCH UTILITIES/STRUCTURES UNLESS OTHERWISE NOTED.

3. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES AND GE/GE'S REPRESENTATIVE FOR THE IDENTIFICATION OF UTILITIES IN THE WORK AREAS AND TEMPORARY PROTECTION OF (AND/OR REMOVAL AND REPLACEMENT, AS NECESSARY, AS DETERMINED BY THE APPROPRIATE UTILITY COMPANY) ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF SOIL/SEDIMENT REMOVAL.

4. THE DRAWINGS MAY NOT INDICATE ALL STRUCTURES/FEATURES SUBJECT TO PROTECTION/REPLACEMENT AS PART OF SITE REMEDIATION ACTIVITIES. THIS WILL NOT RELIEVE THE CONTRACTOR FROM PROTECTING OR REMOVING AND REPLACING (IF NECESSARY) ANY AND ALL SUCH ITEMS AS NECESSARY TO IMPLEMENT THE REMEDIATION ACTIVITIES AT NO ADDITIONAL COST TO GE.

5. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE MEASURES TO AVOID DAMAGE TO STRUCTURES/FEATURES AND VEGETATION THAT ARE NOT SUBJECT TO REMOVAL AND REPLACEMENT AS PART OF THIS CONTRACT. THE CONTRACTOR SHALL REPAIR ANY STRUCTURAL OR EXTERNAL DAMAGES TO SUCH STRUCTURES/FEATURES AND VEGETATION AT NO ADDITIONAL COST TO GE.

6. THE CONTRACTOR SHALL COORDINATE SITE ACTIVITIES TO AVOID INFRINGEMENT UPON COMMERCIAL, BUSINESS, AND NORMAL TRAFFIC FLOW WITHIN PARKING LOTS AND ON ADJACENT ROADWAYS.

7. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL USING LICENSED SURVEYORS TO VERIFY EXISTING (PRE–CONSTRUCTION) GRADES, POST–EXCAVATION ELEVATIONS/DEPTHS, SUBGRADE ELEVATIONS FOR THE ENGINEERED BARRIERS/LANDFILL CAP, AND FINAL (RESTORED) GRADES. GE WILL IDENTIFY LOCATION(S) AND ELEVATION(S) OF SUITABLE BENCHMARKS TO BE USED FOR SURVEY CONTROL. THE CONTRACTOR MUST PROVIDE SURVEY BY A LICENSED SURVEYOR (FOR VERIFICATION BY GE/GE'S REPRESENTATIVE) PRIOR TO INITIATING SUBSEQUENT PHASES OF WORK (E.G., BACKFILLING EXCAVATIONS, INSTALLING ENGINEERED BARRIERS/LANDFILL CAP GEOSYNTHETICS, ETC.). ANY REWORK REQUIRED DUE TO LACK OF SURVEY VERIFICATION BY GE/GE'S REPRESENTATIVE WILL BE AT NO ADDITIONAL COST TO GE.

8. ABOVE–GROUND PORTIONS OF ITEMS SUBJECT TO REMOVAL AND REPLACEMENT TO ACCOMMODATE EXCAVATION ACTIVITIES (I.E., FENCING, GUARDRAILS, ETC.) MAY BE SALVAGED FOR REUSE UPON APPROVAL BY GE. APPROVED SALVAGED MATERIALS MAY BE USED ONCE CLEANED/DECONTAMINATED (AS NECESSARY), WHEN RECONSTRUCTING THESE ITEMS. BELOW–GRADE COMPONENTS AND/OR COMPONENTS THAT HAVE CONTACTED SOILS SUBJECT TO EXCAVATION SHALL BE HANDLED AND DISPOSED OF WITH THE ASSOCIATED SOILS. ALL SUCH ITEMS SHALL BE BROKEN INTO SUFFICIENTLY SMALL PIECES (IF NECESSARY) TO BE ACCEPTABLE FOR OFF–SITE TRANSPORT AND DISPOSAL WITH THE SOILS. BELOW–GRADE COMPONENTS (AND ABOVE–GRADE PORTIONS THAT COULD NOT BE SALVAGED) SHALL BE REPLACED AS PART OF SITE RESTORATION ACTIVITIES.

9. THE CONTRACTOR SHALL PROVIDE A WATER TRUCK AND APPROPRIATE EQUIPMENT FOR DUST SUPPRESSION WITHIN SOIL/SEDIMENT EXCAVATION, STAGING, AND LOADING AREAS. THESE AREAS SHALL BE WATERED BASED ON VISUAL OBSERVATIONS, THE RESULTS OF PERIMETER AIR MONITORING ACTIVITIES, AND/OR DIRECTION BY GE/GE'S REPRESENTATIVE. IF FOLLOWING MEASURES TO MITIGATE WINDBORNE MIGRATION OF PARTICULATE MATTER, DUST FROM THE WORK ZONE IS STILL VISIBLY AIRBORNE, THE CONTRACTOR SHALL IMMEDIATELY DISCONTINUE OPERATIONS UNTIL SUCH MEASURES ARE EFFECTIVE, OR CONDITIONS CHANGE SUCH THAT WINDBORNE MIGRATION OF PARTICULATES CEASES.

10. ON A DAILY BASIS, THE CONTRACTOR SHALL ENSURE PERIMETER AIR MONITORING (TO BE PERFORMED BY OTHERS) IS BEING PERFORMED PRIOR TO AND DURING EXCAVATION OR OTHER SOIL/SEDIMENT HANDLING ACTIVITIES.

11. THE LIMITS OF SOIL AND SEDIMENT REMOVAL AND ENGINEERED BARRIER/LANDFILL CAP CONSTRUCTION SHOWN ON THE TECHNICAL DRAWINGS REPRESENT THE REQUIRED REMEDIATION ACTIVITIES NECESSARY TO ACHIEVE THE REMOVAL ACTION OUTCOME. ADDITIONAL REMOVAL (BEYOND THAT SHOWN) MAY BE REQUIRED TO FACILITATE CONSTRUCTION ACCESS, RESTORATION, ETC.

12. THE HORIZONTAL LIMITS OF EXCAVATION ACTIVITIES SHALL BE PHYSICALLY DELINEATED IN THE FIELD BY THE CONTRACTOR. WITHIN THESE LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE EXCAVATION ACTIVITIES IN ACCORDANCE WITH OSHA REQUIREMENTS AND VERIFYING, BY SURVEY PERFORMED BY THE CONTRACTOR'S LICENSED SURVEYOR AND SUBMITTED FOR APPROVAL BY EPA AND GE/GE'S REPRESENTATIVE, THE SPECIFIED DEPTH OR ELEVATION OF EXCAVATION PRIOR TO BACKFILLING EXCAVATIONS AND/OR INSTALLING ENGINEERED BARRIER/LANDFILL CAP GEOSYNTHETICS.

13. THE CONTRACTOR MAY CONSTRUCT TEMPORARY STOCKPILES FOR EXCAVATED MATERIALS AT AREAS AND OF VOLUMES APPROVED BY GE/GE'S REPRESENTATIVE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING PERIMETER EROSION AND SEDIMENT CONTROL MEASURES (IN THE FORM OF SILT FENCING AND/OR HAY BALES WHERE APPROPRIATE), RUN–ON/RUN–OFF WATER COLLECTION AND CONTROL MEASURES, AND DUST SUPPRESSION MEASURES IN STOCKPILE AREAS. THE CONTRACTOR MAY STOCKPILE EXCAVATED MATERIALS IN FOUR DISTINCT TYPES OF TEMPORARY STOCKPILE AREAS: INSIDE BUILDINGS; IN THE PARKING LOT PORTION OF FORMER INTERIOR LANDFILL SUBJECT TO ENGINEERED BARRIER INSTALLATION; OUTDOOR AREAS SUBJECT TO FUTURE EXCAVATION; AND OUTDOOR AREAS NOT SUBJECT TO FUTURE EXCAVATION OR ENGINEERED BARRIER PLACEMENT. TSCA AND/OR RCRA MATERIALS MAY BE PLACED IN LINED, BERMED STOCKPILES WITHIN BUILDINGS 65 OR 14 (NO COVER REQUIRED) OR DIRECTLY ON TOP OF MATERIALS SUBJECT TO FUTURE EXCAVATION WITH SIMILAR TSCA/RCRA CHARACTERISTICS.
NON–TSCA/NON–RCRA MATERIALS MAY BE PLACED IN LINED, BERMED STOCKPILES LOCATED OUTSIDE BUILDINGS AND AREAS SUBJECT TO FUTURE EXCAVATION. SUCH SOILS MAY ALSO BE STOCKPILED DIRECTLY ON TOP OF MATERIALS SUBJECT TO FUTURE EXCAVATION WITH SIMILAR NON–TSCA/NON–RCRA CHARACTERISTICS. COVERS MUST BE PLACED OVER ALL EXTERIOR STOCKPILES WHEN ACTIVE STOCKPILING OR LOADING OF MATERIALS IS NOT ONGOING. ANY DEWATERED LIQUIDS MUST BE COLLECTED AND TRANSPORTED TO GE'S BUILDING 64G WATER TREATMENT FACILITY. REFER TO SECTION 5.3.5 OF THE FINAL WORK PLAN FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH THE USE OF TEMPORARY STOCKPILES FOR EXCAVATED MATERIALS.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE TRANSPORTATION OF ALL EXCAVATED/REMOVED MATERIALS (BY OTHERS) TO AN APPROPRIATE GE–APPROVED OFF–SITE DISPOSAL FACILITY(IES).

15. THE CONTRACTOR SHALL INSTALL AN INTERIM COVER (E.G., POLYETHYLENE SHEETING) OVER WORK AREAS WHERE EXCAVATION ACTIVITIES HAVE BEEN INITIATED BUT ARE NOT YET COMPLETED. THE INTERIM COVER SHALL BE PROPERLY ANCHORED TO RESIST WIND FORCES AND PREVENT STORM WATER FROM ENTERING SUCH WORK AREAS.

16. THE CONTRACTOR SHALL OBTAIN ALL APPROPRIATE BUILDING PERMITS ASSOCIATED WITH THE ACTIVITIES DESCRIBED HEREIN.

17. DRIVEWAYS, CONCRETE SURFACES, AND/OR OTHER ITEMS SUBJECT TO REMOVAL AND REPLACEMENT SHALL BE RECONSTRUCTED TO SIMILAR DIMENSIONS AND APPEARANCE AS THE ORIGINAL ITEM UNLESS OTHERWISE DIRECTED BY GE. RESTORATION SHALL MEET ALL LOCAL AND/OR STATE BUILDING CODES.

18. UPON BACKFILLING OF EXCAVATED AREAS, THE CONTRACTOR SHALL MAINTAIN IN PLACE OR INSTALL ADDITIONAL EROSION CONTROLS IN THE LOCATIONS INDICATED ON THE DRAWINGS. THE EROSION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE/GE'S REPRESENTATIVE.

19. BACKFILLED AND RESTORED AREAS WILL BE SUBJECT TO FINAL SURVEY VERIFICATION (BY THE CONTRACTOR'S LICENSED SURVEYOR). THE CONTRACTOR SHALL REPAIR ANY ITEMS THAT ARE NOT RESTORED TO THE LOCATIONS AND/OR ELEVATIONS REQUIRED BY THIS CONTRACT.

20. THE CONTRACTOR SHALL RESTORE TO PRE–REMEDIATION CONDITIONS ALL SUPPORT AREAS THAT ARE IMPACTED BY REMEDIATION ACTIVITIES, INCLUDING EQUIPMENT AND MATERIALS STORAGE AREAS, SOIL/SEDIMENT LOADING AND STAGING AREAS, AND PARKING AREAS.

21. ALL EQUIPMENT OPERATED WITHIN THE LIMITS OF EXCAVATION SHALL BE CLEANED PRIOR TO USE OR STORAGE ELSEWHERE ON THE SITE OR TRANSPORT OFF–SITE. A CONTAINED/LINED WHEEL WASH AREA SHALL BE PROVIDED BY THE CONTRACTOR FOR CLEANING EXCAVATION EQUIPMENT AND/OR TRANSPORTATION VEHICLES PRIOR TO THEIR REMOVAL FROM THE WORK SITE. WATER USED TO CLEAN EQUIPMENT SHALL BE RESTRICTED TO AND COLLECTED WITHIN A DESIGNATED EQUIPMENT CLEANING AREA. ALL SUCH WATERS SHALL BE COLLECTED, CONTAINERIZED, AND TRANSPORTED (BY THE CONTRACTOR) TO GE'S BUILDING 64G WATER TREATMENT FACILITY FOR TREATMENT/DISPOSAL BY GE.

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Professional Engineer's Name
-
Professional Engineer's No.
-

State	Date Signed	Project Mgr.
-		CRA
Designed by THL	Drawn by BKD	Checked by MED

ARCADIS U.S., INC.

GENERAL ELECTRIC COMPANY ● PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER

GENERAL NOTES

TECHNICAL DRAWINGS

ARCADIS Project No.
B0040190.0002.00006

Date
APRIL 2014

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TEL. 315.446.9120

Appendix E

Technical Specifications

ARCADIS

Appendix E

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General Electric Company
Pittsfield, Massachusetts

Materials and Performance (M&P)

Section 02190	Maintenance of Sanitary Sewer Flows
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Section 02207	Restoration of Surfaces
Section 02212	Topsoil, Seeding, Planting, and Mulching
Section 02219	Geocomposite
Section 02222	Fill Materials
Section 02232	Geotextile Fabric
Section 02234	Flexible Membrane Liner
Section 02325	Helical Piles
Section 02500	Sewage and Drainage Piping Installation
Section 02514	Precast Concrete Manholes
Section 02600	Bituminous Concrete Pavements
Section 02690	Polyvinyl Chloride (PVC) Pipe
Section 02719	Ornamental Steel Fence and Gates
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MATERIALS AND PERFORMANCE – SECTION 02190

MAINTENANCE OF SANITARY SEWER FLOWS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes all materials, labor, and equipment necessary to obtain, install, maintain, operate, and remove sewage bypass systems necessary to perform the sanitary sewer re-routing activities specified in the Revised Final RD/RA Work Plan for Unkamet Brook Area - Remainder.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02500 – Sewage and Drainage Piping Installation

B. Revised Final RD/RA Work Plan, Section 5.8 – Sanitary Sewer Realignment

C. Revised Final RD/RA Work Plan, Section 7.5.10 – Sanitary Sewer Realignment

1.03 SUBMITTALS

A. Bypass Plan

1. Bypass plan for maintaining sanitary sewer flow when the flow is to be bypassed around work area.

2. The bypass plan shall be subject to review by GE and GE's Representative prior to implementation. The bypass plan shall be submitted for review a minimum of three weeks prior to proposed installation of the bypass system. No bypass operations may commence until the bypass plan has been received and reviewed by GE and GE's Representative.

3. The bypass plan shall be designed, signed, and stamped by an engineer licensed in the Commonwealth of Massachusetts.

4. The bypass plan shall, at a minimum, document the following:

a. General plan detailing the bypass system for conveyance of peak flows to downstream sewer lines.

b. Sewer plugging plan, including type, locations, and manufacturer's information for sewer plugs.

c. Number, type, and capacities of primary and standby pumps proposed.

d. Schematic drawings documenting the arrangement of the bypass pumping system, including pumps, pump sizes, pump locations, size and type of bypass piping, and configuration of pumps and pipe, including suction and discharge lines, location of plugs, etc.

e. Scheduling information on intended bypass system setup, construction operation and inspection, and restoration of flow.

f. Expected flow maintenance capacity of system as installed. Supporting calculations shall be supplied if required by the Engineer.

5. GE's and GE's Representative's receipt of bypass plan submittals does not relieve the Contractor of means, methods, and sequences of construction, requirement to convey peak flows, and safety of the operation.

1.04 EXISTING SANITARY SEWER FLOW INFORMATION

A. The following information provides GE's best estimate of projected peak sanitary sewer flow which may require bypass of flow to complete the work of the project. This information is provided to assist the Contractor in planning bypass operations and developing the bypass system. This value was based on Manning's formula for a pipe flowing at full capacity. The Contractor is alerted that the sanitary sewers are subject to significant increases in flow during wet-weather and that no guarantee is made that the information provided below represents maximum flow that will be encountered in any bypassing situation. The Contractor shall make his own inspection of conditions involved as warranted.

Sanitary Sewer Maximum Full – Flowing Capacity	= 7-8 mgd = 11-12 cfs

PART 2 - PRODUCTS

2.01 GENERAL PERFORMANCE REQUIREMENTS

A. The bypass system shall convey all sewer flows in the existing sewer pipe that is being removed, relocated, or replaced through closed conduits to the downstream line without discharge to the environment, surcharge of upstream tributary sewers, or damage to public or private property.

B. There shall be no interruption in sewer flows during the Contractor's work operations.

2.02 PUMPED SEWER BYPASS SYSTEM REQUIREMENTS

A. The bypass system shall successfully demonstrate its ability to bypass flows prior to initiating work. No sewer removal work shall begin until the capability of the bypass system is successfully demonstrated for a minimum of 15 minutes.

B. All features associated with bypass pumping, including but not limited to pumps, temporary piping, connections, and electrical services shall be provided at no additional cost to GE.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor is responsible for locating any existing utilities in the area selected for installation of the bypass system. The Contractor shall minimize the disturbance to existing utilities and coordinate with GE (who will coordinate activities with the city). The Contractor shall notify the city when it is ready to commence sewer bypass activities.

B. Upon completion of the bypass operations, the Contractor shall remove all components of the bypass system and shall restore all impacted property to pre-construction conditions or better, to the satisfaction of GE.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. All labor, materials, services, and equipment necessary to complete the earthwork activities as depicted on the Technical Drawings and/or as directed by GE or GE's Representative.

B. Earthwork is defined to include, but is not limited to, clearing, pavement removal, rough grading, excavation for subgrades, trenching, handling and disposal of surplus materials, maintenance of excavations, removal of water, backfilling operations, embankments and fills, and compaction.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02207 – Restoration of Surfaces

B. Section 02212 – Topsoil, Seeding, Planting, and Mulching

C. Section 02222 – Fill Materials

D. Revised Final RD/RA Work Plan, Section 5.3 – Soil and Sediment Removal Activities

E. Revised Final RD/RA Work Plan, Section 7.5.4 – Handling of Excavated Materials

F. Revised Final RD/RA Work Plan, Section 7.5.5 – Off-Site Transport and Disposal of Excavated Materials and Remediation-Derived Waste

G. Revised Final RD/RA Work Plan, Section 7.5.6 – Backfilling and Restoration of Soil Removal Areas

H. Revised Final RD/RA Work Plan, Section 7.5.7 – Backfilling and Restoration of Sediment Removal Areas

I. Revised Final RD/RA Work Plan, Section 7.5.8 – Backfilling and Restoration of Re-routed Brook Channel

J. Revised Final RD/RA Work Plan, Section 7.6.2 – Ambient Air Monitoring

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 [2,700 kN-m/m^3])

2. D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.04 SUBMITTALS

A. Proposed equipment and compaction method(s) provided prior to earthwork activities.

B. Results of moisture/density tests performed on fill materials (determined by ASTM D1557), in accordance with Part 3.04.C.2 of this Section.

C. Results of in-place density tests performed on fill materials (determined by ASTM D6938), in accordance with Part 3.04.C.4 of this Section.

PART 2 - PRODUCTS

Refer to Materials and Performance (M&P) – Sections 02212 (Topsoil, Seeding, Planting and Mulching) and 02222 (Fill Materials).

PART 3 - EXECUTION

3.01 UNAUTHORIZED EXCAVATION

A. The Contractor shall not be entitled to any compensation for excavations carried beyond or below the lines and subgrades prescribed on the Technical Drawings. The Contractor shall refill such unauthorized excavations at its own expense and in conformance with the provisions of this section.

B. Should the Contractor, through negligence or for reasons of its own, carry its excavation below the designated subgrade, appropriate materials (as specified in M&P – Sections 02212 [Topsoil, Seeding, Planting, and Mulching] and 02222 [Fill Materials]) shall be furnished and placed as backfill in sufficient quantities to reestablish the required subgrade surface. Fill material used for backfilling shall be spread and compacted in conformance with the requirements of this section and to the percentage compaction outlined herein. The cost of any tests required as a result of this refilling operation shall be borne by the Contractor.

C. All material that slides, falls, or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid to the Contractor for any materials ordered for refilling the void areas left by the slide, fall, or cave-in.

3.02 BACKFILL MATERIALS

A. Fill material shall be used as specified for backfill. Requirements for off-site fill material are specified in M&P – Section 02222 (Fill Materials).

B. Unless otherwise specified on the Technical Drawings or in the Final RD/RA Work Plan or directed by GE or GE's Representative, existing on-site material, designated as "native fill" or "existing soil" material, shall not be used as backfill.

3.03 GENERAL BACKFILLING REQUIREMENTS

A. Backfill shall be started at the lowest section of the area to be backfilled.

B. Drainage of the areas being backfilled shall be maintained at all times.

C. Areas to be backfilled shall be inspected and approved by GE or GE's Representative prior to backfilling operations. All unsuitable materials and debris shall be removed.

D. Backfill material shall not be placed when moisture content is too high to allow proper compaction.

E. When material is too dry for adequate compaction, water shall be added to the extent necessary.

F. Backfill material shall not be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments when placed.

G. No calcium chloride or other chemicals shall be added to prevent freezing.

H. Material incorporated in the backfilling operation that is not in satisfactory condition shall be subject to rejection and removal at the Contractor's expense.

I. The maximum lift thickness for placement of any fill material is 12 inches (measured prior to compaction), unless otherwise noted in the M&P Specifications or on the Technical Drawings.

J. For backfill placed directly over geosynthetics (i.e., in areas where engineered barriers are installed), the first lift installed above the geosynthetics shall not be less than 12 inches.

K. The Contractor shall use appropriately sized equipment and methods when placing and compacting backfill over engineered barriers so as not to damage underlying geosynthetic materials. Areas of the engineered barrier (i.e., geosynthetics) that may have been damaged during backfill installation as determined by the Contractor, GE, or GE's Representative, shall be inspected and repaired, if necessary, in accordance with the Technical Specifications at the Contractor's expense.

3.04 METHOD OF COMPACTION

A. General

1. The Contractor shall adopt compaction methods that produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support.

2. Compaction methods used shall avoid disturbance to underlying fine-grained soils, subsurface utilities, and the geosynthetics used in the engineered barriers.

3. Hydraulic compaction by ponding or jetting shall not be permitted.

4. Backfill material shall not be left in an uncompacted state at the close of a day's construction.

5. Prior to terminating work, ridges of soil left on the final layer of compacted fill, by tractors, trucks, or other equipment used for compaction, shall be eliminated using low-pressure equipment. However, soil surfaces may be left in a "tracked" condition (i.e., with parallel indentations from the tracks of tracked equipment running horizontally along the slope) for purposes of erosion and sediment control.

6. As backfill progresses, the surface shall be graded such that no ponding of water shall occur on the surface of the fill.

B. Equipment

1. Unless otherwise specified on the Technical Drawings or in the Final Work Plan, equipment for compaction shall be consistent with space limitations of the work areas and the need to protect adjacent facilities.

2. Compaction of fill material in confined areas shall be accomplished by means of a drum-type, power-driven, hand-guided vibratory compactor, or by hand-guided vibratory plate tampers.

3. If the proposed method does not produce the degree of compaction required, an alternate method shall be adopted until the required compaction is achieved.

4. The moisture content of backfill or fill material shall be adjusted, if necessary, to achieve the required degree of compaction.

C. Minimum Compaction Requirements

1. Unless otherwise specified on the Technical Drawings or in the Revised Final RD/RA Work Plan, the degree of compaction specified for the various items listed below in Table 1 shall be the minimum allowable.

2. Moisture/density tests (using ASTM D1557) shall be performed by a certified geotechnical testing laboratory on at least one sample of each fill material type delivered to the site (prior to placement). Testing shall be performed at the Contractor's expense and additional tests shall be performed if requested by GE or GE's Representative.

3. Unless the Contractor can successfully demonstrate that its methods will produce the required degree of compaction, materials to be compacted shall be placed in layers not exceeding the uncompacted thicknesses listed in Table 1.

4. In-place density tests (using ASTM D6938) shall be performed by a certified geotechnical testing laboratory at the Contractor's expense. Tests will be required at a minimum frequency of one passing test per each lift of backfill placed, one passing test per 2,500 square feet of subgrade, or one passing test per 100 cubic yards of soil fill placed, whichever results in the greatest frequency.

5. GE or GE's Representative may order additional in-place density tests to ascertain conformance with the compaction requirements shown in Table 1.

6. The Contractor shall dig test holes at no additional cost to GE when requested for the purpose of taking an in-place density test below the current fill level.

7. The Contractor shall provide free access to fill areas for the purpose of making such tests. Payment for all compaction tests shall be made by the Contractor.

8. The Contractor shall anticipate time needed due to testing procedures and shall not have claims for extra compensation occasioned by such time.

9. Minimum compaction requirements in Table 1 are expressed as a percentage of the maximum dry unit weight of the material compacted using ASTM D1557.

TABLE 1

Type of Backfill	Maximum Uncompacted Lift Thickness (inches)	Minimum Compaction
1. Subgrade - Existing Soil	Not Applicable	Proof-rolling
2. Embankments and Fills (not above geosynthetics)	12	90%
3. Fills (above geosynthetics)	12	90%
4. Fills below Paved Areas	10	95%
5. Topsoil	12	Compact by placing/grading only

10. When proof-rolling existing (or native) soils, the layer shall be acceptable when deformations caused by substantial site equipment (e.g., roller, fully loaded dump truck) are no deeper than 1 inch. All soft or wet materials that continue to deform more than 1 inch shall be removed and replaced with suitable material and retested at the expense of the Contractor.

3.05 GRADING

A. After the completion of all backfill operations, the Contractor shall grade the site to the lines, grades, and elevations shown on the Technical Drawings, taking into account any subsequent site restoration requirements (e.g. installation of engineered barriers).

3.06 EXISTING FACILITIES

A. General

1. Existing subsurface facilities may be encountered during construction of the work, or located in close proximity to the work.

2. These facilities may include, but are not necessarily limited to, sewers, drains, water mains, gas mains, electrical conduits and their appurtenances. These facilities may or may not be shown on the Technical Drawings. However, the sizes, locations, heights and depths, if indicated, are only approximate and the Contractor shall conduct its operations with caution and satisfy itself as to the accuracy of the information given. The Contractor shall not claim nor shall it be entitled to receive compensation for damages sustained by reason of the inaccuracy of the information given or by reason of its failure to properly maintain and support such structures.

3. There may be other subsurface facilities, the existence and/or location of which are not known, such as individual water and gas services, electrical conduits, sanitary and storm sewer drains, etc. The Contractor shall consult with GE or GE's Representatives of such facilities and, if possible, shall determine, prior to construction, the location and depth of any such facilities that may exist in the area to be excavated.

4. If underground facilities are known to exist in an area but their location is uncertain, the Contractor shall exercise reasonable care in its excavation technique to avoid damage to them.

5. The Contractor shall notify Massachusetts DIGSAFE at least 72 hours prior to any site work.

B. Notification and Protection Procedures

1. Except where superseded by state or local regulations, or in the absence of any applicable regulations, the Contractor shall, at a minimum, include the following procedures in its operations:

a. Prior to Excavating:

1) Determine correct field location of all nearby underground facilities or arrange for Representatives of the utilities to locate them.

2) Notify owners of nearby underground facilities when excavation is to take place, allowing them reasonable time to institute precautionary procedures or preventive measures which they deem necessary for protection of their facilities.

3) In cooperation with owners of nearby facilities, provide temporary support and protection of those underground facilities that may be especially vulnerable to damage by virtue of their physical condition or location, or those that could create hazardous conditions if damaged.

b. Immediately notify any utility owner of any damage to its underground facilities resulting from the Contractor's operations, and arrange for repairs to be made as soon as possible.

c. In case of any emergency the Contractor shall follow the Contingency and Emergency Procedures Plan outlined in GE's Project Operations Plan. This document will be provided to the Contractor prior to the start of any significant earthwork activities.

3.07 OTHER REQUIREMENTS

A. Unfinished Work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways and watercourses left unobstructed with their surfaces in a safe and satisfactory condition.

B. Hauling Material on Street

1. When hauling material over the streets or pavement, the Contractor shall provide suitably tight-sealing vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets, and pavements clean and free from dirt, mud, stone, and other hauled material.

2. When hauling materials that contain PCBs or other hazardous constituents, the Contractor shall abide by all applicable federal, state, and local codes, including, but not limited to, manifesting and placarding (if necessary).

C. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of its operations to such a degree that it will not endanger the safety and welfare of the general public.

2. In addition, if visible dust from the work is visibly airborne, the Contractor will immediately discontinue operations and implement measures to mitigate windborne migration of particulate matter until there is no further visible airborne dust, either due to the implementation of such measures or a change in conditions.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02207

RESTORATION OF SURFACES

PART 1 - GENERAL

1.01 DESCRIPTION

A. All types of surfaces, structures and appurtenances disturbed, damaged, or destroyed during the performance of the work under or as a result of the operations of the Contract, shall be restored and maintained, as specified herein or as directed by GE or GE's Representative.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to or better than the condition of each before the work began, as approved by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork

B. Section 02212 – Topsoil, Seeding, Planting, and Mulching

C. Section 02222 – Fill Materials

D. Section 02600 – Bituminous Concrete Pavement

E. Section 02719 – Ornamental Steel Fence and Gates

F. Revised Final RD/RA Work Plan, Section 7.5.6 – Backfilling and Restoration of Soil Removal Areas

G. Revised Final RD/RA Work Plan, Section 7.5.7 – Backfilling and Restoration of Sediment Removal Areas

H. Revised Final RD/RA Work Plan, Section 7.5.8 – Backfilling and Restoration of Re-routed Brook Channel

1.03 SUBMITTALS

A. Schedule of restoration operations.

B. Material cut sheets and installation procedures for chain link fencing.

C. Name of proposed fencing installer.

1.04 SCHEDULE OF RESTORATION

A. After an accepted schedule has been agreed upon, it shall be adhered to unless otherwise revised with the approval of GE or GE's Representative.

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

PART 2 - PRODUCTS

2.01 CHAIN-LINK FENCING

A. Chain-link fencing shall comply with the following specifications:

6' or 8' Fence:

Fabric:		2" Aluminized Mesh, 6 gauge, selvage to be knuckle/knuckle
Framework:	Top and bottom rails	1-5/8" schedule 40
	Line posts	2-1/2" schedule 40
	Brace Rail	1-5/8" schedule 40
	Corner Posts	2-1/2" schedule 40
	End Posts	3" schedule 40
	Gate Posts	3" schedule 40
	Gate Frame	2" schedule 40

Post Attachment: install fencing using bolted flanges to concrete slabs or install concrete footings where posts will be located in grass area.

8' Fence: in lawn or earth areas install 48" deep x 12" diameter concrete footings at posts.

6' Fence: drive fence posts to a minimum depth of 4'.

2.02 GUARDRAILS

A. Guardrails shall be replaced in like size and material and in the locations shown on the technical drawings.

PART 3 - EXECUTION

3.01 ASPHALT PAVEMENT

A. Pavement shall be constructed in the areas requiring restoration (i.e., existing pavement damaged as a result of construction activities) and/or as shown on the Technical Drawings.

1. The thickness of the asphalt and subbase coarse shall be at least equal to existing thicknesses (i.e., existing pavement damaged as a result of construction activities) or as shown on the Technical Drawings.

2. After compaction, the surface shall conform to the slope and grade of the area being replaced (i.e., existing pavement damaged as a result of construction activities) and/or as shown on the Technical Drawings.

3.02 GRASSED AREAS

A. The furnishing and placing of topsoil, seed, and mulch shall be as directed by GE or GE's Representative.

B. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

C. Precautionary measures shall be taken to prevent washout or other damage to seeded areas. If a washout or other damage occurs, the area shall be regraded and/or reseeded at the Contractor's expense until a sod, approved by GE or GE's Representative, is established.

D. The Contractor shall maintain the newly seeded areas in good condition, including regrading, reseeding, remulching, and watering, as necessary.

3.04 OTHER TYPES OF RESTORATION

A. Drainage structures, including culverts, manholes, catch basins, sidewalks, pavements and piping, curbs, and gutters, that are destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location and grade unless otherwise shown on the Technical Drawings. When there is minor damage to a drainage structure and with the consent of GE or GE's Representative, a repair may be undertaken, if satisfactory results can be obtained.

B. Fences and gates destroyed, damaged, removed or otherwise altered as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location unless otherwise noted on the Technical Drawings.

C. Chain-link fencing shall be installed by a properly licensed, qualified fencing installer.

3.05 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of two years following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02212

TOPSOIL, SEEDING, PLANTING, AND MULCHING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work under this section consists of furnishing and placing of topsoil, fertilizer, seed, mulch, and erosion control matting, and maintenance of seeded areas until final acceptance.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork

B. Section 02207 – Restoration of Surfaces

C. Section 02222 – Fill Materials

D. Revised Final RD/RA Work Plan, Section 5.5 – Backfilling Excavations

E. Revised Final RD/RA Work Plan, Section 5.10 – NRR/E Activities

F. Revised Final RD/RA Work Plan, Section 7.5.6 – Backfilling and Restoration of Soil Removal Areas

G. Revised Final RD/RA Work Plan, Section 7.5.7 – Backfilling and Restoration of Sediment Removal Areas

H. Revised Final RD/RA Work Plan, Section 7.5.8 – Backfilling and Restoration of Re-routed Brook Channel

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. D5268-13 Standard Specification for Topsoil Used for Landscaping Purposes

1.04 SUBMITTALS

A. Identification of proposed off-site topsoil sources (name and address) and quantity of material available from proposed source(s).

B. Sample results for proposed topsoil to be tested by GE for the chemical contaminants specified in Section 5.5 (Backfilling Excavations) of the Revised Final RD/RA Work Plan. Samples shall be collected and analyzed from the proposed off-site topsoil sources at the appropriate frequency provided in part 2.01A(3) of this section.

C. Identification of agricultural laboratory to be used for topsoil analysis.

D. Results of testing performed by agricultural laboratory on proposed off-site topsoil material (including results for pH and organic content) and laboratory's fertilizer recommendations (e.g., nutrient concentrations, application rates, etc.) based on those testing results. Samples shall be collected and analyzed from the proposed off-site topsoil source(s) at the frequencies provided in Part 2.01A(1) and 2.01A(2) of this section.

E. Quantification of fertilizer additions to topsoil to demonstrate compliance with the recommendations of the agricultural laboratory.

F. Certificates: Submit certificates from seed vendors for each seed mixture to demonstrate compliance with the mixes specified in Part2.01C, of this section. The certificates shall include the following: the botanical name and common name, origin, date of production, date of packaging and name and address of supplier. Submit at least 2 weeks prior to time of planting.

G. Certificates: Submit certificates from plant stock supplier for each group of plant stock required, stating botanical name, common name, date of packaging, and name and address of supplier. Submit at least 2 weeks prior to planting.

H. Should hydroseed be used, the Contractor shall submit all data including material and application rates and methods.

I. Product information for erosion control matting/stakes (if used).

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil

Any off-site topsoil shall be unfrozen, friable, natural loam and shall be free of clay lumps, brush, litter, stumps, stones, and other extraneous matter. The topsoil shall have an organic content between 3% and 5%, and a pH of 7(± 1 Standard Unit).

1. Sampling/Analysis Requirements for Agricultural Parameters – The Contractor shall submit samples of the proposed off-site topsoil material to an agricultural laboratory for analysis to determine existing pH, organic content, nutrient levels, and laboratory-recommended fertilizer requirements (e.g., nutrient concentrations, application rates, etc.) to support the growth and establishment of those grass/herbaceous species identified in Part 2.01C of this section. Representative samples shall be collected and analyzed from the proposed off-site topsoil source at a frequency of one sample for every 500 *in-situ* cubic yards (cy) of topsoil to be used on the project.

2. Sampling/Analysis Requirements to Determine Suitability for Use in Landscaping - The Contractor shall submit samples of the proposed off-site topsoil material to an agricultural laboratory for analysis to determine the suitability of the material for landscaping purposes in accordance with the requirements of ASTM 5268-13. The composition of suitable topsoil shall fall within the following ranges:

Compositional Category	Percentage by Mass
Total Sample:	
Deleterious materials (rock, gravel, slag, cinder, roots, sod)	5 max
Material passing the No. 10 (2 mm) sieve:	
Organic material	2 to 20
Sand content	20 to 60
Silt and clay content	35 to 70
pH	5 to 7

Representative samples shall be collected and analyzed from a proposed off-site topsoil source at a frequency of one sample for every 2000 *in-situ* cubic yards (cy) of topsoil to be used on the project

3. Sampling/Analysis Requirements for Chemical Contaminants – The frequency of sampling/analysis for chemical contaminants is dependent on the source/location of the proposed off-site topsoil material:

   a. If a proposed off-site topsoil material is from an undisturbed in-place source (e.g., an active gravel/borrow pit), one representative sample shall be collected and analyzed. The sampling results will be considered representative of the topsoil material that originates from this source, until such time as the physical characteristics of the source material significantly change (as determined by GE). Additional testing of the source material may be required based on an observed change in physical characteristics.

   b. For off-site topsoil material that has been generated from prior excavation/handling activities (e.g., materials located in a stockpile), representative samples shall be collected and analyzed at a frequency of one sample for every 2,000 *in-situ* cubic yards of topsoil material. Each representative sample shall be a composite of 10 discrete "grab" samples collected at spatially distributed locations within the proposed source material.

   c. Analytical data for the proposed off-site topsoil material shall be no more than six months old at the time the material is delivered to the site.

B. Fertilizer

1. The use of fertilizer or other topsoil amendments must be approved by GE (GE will obtain approval from EPA prior to authorizing the use of such amendments) prior to use. If authorized, fertilizer shall be a standard quality commercial carrier or available plant food containing the nutrient concentrations recommended by the agricultural laboratory (based on the analysis results for the proposed off-site topsoil material). Each bag of fertilizer shall bear the Manufacturer's guaranteed statement of analysis.

C. Seed Mixes

Seed mixes shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix. All seed shall meet the State standards of germination and purity.

1. The following seed mix is to be used within areas subject to Natural Resource Restoration/Enhancement (NRR/E) measures (including vegetative portions of the engineered barrier):

Botanical Name	Common Name	Percent by Weight
Asclepias syriaca	Common Milkweed	5
Aster novae-angliae	New England Aster	1
Monarda fistulosa	Wild Bergamot	1
Zizia aurea	Golden Alexanders	1
Elymus canadensis	Canada Wild Rye	20
Festuca rubra	Creeping Red Fescue	25
Panicum virgatum	Switch Grass	7
Schizachyrium scoparium	Little Bluestem	15
Sorghastrum nutans	Indian Grass	15
Desmodium canadense	Showy Tick-Trefoil	10
		100

The above seed mixture shall be seeded at an overall rate of 40 pounds per acre (30 pounds per acre of wildflower mix with 10 pounds per acre of annual ryegrass [*Lolium temulentum*]).

2. The seed mix to be used within non-inundated portions of wetland areas and in the top third to top half of restored Unkamet Brook bank channels will be composed of the New England Conservation/Wildlife Seed Mix, and shall be seeded at an overall rate of 40 pounds per acre (30 pounds per acre of wildflower mix with 10 pounds per acre of non-invasive annual ryegrass (*Lolium temulentum*)). Components of the New England Conservation/Wildlife Seed Mix are provided as an attachment to this specification. Species may be substituted based on availability only with approval by GE.

3. The seed mix to be used within portions of the wetlands that are periodically inundated will be composed of the New England Wetmix, and shall be seeded at a rate of 30 pounds per acre. Areas subject to placement of this seed mix must not be inundated at the time of placement. Components of the New England Wetmix are provided as an attachment to this specification. Species may be substituted based on availability only with approval by GE.

4. Areas not subject to restoration with the seed mixes specified in Part 2.01 C 1 through 2.01 C 3 above, shall be restored with the following mixture: 65% Kentucky Blue Grass, 20% Perennial Rye Grass, and 15% Fescue. The seed mixture will be seeded at a rate of 150 pounds per acre.

D. Mulch

Mulch shall be stalks of oats, wheat, rye, or other approved crops free from noxious weeds and coarse materials. Wood chips must be composted and can only be used to mulch woody plantings.

E. Plant Stock

1. The herbaceous plant, shrub or sapling species, plant types, sizes, and planting densities for the habitats to be restored will be presented in a forthcoming Tree/Shrub Restoration Planting Plan.

2. Plants shall be true to their name as specified.

3. Plants shall be free of insects and diseases and shall show the appearance of healthy growth and vigor. Root stocks shall display evidence of new growth prior to planting.

4. All plant materials, including collected stock, shall comply with state and federal laws with respect to inspection for plant diseases and insect infestations. Collected plant materials shall be obtained in strict compliance with any applicable wetland or species protection programs.

5. Each species shall be handled and placed in a manner that is consistent with good trade practice to insure the arrival of the plants at site in good condition. Plants that arrive dried out, exposed to excessive heat, or that have been in storage for extended periods of time, will not be accepted. If, upon inspection, the plants or root stocks display mold or decay, the material will not be accepted.

6. All plants stored in the field prior to installation shall be kept cool and shall be sheltered from the drying effects of direct sunlight and prevailing winds. Plants should not be subject to freezing, drying, or warming. It is the Contractor's responsibility to supply adequate water for all plant stock in order to maintain it in a healthy and vigorous state suitable for transplanting.

7. All woody shrubs and trees shall have a heavy fibrous root system that has been developed by proper horticultural treatment, transplanting, and root pruning.

8. All plant stock shall have soil placed about roots sufficient to protect from desiccation and to provide nourishment during storage.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The topsoil shall be applied in a single loose lift of not less than 6 inches and shall have a final thickness as shown on the Technical Drawings. No compaction is required or allowed. Following placement of topsoil and prior to fertilizer application, all stones greater than 1 inch in diameter, sticks, and other deleterious material shall be removed.

B. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disk or other suitable method traveling across the slope if possible.

C. Fertilizer or other topsoil amendments must be authorized by GE prior to use (GE will obtain approval from EPA prior to authorizing the use of such amendments). If authorized, the fertilizer shall be applied to the surface uniformly at the rate recommended by the agricultural laboratory.

D. After the soil surface has been fine-graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at the rates identified above.

1. The seed shall be raked lightly into the surface.

2. Seeding and mulching shall not be done during windy weather.

3. Ensure the entire area receives seed. Reseed areas with gaps in the areas of seeding in excess of 8 square feet.

4. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be performed in such a manner as to prevent washing out of seed and mulch.

5. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed, and mulch. The Contractor must submit all data regarding materials and application rates to GE or GE's Representative for review. If proposed for use, the hydroseed mixture shall not include a tackifier.

6. Mark seeded areas to prevent intrusion by foot traffic and/or equipment.

E. Mulch (where used) shall be finely-shredded straw spread (by hand or machine) to form a uniform, continuous blanket over the seed bed and provide a minimum of 90% surface coverage.

1. Mulch thickness shall be limited to between ¼ and ½ inches at loose measurement. Excessive amounts or bunching of mulch shall not be permitted.

2. Unless otherwise specified, mulch shall be left in place and allowed to decompose.

3. Any mulch that has not disintegrated at time of first mowing shall be removed.

F. Plantings

1. Use species, plant types, sizes, and spacing densities as presented on the forthcoming Tree/Shrub Restoration Planting Plan.

2. Dig pits and beds at least 6 inches larger than the plant root system to be installed in that location.

3. Remove non-biodegradable containers prior to planting.

4. Plant root stocks, bulbs, tubers, and rhizomes by hand unless weighted placement or mechanical means are approved by the Engineer.

5. Do not install plant life when the temperature may drop below 35 degrees F or rise above 90 degrees F.

6. Do not install plant life when the wind velocity exceeds 30 miles per hour.

7. Set plants into their final locations following recommended horticultural practice for that species, taking specific note to plant emergent plants at the shallow end of their depth tolerances. Plant hydrophytes in groupings to establish vegetative communities.

8. Support plants as follows:

   a. One-inch diameter plants: one stake and one tie.
   b. Two-inch diameter plants: two stakes and two ties.

9. Provide and install wood chip mulch by hand to form a continuous blanket over the soil surrounding the plant, approximately 2 inches uniform thickness at loose measurement.

10. An initial watering of planted areas will be performed at a rate of 25,000 gallons per acre, and repeated after the second and fourth weeks following seeding if natural rainfall is less than 1 inch per week. The contractor shall avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering.

11. Mark seeded and planted areas to prevent intrusion by foot traffic and/or equipment.

3.02 MAINTENANCE

A. Maintain planted areas until accepted by the Owner. Maintenance responsibilities begin immediately after planting and continue through at least two full growing seasons following the year of planting.

B. The Contractor shall maintain the vegetation such that 90% coverage and 90% tree/shrub survival are achieved by the end of the first full growing season. Maintenance activities for undesirable plant control include mowing, physical removal, and restricted hand application use of herbicides. Herbicide use shall be performed subject to the appropriate limitations of local and state regulation.

C. Notify GE prior to and following the performance of any maintenance activity.

D. All erosion rills or gullies within the topsoil layer shall be filled with additional approved topsoil, graded smooth, and re-seeded and mulched.

E. The Contractor shall also be responsible for repairs to all erosion of the seeded areas until all new grass is firmly established and reaches a height of not less than 4 inches. All bare or poorly vegetated areas must be re-seeded and mulched.

F. In the event that erosion control matting is used, such matting shall be composed of 100% non-synthetic, biodegradable material (such as jute mesh or approved equal). Erosion control matting shall be secured in place with biodegradable stakes.

END OF SECTION

NEW ENGLAND WETLAND PLANTS, INC

820 West Street, Amherst, MA 01002
Phone: 413.548.8000 Fax: 413.549.4000
email: info@newp.com web address: www.newp.com

New England Conservation/Wildlife Mix

Botanical Name	Common Name	Ind.
Elymus virginicus	Virginia Wild Rye	FACW-
Schizachyrium scoparium	Little Bluestem	FACU
Andropogon gerardii	Big Bluestem	FAC
Festuca rubra	Creeping Red Fescue	FACU
Panicum virgatum	Switch Grass	FAC
Chamaecrista fasciculata	Partridge Pea	FACU
Panicum clandestinum	Deer Tongue	FAC+
Sorghastrum nutans	Indian Grass	UPL
Asclepias syriaca	Common Milkweed	FACU-
Heliopsis helianthoides	Ox Eye Sunflower	UPL
Eupatorium purpureum	Purple Joe Pye Weed	FAC
Euthamia graminifolia	Grass Leaved Goldenrod	FAC
Verbena hastata	Blue Vervain	FACW
Zizia aurea	Golden Alexanders	FAC
Aster umbellatus	Flat Topped/Umbrella Aster	FACW
Solidago juncea	Early Goldenrod	NI

Price per lb. $30.00
Min. quantity: 2 lbs.
Total $60.00
Apply: 25 lbs/acre
Minimum quantity: 2 lbs

The New England Conservation/Wildlife Mix provides a permanent cover of grasses, wildflowers and legumes to provide both good erosion control and wildlife habitat value. This mix is designed to be a no maintenance seeding, and it is appropriate to cut and fill slopes, detention basin slopes, and disturbed areas adjacent to commercial and residential projects. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a Spring seeding. Late Spring through early Summer seeding will benefit with a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering will be required. Late Fall and Winter dormant seeding require an increase in the seeding rate. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free soil surface is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged.

Price is $/bulk pound. FOB warehouse, plus S&H and applicable taxes.

NEW ENGLAND WETLAND PLANTS, INC

820 West Street, Amherst, MA 01002
Phone: 413.548.8000 Fax: 413.549.4000
email: info@newp.com web address: www.newp.com

New England Wetmix (Wetland Seed Mix)

Botanical Name	Common Name	Ind.
Carex vulpinoidea	Fox Sedge	OBL
Carex lurida	Lurid Sedge	OBL
Carex scoparia	Blunt Broom Sedge	FACW
Verbena hastata	Blue Vervain	FACW
Scirpus atrovirens	Green Bulrush	OBL
Carex lupulina	Hop Sedge	OBL
Bidens cernua	Nodding Bur Marigold	OBL
Carex comosa	Bristly/Cosmos Sedge	OBL
Carex crinita	Fringed Sedge	OBL
Juncus effusus	Soft Rush	FACW+
Scirpus cyperinus	Wool Grass	FACW
Glyceria grandis	American Manna grass	OBL
Eupatorium maculatum	Spotted Joe Pye Weed	FACW
Eupatorium perfoliatum	Boneset	FACW
Alisma subcordatum	Mud Plantain	OBL
Aster puniceus	Purple Stemmed Aster	OBL
Glyceria canadensis	Rattlesnake Grass	OBL
Scirpus validus	Soft Stem Bulrush	OBL
Asclepias incarnata	Swamp Milkweed	OBL
Mimulus ringens	Square Stemmed Monkey Flower	OBL

Price per lb. $125.00
Req. quantity: 1 lbs.
Total $125.00
Apply: 18 lbs/acre
Minimum quantity: 1 lbs

The New England Wetmix (wetland seed mix) contains a wide variety of native seeds which are suitable for most wetland restoration sites that are not permanently inundated. All species are best suited to moist disturbed ground as found in most wet meadows, scrub shrub, or forested wetland restoration areas. This mix is well suited for detention basin borders, and the bottom of detention basins not generally under standing water. The seeds will not germinate under inundated conditions. During the first year of growth, several species will produce seeds, while other species will produce seeds after the second growing season. Not all species will grow in all wetland situations. This mix is composed of the wetland species most likely to grow in created/restored wetlands and should produce more than 75% ground cover in two full growing seasons. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a spring seeding. Late spring and early summer seeding will benefit with a light mulching of clean weed-free straw to conserve moisture. If conditions are drier than usual, watering may be required. Late fall and winter dormant seeding require an increase in the seeding rate. Fertilization is not recommended. Preparation of a clean weed free seed bed is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged.

Price is $/bulk pound, FOB warehouse, plus S&H and applicable taxes.

MATERIALS AND PERFORMANCE – SECTION 02219

GEOCOMPOSITE

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide all labor, materials, tools, and equipment necessary to furnish and install geocomposite where specified in the Technical Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02232 – Geotextile Fabric

B. Section 02234 – Flexible Membrane Liner

C. Revised Final RD/RA Work Plan, Section 5.9 – Installation of Engineered Barriers

D. Revised Final RD/RA Work Plan, Section 7.5.11 – Placement of Engineered Barriers

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society of Testing and Materials (ASTM)

1. D1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
2. D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique
3. D1603 Standard Test Method for Carbon Black Content in Olefin Plastics
4. D1777 Standard Test Method for Thickness of Textile Materials
5. D3776 Standard Test Methods for Mass per Unit Area (Weight) of Fabric
6. D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
7. D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
8. D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
9. D4716 Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
10. D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
11. D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
12. D5199 Standard Test Method for Measuring Thickness of Geotextiles and Geomembranes
13. D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

14. D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites

15. F904 Standard Test Method for Comparison of Bond Strength or Ply Adhesion of Similar Laminates Made from Flexible Materials

B. Geosynthetic Research Institute (GRI)

1. GRI Test Method GC 7 (GRI GC7): Determination of Adhesion and Bond Strength of Geocomposites

C. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

1.04 SUBMITTALS

A. Manufacturer's data for the geocomposite including physical properties and roll size.

B. The origin (supplier's name and production plant) and identification (brand name and number) of the geotextile and geonet used to fabricate the geocomposite.

C. Material sample of geocomposite.

D. Manufacturer's installation procedures and specifications.

E. Manufacturer's Quality Assurance (QA)/Quality Control (QC) program.

F. Written certification that the minimum test values provided under Part 2.02 of this section are guaranteed by the Manufacturer.

G. Contractor's proposed transportation, handling, and storage techniques for the geocomposite.

H. Contractor's written certification (provided prior to the installation of the geocomposite) that the field-delivered geocomposite has not been damaged due to improper transportation, handling, or storage.

I. Contractor's written certification (provided prior to the installation of the geocomposite) that the surface on which the geocomposite is to be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE's Representative.

J. All personnel performing installation shall be qualified by previous experience.

K. Shop drawings depicting installation details, a panel layout diagram, and a description of proposed installation techniques for the geocomposite.

L. QC certificates (signed by a responsible party employed by the Manufacturer) for the geocomposite, which identify the sections of field-delivered material they represent. The QC certificates shall include lot and roll identification numbers, testing procedures, and results of QC tests. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

1. Unit Weight (geotextile component) (ASTM D5261).

2. Thickness (ASTM D1777).

3. Geotextile-Geonet Ply Adhesion (ASTM D7005/F904/GRI GC7).

4. Transmissivity (ASTM D4716).

QC tests for the above-listed properties shall be performed in accordance with the Manufacturer's QA/QC program.

M. Contractor's written certification that the field-delivered material meets the Manufacturer's specifications. The Contractor shall also provide the lot and roll identification numbers for the field-delivered material.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. GSE Lining Technology, Inc.

B. TENAX.

C. SKAPS Industries

D. Approved equal.

2.02 MATERIALS

A. The geocomposite shall be comprised of a high-density polyethylene (HDPE) drainage net composited with two, 8 oz/yd^2 non-woven geotextiles. The geotextiles shall be heat bonded to both sides of the drainage net.

1. The drainage net to be used in the composite shall be a profiled mesh made by extruding two sets of high density strands together to form a diamond shaped, three-dimensional net to provide planar fluid flow. The drainage net shall be made of HDPE containing carbon black, anti-oxidants, and heat stabilizers that shall be manufactured from resin provided from one resin supplier.

2. The geotextile shall be a non-woven, needle punched polymeric material.

B. Geocomposite material may be acceptable for use provided the selected product meets the above-described requirements and the following minimum test values:

GEOCOMPOSITE

1. Drainage Net

Property	Test Method	Unit of Measure	Minimum Test Value
Specific Gravity	ASTM D1505	g/cm^3	0.94
Melt Flow Index	ASTM D1238 – Condition E	g/10 min.	0.3 maximum
Carbon Black Content	ASTM D1603	%	2.0 – 3.0

2. Geotextile

Property	Test Method	Unit of Measure	Minimum Test Value
Grab Tensile	ASTM D4632	lbs	158
Grab Elongation	ASTM D4632	%	50
Puncture	ASTM D4833	lbs	56
Trapezoidal Tear	ASTM D4533	lbs	56
Burst Strength	ASTM D3786	lbs	189
Permittivity	ASTM D4491	sec^{-1}	1.3
Apparent Opening Size	ASTM D4751	mm	< 0.25

3. Composited Materials

Property	Test Method	Unit of Measure	Minimum Test Value
Transmissivity	ASTM D4716*	m^2/s	2.0×10^{-4}
Ply Adhesion	ASTM D7005/F904 GRI GC7	lb/in width	0.5

* Test method to be performed with the following modifications:

Substrate Material:	60-mil textured HDPE geomembrane on top of steel plate and overlain by a steel plate
Superstrate Material:	Neoprene or 6 inches of representative soil
Applied Normal Compressive Load:	5,000 lbs/ft^2
Seating Time:	100 hours (minimum)
Hydraulic Gradient:	0.1

Conformance testing of alternative materials shall be at the Contractor's expense. Conformance test results will be reviewed by GE or GE's Representative. The material shall either be accepted or rejected by GE or GE's Representative based on the results of the conformance testing. Deployment of the geocomposite shall not commence until

GE or GE's Representative has determined that the material is acceptable. If the Contractor has reason to believe that failing tests may be the result of the Construction Quality Assurance (CQA) Laboratory incorrectly conducting the tests, the Contractor may request that the sample in question be retested by the CQA Laboratory with a technical representative of the Manufacturer present during the testing. This retesting shall be done at the expense of the Contractor. Alternatively, the Contractor may have the sample retested at two different approved CQA Laboratories at the expense of the Contractor. If both laboratories produce passing results, the material may be accepted at the discretion of GE or GE's Representative. If both laboratories do not produce passing results, then the original CQA Laboratory's test results will be accepted. The use of these procedures for dealing with failed test results is subject to the approval of GE or GE's Representative.

If a test result is not in conformance with a required minimum test value, all material from the lot represented by the failing test shall be considered out of specification and rejected. Alternatively, at the option of GE or GE's Representative, additional conformance test samples may be taken to "bracket" the portion of the lot not meeting specification (note that this procedure is valid only when all rolls in the lot are consecutively produced and numbered from one manufacturing line). To isolate the out-of-specification material, additional samples must be taken from rolls that have roll numbers immediately adjacent to the roll that was sampled and failed. If both of the additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number) will be rejected. If one or both of the additional tests fail, then the entire lot will be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot. The additional conformance test samples will be collected by GE or GE's Representative and submitted to the same CQA laboratory that was used for the original conformance testing. The costs associated with the additional conformance testing will be borne by the Contractor.

2.03 DELIVERY, STORAGE, AND HANDLING

A. The geocomposite shall be packaged and shipped by appropriate means so as to prevent damage. Geocomposite rolls will be wrapped in relatively opaque and water tight plastic to prevent damage during shipping and storage. Geocomposite rolls that have been delivered to the job site will be unloaded and stored in their original, unopened wrappers in a secure, dry area, and protected from weathering. Materials shall be delivered only after the required submittals have been received and approved by GE or GE's Representative.

B. The geocomposite shall be furnished in rolls marked or tagged with the following information:

1. Manufacturer's Name.

2. Product Identification.

3. Lot/Batch Number.

4. Roll Number.

5. Roll Dimensions.

C. The geocomposite shall be stored in an area approved by GE or GE's Representative that prevents damage to the product or packaging.

D. The geocomposite shall be kept clean and free from dirt, dust, mud, and any other debris.

E. Any geocomposite found to be damaged shall be replaced with new material at the Contractor's expense.

2.04 QUALITY ASSURANCE

A. The field-delivered material shall meet the specification values according to the Manufacturer's specification sheet and meet or exceed the requirements in this specification.

B. The Manufacturer shall have developed and shall adhere to its own QA program in the manufacture of the geocomposite.

PART 3 - EXECUTION

3.01 PREPARATION

A. The areas designated for placement of geocomposite shall be free from any deleterious material.

B. If the geocomposite is not clean before installation, it shall be washed by the Contractor until accepted by GE or GE's Representative.

C. Prior to installation of any geocomposite, GE or GE's Representative and the Contractor must both concur that the underlying Flexible Membrane Liner (FML) is acceptable. This will necessitate reviewing of all QA/QC testing of the FML by GE or GE's Representative and the Contractor. The Contractor shall submit written verification that both GE or GE's Representative and the Contractor agree that the underlying FML is acceptable (refer to Part1.04I of this section).

3.02 INSTALLATION

A. Geocomposite shall be installed at locations shown on the Technical Drawings.

B. Adjacent rolls shall be installed so that the geonet component will have a minimum overlap of 4 inches.

C. The geonet shall be tied with plastic fasteners every 5 feet along the slope and every 6 inches on butt seams and in the anchor trenches.

D. The geotextiles shall be continuously sewn using a polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile.

E. The geocomposite shall be unrolled downslope, keeping the net in slight tension to minimize wrinkles and folds.

F. If a tri-planar material is used, it must be installed in the appropriate flow direction.

G. Adequate loading shall be placed to prevent uplift by wind.

H. Holes or tears in the geocomposite shall be repaired in accordance with the Manufacturer's recommendations.

I. Any portion of the geocomposite exhibiting a flaw shall be repaired. Prior to acceptance of the geocomposite, the Installer shall locate and repair all damaged areas as directed by GE's Representative.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02222

FILL MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work under this section shall include, but not necessarily be limited to, supplying of all labor and materials, excavating, transporting, dumping, spreading, and compacting fill materials in the locations and to the lines and grades shown on the Technical Drawings and/or as directed by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork

B. Section 02207 – Restoration of Surfaces

C. Revised Final RD/RA Work Plan, Section 5.5 – Backfilling Excavations

D. Revised Final RD/RA Work Plan, Section 7.5.6 – Backfilling and Restoration of Soil Removal Areas

E. Revised Final RD/RA Work Plan, Section 7.5.7 – Backfilling and Restoration of Sediment Removal Areas

F. Revised Final RD/RA Work Plan, Section 7.5.8 – Backfilling and Restoration of Re-routed Brook Channel

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. ASTM International

1. D422 Standard Test Method for Particle-Size Analysis of Soils

2. D5519 Standard Test Methods for Particle-Size Analysis of Natural and Man-Made Riprap Materials

3. D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. American Association of State Highway and Transportation Officials (AASHTO)

1. T 11 Materials Finer than No. 200 (75 µm) Sieve In Mineral Aggregates by Washing

2. T 27 Sieve Analysis of Fine and Coarse Aggregates

C. Massachusetts Highway Department Standard Specifications for Highways and Bridges (MHD Specifications)

MATERIALS AND PERFORMANCE – SECTION 02222

FILL MATERIALS

1.04 SUBMITTALS

A. Identification of proposed off-site fill sources (names and addresses) and quantity of material available from each source.

B. Sieve or particle size analysis results for proposed off-site soil fill, asphalt subbase, riprap, structural fill, silty sand, and filter stone materials. Samples shall be collected and analyzed for geotechnical properties from each proposed fill source at the frequencies provided in Part 2.01D of this section.

C. Samples of the proposed soil fill and silty sand material to be tested by GE for the chemical contaminants specified in Section 5.5 (Backfilling Excavations) of the Revised Final RD/RA Work Plan. Samples shall be collected and analyzed from the proposed off-site soil fill source at the frequencies provided in Part 2.01E of this section.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fill materials shall be of the types listed below:

1. Soil Fill (General Fill):

a. Soil fill material shall be free from excessive moisture, frost, stumps, trees, roots, sod, muck, marl, vegetable matter, or other unsuitable materials, and demonstrated to be clean based on chemical analysis. Soil fill shall consist of clean common earth fill, free from organic material, coatings, sharp angular stones, and other deleterious materials, and shall have a maximum particle size of 3 inches. Soil fill shall have the following gradation by weight:

Sieve	Percent Passing
3 inch	100
No. 200	10-30

2. Asphalt Subbase:

a. Subbase/gravel shall have a percentage of wear, by the Los Angeles test, of not more than 45. Fine aggregate shall consist of natural or crushed stone. The composite material shall be free from clay, loam or other plastic material, and shall conform to the following grading requirements:

Sieve	Percent Passing
2 inch	100
1½ inch	70-100
¾ inch	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

b. Sampling and testing shall be in accordance with the following standard AASHTO methods:

Sieve Analysis – T27
Passing No. 200 (75μm) – T11

3. Silty Sand :

a. Silty Sand having the following gradation by weight:

Sieve	Percent Passing
No. 8	100
No. 50	40-90
No. 200	0-10

b. Total organic content not less than 0.5 percent, as determined by the Lloyd-Kahn Method of the entire sample fraction.

4. Riprap

a. Type I - Stone material shall meet the following gradation requirements for AASHTO Processed Aggregate Size No. 1.

Sieve	Percent Passing
4 inch	100
3-1/2 inch	90 - 100
2-1/2 inch	25 - 60
1-1/2 inch	0 -15
¾ inch	0 - 5

b. Type II - Stone material shall meet the quality and gradation requirements for MHD M2.02.4 - Modified Rockfill, as specified in the attached MHD specifications.

c. Type III - Stone material shall possess a D_{50} of 8 inches.

d. Each load of riprap shall be reasonably well graded from smallest to the maximum size specified and shall not be delivered to the site with deleterious material such as wood, debris or other objectionable particles adhering to the stone.

e. In addition to meeting the gradation requirements set forth in this section for the type of riprap indicated, riprap shall consist of stones shaped as nearly as practicable in the form of right rectangular prisms.

f. Alternative material gradations may be considered (subject to approval by GE and EPA prior to use) in the event the above material is not readily available.

5. Structural Fill (Pipe Bedding, Initial Pipe Backfill):

a. Structural Fill shall be M2.01.4 crushed stone, as specified in the attached MHD specifications.

6. Filter Stone:

    a. Material placed around collection piping shall be washed, rounded crushed stone, with a D_{max} of 1½ inches and a D_{min} of ¾ inches.

    b. Filter stone shall be wrapped with non-woven geotextile as shown on the Technical Drawings.

7. Controlled Low Strength Material:

    a. Controlled Low Strength Material shall be M4.08.0 Type 1E or 2E controlled density fill, as specified in the attached MHD specifications.

B. Fill materials shall be inspected prior to placement and all roots, vegetation, organic matter, or other foreign debris shall be removed.

C. Stones shall not be allowed to form clusters with voids.

D. Sampling/Analysis Requirements for Geotechnical Parameters – The Contractor shall submit samples of the proposed off-site soil fill, asphalt subbase, structural fill, riprap, silty sand and filter stone materials to a geotechnical laboratory for sieve analysis to demonstrate compliance with the requirements of Part 2.01A of this section. In addition, silty sand material will be tested for organic content to demonstrate compliance with Part 2.01A.3.b. Representative samples shall be collected and analyzed from each proposed off-site fill source at a frequency of one sample for every 500 *in-situ* cubic yards (cy) of fill material to be used on the project. Each representative sample shall be a composite of 10 discrete "grab" samples collected at spatially distributed locations within the proposed source material.

E. Sampling/Analysis Requirements for Chemical Contaminants – The frequency of sampling/analysis for chemical contaminants is dependent on the source/location of the proposed off-site soil fill material:

    1. If the proposed off-site soil fill material is from an undisturbed in-place source (e.g., an active gravel/borrow pit), one representative sample per 2,000 CY shall be collected and analyzed for PCBs, and one representative sample per 5,000 CY shall be collected and analyzed for Appendix IX+3. The sampling results will be considered representative of the soil fill material that originates from this source, until such time as the physical characteristics of the source material significantly change (as determined by GE or GE's Representative). Additional testing of the source material may be required based on the observed change in physical characteristics.

    2. For off-site soil fill material that has been generated from prior excavation/handling activities (e.g., materials located in a stockpile), representative samples shall be collected and analyzed at a frequency of one sample for every 2,000 in situ cy of soil fill material. Each representative sample shall be a composite of 10 discrete "grab" samples collected at spatially distributed locations within the proposed source material.

    3. If more than one off-site source is proposed for the soil fill material, samples shall be collected and analyzed from each source at the appropriate frequency provided above.

4. Analytical data for the proposed off-site soil fill material shall be no more than six months old at the time the material is delivered to the site.

PART 3 - EXECUTION

3.01 FILL PLACEMENT

A. In general, fill material shall be placed and compacted in horizontal layers not exceeding those thicknesses indicated in Materials and Performance (M&P) – Section 02200 (Earthwork). Subgrade that will receive fill material shall be first approved by GE or GE's Representative. Fill material shall not be placed in areas that will not support the weight of construction equipment.

B. Each layer of fill material shall be thoroughly tamped or rolled to the required degree of compaction by mechanical tampers (including excavator buckets) or vibratory compactors as specified in M&P – Section 02200 (Earthwork). Successive layers shall not be placed until the layer under construction has been thoroughly compacted.

C. Where required, the Contractor shall, at its own expense, moisture-condition the fill to meet the compaction requirements. If the material is too wet for satisfactory compaction due to rain or other causes, it shall be allowed to dry or be removed as required before compaction.

D. No compaction is required for riprap.

E. Trucks or other heavy equipment shall not be operated over pipelines/culverts until the minimum thickness of fill material above the crown of the trenched pipe has been placed and properly compacted.

F. Unless indicated otherwise, asphalt subbase material shall be underlain with a single layer of woven geotextile as specified in M&P – Section 02232 (Geotextile Fabric).

3.02 FIELD TESTING AND QUALITY CONTROL

A. In-place density tests (using ASTM D6938) shall be performed by an independent testing laboratory (at the Contractor's expense) at the frequency specified in M&P – Section 02200 (Earthwork).

B. If a defect (e.g., insufficient layer thickness, materials that exceed particle size requirements, etc.) is discovered in a finished fill material layer, GE or GE's Representative will determine the extent and nature of the defect by additional testing, observation, a review of records, or other means that GE or GE's Representative deems appropriate. The Contractor shall be responsible for correcting all deficiencies to the satisfaction of GE or GE's Representative.

3.03 CRITERIA AND TOLERANCES

A. Fill material shall be constructed to such heights as to make allowance for post-construction settlement. Any settlement that occurs before final acceptance of the Contract shall be corrected to make the backfill conform to the required lines and grades.

END OF SECTION

SECTION M2

AGGREGATES AND RELATED MATERIALS

M2.01.0 Crushed Stone.

Crushed stone shall consist of one or the other of the following materials:

1. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated* or other objectionable pieces.

A detrimental quantity will be considered as any amount in excess of 15% of the total mass.

2. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 200 millimeters.

*Thin or elongated pieces are defined as follows. Thin stones shall be considered to be such stones whose average width exceeds four (4) times their average thickness. Elongated stones shall be considered to be such stones whose average length exceeds four (4) times their average width.

The crushed stone shall be reasonably free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a 75 micrometer sieve will be allowed to adhere to the crushed stone. Where crushed stone is to be used for surfacing, this requirement shall be not more than 0.5% of satisfactory material passing a 75 μm sieve.

The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO T 96) as follows:

1. For Class I Bituminous Concrete 30% **
2. For Cement Concrete Aggregate 45% ***
3. Crushed Stone for Subbase 45%
4. Special Borrow Ledge 45%

**Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

***Except for 35 megaPascals or greater cement concrete and prestressed concrete which shall be 30%.

The crushed stone shall be uniformly blended according to the grading requirements for the respective stone sizes shown in Table 1.

TABLE 1

Tabulation of Stone Sizes (Percent by Mass Passing Through)

Sieve Opening	M2.01.1/M2.01.2	M2.01.3	M2.01.4	M2.01.5	M2.01.6
	37.5 mm	31.5 mm	19.0 mm	12.5 mm	9.5 mm
63 mm					
50 mm	100				
37.5 mm	95 - 100	100			
31.5 mm		85 - 100			
25.0 mm	35 - 70		100		
19.0 mm	0 - 25	10 - 40	90 - 100		
16.0 mm				100	
12.5 mm		0-8	10 - 50	85 - 100	100
9.5 mm			0 - 20	15 - 45	85 - 100
4.75 mm			0 - 5	0 - 15	20-50
2.36 mm				0 - 5	0 - 15

1.18 mm	0 - 5

M2.01.1 to M201.6 (See Table 1 for grading requirements)

M2.01.7 Dense Graded Crushed Stone for Sub-base.

This specification covers the quality and gradation requirements for a sub-base material combining crusher-run coarse aggregates of crushed stone (trap only, meeting M2.01.0,1) and fine aggregates of natural sand or stone screenings uniformly premixed with a predetermined quantity of water.

Coarse aggregate shall consist of hard, durable particles of fragments of stone. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.

Coarse aggregate shall have a percentage of wear, by the Los Angeles test, of not more than 45.

Fine aggregate shall consist of natural or crushed sand.

The composite material shall be free from clay, loam or other plastic material, and shall conform to the following grading requirements:

Sieve Designation	Percentage by Mass Passing Square Mesh Sieves
50 mm	100
37.5 mm	70 - 100
19.0 mm	50 - 85
4.75 mm	30 - 55
300 µm	8 - 24
75 µm	3 - 10

Sampling and testing shall be in accordance with the following standard AASHTO methods:

Sieve Analysis	T 27
Passing 75 µm	T 11

The use of Processed Glass Aggregate (PGA) meeting the requirements of M2.01.8 will be allowed at a maximum addition rate of 10% by mass, providing the blended material is homogeneous and the physical requirements of dense graded crushed stone are maintained.

M2.01.8 Processed Glass Aggregate (PGA).

Processed Glass Aggregate (PGA) shall be manufactured from an approved supplier of crushed cullet. The material shall consist of recycled glass food or beverage containers free of debris such as paper, metals, fabrics, toxins, clay, loam, or other materials that would be associated with the glass recycling process. A maximum of 5% mass of the material may be produced from china dishes, ceramics, plate glass or other glass products. The material will have a nominal aggregate size of 10 millimeters and meet the following gradation requirements:

Sieve Designation	Percentage by Mass Passing Square Mesh Sieves
9.5 mm	100
4.75 mm	70 - 100
2.36 mm	35 - 88
1.18 mm	15 - 40
300 µm	4 - 12
75 µm	0 - 5

sandstone or similar stone or relatively thin slabs will not be acceptable. Each stone shall have a mass of not less than 25 kilograms not more than 55 kilograms and at least 75% of the volume shall consist of stones having a mass of not less than 35 kilograms each. The remainder of the stones shall be so graded that when placed with the larger stones the entire mass will be compact.

M2.02.4 Modified Rockfill.

Modified rockfill shall consist of hard, durable angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable.

Stone shall be free from overburden, spoil, shale, organic material and meet the following gradation requirements:

Size of Stone	Passing Percentages
200 mm	95 - 100
100 mm	0 - 25
63 mm	0 - 5

M2.03.0 Granite Rubble Block.

Rubble pavement blocks shall be granite, basically light grey in color, free from seams and other structural imperfections or flaws which would impair its structural integrity, and of a smooth splitting appearance. Natural color variations characteristic of the deposit from which the paving blocks are obtained will be permitted.

Rubble pavement blocks shall be not less than 100 millimeters nor more than 300 millimeters in length, not less than 90 millimeters nor more than 115 millimeters in width and depth. Rubble blocks shall be rectangular in shape with one good face.

Opposite faces of rubble blocks shall be approximately parallel and adjoining faces shall be approximately at right angles to each other. Blocks shall be dressed so that they may be laid with 25 millimeter to 38 millimeter joints.

M2.04.0 Aggregate for Sand Blasting.

Aggregate to be used for sand blasting shall be an approved material currently used in the industry. It shall be graded to produce the profile requirements of the material being cleaned and shall meet the applicable requirements of OSHA, EPA, and DEP.

M2.05.0 Stone Screenings.

Stone Screenings shall be that product from a stone crusher that completely passes a 4.75 millimeter sieve and not less than 40% passes a 2.36 millimeter sieve.

M2.06.0 Slope Paving.

Stone for slope paving shall be sound, angular in shape and free from structural defects. Each stone shall have one reasonably flat face and a thickness perpendicular to the face of not less than 150 millimeters, which shall be the least dimension of the stone.

Approximately 60% of the stones shall vary from 0.06 to 0.08 cubic meters each in volume and the remainder of the stones shall each be from 0.03 to 0.06 cubic meters in volume.

M2.06.1 Special Slope Paving Under Bridge (Quarry Stone).

M4.08.0 Controlled Density Fill.

Controlled Density Fill (CDF) material is a flowable, self consolidating, rigid setting, low density material that can substitute for compacted gravel for backfills, fills and structural fills. There are two main categories of CDF's, excavatable and non-excavatable with a subcategory of flowable and very flowable. It shall be a mixture of portland cement, flyash (if very flowable), sand, and water designed to provide strengths within the range specified.

The categories of CDF's are:

Type 1	Very Flowable (Non-Excavatable)
Type 1E	Very Flowable (Excavatable)
Type 2	Flowable (Non-Excavatable)
Type 2E	Flowable (Excavatable)

The Very Flowable mixes (Type 1 and 1E) shall contain a minimum of 115 kilograms of Class F Fly Ash or high air (25% plus) and will be self leveling.

Excavatable mixes (Type 1E and 2E) shall be hand tool excavatable.

Type 1 mixes are intended for permanent installations such as structural fills under structures. It has very flowable characteristics needed for distances and small areas. This type of mix should not be used as a bedding material. It is used to fill small hard-to-reach areas.

Type 1E mixes are excavatable material designed to have very flowable characteristics needed for filling small or far areas that later may need to be removed.

Type 2 mixes are used in areas where size and distance do not need the very flowable characteristic. It is intended for permanent installations such as thick fills under structures.

Type 2E mixes are excavatable mixes where size and distance of the installation do not require the flowable characteristics of a Type 1E mix.

CDF is to be batched at a ready mix plant and is to used at a high or very high slump of approximately 250 millimeters to 300 millimeters. It shall be flowable, require no vibration and after it has been placed can, for Types 1E and 2E, be excavatable by hand tools and/or small machines.

The ingredients shall comply with the following:

Portland Cement	AASHTO M 85
Fly Ash	AASHTO M 295 Class F
Sand	M4.02.02
Air entraining admixtures	M4.02.05

Note 1. In lieu of the slump test, a 150 millimeter long, 75 millimeter diameter tube may be filled to the top and then slowly raised. The diameter of the resulting "pancake" may be measured and the range of the diameter shall be 230 millimeters to 360 millimeters.

Note 2. The maximum strength for structural flowable fills may be expressed in increments of 5 MPa's and will depend on the Engineer's requirements.

Note 3. High air (25% plus) may be used instead of fly ash with an adjustment in sand content.

The following Type 1E mix design is for information only, the actual mix designs submitted by the ready mix operator, in accordance with standard Department practice, must be confirmed by trial batches.

Cement	23 kilograms
Fly Ash	115 kilograms
Sand	1225 kilograms
Water	225 liters

The following Type 1 mix design is for information only, the actual mix designs submitted by the ready mix

operator, in accordance with standard Department practice, must be confirmed by trial batches.

Cement	45 kilograms
Fly Ash	115 kilograms
Sand	1200 kilograms
Water	225 liters

Various types of controlled density fill must meet the requirements set forth in the table below:

Controlled Density Fill	Type 1 & 2	Type 1E & 2E
Compressive Strength @ 28 days	210 - 1030 kPa	210 - 550 kPa*
Compressive Strength @ 90 days	1380 kPa max.	700 kPa max.*
Slump	250-300 mm	250 - 300 mm

* May be changed by design engineer to fit particular job requirements.

MATERIALS AND PERFORMANCE – SECTION 02232

GEOTEXTILE FABRIC

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall supply all labor, materials, tools, and equipment required to furnish and install geotextile fabric as shown on the Technical Drawings or as indicated by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02219 – Geocomposite

B. Section 02234 – Flexible Membrane Liner

C. Final RD/RA Work Plan, Section 7.5.11 – Placement of Engineered Barriers

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. ASTM International

1. D3786 Standard Test Method for Bursting Strength of Textile Fabrics (Diaphragm Bursting Strength Tester Method)

2. D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus

3. D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

4. D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles

5. D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

6. D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile

7. D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

8. D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

B. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

1.04 SUBMITTALS

A. Manufacturer's data for non-woven geotextile fabric including, at a minimum, physical properties, packaging, and installation techniques.

B. The origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin used to manufacture the non-woven geotextile fabric.

C. Material sample of non-woven geotextile fabric.

D. Manufacturer’s installation procedures and specifications for non-woven geotextile.

E. Manufacturer's Quality Assurance (QA)/Quality Control (QC) program for non-woven geotextile.

F. Results of QC tests conducted by the Manufacturer during the manufacturing of the field-delivered non-woven geotextile fabric. The results shall identify the sections/panels of the fabric they represent. The Contractor shall also provide the lot and roll identification numbers for the field-delivered non-woven geotextile fabric.

G. Written certification, by the Manufacturer, that the minimum test values provided under Part 2.02 of this section are guaranteed by the Manufacturer for the non-woven geotextile fabric.

H. Contractor’s proposed transportation, handling, storage, and installation techniques for the non-woven geotextile fabric.

I. Shop drawings (provided at least one week prior to installation) depicting installation details and a description of proposed installation techniques for the non-woven geotextile fabric.

J. Manufacturer’s standard warranty provided for the non-woven geotextile fabric.

K. Contractor’s written certification that the field-delivered non-woven geotextile fabric meets the Manufacturer’s specifications.

L. Contractor’s written certification (provided prior to the installation of the non-woven geotextile fabric) that the field-delivered non-woven geotextile fabric has not been damaged due to improper transportation, handling, or storage.

M. Contractor’s written certification (provided prior to the installation of the non-woven geotextile fabric) that the surface on which the non-woven geotextile fabric will be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE’s Representative.

N. Results of QC tests conducted by the Manufacturer on the non-woven geotextile fabric. The QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

   1. Unit Weight (ASTM D5261)

   2. Grab Strength (ASTM D4632)

   3. Trapezoidal Tear Strength (ASTM D4533)

   4. Burst Strength (ASTM D3786)

   5. Puncture (ASTM D6241)

   6. Ultraviolet Resistance (ASTM D4355)

7. Apparent Opening Size (ASTM D4751).

8. Permeability (ASTM D4491) (not required for cushioning geotextile).

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Synthetics Industries.

B. Amoco.

C. Mirafi Tencate.

D. Approved equal.

2.02 MATERIALS

A. For the purposes of the Technical Drawings and Specifications, the terms "geotextile" and "geotextile fabric" shall be considered synonymous.

B. The non-woven geotextile shall be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene, shall be free of any chemical treatment that reduces permeability, and shall be inert to chemicals commonly found in soil.

C. The non-woven geotextile indicated on the Technical Drawings for cushioning beneath the Flexible Membrane Liner (FML) shall have the following minimum test values:

Property	Test Method	Unit of Measure	Minimum Test Value
Grab Tensile	ASTM D4632	lbs	310
Grab Elongation	ASTM D4632	%	50
Trapezoidal Tear	ASTM D4533	lbs	115
Puncture Strength	ASTM D6241	lbs	620
Apparent Opening Size	ASTM D4751	U.S. Sieve	100
Unit Weight	ASTM D5261	oz/yd^2	16

D. The non-woven geotextile indicated on the Technical Drawings for applications other than cushioning beneath the FML shall have the following minimum test values:

Property	Test Method	Unit of Measure	Minimum Test Value
Grab Tensile	ASTM D4632	lbs	230
Grab Elongation	ASTM D4632	%	50
Trapezoidal Tear	ASTM D4533	lbs	90
Puncture Strength	ASTM D6241	lbs	700
Apparent Opening Size	ASTM D4751	U.S. Sieve	100
Unit Weight	ASTM D5261	oz/yd^2	8

2.03 DELIVERY, STORAGE, AND HANDLING

A. The geotextile shall be furnished in a protective wrapping that shall be labeled with the following information: Manufacturer's name, product identification, lot number, roll number, and dimensions.

B. The geotextile shall be protected from ultraviolet light, precipitation, mud, soil, excessive dust, puncture, cutting, and/or other damaging conditions prior to and during delivery and on-site storage. The geotextile shall be shipped and stored in relatively opaque and watertight wrappings. The geotextile shall be stored on-site at a location approved by GE or GE's Representative.

2.04 QUALITY ASSURANCE

A. The field-delivered fabric shall meet the specification values according to the Manufacturer's specification sheet.

B. The Manufacturer shall have developed and shall adhere to its own QA program in the manufacture of the geotextile.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to installing the geotextile, placement surfaces shall be leveled and uniformly compacted, as necessary, to provide a stable interface for the geotextile that is as smooth as possible.

3.02 GEOTEXTILE INSTALLATION

A. The following procedures and requirements shall be followed during the installation of the geotextile.

GEOTEXTILE FABRIC

1. Placement:

   a. Placement of the geotextile shall not be conducted during adverse weather conditions. The geotextile shall be kept dry during storage and up to the time of deployment. During windy conditions, all geotextiles shall be secured with sandbags or an equivalent approved anchoring system. Removal of the sandbags or equal shall only occur upon placement of an overlying soil layer. Geotextiles shall not be placed during excessively windy periods that preclude the proper placement of the geotextiles.

   b. Proper cutting tools shall be used to cut and size the geotextile materials. Care shall be exercised while cutting geotextiles.

   c. During the placement of geotextiles, all dirt, dust, sand, and mud shall be kept off the geotextile to prevent clogging. If excessive containment materials are present on the geotextile, it shall be cleaned or replaced as directed by GE or GE's Representative.

   d. Geotextile shall be covered within the time period recommended by the Manufacturer, and in no case later than two weeks after its placement.

   e. In all cases, seams on slopes shall be parallel to the line of slope. Horizontal seams shall be avoided on slopes.

2. Seaming and Repairing

   a. Geotextiles used for cushioning beneath the FML shall be continuously sewn using a polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile.

   b. Geotextiles used for trench or other applications shall be placed to allow for 3 feet of overlap from the upstream roll to the downstream roll as necessary between rolls or installed sections of geotextile. For trench applications, a minimum of 6-inch overlap shall be provided at the top of the trench.

   c. Repair of tears or holes in the geotextile shall require the following procedures:

      1) On slopes: A patch made from the same geotextile shall be double seamed into place; with each seam 1/4-inch to 3/4-inch apart and no closer than 1 inch from any edge. Should any tear exceed 10% of the width of the roll, that roll shall be removed from the slope and replaced.

      2) Non-slopes: A patch made from the same geotextile shall be spot-seamed in place with a minimum 24-inch overlap in all directions.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02234

FLEXIBLE MEMBRANE LINER

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Under this section, the Contractor shall furnish and install 60-mil thick, textured high-density polyethylene (HDPE) Flexible Membrane Liner (FML) material as shown on the Technical Drawings and as specified herein and/or directed by GE or GE's Representative.

2. The Contractor shall be responsible for all Quality Assurance (QA)/Quality Control (QC) testing specified herein and as indicated on the Technical Drawings. All QA/QC testing, with the exception of non-destructive tests, shall be conducted by an independent laboratory at the Contractor's expense.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02219 – Geocomposite

B. Section 02232 – Geotextile Fabric

C. Revised Final RD/RA Work Plan, Section 5.9 – Installation of Engineered Barriers

D. Revised Final RD/RA Work Plan, Section 7.5.11 – Placement of Engineered Barriers

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. D638 Standard Test Method for Tensile Properties of Plastics

2. D792 Standard Test Methods for Density and Specific Gravity (Relative Gravity) of Plastics by Displacement

3. D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

4. D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

5. D1603 Standard Test Method for Carbon Black Content in Olefin Plastics

6. D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

7. D4437 Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes

8. D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

9. D5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

10. D5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

11. D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembrane

12. D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

13. D7466 Standard Test Method for Measuring the Asperity Height of Textured Geomembrane

B. Geosynthetic Research Institute (GRI)

1. GRI Test Method GM 13 (GRI GM13): Test Properties, Testing Frequencies, and Recommended Warranty for HDPE Textured Geomembranes

C. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

1.04 SUBMITTALS

A. The Contractor shall submit the following information regarding the FML Manufacturer:

1. Corporate background and information.

2. Manufacturing capabilities including:

a. QC procedures for manufacturing.

b. List of material properties including certified test results, to which FML samples are attached.

3. Origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin.

4. Copies of dated QC certificates issued by the resin supplier.

5. Written certification that the minimum specification limits provided in Part 2.02 of this section are guaranteed by the Manufacturer.

B. A copy of the Installer’s letter of approval or license by the Manufacturer.

C. Record drawings (prepared by the Installer and provided upon completion of installation) illustrating the following information:

1. Dimensions of all FML field panels.

2. Panel locations referenced to the Technical Drawings, which depict the identification number assigned to each FML panel.

3. All field seams and panels with the appropriate number or code.

4. Location of all patches, repairs, and destructive testing samples.

D. Shop drawings (provided at least one week prior to installation) that include the layout plan for all FML field panels.

E. QC program manuals covering all phases of manufacturing and installation.

F. Complete and detailed written instructions for the storage, handling, installation, seaming, inspection plan fail criteria for liner inspections, and QA/QC testing procedures of the liner in compliance with this section and the condition of its warranty.

G. Manufacturer's standard warranty provided for the FML.

H. Results of QC tests conducted by the Manufacturer. The QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

1. Density (ASTM D1505)

2. Carbon Black Content (ASTM D1603)

3. Carbon Black Dispersion (ASTM D5596)

4. Thickness (ASTM D5994)

5. Tensile Properties (ASTM D638)

6. Tear Strength (ASTM D1004)

I. Installer's written certification (provided prior to the installation of the FML) that the final surface on which the FML is to be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE's Representative.

J. Contractor's written certification (provided prior to the installation of the FML) that the field-delivered FML has not been damaged due to improper transportation, handling, or storage.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Solmax Geosynthetics

B. GSE Lining Technology, Inc.

C. Poly-Flex, Inc.

D. Approved equal

2.02 MATERIALS

A. HDPE Lining Material Specifications:

1. HDPE FML material shall meet the following minimum specification values listed below and as listed in GRI GM13.

Property	Test Method	Specification Limit
		60 mil Textured
Density (min.)	ASTM D1505/D792	0.940 g/cc
Carbon Black Content	ASTM D1603 (3) /D4218	2.0 – 3.0%
Carbon Black Dispersion	ASTM D5596	8 of 10 views in categories 1 or 2 All 10 views in categories 1, 2 or 3
Thickness (nominal) Thickness (min. avg.) lowest individual 8 of 10 values lowest individual of 10 values	ASTM D5994	60 mil 57 mil 54 mil 51 mil
Tensile Strength at Break (min.)	ASTM D6693 Type IV	90 lb/in
Tensile Strength at Yield (min.)		126 lb/in
Elongation at Break (min.)		100%
Elongation at Yield (min.)		12%
Tear Resistance (min.)	ASTM D1004	42 lbs
Asperity Height	ASTM D7466	10 mil
Puncture Resistance (min.)	ASTM D4833	90 lbs
Stress Crack Resistance	ASTM D5397	3 hrs

Conformance testing of alternative materials shall be at the Contractor's expense.

Conformance test results, if required, will be reviewed by GE or GE's Representative. The material shall either be accepted or rejected by GE or GE's Representative based on the results of the conformance testing. Deployment of the FML shall not commence until GE or GE's Representative has determined that the material is acceptable. If the Contractor has reason to believe that failing tests may be the result of the Construction Quality Assurance (CQA) Laboratory incorrectly conducting the tests, the Contractor may request that the sample in question be retested by the CQA Laboratory with a technical representative of the Manufacturer present during the testing. This retesting shall be done at the expense of the Contractor. Alternatively, the Contractor may have the sample retested at two different approved CQA Laboratories at the expense of the Contractor. If both laboratories produce passing results, the material may be accepted at the discretion of GE or GE's Representative. If both laboratories do not produce passing

results, then the original CQA Laboratory's test results will be accepted. The use of these procedures for dealing with failed test results is subject to the approval of GE or GE's Representative.

If a test result is not in conformance with a required minimum specification limit, all material from the lot represented by the failing test shall be considered out of specification and rejected. Alternatively, at the option of GE or GE's Representative, additional conformance test samples may be taken to "bracket" the portion of the lot not meeting specification (note that this procedure is valid only when all rolls in the lot are consecutively produced and numbered from one manufacturing line). To isolate the out-of-specification material, additional samples must be taken from rolls that have roll numbers immediately adjacent to the roll that was sampled and failed. If both of the additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number) will be rejected. If one or both of the additional tests fail, then the entire lot will be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot. The additional conformance test samples will be collected by GE or GE's Representative and submitted to the same CQA laboratory that was used for the original conformance testing. The costs associated with the additional conformance testing will be borne by the Contractor.

B. Welding Material

1. The resin used in the welding material must be identical to the liner material.

2. All welding materials shall be of a type recommended and supplied by the Manufacturer and shall be delivered in the original sealed containers, each with an indelible label bearing the brand name, Manufacturer's mark number, and complete directions as to proper storage.

C. Labeling FML Rolls

1. Labels on each roll or factory panel shall identify the following:

a. Thickness of the material

b. Length and width of the roll or factory panel

c. Manufacturer

d. Directions to unroll the material

e. Product identification

f. Lot number

g. Roll or field panel number

2.03 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall be liable for all damages to the materials incurred prior to and during transportation to the site.

B. Handling, storage, and care of the FML prior to and following installation at the site is the responsibility of the Contractor. The Contractor shall be liable for all damages to the materials incurred prior to final acceptance of the lining system by GE or GE's Representative.

C. The Contractor shall notify GE or GE's Representative of the anticipated delivery time.

PART 3 - EXECUTION

3.01 FML INSTALLATION

A. Related Earthwork

1. The Contractor shall ensure that all related earthwork requirements under this section are complied with:

a. The FML installations shall be performed on geotextile-covered surfaces free from stones or protruding objects.

b. No FML shall be placed onto an area that has become softened by precipitation. Appropriate methods of moisture control are the responsibility of the Contractor.

c. No FML shall be placed on frozen soil material. Such material shall be removed and replaced with new soil fill as specified in Materials and Performance (M&P) – Section 02222 (Fill Materials).

d. All surfaces on which the FML is to be installed shall be acceptable to GE or GE's Representative prior to FML installation.

e. Free edges of FML shall be secured so as to prevent uplift by wind or the intrusion of water under the liner. Edge protection shall include sandbags, polyethylene sheeting, or other methods as deemed necessary by the Contractor and approved by GE or GE's Representative.

f. The FML shall be anchored within an anchor trench constructed to the dimensions shown on the Technical Drawings. Care shall be taken while backfilling the trenches to prevent damage to the FML.

B. FML Deployment

1. FML shall be deployed according to the following procedures:

a. Placement of the FML panels shall be according to the approved location and position plan provided by the Installer. Placement shall follow all instructions on the boxes or wrapping containing the FML materials that describe the proper methods of unrolling panels.

b. FML deployment shall not be undertaken if weather conditions will preclude material seaming following deployment.

c. The method of placement must ensure that:

1) Deployed FML must be visually inspected for uniformity, tears, punctures, blisters, or other damage or imperfections. Any such imperfections shall be immediately repaired and reinspected.

2) No equipment used shall damage the FML by handling, trafficking, leakage of hydrocarbons, or other means.

3) No personnel working on the FML shall smoke, wear damaging shoes, or engage in other activities that could damage the FML.

4) The prepared surface underlying the FML must not be allowed to deteriorate after acceptance, and must remain acceptable up to the time of FML placement and until completion of the project.

5) Adequate temporary loading and/or anchoring (e.g., sand bags), not likely to damage the FML, shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).

6) Direct contact with the FML shall be minimized (i.e., the FML in excessively high-traffic areas shall be protected by geotextiles, extra FML, or other suitable materials).

7) The method used to unroll or adjust the panels does not cause excessive scratches or crimps in the FML and does not damage the supporting soil or underlying geotextile (where applicable).

8) The method used to place the panels minimizes wrinkles (especially differential wrinkles between adjacent panels).

d. Any damage to the FML panels or portions of the panels as a result of placement must be replaced or repaired at no cost to GE or GE's Representative. The decision to replace or repair any panel or portions of panels shall be made by GE or GE's Representative.

e. The Installer shall assign an "identification number" to each FML panel placed. The number system used shall be simple, logical, and shall identify the relative location in the field.

C. All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests.

D. Seaming

1. The seaming procedures below shall be implemented, where applicable, during installation of the FML. The seaming procedures are as follows:

   a. Generally, all seams whether field or factory, shall be oriented parallel to the line of slope, not across slope. At liner penetrations and corners, the number of seams shall be minimized.

   b. The area of the FML to be seamed shall be cleaned and prepared according to the procedures specified by the Manufacturer. Any abrading of the FML shall not extend more than one-half inch on either side of the weld. Care shall be taken to eliminate or minimize the number of wrinkles and "fishmouths" resulting from seam orientation.

   c. Field seaming is prohibited when either the air or sheet temperature is below 32ºF, when the sheet temperature exceeds 122ºF, or when the air temperature is above 104ºF. At air or sheet temperatures between 32ºF and 40ºF, seaming shall be conducted directly behind a preheating device. In addition, seaming shall not be conducted when FML material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.

   d. Seaming shall not be performed on frozen or excessively wet underlying soil surfaces.

   e. Seams shall have an overlap beyond the weld large enough to perform destructive peel tests, but shall not exceed 5 inches.

   f. The Contractor shall perform trial seams on excess FML material. A 1-foot by 3-foot seamed liner sample shall be fabricated with the seam running down the 3-foot length in the center of the sample. Such trial seaming shall be conducted prior to the start of each seaming session for each seaming crew, every 4 hours, after any significant change in weather conditions or FML temperature, or after any change in seaming equipment. From each trial seam, four field test specimens shall be taken. The test specimens shall be 1-inch by 12-inch strips cut perpendicular to the trial seam. Two of these specimens shall be shear tested and two shall be peel tested using a field tensiometer, and recorded as pass (failure of liner material) or fail (failure of seam). Upon initial failure, a second trial seam shall be made; if both trial seams fail, then the seaming device and its operator shall not perform any seaming operations until the deficiencies are corrected and two successive passing trial seams are produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.

   g. Where fishmouths occur, the material shall be cut, overlapped, and an overlap weld shall be applied. Where necessary, patching using the same liner material shall be welded to the FML sheet.

   h. Acceptable seaming methods for FML are:

      1) Extrusion welding using extrudate with identical physical, chemical, and environmental properties; and

2) Hot wedge welding using a proven fusion welder and master seamer.

i. Seaming device shall not have any sharp edges that might damage the FML. Where self-propelled seaming devices are used, it shall be necessary to prevent "bulldozing" of the device into the underlying soil.

E. Seam Testing

1. The Contractor shall perform non-destructive seam testing on 100 percent of field seams. The following test method and procedures may be used:

a. Air pressure testing may be used if double-track hot-wedge welding has been used to seam the HDPE FML. Using approved pressure testing equipment, the following procedures will be followed:

1) Seal both ends of the air channel separating the double-track hot-wedge welds.

2) Insert pressure needle into air channel and pressurize the air channel to 27 psi.

3) Monitor pressure gauge for 3 minutes and determine whether pressure is maintained without a loss of more than 2 psi.

4) If the pressure test fails, then localize the leak and mark the area for repair.

a) Air pressure testing will be conducted under the direct observation of GE or GE's Representative.

b) Vacuum testing will be used on all seams not tested using air pressure testing. Using an approved vacuum box, the following procedures will be followed:

i. Apply a soapy water mixture over the seam.
ii. Place vacuum box over soapy seam and form a tight seal.
iii. Create a vacuum by reducing the vacuum box pressure to 5 psi for 10 seconds.
iv. Observe through the vacuum box window any bubbles.
v. Where bubbles are observed, mark seam for repair.
vi. Move vacuum box further down seam overlapping tested seam by 3 inches.
vii. Where hot-wedge seaming has been performed, the overlap must be cut back to the weld.

c) All vacuum testing will be conducted under the direct observation of GE or GE's Representative.

2. In addition to non-destructive seam testing, the Contractor will perform destructive testing. The destructive testing procedures are as follows:

a. Test samples will be prepared by the Installer every 500 feet of seam length, a minimum of one test for each seaming machine per day, or more frequently at the discretion of GE or GE's Representative. Sample location and size will be selected by GE or GE's Representative. The sample size (12 x 56 inches) will be large enough to produce three sets of test specimens for the following tests:

   1) Seam Shear Strength (ASTM D4437).

   2) Peel Adhesion (ASTM D4437).

b. Ten specimens will compose a set. Five of these will be tested for peel and the other five for shear strength. Each specimen will be 1-inch wide and 12-inches long with the field seam at the center of the specimen. The 56-inch sample length will first be cut at the ends to produce two field peel test specimens. The remaining 54 inches will be divided up into thirds and one-third submitted to the Contractor, one-third to the independent testing laboratory, and one-third to GE or GE's Representative for storage and future reference.

c. Test specimens will be considered passing if the minimum values below are met or exceeded for four of the five test specimens tested by the independent laboratory. All acceptable seams will lie between two locations where samples have passed.

d. The cost of destructive testing will be borne by the Contractor.

e. Seams will meet the following minimum criteria:

Field Seam Properties	Test Method	Specification Limit
Shear Strength	ASTM D6392	120 ppi
Peel Adhesion – Fusion	ASTM D6392	91 ppi and Film tear bond
Peel Adhesion – Extrusion	ASTM D6392	78 ppi and Film tear bond

3. If a sample fails destructive testing, the Contractor shall ensure that: the seam is reconstructed in each direction between the location of the sample that failed and the location of the next acceptable sample; or the welding path is retraced to an intermediate location at least 10 feet in each direction from the location of the sample that failed the test, and a second sample is taken for an additional field test. If this second test sample passes, the seam must be then reconstructed between the location of the second test and the original sampled location. If the second sample fails, the process must be repeated.

   a. All costs for work performed to achieve passing tests along with costs for retesting will be borne by the Contractor.

4. If double-track hot-wedge welding is used, GE or GE's Representative and the Installer must agree on the track weld that will be used in the destructive testing. The weld chosen inside or outside must be consistently tested, and must pass according to the criteria above.

5. All holes created by cutting out destructive samples will be patched by the Contractor immediately with an oval patch of the same material welded to the membrane using extrusion welding. The patch seams will be tested using a vacuum box and using the procedures described above. Work will not proceed with materials covering the FML until passing results of destructive testing have been achieved.

6. At the ends of each field seam, two field test specimens will be taken and field tested with a field tensiometer. Both specimens must pass prior to placing the membrane in the anchor trench or continuing with additional seams. Failure of these specimens will require correcting the seaming device and repair of the preceding seam according to the failure testing and procedures described above.

F. Liner Repair

1. All imperfections, flaws, construction damage, and destructive and nondestructive seam failures shall be repaired by the Installer of the FML. The appropriate methods of repair are listed below:

   a. Patching, used to repair holes, tears, undispersed raw materials, and contamination by foreign matter.
   b. Grinding and rewelding, used to repair small sections of extruded seams.

   c. Spot welding or seaming, used to repair pinholes or other minor, localized flaws.

   d. Capping, used to repair large lengths of failed seams.

   e. Topping, used to repair areas of inadequate seams which have an exposed edge.

   f. Removing bad seams and replacing with a strip of new material welded into place.

G. Construction Material Placement and Penetrations

1. Wrinkles that develop from normal placement procedures must be controlled such that the underlying FML does not fold over. Small wrinkles, defined as having their height less than or equal to one-half their base width, may be trapped and pushed down by the overlying soil. Any wrinkle that becomes too large and uncontrollable or that folds the FML over must be brought to the attention of GE or GE's Representative. If necessary, the FML shall be uncovered, cut, laid flat, seamed by extrusion welding, and non-destructively tested.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02325

HELICAL PILES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to design, furnish and install helical piles, including connection details, at locations shown on the Drawings. The Contractor shall design and install helical piles that will develop the vertical working load capacities as further defined herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02190 – Maintenance of Sanitary Sewer Flows

B. Section 03301 – Cast-In-Place Concrete

C. Revised Final RD/RA Work Plan, Section 5.8 – Sanitary Sewer Realignment

D. Revised Final RD/RA Work Plan, Section 7.5.10 – Sanitary Sewer Realignment

1.03 REFERENCES

A. Standards referenced in this Section are:

1. ASTM A29/A29M, Specification for Steel Bars, Carbon and Alloy, Hot-Wrought, General Requirements for.

2. ASTM A36/A36M, Specification for Carbon Structural Steel.

3. ASTM A53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

4. ASTM A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

5. ASTM A193/A193M, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.

6. ASTM A252, Specification for Welded and Seamless Steel Pipe Piles.

7. ASTM A500/A500M, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
8. ASTM A572/A572M, Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

9. ASTM A618/A618M, Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.

10. ASTM A656/A656M, Specification for Hot-Rolled Structural Steel, High-Strength Low-Alloy Plate with Improved Formability.

11. ASTM A1018/A1018M, Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer:

a. Manufacturer shall be able to document at least five years successful experience in fabricating helical piles of scope and type similar to that required.

2. Professional Engineer:

a. The Contractor or helical pile system manufacturer shall retain a registered professional engineer. Professional engineer shall have at least five years experience designing helical piles.

b. Responsibilities include:

1) Reviewing helical pile performance and design criteria stated in the Contract Documents.
2) Preparing written requests for clarifications or interpretations of performance or design criteria for submittal to GE's Representative by the Contractor.

3) Preparing or supervising preparation of design calculations, helical pile design drawings, and related Shop Drawings.

4) Signing and sealing all calculations, helical pile design drawings, and Shop Drawings.

5) Certifying that:

a) Design of helical pile system was performed in accordance with performance and design criteria stated in the Contract Documents, and

b) Design conforms to all applicable local, state, and federal Laws and Regulations, and to prevailing standards of practice.

3. Installer Qualifications:

a. Retain a single installer trained and certified by the manufacturer, with record of successful experience in installing helical pile systems of scope and type similar to that required.

b. Installer shall employ only tradesmen with specific skill and successful experience in the type of Work required.

c. When requested by GE or GE's Representative, submit name and qualifications of installer with the following information for at least three successful, completed projects:

1) Names and telephone numbers of owner or engineer responsible for each project.

2) Approximate contract cost of the helical pile systems for which installer was responsible.

3) Amount (linear feet) of helical piles installed.

B. Component Supply and Compatibility:

1. Obtain all products included in this Section regardless of component manufacturer, from a single helical pile system manufacturer.

2. Helical pile system manufacturer shall review and approve or prepare all Shop Drawings and other submittals (except for delegated design submittals, when professional engineer is retained by other than helical pile manufacturer) for all components furnished under this Section.

3. Components shall be specifically constructed for specified service conditions.

C. Certifications:

1. Furnish certification, signed by authorized officer of manufacturer and notarized, stating that helical pile systems conform to the design prepared by the professional engineer.

2. Furnish certification, signed by authorized officer of the Contractor and notarized, stating that all components are furnished by the same manufacturer.

1.05 DEFINITIONS

A. Coupling - Central steel shaft connection to the extension shaft.

B. Coupling Bolts - High-strength, structural steel fasteners used to connect helical pile segments together.

C. Helical Extension - Helical pile foundation component installed immediately following the lead or starter section. This component consists of one or more helix plates welded to a central shaft. Its function is to increase bearing area.

D. Helix Plate - Generally this is a round steel plate formed into a ramped spiral. The helical shape provides the means to install the helical pile, plus transfers load to the soil in end bearing.

E. Helical Pile - A bearing type foundation element consisting of a lead or starter section, helical extension (if required), plain extension section(s), and a steel cap plate.

F. Lead Section - The first helical pile foundation component installed into the soil, consisting of single or multiple helix plates welded to a central steel shaft.

G. Plain Extension - Central steel shaft segment without helix plates. It is installed following the installation of the lead section or helical extension (if used). Plain extensions are used to extend the helix plates beyond the specified minimum depth and into competent load bearing stratum.

H. Safety Factor - The ratio of the ultimate capacity to the working or design load used for the design of the pile or structural element of the pile.

1.06 SUBMITTALS

A. Shop Drawings:

1. Submit detailed shop drawings at least 3 weeks prior to the start of helical pile installation. Drawings shall include the following: installation sequence, location and identification number of each proposed pile, type and size of central steel shaft, helix plate configuration (number, diameter, and spacing of the helix plates), minimum effective installation torque, minimum overall length, cut-off elevation, and cap plate detail.

B. Product Data:

a. Submit descriptive literature of the helical pile system, parts, and installation procedures.

b. Submit description of installation equipment, including position/location during helical pile installation.

C. Design Data:

1. Submit design computations or complete structural analysis of helical pile system, signed and sealed by professional engineer. Professional engineer's seal shall be clearly legible, including state of registration, registration number, and name on seal.

2) Submit certification by professional engineer that professional engineer has performed design of helical pile system in accordance with performance and design criteria stated in the Contract Documents, and that design conforms to all local, state, and federal Laws and Regulations, and to prevailing standards of practice.

D. Certification letters, laboratory test reports, certified mill reports, and other data as required to demonstrate product compliance with these Specifications.

E. Calibration reports for each torque indicator or torque motor. Calibration tests shall have been performed within 180 days of the submittal date. Helical pile installation shall not proceed until the Engineer has received the calibration reports. Reports shall include: name of testing agency, identification number of device calibrated, description of calibrated testing equipment, date of calibration, and calibration data.

F. Helical pile installation records, provided to GE and/or GE's Representative within 24 hours after each pile installation is completed. These records shall include, but are not limited to; the name of project and Contractor, name of Contractor's supervisor during installation, date and time of installation, name and model of installation equipment, type of torque indicator used, location of helical pile, actual helical pile type and configuration (including lead section, number and size of helix plates, number and type of extension sections), helical pile installation duration and observations, total length of helical pile, cut-off elevation, installation torque at 1-ft intervals for the final 10 feet, comments pertaining to interruptions, obstructions or other relevant information, and rated load capacity.

G. Qualifications statements for the manufacturer, professional engineer, and installer.

H. Record drawings depicting as-built location of each helical pile.

1.07 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, and Unloading:

1. Prior to shipping, completely inspect products to assure that components are complete and comply with requirements of Contract Documents and recommendations of manufacturer. Box or crate products as required to prevent damage during shipment.

2. Deliver products to Site in such quantities and at such times to ensure continuity of pile driving operations. Deliver products in ample time to prevent delaying the Work.

3. Inspect all boxes, crates, and packages upon delivery to Site and notify GE or GE's Representative in writing of loss or damage to products. Promptly remedy loss and damage to new condition per manufacturer's instructions.

B. Storage and Protection:

1. Protect products from corrosion and deterioration.

C. Handling of Products:

1. Handle materials in accordance with the manufacturers' recommendations.

1.08 JOB CONDITIONS

A. Subsurface Information: Refer to Appendix H of this Revised Final RD/RA Work Plan for data on subsurface conditions. Data is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater levels at dates and times other than date and time when measured. GE will not be responsible for interpretations or conclusions drawn thereof by the Contractor. Data is solely made available for the convenience of the Contractor.

1. Additional test borings and other exploratory operations may be made by the Contractor, at no additional cost to GE.

B. Line and Level:

1. GE or GE's Representative will establish a benchmark on the Site and a base line for use by the Contractor in establishing lines and levels for the Work. The Contractor shall establish and locate all other lines and levels and be responsible for the correct location and deviation of all piles.

B. Protection:

1. Protect structures, underground utilities and other construction from damage caused by pile installation operations.

C. Cost of GE Representative's Redesign:

1. Piling installed incorrectly, out of position, or which is defective in any way shall be corrected as directed by GE's Representative and as described hereafter.

2. GE's Representative will record all time required by him and their consultants, if any, in redesigning piling, foundations or other related structural work and in making revisions to the Contract Documents.

3. The Contractor shall reimburse GE for the additional services of GE's Representative based on a charge of 3.5 times salary costs.

PART 2 - PRODUCTS

2.01 SYSTEM PERFORMANCE

A. Design Criteria:

1. Each helical pile shall be designed to develop a working vertical soil bearing load capacity of 18 tons and ultimate capacity of 36 tons. Each helical pile shall have an allowable structural capacity of 19.5 tons, which includes a downdrag load on the shaft developed from settlement of surrounding soils.

2. Capacity of each helical pile shall be developed from bearing within the sand layer. All piles shall be embedded a minimum of 7 feet into the sand layer.

3. Minimum installation torque shall be as required to properly install helical piles. The helical pile design professional engineer shall provide final design of the helical piles.

4. The allowable working load in compression of the helical piles shall not exceed the following value: P =0.4 x (min. yield strength of central shaft) x (area of the central steel shaft). The ultimate structural capacity in compression shall be determined as: Pult **=** (min. yield strength of central steel shaft) x (area of central steel shaft).

5. The ultimate bearing capacity of the installed helical pile shall be at least twice the rated working load of the installed pile.

6. Cap plates and foundation brackets shall be sized to distribute the rated working load of the pile to the concrete pile cap, at a bearing capacity not to exceed 1000 psi.

2.02 MATERIALS

A. Helical piles:

1. The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be square shaft or round shaft. Square shaft shall be hot-rolled Round-Cornered-Square solid steel bar meeting dimensional requirements of ASTM A29/A29M. The bar shall be modified medium carbon steel grade (similar to AISI 1044) or High Strength Low Alloy low to medium carbon grade steel, with improved strength due to fine grain size. Round shaft shall be structural steel pipe or tube, welded or seamless, meeting ASTM A500/A500M, A53/A53M, A252 or A618/A618M; wall thickness shall be minimum 0.262 inches.

2. The helix plate shall be hot rolled carbon steel, strip, or plate formed on matching metal dies to true helical shape and uniform pitch, meeting ASTM A656/A656M, A1018/A1018M, with minimum yield strength of 80 ksi. Minimum plate thickness shall be 3/8 inch.

3. Coupling bolts shall be of diameter as determined by manufacturer's professional engineer, meeting ASTM A193/A193M, Grade B7.

4. Couplings shall be formed as an integral part of the plain and helical extension material as hot upset forged sockets or internal sleeve wrought steel connectors.

5. Displacement plates (lead or extension plates) shall be fabricated from steel or other material (not wood) that will not affect the structural integrity of the central steel shaft or grout column.

6. Cap plates at the tops of installed piles shall be a welded assembly, conforming to ASTM A36/A36M, or A572/A572M Grade 50.

7. The helical piles shall be hot-dip galvanized after fabrication in accordance with ASTM A123/A123M, with 3.9 mils coating thickness, minimum.

8. Product and Manufacturer: Provide one of the following:

a. Chance Helical Pile System, by A.B. Chance, a Division of Hubbel Power Systems, Inc.

b. Or equal.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Contractor shall examine the areas and conditions under which helical piles are to be installed. Notify GE or GE's Representative, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to GE or GE's Representative.

3.02 INSTALLATION

A. Helical Piles:

1. All piles shall be installed in the presence of GE or GE's Representative. GE and GE's Representative shall have the right of access to any and all field installation records.

2. Installation equipment shall be rotary type, hydraulic power driven torque motor; with clockwise, and counter-clockwise rotation capabilities. The torque motor shall be capable of continuous adjustment to revolutions per minute (RPMs) during installation. Percussion drilling equipment shall not be permitted. The torque motor shall have torque capacity 15% greater than the torsional strength rating of the central shaft to be installed.

3. Equipment shall be capable of applying adequate downward pressure and torque simultaneously to suit project soil conditions and load requirements. The equipment shall be capable of continuous position adjustment to maintain proper helical pile alignment.

4. Installation tooling shall consist of a Kelly Bar Adapter and appropriate drive tools as manufactured by the helical pile system manufacturer. Installation tooling shall be maintained in good working order.

5. A torque indicator shall be used during the helical pile installation. The torque indicator can be an integral part of the installation equipment or externally mounted in-line with the installation tooling. The indicators shall be capable of providing continuous measurement of applied torque throughout the installation, in increments of at least 500 ft-lb. The indicator shall be calibrated prior to start of work. Torque indicators which are an integral part of the installation equipment shall be calibrated onsite. Torque indicators which are mounted in-line with the installation tooling shall be calibrated either on site or at an appropriately equipped test facility. Indicators that measure torque as a function of hydraulic pressure shall be calibrated at normal operating temperatures. Torque indicators shall be recalibrated if, in the opinion of GE or GE's Representative, there is reasonable doubt as to the accuracy of the torque measurements.

6. Installation Procedures - Central Steel Shaft (Lead and Extension Sections):

   a. The Helical Pile installation technique shall be such that it is consistent with the geotechnical, logistical, environmental, and load carrying conditions of the project.

b. The lead section shall be positioned at the location shown on the Drawings. The helical pile sections shall be engaged and advanced into the soil; in a smooth continuous manner at a rate of rotation of *5* to 20 RPMs. Extension sections shall be provided to obtain the required minimum overall length and installation torque. Connect sections together using coupling bolt(s) with nut torqued to 40 ft-lb.

c. Sufficient downward pressure shall be applied to uniformly advance the helical pile sections approximately 3 inches per revolution. The rate of rotation and magnitude of downward pressure shall be adjusted for different soil conditions and depths.

d. All piles shall be embedded a minimum of 7 feet into the sand layer.

B. Termination Criteria:

1. The torque as measured during the installation shall not exceed the torsional strength rating of the central steel shaft.

2. The minimum installation torque and minimum overall length criteria shall be satisfied prior to terminating the helical pile installation. Helical piles shall be installed to the minimum torque value required to provide the load capacities specified in Paragraph 2.01.A of this Section.

3. If the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to achieving the minimum overall length required, the Contractor shall have the following options, with the approval of GE or GE's Representative:

   a. Terminate the installation at the depth obtained.

   b. Remove the in-place helical pile and install a new one with fewer and/or smaller diameter helix plates. The new helix configuration shall be as recommended by the helical pile design professional engineer. If reinstalling in the same location, the top-most helix plate of the new helical pile shall be terminated at least 3 feet deeper than the tip termination depth of the removed helical pile.

   c. Do not reuse the removed pile.

4. If the minimum installation torque is not achieved at the minimum overall length, the Contractor shall have the following options, with the approval of GE or GE's Representative:

   a. Install the helical pile deeper using additional extension sections.

   b. Remove the in-place helical pile and install a new one with additional and/or larger diameter helix plates, as recommended by the helical pile design professional engineer. If reinstalling in the same location, the top-most helix plate of the new helical pile shall be terminated at least 3 feet deeper than the tip termination depth of the removed helical pile.

5. If the helical pile is refused or deflected by a subsurface obstruction, the installation shall be terminated and the pile removed. The obstruction shall be removed, if feasible, and the pile reinstalled, if not damaged. If the obstruction cannot be removed, the helical pile shall be installed in an adjacent location, as directed by GE or GE's Representative.

6. If the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to proper positioning of the last plain section relative to final elevation, the Contractor may remove the last plain extension and replace it with a shorter length extension. If this is not feasible, the Contractor may cut the extension shaft to the correct elevation. The Contractor shall not reverse (back out) the helical pile to facilitate extension removal.

7. The average torque for the last 3 feet of penetration shall be used as the basis of comparison with the minimum installation torque. The average torque shall be defined as the average of the last three readings recorded at 1-foot intervals.

C. Allowable Tolerances:

1. Centerline of the installed helical piles shall not be more than 3 inches from the indicated location on the Drawings, and shall be within 2 degrees of vertical. Top elevation at the cap plates and underpinning brackets shall be within +1 inch to -2 inches of the design vertical elevation.

END OF SECTION

MATERIALS AND PERFORMANCE - SECTION 02500

SEWAGE AND DRAINAGE PIPING INSTALLATION

PART 1 - GENERAL

1.01 WORK SPECIFIED

A. Underground sewage and drainage piping shall be installed in compliance with the information provided herein.

B. Piping shall be furnished and installed of the materials, sizes and classes designated on the Technical Drawings and as specified in the section for the specific pipe material, or as otherwise specified and at the grades and locations shown on the Technical Drawings.

1.02 RELATED SECTIONS

A. Section 02190 – Maintenance of Sanitary Sewer Flows

B. Section 02200 – Earthwork

C. Section 02222 – Fill Materials

D. Section 02232 – Geotextile Fabric

E. Section 02504 – Precast Reinforced Concrete Manholes

F. Section 02690 – Polyvinyl Chloride (PVC) Pipe

G. Revised Final RD/RA Work Plan, Section 5.8 – Sanitary Sewer Realignment

H. Revised Final RD/RA Work Plan, Section 7.5.10 – Sanitary Sewer Realignment

1.03 REFERENCES

A. Material and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements are specified herein.

1. American Society for Testing and Materials (ASTM)
2. American National Standards Institute (ANSI)
3. Massachusetts Highway Department (MHD)

PART 2 - PRODUCTS

2.01 MATERIALS

A. All piping materials shall be as specified in the Revised Final RD/RA Work Plan for Unkamet Brook Area - Remainder.

PART 3 - EXECUTION

3.01 PROTECTION OF EXISTING FACILITIES

A. The Contractor shall protect existing facilities to remain and will repair any damage at no additional cost to GE.

B. The Contractor shall conduct operations such that no interruptions to the existing utility systems shall occur. Where existing sanitary sewers are being replaced or interrupted, the Contractor shall maintain the flow in accordance with Section 02190, Maintenance of Sanitary Sewer Flows.

C. Existing sanitary sewer laterals damaged in the work or temporarily disconnected shall be restored to operation by the end of each work day. Existing sewer laterals crossing over new pipelines shall be restored to pre-construction conditions.

D. The Contractor shall maintain existing manholes, catch basins and other utility structures not scheduled for replacement or modification in their pre-construction condition. Any material or debris entering same due to the Contractor's operation shall be promptly removed.

E. Staking

1. Prior to start of construction, the Contractor shall have staked or marked all underground utilities (e.g., water, gas, electrical, telephone, cable, storm sewer, sanitary sewer, laterals, and services).

2. In the event such locations indicate a possible interference, or when needed to locate points of connection to existing facilities, the Contractor shall perform exploratory excavations to determine the utilities' locations and elevations. The Contractor shall provide the GE and GE’s Representative with the results of the exploratory excavations.

3. The Contractor shall allow GE and GE’s Representative sufficient time to determine any changes required as a result of such exploratory excavations prior to start of construction. Refer to Section 02200, Earthwork, for additional details regarding existing facilities.

F. When the project consists of reconstructing sewers and reconnecting existing sewer laterals, the Contractor shall only reconnect live laterals, unless otherwise shown on the Technical Drawings. The Contractor shall verify whether the lateral is live or abandoned and the source of the lateral using such methods as necessary including dyeing, flushing with water, rodding, pipe locators and exploratory excavations.

3.02 LINES AND GRADES

A. Pipes shall be laid to the lines and grades shown on the Technical Drawings and shall be straight between manholes.

B. The grade of the sewer between manholes and from pipe length to pipe length shall not vary from the design grade shown on the Technical Drawings by more than 0.15 times the design grade, unless a change in grade has been ordered by GE, in which case the same tolerance shall apply. In addition, invert elevations at any location shall not vary from the design elevations by more than 0.05 feet, unless a change in invert elevation has been ordered by GE, in which case the same tolerance shall apply. Any sewer grade or invert elevation which exceeds these tolerances shall be corrected at the Contractor's expense.

C. The method used to install the sewer shall be consistent with standard practice of establishing line and grade and sufficiently accurate to ensure that the above requirements are met.

D. Where replacing short sections of existing sewer of length less than the distance from manhole to manhole, the Contractor shall verify by exploratory excavation the existing location and grade at each end of the section to be replaced and employ methods, such as transit and level, to install the new sewer true to line and grade within the prescribed tolerances. The final alignment of the sewer shall be such that a clear and unobstructed line of sight exists between manholes.

E. For manhole-to-manhole reaches, the Contractor shall use the laser beam method to establish line and grade, and the Contractor shall check the grade of pipe at not more than 50-foot intervals by use of level instrument and tripod.

F. The Contractor shall furnish all labor, materials, surveying instruments and tools to establish and maintain all lines and grades. The Contractor shall have personnel on duty at all times who are qualified to set and check grades of sewers and manholes as they are installed.

G. The Contractor shall employ a land surveyor licensed in the Commonwealth of Massachusetts to verify final rim and pipe invert elevations at manholes of all piping installed on this project and the length between manholes. This information shall be recorded on the record drawings to be delivered to GE and GE's Representative.

3.03 TRENCH EXCAVATION

A. Trenches for underground drainage and sewer piping shall be excavated and maintained as shown on the Technical Drawings and specified in Section 02200, Earthwork.

3.04 PIPE FOUNDATIONS

A. All pipes, fittings, or specials shall be properly bedded in, and uniformly supported on, pipe foundations specified herein and shown on the Technical Drawings.

B. Trenches shall be excavated to the necessary depth and maintained in accordance with Section 02200 Earthwork, prior to installing the foundation.

C. Trenches shall be dewatered and all work performed in a dry trench.

D. Bedding material shall be spread and compacted in accordance with Section 02200, Earthwork until the required total depth of bedding has been built up.

E. The Contractor shall perform bedding operations with care to maintain line and grade.

F. The pipe foundation above the midpoint of the pipe shall be spread and compacted in accordance with Section 02200, Earthwork.

G. Normal Soil Conditions

1. Pipe located in normal soil conditions shall be supported on a foundation as indicated on the Technical Drawings.

2. The trench shall be excavated as shown on the Technical Drawings.

3. Structural fill material per Section 02222, Fill Materials, shall be furnished, placed and compacted in the trench for its full width to the required minimum depth, as shown on the Technical Drawings.

4. Structural fill shall extend upward to a point a minimum of 12-inches over the top of plastic pipe, with the exception of areas where the depth will vary, as shown on the Technical Drawings.

3.05 INSPECTION OF PIPE BEFORE INSTALLATION

A. All pipe, fittings and specials shall be carefully inspected by the Contractor prior to installation.

B. Cracked, broken, warped, out-of-round, damaged joints, or otherwise defective pipe, fittings or specials, as determined by GE and GE's Representative, shall not be installed. Any pipe or fitting which has received a blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed from the site.

C. Rejected pipe and fittings shall be clearly tagged in such a manner as not to deface or damage them, and then shall be removed from the job site by the Contractor.

D. The pipe shall be cut in a neat and workmanlike manner without damage to the pipe. All pipe ends shall be cut square at right angles to the axis of the pipe, deburred and beveled. The chamfer shall be 15° and cut 1½-inches from the spigot end.

E. Pipe shall be handled and stored in accordance with manufacturer's requirements.

3.06 INSTALLATION OF PIPE

A. Installation of piping shall be in accordance with manufacturer's technical data and printed instructions.

B. All pipe, fittings and specials shall be carefully lowered into the trench with ropes, slings or other equipment designed or intended for the task.

C. Pipe which becomes cracked, broken or otherwise damaged during or after installation shall be marked and removed from the job site by the Contractor at its own expense.

D. The cutting of pipe, if required, to make connections to new or existing work, shall be done with proper tools in accordance with the pipe manufacturer's requirements.

E. Ends of pipe which terminate at manholes, catch basins or other structures shall be cut cleanly and trimmed to a neat, sheared edge which comes flush with the inside wall of the structure unless shown otherwise on the Technical Drawings.

F. All pipes entering or leaving a structure shall not have joints within 3 ' 6" from the wall of the structure.

G. The pipe, fittings and specials shall be installed to the required line and grade, and shall be firmly bedded in the trench so that the pipe barrel is uniformly supported and cradled throughout its length, consistent with the requirements of the pipe foundation used.

H. Blocking will not be permitted under the pipe, except where the pipe is to be installed in concrete encasement or concrete cradle.

I. Depressions in the pipe foundation shall be provided to receive bells, couplings, or similar projections to assure proper bedding of the pipe barrel.

J. When the pipe is in proper position, it shall be joined or coupled to the mating end of the previously laid pipe using the manufacturer's required assembly procedure.

K. The completed assembly of pipe sections shall form a sewer or drain with uniform slope unless indicated otherwise on the Technical Documents.

L. Manufactured pipe plugs or temporary bulkheads shall be placed in the open ends of sewer lines whenever pipe laying is stopped overnight, over weekends, or whenever dirt or debris could enter the pipeline during construction.

3.07 FINAL INSPECTION

A. Each section of installed sewer or drain pipeline between manholes, catch basins or structures must be inspected by the Contractor and GE, before final acceptance.

B. Such inspection shall be continuous color VHS videotape/DVD and logging over the pipe interior's entire length. The Contractor shall engage the services of an approved professional independent sewer inspection service, which specializes and is experienced in the color videotape methods and pay all costs associated with this work. The televised sewer inspection shall be conducted after the final backfill has been in place at least thirty (30) days. Pipes shall be televised in the direction of flows. The color videotape record shall be made in the presence of GE and GE's Representative and submitted to GE and GE's Representative directly by the sewer inspection service. The color videotape/DVD shall be properly identified, narrated as necessary and accompanied by a written record of each televised run.

C. The pipe and fittings shall be true to both line and grade, shall show no leaks, shall show no obstruction to flow, shall have no projections of connecting pipe into the line, shall be free from cracks and protruding joint materials, and shall contain no deposits of dirt, debris or other material which will in any way reduce the full cross sectional area of the pipe. Refer to the subsection, entitled Lines and Grades, for allowable tolerances.

D. Any section of sanitary or storm sewer, or portions thereof, which do not comply with the inspection criteria defined above, as determined by GE and GE's Representative, shall be promptly corrected or repaired by the Contractor at his own expense.

E. Pipe that is cracked or collapsed shall be dug up and replaced with new pipe; pipe which is out of line or grade shall be dug up and re-laid to the correct line and grade.

F. Connecting pipes which protrude into the line shall be dug up and the connection remade, or the protruding portion of the connecting pipe shall be trimmed back flush with the wall of the main sewer, if the main line can be entered.

G. Deposits of dirt and debris shall be flushed with water through to the downstream manhole and removed by the Contractor.

H. At points of leakage, the pipe shall be excavated and replaced or repaired using methods approved by GE or GE's Representative with approved repair clamp couplings (stainless steel Type 316 with stainless steel bolts and nuts or cast iron coupling with stainless steel bolts and nuts) so as to permanently stop the leak.

I. All manholes shall be watertight. All joints and precast wall sections, between cast iron frame and brick, and between brick units themselves shall be neat, continuous, and flush with the adjacent surfaces. Dirt and debris shall be removed from all manholes.

3.08 LEAKAGE TESTS ON GRAVITY SANITARY SEWERS AND MANHOLES

A. All gravity sanitary sewers, including manholes, and other structures constructed under this Contract, shall be tested for leakage and shall satisfactorily meet the test requirements prior to final acceptance of the work.

B. The Contractor shall furnish all labor, testing materials, and equipment and shall perform the tests described herein. All water necessary for flushing and testing shall be furnished by the Contractor.

C. The Contractor shall re-excavate the pipe and make all necessary repairs or replacements, and shall repeat the final leakage test(s) until the leakage requirements are met.

D. A series of consecutive sections of sanitary or storm sewer may be tested simultaneously. A section of sewer or drain is defined as the length of sewer between two consecutive manholes.

E. Testing shall be completed prior to final paving and/or final restoration.

F. Leakage Tests - New Sanitary Sewer Systems

1. Leakage tests shall be performed on all new sanitary sewers and new manholes using exfiltration testing.

2. Where the new piping fails to pass inspection or joint tests, the failed pipe or joint shall be re-excavated and replaced or corrected with a permanent repair satisfactory to GE and GE's Representative. Use of chemical sealant to stop leaks shall not be an acceptable method.

G. Exfiltration Testing of Installed Sanitary Sewer Pipe and Manholes

1. Exfiltration shall be measured by the drop of water level in the manholes of the section being tested or in a standpipe.

2. The sanitary sewer pipe and manholes shall be filled with clear water to provide a head of at least 5 feet above the top of the sewer pipe or 5 feet above the level of the ground water table, whichever is higher, at the highest point of the line under test. Exfiltration shall be measured as the loss of water from the pipe by the amount which must be added during the length of the test to maintain the original level.

3. In this test, the pipe and/or structure must remain filled with water for at least 24 hours prior to taking measurements, and test period (for taking measurements) shall not be less than two hours.

4. Visible leaks in manholes shall be permanently repaired prior to start of filling pipe structure with water.

5. When the level of the groundwater table is of such height that the manholes cannot be used for measuring, or if the vertical distance between the top of the pipe and the manhole rim is less than 5 feet, the Contractor shall test the pipe separately from the manholes utilizing the standpipe method including plugs, hoses, etc., to establish the required head of water above the pipe. When a standpipe and plug arrangement is used in the upper manhole of a pipe under test, the Contractor shall provide a positive method of releasing entrapped air in the sewer prior to taking measurements.

   When standpipes are used for pipe tests, the manholes shall be tested for infiltration as follows:

   a. Measure leakage by means of a watertight weir or other approved means installed at the lower end of each section under test (next downstream manhole).

   b. Test for a period of at least five days.

   c. Total leakage of any pipe section tested shall not exceed the total of 100 gallons per mile of pipe per 24 hours per inch of nominal internal pipe diameter.

   d. If the leakage in the system tested exceeds the specified amount, the Contractor shall make the necessary repairs or replacements required to reduce the leakage to within the specified limits and the test shall be repeated until the leakage requirement is met.

6. The total leakage of any section tested shall not exceed the rate of 100 gallons per mile of pipe per 24 hours per inch of nominal pipe diameter; plus leakage allowance for manholes included in the test section.

7. The equivalent leakage allowance shall be 4.5 gallons per manhole per 24 hours for 48-inch diameter manholes, and shall be 5.7 gallons per manhole per 24 hours for 60-inch and above diameter manholes and greater.

8. Sewer sections that fail the leakage test shall be repaired prior to retesting. A period of not less than 24 hours shall be maintained between draining of line for repair and refilling of pipeline for retesting.

END OF SECTION

MATERIALS AND PERFORMANCE - SECTION 02514

PRECAST CONCRETE MANHOLES

PART 1 - GENERAL

1.01 WORK SPECIFIED

A. The Contractor shall furnish and install precast concrete manholes of the type(s) shown on the Technical Drawings and as specified herein. The work shall include the following:

1. Required inlet and outlet pipe connections for new and/or existing sewers, frames and covers, masonry, concrete, reinforcing steel, special pipe fittings, precast units, all other materials, tools and equipment necessary to produce complete manholes.

2. Manholes shall be watertight. Manhole testing shall be in accordance with Section 02500, Sewage and Drainage Piping Installation. Associated work such as excavation, backfilling, grading and paving is specified elsewhere.

1.02 RELATED SECTIONS

A. Section 02190 – Maintenance of Sanitary Sewer Flows

B. Section 02200 – Earthwork

C. Section 02222 – Fill Materials

D. Section 02500 – Sewage and Drainage Piping Installation

E. Section 02690 – Polyvinyl Chloride (PVC) Piping

F. Revised Final RD/RA Work Plan, Section 5.8 – Sanitary Sewer Realignment

G. Revised Final RD/RA Work Plan, Section 7.5.10 – Sanitary Sewer Realignment

1.03 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent standards are specified herein:

1. American Society for Testing and Materials (ASTM)
2. Occupational Safety and Health Administration (OSHA)
3. American Association of State Highway and Transportation Officials (AASHTO)
4. Massachusetts highway Department (MHD)

1.04 QUALITY ASSURANCE

A. Only precast reinforced concrete sections made in a plant currently approved by MHD for manufacture of concrete pipe shall be used to construct manholes.

B. The contractor shall provide manufacturer certification that all precast concrete manhole sections furnished to this project conform to ASTM Specification C-478, except as modified and/or supplemented in this section of the specifications.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Precast concrete manholes shall be supplied by a manufacturer approved by MHD.

2.02 PRECAST CONCRETE BASES

A. Precast concrete bases shall conform to the following:

1. The general requirements of this Section.

2. The provisions of ASTM Specification C-478.

3. The basic dimensions shown on the Technical Drawings.

B. The horizontal joint at the top of the base shall be compatible with that of the precast wall sections.

C. The precast bases shall be uniformly supported on a compacted, level, geotextile lined foundation mat of Type "F" run-of-crusher stone, as specified in Section 02222 – Fill Materials.

1. The foundation mat shall bear on sound undisturbed earth, lined with geotextile.

2. The minimum depth of the mat shall be twelve inches throughout, but shall vary to the depth necessary to reach undisturbed earth.

3. Minimum diameter of the mat shall be the outside diameter of the base plus two feet.

D. The precast bases shall be manufactured with openings in the wall to receive the ends of the pipe, and shall be accurately set to conform with the line and grade of the pipe.

1. Openings shall be precast or machine cored.

2. All connections between manholes and pipes shall be watertight using flexible rubber sleeves attached to the manhole at the opening and connected to the pipe by means of stainless steel straps and bolts.

3. The flexible rubber sleeves shall be installed in accordance with the manufacturer's recommendations.

4. Where sleeve sizes are not commercially available due to either the size of the pipe to be connected or due to the outside diameter of the pipe not allowing a proper sleeve fit, the Contractor shall connect the pipe to the manhole opening using an elastomeric waterstop gasket.

5. At manholes connecting to existing sewers, the pipe shall be accurately positioned in the openings, properly secured against movement, and the remaining annular space between the pipe wall and the base completely packed with Anti-Hydro "Axpandcretes", Masterflow 713 by Master Builders, or Five Star Grout by U.S. Grout Corp.; or approved equal.

6. Before the grout has set, the Contractor shall recheck invert elevations of the ends of the pipe, and perform any adjustments which are necessary to establish the required line and grade of the sewer.

E. Manhole bases shall conform to the details shown on the Technical Drawings.

F. All precast concrete bases shall be free from cracks, damaged joints, exposed reinforcing, aggregate pockets, spalls, and dimensional distortions or other irregularities. Any rejected units shall be tagged and removed from the job site immediately.

2.03 PRECAST CONCRETE WALLS AND MANHOLE TOPS

A. Precast Concrete Walls

1. Precast concrete walls shall be fabricated using straight, circular pipe sections.

2. The total height of precast wall required for each manhole shall be determined in the field.

3. The vertical distance between the top of the assembled precast units and the bottom of the installed cast iron manhole frame shall be a minimum of 4 inches and a maximum of 12 inches, to allow for masonry work or precast concrete grade rings.

B. Precast Reinforced Concrete Tops

1. Precast reinforced concrete tops for manholes shall be manufactured in accordance with ASTM Specification C-478, and sufficient to provide H-20 wheel loadings.

2. Openings shall be eccentric and the proper diameter to receive the frame specified.

C. All precast units shall be laid up plumb and level.

D. Joints

1. All tongue-and-groove (or male and female) joints in the precast wall, including the joint at the top of the base, shall be made up using the "Snap-On" Type "0"-ring gasket.

2. All joints shall conform to ASTM Specification C-443.

3. The precast sections shall be provided with a special groove, cast into the male end, to receive and hold the gasket in position during joint assembly.

4. After joint assembly, the gap between sections shall be packed on the inside and outside with Anti-Hydro "Axpandcretes," Masterflow 713 by Master Builders; or Five Star Grout by

U.S. Grout Corp., and shall be troweled smooth so that no projections remain on the inside.

5. There shall be concrete to concrete bearing between the various sections, and the gasket shall not support the weight of the section.

E. All precast concrete sections shall be free from cracks, damaged joints, exposed reinforcing, aggregate pockets, spalls, dimensional distortions, or other irregularities. Any rejected units shall be tagged and removed from the job site immediately.

2.04 MASONRY WORK AND GRADE RINGS

A. The manhole frame shall be supported and adjusted to finished grade using solid, brick masonry as shown for the manholes. Precast concrete grade rings may be utilized, in lieu of brick, to support and adjust manhole frames. Grade rings shall conform to ASTM Specification C-478, and shall be carefully set in a full bed of mortar.

B. Materials shall conform to the following requirements:

Item	ASTM Specification	Remarks
Brick	C-62	Grade "SW"
Concrete Block	C-90	Grade "U-1"
Portland Cement	C-150	Type I or III
Sand	C-144	---
Lime	C-207	Type "N"
Water	---	Clear and free from all deleterious materials.
Mortar Mix	C-207	Type "M" (min. 2500 psi strength) 1 part cement 3 part hydrated lime 3 parts sand

C. Construction

1. Brick shall be wetted just prior to being laid.

2. Brick shall be full mortar bed, and mortar for the bed shall be spread to a uniform thickness (not furrowed).

3. All interior joints shall be filled solidly before laying the next course; and all vertical joints shall be shoved tight.

4. All brick is to be laid true to lines, with both sides plumb. Bed joints shall be 3/8-inch to 1/2-inch thick.

5. Mortar on inside and outside joints shall be struck off flush with wall surface and joints shall be so planned that courses will come level with and conform to the overall dimensions required.

6. The interior and exterior face of the brick to be finished smooth with mortar.

2.05 BENCH WALLS

A. Flow Channels

1. The flow channels in each manhole shall be carefully shaped as shown on the Technical Drawings.

2. Flow channels shall match the inverts and size of pipes which connect to the manhole, creating a channel of gradual slope and curvature, assuring an uninterrupted flow through the manhole.

3. The inverts of these channels shall be constructed of half sewer pipe sections or concrete.

4. Short sections of half sewer pipe may be cut and used to form the channel for bends.

5. The channel wall shall be extended to the top of the highest pipe entering the manhole, forming the bench wall.

6. The bench surface itself shall extend to the manhole walls, pitching slightly toward the flow channel.

B. Concrete shall be used for bench walls and all exposed surfaces shall receive a steel-troweled finish. Horizontal surfaces shall then be brush finished.

C. Concrete shall have the following characteristics.

1. Comprehensive Strength at 28 Days (psi)	2,500
2. Maximum Net Water to Cement Ratio by Weight	0.71
3. Minimum Cement Per Yard of Concrete (lbs)	423
4. Consistency Range in Slump (inches)	3-6

D. Concrete shall use Type II low alkali cement per ASTM C-150.

2.06 FRAMES AND COVERS

A. The Contractor shall furnish and install new manhole frames and covers on all new manholes.

B. Manhole frames and covers to be LeBaron Foundry, Inc. #LC248-1, or equal.

C. Catch basin frames and covers to be LeBaron Foundry, Inc. #LF248-2 with grate #L24SG1, or equal.

D. Frames and covers shall be heavy duty, non-penetrating pick-hole type of non-rocking design, or shall have machined bearing surfaces to prevent rocking and rattling under traffic loads. Covers shall have cast in, 1 2 -inch wide, raised letters. Sanitary manholes shall have the words "SEWER" cast in and drain manholes shall have the words "DRAIN" cast in the covers.

2.07 STEPS

A. Steps shall be furnished for all manholes. Steps shall be copolymer polypropylene steel reinforced as manufactured by M.A. Industries, Inc. or equal conforming to ASTM D-4101, ASTM C-478, AASHTO C199 and OSHA STD. 1-1.9. Steps shall be cast integrally with manholes.

2.08 WATERPROOFING

A. The Contractor shall furnish manhole waterproofing over the entire exterior surface that will be below finished grade.

B. Waterproofing shall be completed prior to the installation of precast structures.

C. Waterproofing shall consist of a two-coat application of Permaquik as manufactured by Permagile; Vandex; Xypex; or equal, and shall be applied according to manufacturer's requirements.

END OF SECTION

MATERIALS AND PERFORMANCE – SECTION 02600

BITUMINOUS CONCRETE PAVEMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall be responsible for providing all labor, equipment, and materials required for installation of bituminous concrete paving (i.e., asphalt pavement) as shown on the Technical Drawings and as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02207 – Restoration of Surfaces

B. Section 02222 – Fill Materials

C. Revised Final RD/RA Work Plan, Section 7.5.6.2 – Surface Restoration

D. Revised Final RD/RA Work Plan, Section 7.5.11 – Placement of Engineered Barriers

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society of State Highway and Transportation Officials (AASHTO)

1. M 20 Standard Specification for Penetration-Graded Asphalt Cement

B. Massachusetts Highway Department Standard Specifications for Highways and Bridges (MHD Specifications).

1.04 TIME OF CONSTRUCTION

A. The Contractor shall:

1. Apply prime and tack coats when ambient temperature is above 50°F, and when temperature has not been below 35°F for 12 hours immediately prior to application. The Contractor may not install paving when the base is wet or contains excess moisture.

2. Construct bituminous concrete wearing surface when surface temperature is above 42°F and when the binder is dry.

3. Base course may be placed when air temperature is above 32°F and rising.

4. Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.01 SUBBASE COURSE

A. Subbase course material must be capable of achieving the gradation and compaction requirements specified in Materials and Performance (M&P) – Section 02222 (Fill Materials).

2.02 BASE COURSE AGGREGATE

A. The crushed aggregate for the bituminous concrete base course shall conform to the requirements of the MHD specifications.

2.03 BITUMINOUS BINDER

A. The binder shall be asphalt cement conforming to the requirements of AASHTO M 20.

2.04 WEARING SURFACE

A. The wearing surface shall be a Type I material conforming to the quality requirements of the MHD specifications.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Remove loose matter from the compacted subbase surface immediately before applying prime coat.

B. Proof-roll prepared subbase to check for unstable areas and areas requiring additional compaction.

C. Notify appropriate personnel of unsatisfactory subbase conditions. Paving work may not proceed until deficient subbase areas have been corrected and are ready to receive paving.

D. Apply tack coat to contact surfaces of previously constructed asphalt surfaces, Portland cement concrete surfaces, and surfaces abutting or projecting into asphalt concrete pavement. The Contractor shall distribute tack coat at rate of 0.05 to 0.15 gallons per square yard of surface.

E. Allow drying of all surfaces until they are of the proper condition to receive paving.

3.02 PAVING

A. General

1. Place concrete mixture on prepared surface, spread, and strike-off. Spread mixture at minimum temperature of 225°F (107°C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.

B. Pavement Placing

1. Place in strips not less than 10 inches wide, unless otherwise acceptable to GE or GE's Representative. After strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.

2. The Contractor shall use appropriately sized equipment and methods when placing and compacting bituminous concrete over engineered barriers so as not to damage underlying geosynthetic materials. Areas of the engineered barrier (i.e., geosynthetics) that may have been damaged during pavement installation as determined by the Contractor, GE, or GE's Representative, shall be inspected and repaired, if necessary, in accordance with the Technical Specifications and at the Contractor's expense.

C. Joints

1. Joints between old and new pavements, and between successive days' work, shall be constructed so as to ensure a continuous bond between adjoining surfaces. Joints shall have same texture and smoothness as other sections of bituminous pavement. All joint surfaces shall be cleaned and receive tack coat.

3.03 ROLLING

A. General

1. Begin rolling when mixture will bear roller weight without excessive displacement.

2. Compact mixture with hot tampers or vibrating plate compactors in areas inaccessible to rollers.

B. Breakdown Rolling – Accomplish breakdown rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.

C. Second Rolling – Follow breakdown rolling as soon as possible while mixture is hot. Continue rolling until mixture has been thoroughly compacted.

D. Finish Rolling – Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until marks are eliminated and course has attained maximum density.

E. Patching – Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot bituminous concrete. Compact by rolling mixture to maximum surface density and smoothness.

F. Protection – After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

END OF SECTION

MATERIALS AND PERFORMANCE - SECTION 02690

POLYVINYL CHLORIDE (PVC) PIPE

PART 1 - GENERAL

1.01 WORK SPECIFIED

A. This section includes the material and quality requirements for polyvinyl chloride (PVC) pipe and fittings.

1.02 RELATED SECTIONS

A. Section 02190 – Maintenance of Sanitary Sewer Flows

B. Section 02200 – Earthwork

C. Section 02500 – Sewage and Drainage Piping Installation

D. Section 02504 – Precast Reinforced Concrete Manholes

E. Revised Final RD/RA Work Plan, Section 5.8 – Sanitary Sewer Realignment

F. Revised Final RD/RD Work Plan, Section 7.5.10 – Sanitary Sewer Realignment

1.03 REFERENCES

A. Material and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements are specified herein:

1. ASTM F679 (Standard Specification for Poly Vinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings).

2. ASTM D2321 (Standard Specification for Underground installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications).

1.04 SUBMITTALS

A. Prior to obtaining any material in connection with the work of this Section, detailed shop drawings shall be submitted to GE and GE's Representative a minimum of three weeks prior to mobilization of such materials to the site.

B. Manufacturer's data and drawings of the pipe, joints, fittings, and connection details to new and existing structures, showing compliance with this Section.

MATERIALS AND PERFORMANCE - SECTION 02690

POLYVINYL CHLORIDE (PVC) PIPE

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe

1. PVC pipe shall be Ring-Tite as manufactured by JM Eagle Inc. or equal.

2. PVC pipe and accessories for non-pressure services shall conform to the requirements of ASTM F679 (SDR 35)

B. Fittings and Couplings

1. PVC fittings and couplings shall conform to the requirements of the PVC pipe for classification and size.

C. Joints

1. Joints shall be of the push-on type with integral bell and elastomeric joints.

2. Rubber gaskets for elastomeric joints shall conform to ANSI/ASTM F477.

   a. Lubricant for the joints shall be furnished by the pipe manufacturer.

   b. The rubber gaskets shall be factory installed in the bell of the pipe, fittings, and couplings.

3. The plain end of the pipe shall be marked by the manufacturer to show the depth of penetration into the bell or coupling.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General

1. PVC pipe shall be installed in accordance with the applicable provisions of Section 02500 - Sewage and Drainage Piping Installation and the manufacturer's requirements.

2. PVC pipe shall be handled and stored in accordance with the manufacturer's requirements.

B. Testing

1. Testing shall be in accordance with Section 02500 – Sewage and Drainage Piping Installation.

END OF SECTION

MATERIALS AND PERFORMANCE SECTION 02719

ORNAMENTAL STEEL FENCE AND GATES

PART 1 – GENERAL

1.01 WORK SPECIFIED

A. Contractor shall provide all labor, materials, and equipment required to:

1. Install new ornamental steel fence and gate on concrete curb as shown on the Technical Drawings.

B. Contractor shall remove only those portions of existing ornamental steel or chain link fence and gates necessary to facilitate the work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03301 – Cast-in-Place Concrete

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. ASTM International (ASTM):

1. A653, Standard Specification for Steel Sheet, Zinc-Coated *(Galvanized)* or Zinc-Iron Alloy Coated *(Galvanized)* by the Hot-Dip Process.

2. B117 - Practice for Operating Salt-Spray (Fog) Apparatus.

3. D523 - Test Method for Specular Gloss.

4. D714 - Test Method for Evaluating Degree of Blistering in Paint.

5. D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

6. D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.

7. D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

8. F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.04 SUBMITTALS

A. Shop drawings showing the layout of fencing and gates with dimension, elevations, details, and finishes of components, accessories, and post foundations.

B. Product data for fencing and gate components and accessories demonstrating compliance with the contents of this section.

C. Manufacturer's standard warranty (minimum 10 years) for new fencing and gate materials. Warranty shall cover any defects in material finish, including cracking, peeling, chipping, blistering or corroding.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store and handle materials in accordance with manufacturer's instructions. In the event of damage, make repairs or replacements approved by GE/GE's Representative.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. The fence system shall conform to Montage Plus Classic design with standard picket space, welded and rackable ornamental steel, with bottom rail treatment and 3-rail style as manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma. The system shall include all components (i.e., panels, posts, gates and hardware) required.

2.02 MATERIALS

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft2 (184 g/m2), Coating Designation G-60.

B. Material for pickets shall be 3/4" square x 18 gauge tubing. The rails shall be steel channel, 1.5" x 1.4375" x 14 gauge. Picket holes in the rail shall be spaced 4.675" on center for standard picket space. Fence posts and gate posts shall meet the following minimum size requirements:

Table 1 – Minimum Sizes for Posts

Fence Posts	Panel Height
2-1/2" x 16 Ga.	Up to & Including 6' Height

Gate Leaf	Gate Height Over 4' Up to & Including 6'
Up to 4'	3" x 12 Ga.
4'1" to 6'	3" x 12 Ga.
6'1" to 8'	4" x 12 Ga.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Gates shall be fabricated using fusion welded ornamental panel material and 1-3/4" sq. x 14ga. gate ends. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

C. The manufactured fence system shall be capable of meeting the performance requirements for Industrial weight fences under ASTM F2408.

D. Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.

1. Minimum hardness measured in accordance with ASTM D3363: 2H.

2. Direct impact resistance tested in accordance with ASTM D2794: Withstand 160 inch-pounds.

3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than 3/16 inch undercutting.

4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

E. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 180 degree F and aged 14 days.

F. Color: Black

PART 3 – EXECUTION

3.01 PREPARATION

A. Verify subgrade for concrete curb/wall has been constructed to the required grades and elevations.

3.03 INSTALLATION

A. General

1. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.

2. Cast concrete curb/wall in accordance with Section 03301 - Concrete and as detailed on Drawings and approved shop drawings.

3. Allow 24 inches minimum embedment of posts.

MATERIALS AND PERFORMANCE SECTION 02719

ORNAMENTAL STEEL FENCE AND GATES

B. Fence Framework

1. Posts

a. Posts shall be set plumb in footings to the depths specified on the Design Drawings. Temporarily brace fence posts with 2 by 4 wood supports until concrete is set.

b. Concrete shall be placed around posts in a continuous pour.

c. Concrete shall cure a minimum of 72 hours before further work is done on post.

2. Fence Panels: Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.

C. Gates

1. Direction of swing shall be inward. Gate posts shall be spaced according to the approved shop drawings.

2. Attach hardware by means which will prevent unauthorized removal.

3. Adjust hardware for smooth operation and lubricate where necessary.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 03301

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work under this section consists of furnishing and placing of topsoil, fertilizer, seed, mulch, and erosion control matting, and maintenance of seeded areas until final acceptance

1. Formwork for cast-in-place concrete.

2. Openings for other work.

3. Form accessories.

4. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

5. Cast-in-place concrete.

6. Finishing and curing of horizontal and vertical concrete surfaces.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork

B. Section 02719 – Ornamental Fence and Gates

1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. ASTM A185/A185M, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

2. ASTM A615/A615M, Standard Specification for Deformed and Plan Carbon-Steel Bars for Concrete Reinforcement

3. ASTM A616/A616M, Standard Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement

4. ASTM C33/C33M, Standard Specification for Concrete Aggregates

5. ASTM C150/C150M, Standard Specification for Portland Cement

6. ASTM C260/C260M, Standard Specification for Air Entraining Admixtures for Concrete

7. ASTM C309/C309M, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

8. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete

9. ASTM C618,C618M, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

10. ASTM D994/D994M, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

B. American Concrete Institute (ACI)

1. ACI 301-10, Specifications for Structural Concrete

1.04 QUALITY ASSURANCE

A. Comply with ACI 301-10 unless specifically noted otherwise.

1.05 DEFINITIONS

A. Exposed: Exposed to view by persons responsible for operation or maintenance of the structure.

1.06 SUBMITTALS

A. List of concrete materials and concrete mix designs proposed for use. Include results of tests performed to qualify the materials and to establish the mix designs.

B. Manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.

C. Informational Submittals: Submit the following:

1. Delivery Tickets: Copies of all delivery tickets for each load of concrete delivered to or mixed at the Site. Each delivery tickets shall contain the information in accordance with ASTM C94/C94M along with project identification name and number.

2. Site Quality Control Submittals:

a. Report of testing results for testing of field concrete cylinders for each required time period. Submit within 24 hours after completion of associated test. Test report shall include results of all testing required at time of sampling.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of form marks

1. Plywood: U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Earth Forms: Subject to GE or GE's Representative's approval.

D. Form Ties: Factory-fabricated removable or snap-off metal type designed to prevent form deflection and to prevent spalling concrete upon removal. Units to leave no metal closer than 1 inch to surface.

E. Form Release Agent: Colorless mineral oil which will not stain concrete or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete including curing compound, sealer, or water-proofing.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet steel bars, unfinished; or ASTM A616, 60 ksi yield grade, deformed rail steel bars, unfinished.

B. Welded Wire Fabric: ASTM A185, plain wire, sheet form. Rolled fabric not permitted.

2.03 CONCRETE MATERIALS AND ADMIXTURES

A. Cement: ASTM C150, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C33 (normal weight aggregate); materials containing deleterious substances (spalling causing) are not acceptable.

C. Water: Clean and not detrimental to concrete.

D. Air Entrainment: ASTM C260; Master Builders Micro-Air, or as approved.

E. Chemical: ASTM C494 Type A - Water-Reducing, Type B - Retarding, Type D - Water-Reducing and Retarding, Type F - Water-Reducing, High Range, Type G - Water-Reducing, High Range and Retarding; containing no chlorides; Master Builders, W.R. Grace, or as approved.

F. Fly Ash: ASTM C618 Class F or C; loss on ignition less than 3 percent.

2.04 CURING MATERIALS

A. Membrane Curing Compound: ASTM C309, Type I-D, Class B, clear with fugitive dye which disappears approximately 24 hours after exposure to sunlight; Spray-Cure Safe Cure Clear, Euclid Chemical Company Kurez DR, or as approved. Curing compound shall be compatible with coatings which are to be applied to the concrete surface.

B. Absorptive Mats: Burlap-polyethylene, minimum 8 ounces per square yard bonded to prevent separation during handling and placing.

C. Water: Potable, not detrimental to concrete.

2.05 ACCESSORIES

A. Expansion Joint Filler Type A: ASTM D994; asphalt-impregnated fiberboard or felt; W.R. Meadows Asphalt Joint, or as approved.

2.06 CONCRETE MIX

A. Concrete Proportions and Mixing: Comply with ACI 301, 4.

B. Class I Concrete: Provide concrete to the following criteria:

1. Compressive Strength (7 Day): 3,600 psi.

2. Compressive Strength (28 Day): 4,500 psi.

3. Water/Cement Ratio (Maximum): 0.45 by weight.

4. Air Entrained: 6 percent, +1 percent.

5. Fly Ash Content: Maximum 25 percent of cement content.

6. Slump (Maximum): 3 inches (due to water).

7. Mid or High Range Water Reducer: Add at Site to increase slump to 6 inches, +1-1/2 inches

PART 3 - EXECUTION

3.01 ERECTION - FORMWORK

A. Align joints and make water-tight.

B. Coordinate with Work of other Sections in forming and placing openings, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

C. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.

D. Provide chamfer strips on all external corners, and on other edges as indicated.

3.02 PLACEMENT OF REINFORCEMENT

A. Place, support, and secure reinforcement against displacement. Do not deviate from required position.

B. Unless noted otherwise, maintain concrete cover for reinforcement as follows:

Item	**Coverage**
Column Ties and Beam Stirrups	1-1/2 inch
Footings and Concrete Formed Against Earth	3 inch
Slabs on Fill	3 inch
All Other	2 inch

C. Lap splices as indicated on Drawings, or if not indicated, lap a minimum of 36 bar diameters.

D. Do not field-cut reinforcement without GE/GE's Representative's permission.

3.03 GENERAL

A. Use Class I concrete for all structural concrete, and concrete for pavements, sidewalks and fence curbs.

B. Cut contraction joints within 12 hours after placement of concrete. Cut 1/4 depth of slab thickness. Locate joints as shown.

3.04 PLACING CONCRETE

A. When Class I concrete arrives at the Project with slump below 3 inches, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. Slump adjustment, with water, shall be made only one time.

B. Placement of concrete under water is not permitted.

C. Advise the designated testing agency not less than 24 hours before operations to allow for completion of quality tests.

3.05 CONCRETE FINISHING

A. Concrete Surfaces Not Exposed: ACI 301, 5.3.3.3.a, rough form finish.

B. Exposed Formed Surfaces: ACI 301, 5.3.3.4.b, grout-cleaned finish.

C. Exterior Traffic Surfaces: ACI 301, 5.3.4.2.d, broom finish.

3.06 CURING

A. Horizontal Surfaces: Cure horizontal unformed surfaces in accordance with ACI 301 using any of the following accepted procedures.

1. Spraying: Spray water over surfaces and maintain wet for 7 days.

2. Absorptive Mat: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place for 7 days.

3. Membrane Curing Compound: Pavement, walks, and curbs only.

B. Vertical Surfaces: Cure surfaces using any of the following accepted procedures.

1. Formwork: Keep forms in place for 7 days.

2. Membrane Curing Compound.

3.07 FIELD QUALITY CONTROL

A. Tests of concrete slump, air content and strength will be made at the direction of Ge or GE's Representative. Samples for air content and strength should be taken as near as practical to the point of placement into the formwork or at a location which closely matches the handling conditions when the concrete is placed in the forms. Prior to the addition of a mid or high range water reducer, a slump test may be made from a sample taken from the very first concrete out of the load.

END OF SECTION

ARCADIS

Appendix F

Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions

APPENDIX F

UNKAMET BROOK HYDROLOGIC AND HYDRAULIC MODELING OF POST-REMEDIATION CONDITIONS

Prepared for

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April 2014

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1 INTRODUCTION

Appendix F to the *Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* (Remainder Conceptual Work Plan; ARCADIS 2009) presented a summary of previous hydraulic and hydrological modeling activities for Unkamet Brook, using the hydraulic (HEC-RAS) model of Unkamet Brook and the U.S. Environmental Protection Agency's (EPA's) Hydrologic Simulation Program-FORTRAN (HSPF) hydrologic model. In response to comments from EPA, supplemental modeling information was presented in Attachment E to the January 2010 *Addendum to Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* (Remainder Conceptual Addendum; ARCADIS 2010a) and Attachment A to the August 2010 *Second Addendum to Conceptual Removal Design/Removal Action Work Plan for Unkamet Brook Area – Remainder* (Remainder Second Addendum; ARCADIS 2010b). The latter document stated that the Final Removal Design/Removal Action Work Plan for the Unkamet Brook Area-Remainder would document the results of additional modeling to support the design, including any necessary modifications to the model in light of updated information and to represent post-remediation conditions, along with simulations and sensitivity analyses to evaluate anticipated post-remediation conditions within the system.

Since the submittal of those documents, in accordance with the statements in the Remainder Second Addendum, the existing conditions hydraulic model described in that addendum was updated to include more accurate site information related to culvert sizes, dimensions, and elevations, and the model calibration was updated accordingly. The hydraulic model was then reconfigured to reflect post-remediation conditions – i.e., to reflect re-routing of a portion of the Unkamet Brook channel and changes in culvert conditions and floodplain topography associated with remediation actions (specifically, soil removal in the phragmites areas, soil removal to facilitate the Brook re-routing, installation of an engineered barrier/cap over the former interior landfill, grading associated with realignment of a sanitary sewer, culvert cleaning activities, and slip-lining of one culvert as discussed below). Finally, the hydraulic model was used to simulate a range of flow rates (developed using the hydrologic model as well as Federal Emergency Management Agency [FEMA] flood flow estimates) to evaluate the effects, if any, that the proposed design will have on upstream water surface elevations. Sensitivity analyses were also conducted as part of these simulations.

This appendix documents the specific updates that were made to the modeling and presents model output graphics reflecting the updated calibration, information on design flows that were simulated with the model, and results from the post-remediation conditions model simulations, as well as the results from the sensitivity analyses.

2 UPDATES TO EXISTING CONDITIONS HYDRAULIC MODEL

2.1 Model Inputs

The existing conditions hydraulic model presented in the Remainder Second Addendum Attachment was updated to reflect more accurate site information on certain culverts collected by Hill Engineering and ARCADIS.[1] These model updates included the following:

1. The geometry, invert elevations, and sediment blockage thickness of the Dalton Avenue Culvert were modified based on additional survey work performed by ARCADIS in April 2014.
2. An additional cross-section was added to the model to better represent the region where elevation changes will occur as a result of grading associated with a sanitary sewer realignment.
3. The diameter and invert elevations of the twin culverts that constitute the Rail Spur Culvert (referred to herein as Culverts #1a and #1b) were modified based on additional survey work performed by Hill Engineering in October 2010.
4. The diameter and geometry of the Underground Culvert were updated in the model based on field observations made by ARCADIS in March 2013. Since this culvert could not be fully accessed or inspected at that time, there is uncertainty with regard to its geometry, construction specifications, and blockage conditions. The March 2013 field observations indicate that this culvert consists of multiple circular steel vessels that transition in diameter from approximately 3-4 feet at the upstream end to approximately 8-10 feet at the downstream end; these observations were confirmed during video inspection activities conducted in August 2013. This culvert was

[1] The culverts identified in the main text of the Remainder Final Work Plan as Culverts #1 through #4 are identified herein as follows: Culvert #1 is referred to as the Rail Spur Culvert and consists of twin culverts (designated as Rail Spur Culverts #1a and #1b); and Culverts #2, #3, #4 are referred to as the Merrill Road Culvert, the Underground Culvert, and the Railroad Culvert, respectively. The unnumbered culvert under Dalton Avenue is identified as the Dalton Avenue Culvert.

simulated in the hydraulic model as a 4-foot-diameter circular culvert with no blockage, to represent the approximate average cross-sectional area of flow over its length.

Table F-1 provides a listing of the parameters specified for all culverts (that is, geometry, material, specified entrance and exit loss coefficients, culvert roughness coefficients, and upstream and downstream invert elevations) in the existing conditions hydraulic model, including the updated geometry and elevations for the Dalton Avenue, Rail Spur, and Underground Culverts, as described above. (This table represents an update to Table 1 of the Remainder Second Addendum Attachment.)

2.2 Model Calibration

As described in the previous modeling documents, hydraulic model calibration was performed to simulate the low-flow water surface profile observed during the summer 2008 stream topographic survey. During this survey, flows in Unkamet Brook were approximately 2 cubic feet per second (cfs) in the upper portion of the Brook and approximately 5 cfs in the remainder of the Brook. To assess the model calibration under higher flow conditions, the water surface elevations measured from 2007 to 2009 at the "upstream" and "downstream" gauging stations (reported by GE 2006) were compared to model-predicted water surface elevations at these two locations under a range of somewhat higher flows (i.e., ranging from 10 to 50 cfs).

Results of the updated low flow calibration are shown on Figures F-1a and F-1b, and the higher flow results are shown on Figure F-2. Comparison of these figures with those presented previously (i.e., Figures 5a, 5b, and 6 of the Remainder Second Addendum Attachment) indicates that the updates to the existing conditions model to include a new transect in the sanitary sewer realignment area and better reflect the Dalton Avenue, Rail Spur, and Underground Culverts did not have a significant impact on the computed water surface elevations, and that the model continues to reasonably reproduce the observed water surface elevations under the flow conditions evaluated.

3 MODELING EVALUATION OF POST-REMEDIATION CONDITIONS

In order to simulate post-remediation conditions, the hydraulic model required the following modifications:

- To capture the re-routing of a portion of the stream channel, select cross-sections were reoriented to better capture the direction of flow in the model, and the associated elevations were updated accordingly.
- Elevations of certain cross-sections were updated to reflect changes in floodplain topography associated with grading, removal, and capping activities in certain areas (as described above).
- Geometry changes were made for Rail Spur Culvert #1a to represent anticipated future slip-lining activities.

Details of these specific changes to the model to reflect post-remediation conditions are provided in the following subsections.

3.1 Post-Remediation Geometry

3.1.1 Cross-Section Updates

Due to the planned re-routing of the Unkamet Brook channel in the area near the former interior landfill, select cross-sections in the hydraulic model between Dalton Avenue and the Rail Spur Culvert (cross-sections 34 to 40; Figure F-3) required modifications to their orientation. These modifications were made so that each cross-section is oriented perpendicular to the flow of the Brook when it crosses the new channel alignment. Based on the realignment of the channel, the same cross-sections required updates to their elevations to reflect the changes in elevations that will be present in the post-remediation condition. These proposed elevation changes include the location of the proposed re-routed channel, and capping and grading in sections of the former interior landfill, including the location of the existing channel, as well as removal in the phragmites areas (Figure F-3).[2] Likewise, the new cross-section added to the model (cross-section 33a; Figure F-3) included elevation changes for the post-remediation condition to represent grading associated with a sanitary

[2] As shown on Figure F-3, the western ends of cross-sections 33 and 32 cover the capping area south of the former interior landfill; however, because the cap in this area will be returned to existing grade, no updates were required for these cross-sections in the hydraulic model.

sewer realignment. Cross-sectional plots showing the elevations at these transects for post-remediation conditions, as compared to elevations previously contained in the existing conditions model, are presented in Figures F-4a and F-4b.

Figure F-5 presents the comparison of the channel thalweg elevations between the existing conditions hydraulic model and the post-remediation conditions hydraulic model. (Note that this figure also depicts the locations of the culverts within the system but does not include the culvert invert elevations in the channel thalweg representations.) The proposed remediation activities also include placing a 6-inch layer of stone as erosion protection material along the bed of the re-routed channel. Over time, sediment is expected to accumulate along the channel bed, comparable to the existing channel bed conditions; therefore, the channel roughness coefficient (Manning's n) value was not altered for the post-remediation base conditions model. However, a sensitivity analysis evaluating the effects of the Manning's n value on predicted water surface elevations was conducted and is described in Section 3.4.3.

3.1.2 Culverts

In the existing conditions model, the Rail Spur Culvert was represented as a twin culvert system, with each culvert having a diameter of 4 feet. As part of the remediation design, one of the culverts (Culvert #1a) will be slip-lined with a 3.5-foot-inside-diameter corrugated steel pipe. The post-remediation conditions model was, therefore, updated to reflect the proposed change by decreasing the diameter of that culvert (see Table F-1) from 4 feet to 3.5 feet and increasing the invert elevation by 0.25 feet. A roughness coefficient (Manning's n) value of 0.012 was used for the slip-lined pipe to represent the steel material based on manufacturer's literature (Contech 2013).

As noted in Table F-1, the thicknesses of the blockage for Rail Spur Culverts #1a and #1b used in the existing conditions model were 3 feet and 3.5 feet, respectively. As a base condition pertaining to culvert blockage for simulating post-remediation conditions, the hydraulic model maintained approximately the same amount of relative sediment blockage as in the existing conditions model, resulting in a blockage thickness of 2.75 feet for Rail Spur Culvert #1a and 3.5 feet for Rail Spur Culvert #1b. The effects of alternate sediment blockage assumptions were evaluated through sensitivity analysis.

For the remaining culverts in the system, the culvert blockage thicknesses in the base post-remediation conditions model were assumed to be the same as in the existing conditions model. This is considered a conservative estimate to represent long-term conditions because the proposed remedial activities include removing the sediment blockages from the culverts.

3.2 Model Boundary Conditions

As described previously, the HEC-RAS hydraulic model was used to simulate a range of flow rates to evaluate the potential effects of the proposed design on upstream water surface elevations. The previous simulations conducted with the model (e.g., as documented in the Remainder Second Addendum Attachment) used the range of flows observed during the 2007-2009 monitoring period (which were relatively low), and did not include larger, more extreme flow events.

Evaluations of higher flow events were based on data obtained from the FEMA Flood Insurance Study (FIS) for the City of Pittsfield, Massachusetts (FEMA 1987). For flows between the lower flow rates observed during the 2-year monitoring period and the more extreme flow events from FEMA, results from EPA's HSPF hydrologic model of the watershed were used. As described in previous modeling documents, results from the EPA-calibrated and validated HSPF hydrologic model were used to provide estimates of the statistical characteristics of stream flows within the Brook (e.g., to predict flow rates associated with storm events of various intensities). Use of hydrologic model predictions to estimate flow statistics in the design of the re-routed Brook channel was necessary because no long-term flow data record (e.g., on a decadal time scale) exists for the Brook. The subsections below describe the method used to estimate flow rates associated with storm events of various intensities.

In addition, as part of model development, a downstream stage/rating curve was developed for the range of flows simulated during model calibration (described in Section 3.1.3 of Appendix F to the Remainder Conceptual Work Plan). To evaluate the effects of the proposed design on upstream water surface elevations, it was necessary to expand this rating curve to incorporate downstream water surface elevations at higher flows. The revised downstream rating curve is summarized in Section 3.2.2.

3.2.1 Upstream Flow

As discussed previously, to evaluate the proposed post-remediation conditions at higher flows, flood flow rates for Unkamet Brook were obtained from FEMA (1987) for the 10-, 50-, and 100-year flow events (referred to as "return interval events"). Table F-2 summarizes the FEMA return interval flow rates for Unkamet Brook that were used in this analysis.

Table F-2
Unkamet Brook Flow Rates Associated with
FEMA (1987) Return Interval Events

Return Interval (years)	Flow in Unkamet Brook (cfs)
10	275
50	600
100	700

The EPA hydrologic model (HSPF) was used to simulate flows in Unkamet Brook over a 26-year time period from 1979 through 2004 on an hourly time scale. Output from this simulation was used to conduct a flood frequency analysis based on the Log-Pearson Type III distribution (e.g., Bedient and Huber 1992). The typical way of conducting a flood frequency analysis (when using flow monitoring data) is to use instantaneous maximum peak flows for the years involved to estimate flows associated with desired return intervals. One limitation with using instantaneous output from a hydrologic model such as HSPF is that, although the model predictions are reasonable over longer time scales, model predictions at relatively short time scales (such as hourly) are less reliable. Specifically, it is difficult to simulate precise timing of flows in a hydrologic model given the uncertainties in timing of model inputs such as precipitation (Donigian 2002). For this reason, the HSPF return frequency analysis was conducted using daily average maximum peak flows for the years involved. A probability distribution of the 26 annual peak flow values predicted by HSPF is shown on Figure F-6. Table F-3 summarizes the HSPF-predicted flood frequency results for return interval events that are lower than those included in the FEMA study.

Table F-3
Unkamet Brook Flow Rates Associated with HSPF Return Interval Events

Return Interval (years)	Flow in Unkamet Brook (cfs)
1	28
1.5	48
2	57

3.2.2 Downstream Stage/Rating Curve at Housatonic River

For the downstream boundary condition, similar to the upstream flow rates, in order to evaluate post-remediation conditions at higher flows, water surface elevations in the Housatonic River at the mouth of Unkamet Brook were obtained from FEMA (1987) for the 10-, 50-, and 100-year return interval events. Table F-4 summarizes the FEMA return interval water surface elevations for the Housatonic River at the mouth of Unkamet Brook that were used for the hydraulic model's downstream boundary condition in this analysis.

Table F-4
Water Surface Elevations of the Housatonic River at the Mouth of Unkamet Brook Associated with FEMA (1987) Return Interval Events

Return Interval (years)	Water Surface Elevation (feet NGVD 29)
10	988.5
50	992.75
100	994.75

Note:
NGVD 29 = the National Geodetic Vertical Datum of 1929

The method used to develop the Unkamet Brook hydraulic model downstream boundary condition (specified as a rating curve) at the Housatonic River for flows less than the FEMA return interval events was described previously in Appendix F to the Remainder Conceptual Work Plan. In summary, because water surface elevation and flow data have not been collected in the Brook at its mouth, a relationship between the water surface elevation in the Housatonic River (at the point where Unkamet Brook enters the river) and flows measured in Unkamet Brook at the "upstream" gauging station was developed. As noted previously, using this relationship to estimate the Unkamet Brook downstream boundary condition

required making the reasonable assumption that the water surface elevation in the Housatonic River at the Unkamet Brook mouth is the same as the water surface elevation in the Brook itself. This original rating curve, which covered a range of flows in the Brook up to approximately 30 cfs, is shown (in orange) on Figure F-7. This rating curve was extrapolated in order to estimate a stage height corresponding to the 2-year return interval flow rate (57 cfs) of approximately 988 feet (Figure F-7). Given the uncertainty associated with this simple extrapolation, a second (lower) water surface elevation of 985 feet was evaluated; this value was estimated by backwards extrapolation of the FEMA (1987) flood elevations down to lower flow rates (e.g., because the FEMA 10-year flow event elevation is approximately 988.5 feet, it is likely that the corresponding elevation for a 2-year flow event would be lower than 988 feet). This value is also shown on Figure F-7. These two water surface elevations (i.e., 988.0 feet and 985.0 feet) were considered bounding cases and were, therefore, both simulated for the estimated 2-year return interval flow.

3.2.3 Design Flow Summary

Table F-5 summarizes the flow rates and corresponding water surface elevations used in the design hydraulic modeling.

Table F-5
Summary of Flow Simulation Parameters

Flow in Unkamet Brook (cfs)	Water Surface Elevation (feet NGVD 29)	Return Interval (years)
2	976.85	-
5	977.49	-
10	978.4	-
15	978.4	-
20	980.32	-
30	982.12	-
40	983.4	-
50	984.2	-
60	985.0	2-year low stage
60	988.0	2-year high stage
275	988.5	10-year FEMA
600	992.75	50-year FEMA
700	994.75	100-year FEMA

3.3 Model Results

This section discusses the results of the model simulations conducted for post-remediation conditions, focusing on predicted water surface elevations. Other results from the hydraulic model, such as predictions of velocities within the system, were also used to support the remedial design; these are discussed briefly in this section as well. Attachment F-1 contains the raw HEC-RAS outputs for the base case post-remediation simulation.

Figures F-8a through F-8m present a comparison of the predicted water surface elevation profiles over the model domain for the existing conditions model and post-remediation conditions model simulations, for each of the flow rates listed in Table F-5. As described previously, the post-remediation conditions model used the same relative blockage thickness for Rail Spur Culvert #1a (which had a reduced diameter due to slip-lining) as the existing conditions model. All other culvert blockage thicknesses in the post-remediation base conditions model are the same as in the existing conditions model. Differences in water surface elevations are predicted upstream of the Rail Spur Culvert, whereas no differences are predicted downstream of the Rail Spur Culvert. For some of the lower flow cases, the post-remediation conditions model predicted water surface elevations upstream of the Rail Spur Culvert that are slightly higher than those of the existing conditions model, as a result of the reduced cross-sectional area and increased invert elevation associated with slip-lining of Rail Spur Culvert #1a. The greatest increase in predicted water surface elevation upstream of the Rail Spur Culvert corresponded to the flow rate of 10 cfs, with the difference in predicted water surface elevation being approximately 0.4 foot or less (Figure F-8c). In the post-remediation conditions model, the 10-cfs flow rate results in a predicted water surface elevation that just overtops the Rail Spur Culvert, whereas in the existing conditions model, the flow is able to be conveyed entirely through that culvert. For flows higher than 30 cfs, including the 2-year, 10-year, 50-year, and 100-year cases, there was essentially no difference in the predicted water surface elevations between the existing conditions and post-remediation conditions models throughout the model domain. For these higher flow cases, the predicted water surface elevations downstream of the Rail Spur Culvert have a greater influence on the predicted water surface elevations upstream of the culvert than in the lower flow cases, resulting in less of a difference between the existing conditions and post-remediation conditions models. For the 50-year and 100-year FEMA flow cases, both the existing conditions and post-remediation conditions models depict a backwater effect in

which the water surface elevations predicted throughout the Brook are controlled by the stage height in the Housatonic River.[3]

Table F-6 presents a comparison of model-predicted channel velocities for the existing conditions and post-remediation conditions for the 10- and 100-year FEMA return interval flows. The results in this table demonstrate that there will be no significant net increases in velocities throughout the brook during these events.

Overall, these results indicate that the changes to the channel alignment and floodplain topography associated with the remediation will not adversely affect flood elevations or channel velocities upstream of or within the project area. The reduced cross-sectional area associated with slip-lining Rail Spur Culvert #1a results in small (≤ 0.4-foot) predicted increases in water surface elevations but only at lower flows.

3.4 Model Sensitivity Analyses

As presented in the Remainder Second Addendum Attachment, sensitivity analyses were previously conducted with the existing conditions hydraulic model pursuant to directives from EPA in its July 19, 2010 conditional approval letter for the Remainder Conceptual Addendum. These sensitivity analyses were performed by varying the hydraulic roughness coefficients (Manning's n values) in the channel and floodplains between Dalton Avenue and the Rail Spur Culvert, as well as the amount of sediment blockage in the Dalton Avenue and Rail Spur Culverts. In accordance with the Remainder Second Addendum, additional sensitivity analyses have now been conducted to assess post-remediation conditions for various amounts of sediment blockage in the Dalton Avenue Culvert and the downstream culverts, as well as various Manning's n values, over a range of flows. Details describing each of these sensitivity analyses and corresponding results are discussed in the following subsections.

[3] For the 50-year event, there is a slight difference between the existing conditions and post-remediation conditions models in predicted water surface elevations at the downstream end of the Dalton Avenue Culvert (Figure F-8*l*). This difference is due to the fact that the existing conditions model has a predicted water surface elevation that just overtops the Dalton Avenue Culvert, causing hydraulic jump-type behavior with the higher velocities as the water spills over Dalton Avenue and then enters slower moving water downstream, resulting in a slightly lower predicted water surface elevation than the post-remediation conditions model at that location.

3.4.1 Dalton Avenue Culvert Sediment Blockage

As noted in Table F-1, the thickness of the blockage in the Dalton Avenue Culvert used in both the existing conditions and post-remediation base conditions models was 2.2 feet. To evaluate the effects of the blockage value within the Dalton Avenue Culvert on the predicted water surface elevations upstream of Dalton Avenue, two additional simulations were performed. The first simulation was performed by increasing the blockage within the culvert by 0.5 foot to a thickness of 2.7 feet. The second simulation was performed by decreasing the blockage within the culvert by 1 foot to a thickness of 1.2 feet. This range of thickness variations is considered representative of observed variations in sediment thickness at this culvert, as discussed in the Remainder Second Addendum Attachment and confirmed by April 2014 survey activities.

Figures F-9a through F-9m present the predicted water surface elevation profiles computed by the model for the sensitivity analyses related to the Dalton Avenue Culvert blockage. As expected, decreasing the blockage thickness resulted in lower predicted water surface elevations upstream of the Dalton Avenue Culvert compared to that of the base case. The greatest decrease in predicted water surface elevation upstream of the Dalton Avenue Culvert as a result of decreasing the blockage corresponded to the 2-year return interval flow, with a difference in predicted water surface elevation of approximately 1.8 feet (Figure F-9j). For flow cases less than the 10-year return interval flow, increasing the blockage thickness resulted in higher predicted water surface elevations upstream of the Dalton Avenue Culvert. The greatest increase in predicted water surface elevation corresponded to the flow rate of 50 cfs, with a difference in predicted water surface elevation of approximately 1.2 feet (Figure F-9h). However, for the higher flows (i.e., 10-year, 50-year, and 100-year flow cases), there was minimal or no difference in the predicted water surface elevation upstream of the Dalton Avenue Culvert between the base case and increased blockage case. For the 50-year and 100-year FEMA flow cases, the model predicts a backwater effect in which the water surface elevations predicted throughout the Brook are controlled by the stage height in the Housatonic River, while for the 10-year event, differences are minimal due to the flow being predicted to overtop the culvert.

3.4.2 Sediment Blockage in Downstream Culverts

As part of the remediation activities, the blockages in the downstream culverts within the project area will be cleaned, with the method and extent of such cleaning to be finalized following their video inspection. Although the blockages are expected to re-accumulate over time, likely to a level similar to existing conditions, a simulation was performed to evaluate the sensitivity of these blockage values on the predicted water surface elevations. Specifically, the simulation was performed by running the post-remediation conditions model based on the assumption that the blockages in the Rail Spur, Merrill Road, and Railroad Culverts are fully removed. (No changes were made to the Underground Culvert for this simulation because it was simulated with no blockage, as discussed in Section 2.1.) Field observations made by ARCADIS over the course of the design phase indicated that the culvert blockages can vary over time; the August 2013 video inspection activities further confirmed this variability. Therefore, the simulations using the base post-remediation conditions model described above and the sensitivity simulation with the blockages removed were considered as bounding cases for the likely range of future blockage conditions.

Figures F-10a through F-10m present a comparison of the predicted water surface elevation profiles for the post-remediation conditions model with and without blockages in the Rail Spur, Merrill Road, and Railroad Culverts. As demonstrated by the figures, differences in water surface elevations were predicted upstream of the Railroad Culvert, with no differences predicted downstream of that culvert. For the majority of the flow cases, clearing the blockages from the three culverts resulted in significant decreases in the predicted water surface elevations (ranging up to approximately 3 feet, and extending up to and past Dalton Avenue in some cases). The 10-year, 50-year, and 100-year FEMA flow cases did not result in any significant difference in predicted water surface elevations, due to the backwater effect from the Housatonic River at these flows.

These sensitivity analyses indicate that, at lower and intermediate flow cases, reductions in the thickness of the blockage within the culverts, including periods just after they are cleaned out, would be expected to result in decreases in water surface elevations. However, during the highest flow events evaluated, the water surface elevation predicted throughout the Brook is controlled by the stage height in the Housatonic River.

3.4.3 Roughness Coefficients (Manning's n)

The sensitivity analysis for the Manning's n value was conducted using the same approach outlined in the Remainder Second Addendum Attachment, in which simulations were performed with higher and lower values for both the channel and floodplain Manning's n coefficients in the stretch between the Dalton Avenue Culvert and the Rail Spur Culvert (i.e., model transects 40 to 32). Figures F-11a through F-11m present the results of this sensitivity analysis. As demonstrated by these figures, the results of the Manning's n sensitivity analysis showed no perceptible differences in the predicted water surface elevations. The results indicate that a change in bottom roughness does not have a significant impact on the water surface elevations predicted by the model, which was expected because water surface elevations are controlled by the hydraulic structures in this part of the Brook.

4 SUMMARY AND CONCLUSIONS

Updates were made to the existing conditions hydraulic model of Unkamet Brook based on new information and the calibration was re-checked. Modeling analyses were conducted to assess post-remediation conditions, and sensitivity analyses pertaining to culvert blockages and roughness coefficients were conducted. The overall goal of the analyses was to assess the potential impact that the remediation activities may have on water surface elevations during high flow events. Flow rates and water surface elevation cases simulated were based on results from HSPF modeling as well as FEMA FIS values.

Based on the updated calibration results described in this appendix, the model provides a good representation of the relationship between stage height and flow in Unkamet Brook, as well as the water surface profile and major hydraulic controls (i.e., culverts) in the modeled section of the stream. Overall, the model results indicate that, during most flow regimes, the predicted water surface elevations within the system are controlled by the hydraulic structures within the system and blockages within the culverts. However, during higher flow events, the water surface elevation predicted throughout the Brook is controlled by the stage height in the Housatonic River.

The results from the model simulations of post-remediation conditions indicate that the changes to the channel alignment and floodplain topography associated with the remediation will not adversely affect flood elevations or current velocities upstream of or within the project area. The reduction in cross-sectional area and increase in invert elevation associated with slip-lining Rail Spur Culvert #1a are predicted to have a small impact on predicted water surface elevations upstream of the Rail Spur Culvert (≤ 0.4 foot increase), but only at lower flows and not in other project areas. However, the model sensitivity analyses indicate that water surface elevations are sensitive to the extent of blockage in the culverts, and that reductions in the amount of blockage associated with culvert cleaning and/or slip-lining would offset the small increases due to the reduction in diameter associated with slip-lining of Culvert #1a. The model sensitivity analyses also indicate that water surface elevations are not sensitive to channel and floodplain bottom roughness.

5 REFERENCES

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TABLES F-1 AND F-6

Table F-1

Summary of Culvert Loss Coefficients, Manning's n Roughness Coefficients, and Invert Elevations for Existing Conditions

Culvert Number	Location	Geometry	Material	Dimensions (feet)	Length (feet)	Sediment Blockage (feet)	Entrance Loss	Exit Loss	Culvert Roughness	Culvert Bottom Roughness (sedimentation)	Upstream Invert Elevation (feet)	Downstream Invert Elevation (feet)
--	Dalton Avenue	Box	Concrete	6 x 4.5	295	2.2	0.9	1	0.013	0.03	985.9	983.2
1a	Railroad Spur Culvert 1	Circular	Corrugated metal	4	40	3	0.5	1	0.019	0.03	984.5	983.6
1b	Railroad Spur Culvert 2	Circular	Corrugated metal	4	40	3.5	0.5	1	0.023	0.03	983.8	983.3
2a	Merrill Road Culvert 1	Circular	Corrugated metal	4	110	1	0.5	1	0.023	0.03	983.6	983.4
2b	Merrill Road Culvert 2	Circular	Corrugated metal	4	110	1	0.5	1	0.023	0.03	983.6	983.4
3	Underground Culvert	Circular	Corrugated metal	4	575	0	0.5	1	0.011	0.011	983.5	983.4
4	Railroad Culvert	Circular	Concrete	4	60	2	0.5	1	0.02	0.03	983.0	982.0

Sources:

Entrance loss – USACE (U.S. Army Corps of Engineers), 2008. *HEC-RAS River Analysis System, Hydraulic Reference Manual, Version 4.0,* March 2008 (Page 6-26).

Exit loss – USACE, 2008. *HEC-RAS River Analysis System, Hydraulic Reference Manual, Version 4.0,* March 2008 (Page 6-23).

Culvert roughness – USACE, 2008. *HEC-RAS River Analysis System, Hydraulic Reference Manual,* Version 4.0, March 2008 (Pages 6-4, 25).

Note:

For post-remediation conditions, Culvert 1a was simulated as a 3.5-foot-diameter circular culvert with 2.75 feet of blockage, an upstream invert elevation of 984.75 feet, a downstream invert elevation of 983.85 feet, and a culvert roughness of 0.012 to represent slip-lining.

Table F-6
Model-Predicted Channel Velocity Comparison

Transect	10-Year Return Interval Channel Velocities (ft/s)			100-Year Return Interval Channel Velocities (ft/s)		
	Pre-Remediation Condition	Post-Remediation Base Condition	Velocity Change	Pre-Remediation Condition	Post-Remediation Base Condition	Velocity Change
44	0.88	0.88	0	1.25	1.25	0
43	1.2	1.2	0	1.32	1.32	0
42	1.42	1.42	0	2.51	2.51	0
41	1.69	1.7	0.01	2.87	2.86	-0.01
	Dalton Avenue Culvert		--	Dalton Avenue Culvert		--
40	3.35	1.27	-2.08	0.16	0.13	-0.03
39	0.1	0.08	-0.02	0.09	0.08	-0.01
38	0.11	0.17	0.06	0.1	0.14	0.04
37	2.11	0.19	-1.92	0.15	0.25	0.1
36	0.16	0.22	0.06	0.21	0.28	0.07
35	0.15	0.22	0.07	0.21	0.31	0.1
34	0.16	0.22	0.06	0.21	0.28	0.07
33.5	0.16	0.22	0.06	0.2	0.26	0.06
33	0.2	0.2	0	0.22	0.22	0
32	1.96	1.96	0	0.29	0.3	0.01
	Railroad Spur Culvert		--	Railroad Spur Culvert		--
31	1.41	1.41	0	0.28	0.28	0
30	0.63	0.63	0	0.53	0.53	0
29	0.67	0.67	0	0.57	0.57	0
28	1.02	1.02	0	0.61	0.61	0
	Merrill Road Culvert		--	Merrill Road Culvert		--
27	3.59	3.59	0	0.32	0.32	0
26	3.12	3.12	0	0.23	0.23	0
25	2.58	2.58	0	0.27	0.27	0
24	2.01	2.01	0	0.25	0.25	0
	Underground Culvert		--	Underground Culvert		--
23	0.6	0.6	0	0.12	0.12	0
22	0.4	0.4	0	0.13	0.13	0
21	4.81	4.81	0	0.12	0.12	0
	Railroad Culvert		--	Railroad Culvert		--
20	0.19	0.19	0	0.08	0.08	0
19	0.14	0.14	0	0.1	0.1	0
18	0.15	0.15	0	0.1	0.1	0
17	0.16	0.16	0	0.1	0.1	0
16	0.19	0.19	0	0.15	0.15	0
15	0.18	0.18	0	0.15	0.15	0
14	0.22	0.22	0	0.16	0.16	0
13	0.28	0.28	0	0.19	0.19	0
12	0.2	0.2	0	0.17	0.17	0
11	0.24	0.24	0	0.16	0.16	0

Table F-6
Model-Predicted Channel Velocity Comparison

Transect	10-Year Return Interval Channel Velocities (ft/s)			100-Year Return Interval Channel Velocities (ft/s)		
	Pre-Remediation Condition	Post-Remediation Base Condition	Velocity Change	Pre-Remediation Condition	Post-Remediation Base Condition	Velocity Change
10	0.38	0.38	0	0.33	0.33	0
9	0.27	0.27	0	0.29	0.29	0
8	0.31	0.31	0	0.35	0.35	0
7	0.34	0.34	0	0.38	0.38	0
6	0.39	0.39	0	0.41	0.41	0
5	0.41	0.41	0	0.41	0.41	0
4	0.49	0.49	0	0.51	0.51	0
3	0.89	0.89	0	0.73	0.73	0
2	1.12	1.12	0	0.87	0.87	0
1	0.56	0.56	0	0.6	0.6	0

Note:
The velocity change equals the post-remediation condition minus the pre-remediation condition; therefore, a negative velocity change indicates a decrease in velocity from pre-remediation to post-remediation conditions.

FIGURES

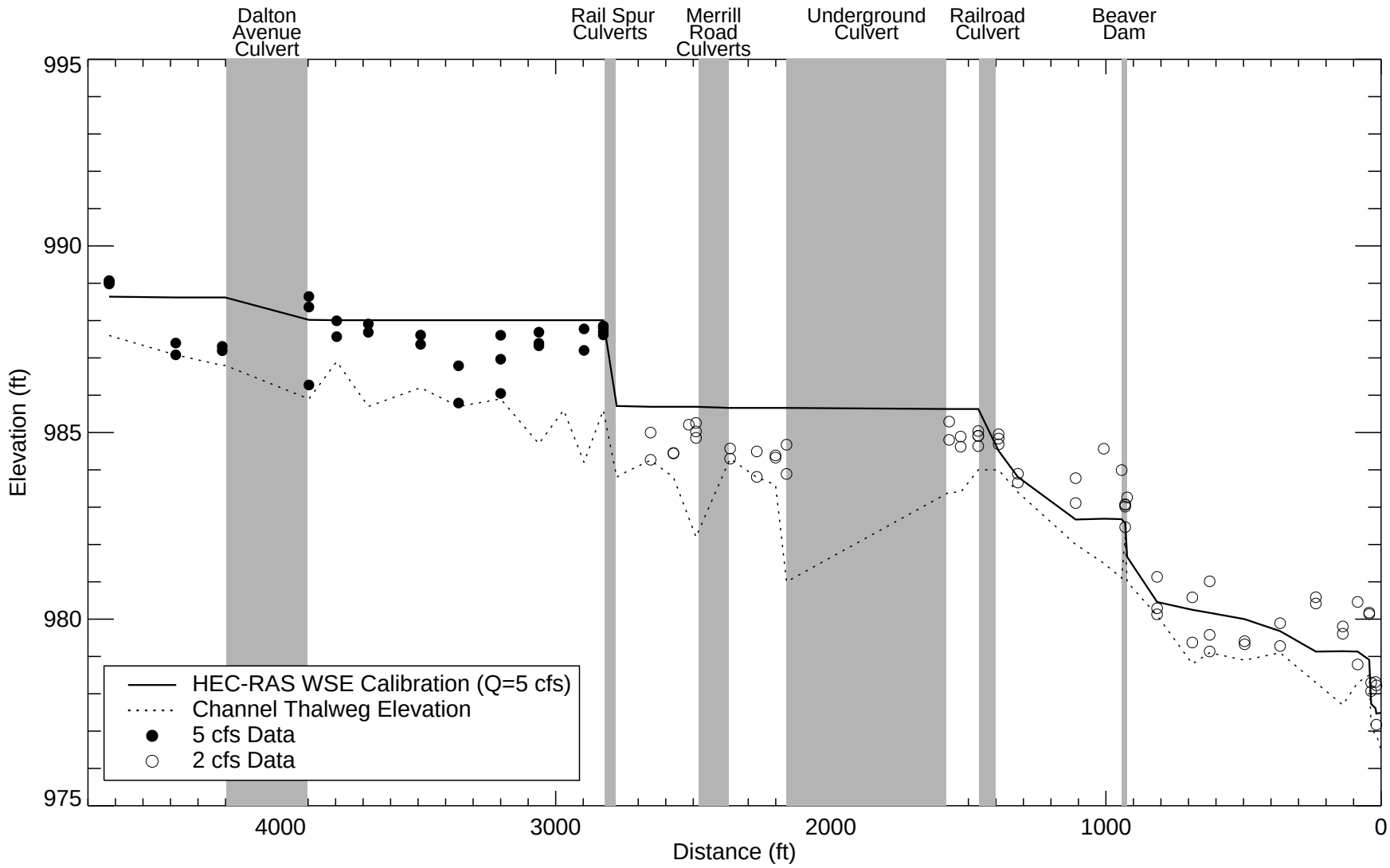


Figure F-1a

Low Flow Water Surface Profile Calibration Plot
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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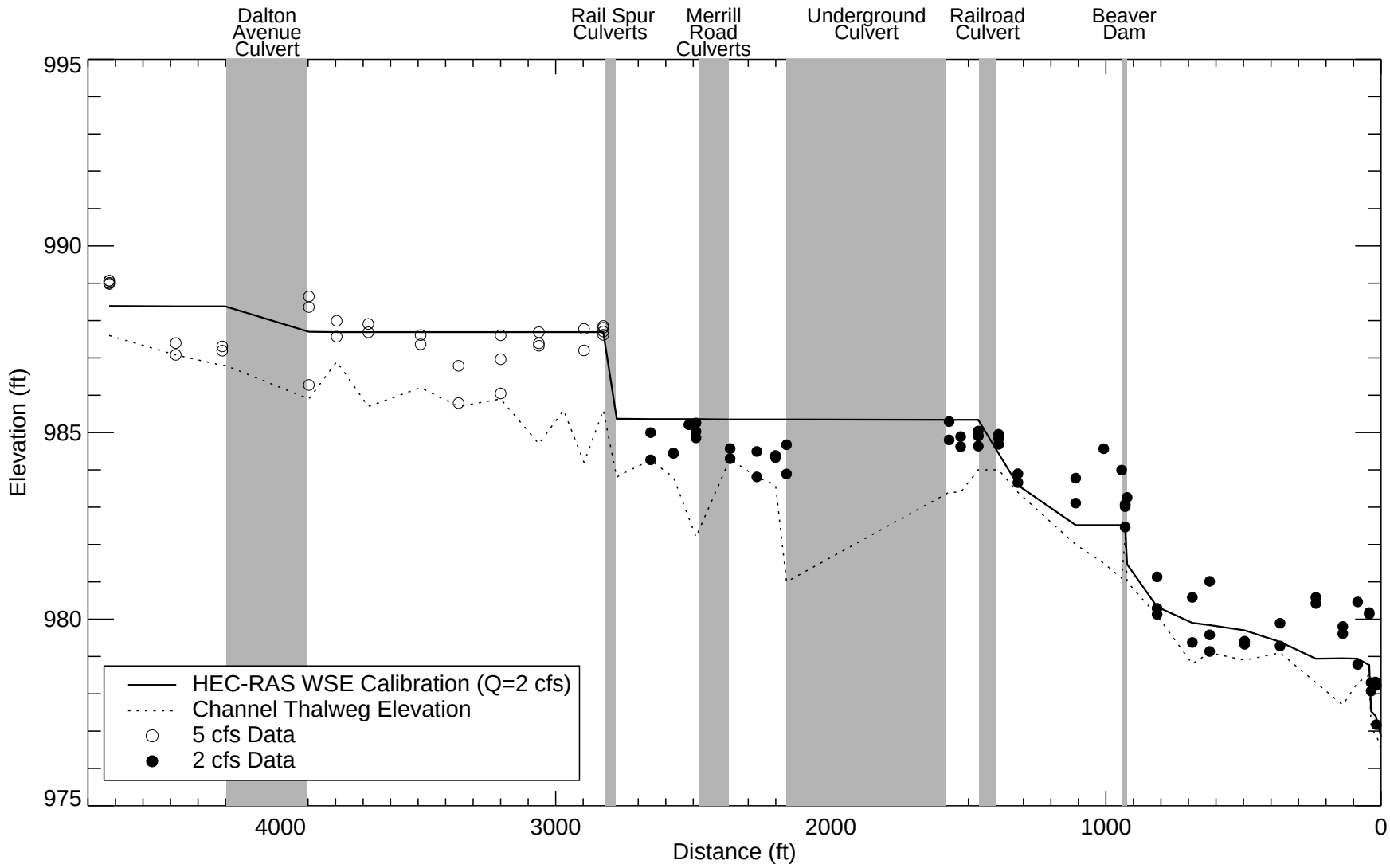


Figure F-1b

Low Flow Water Surface Profile Calibration Plot
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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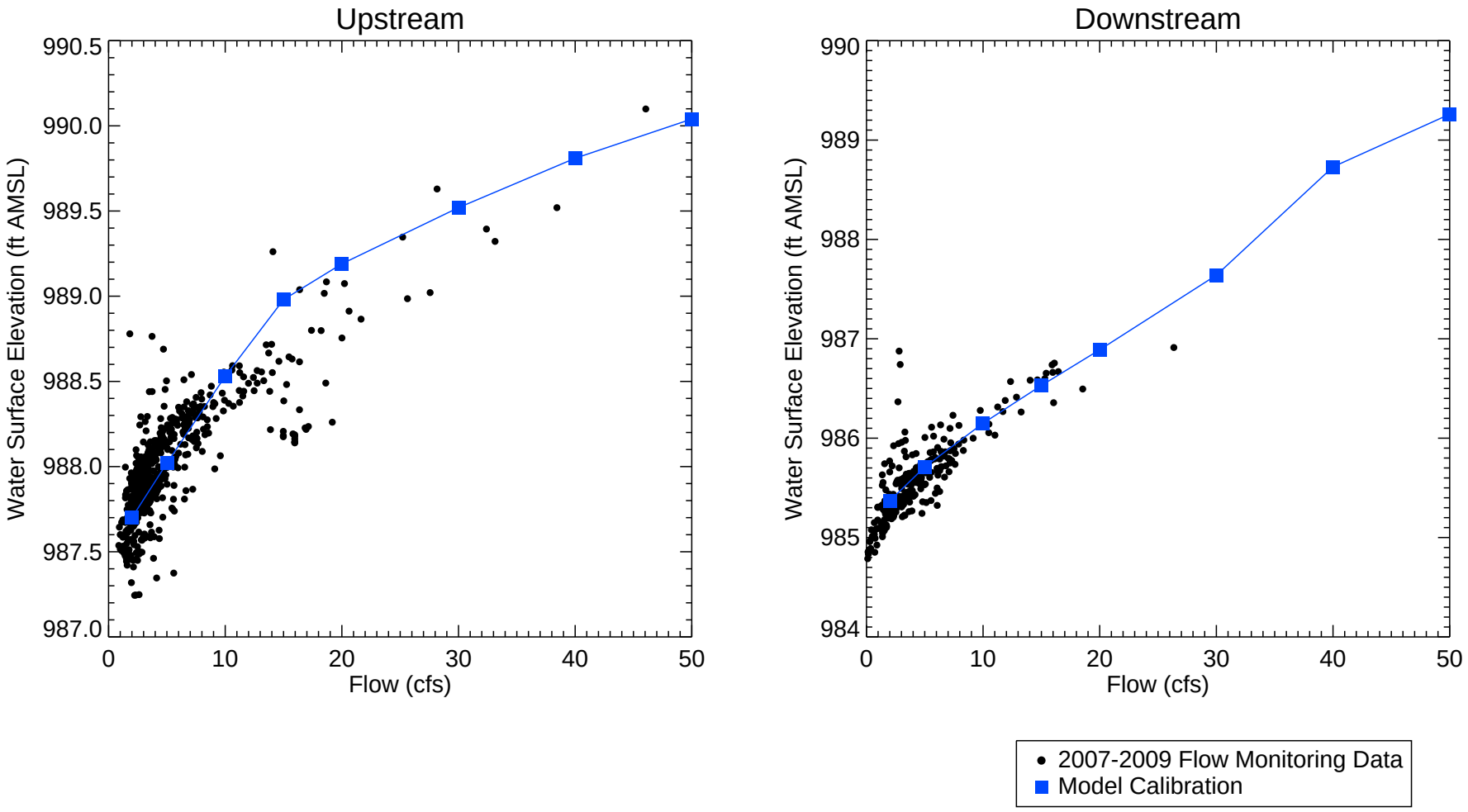


Figure F-2

Rating Curve Calibration Plot for Upstream and Downstream Locations
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

Note: Comparison of daily water surface elevation measured at the upstream and downstream gage at Unkamet Brook during 2007-09 with those predicted by HEC-RAS near Transects 40 (upstream) and 31 (downstream).

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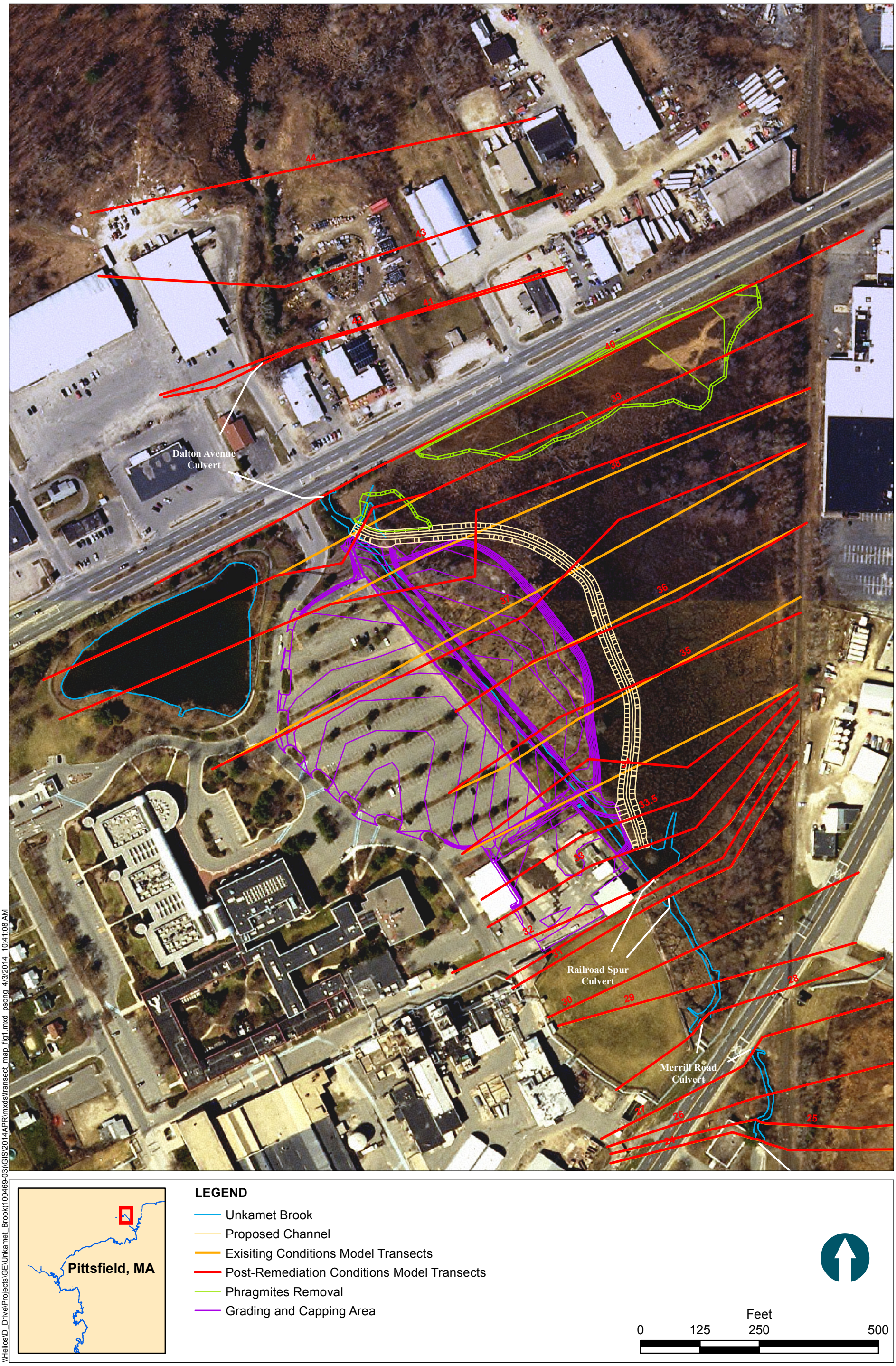


Figure F-3
HEC-RAS Transects and Proposed Channel Rerouting for Unkamet Brook
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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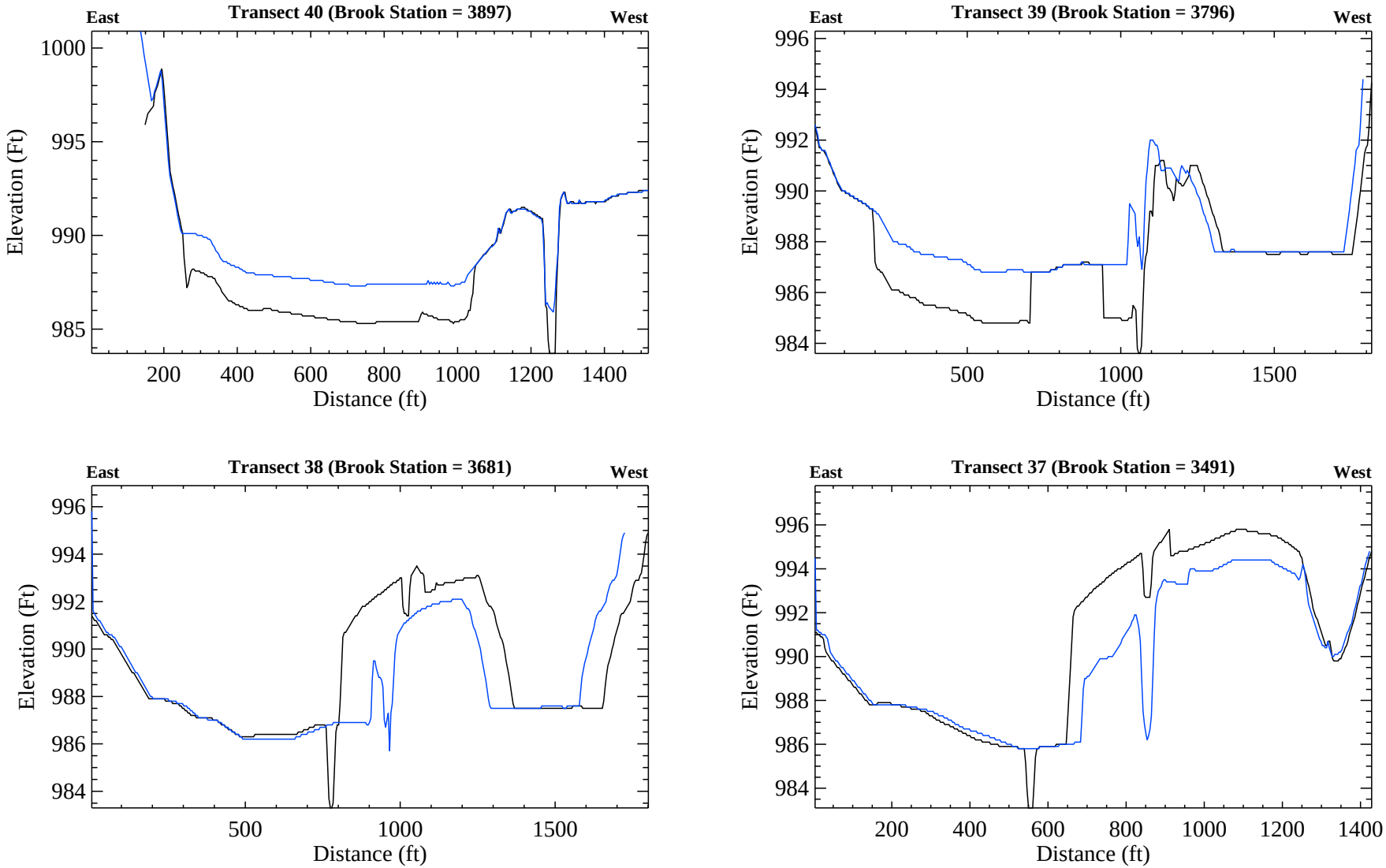


Figure F-4a

Transect Topography Comparison Plot Showing Modifications to Channel Alignment
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

Note: Transects 39, 38, and 34 do not completely align between existing and post-remediation conditions due to differences in transect lengths.

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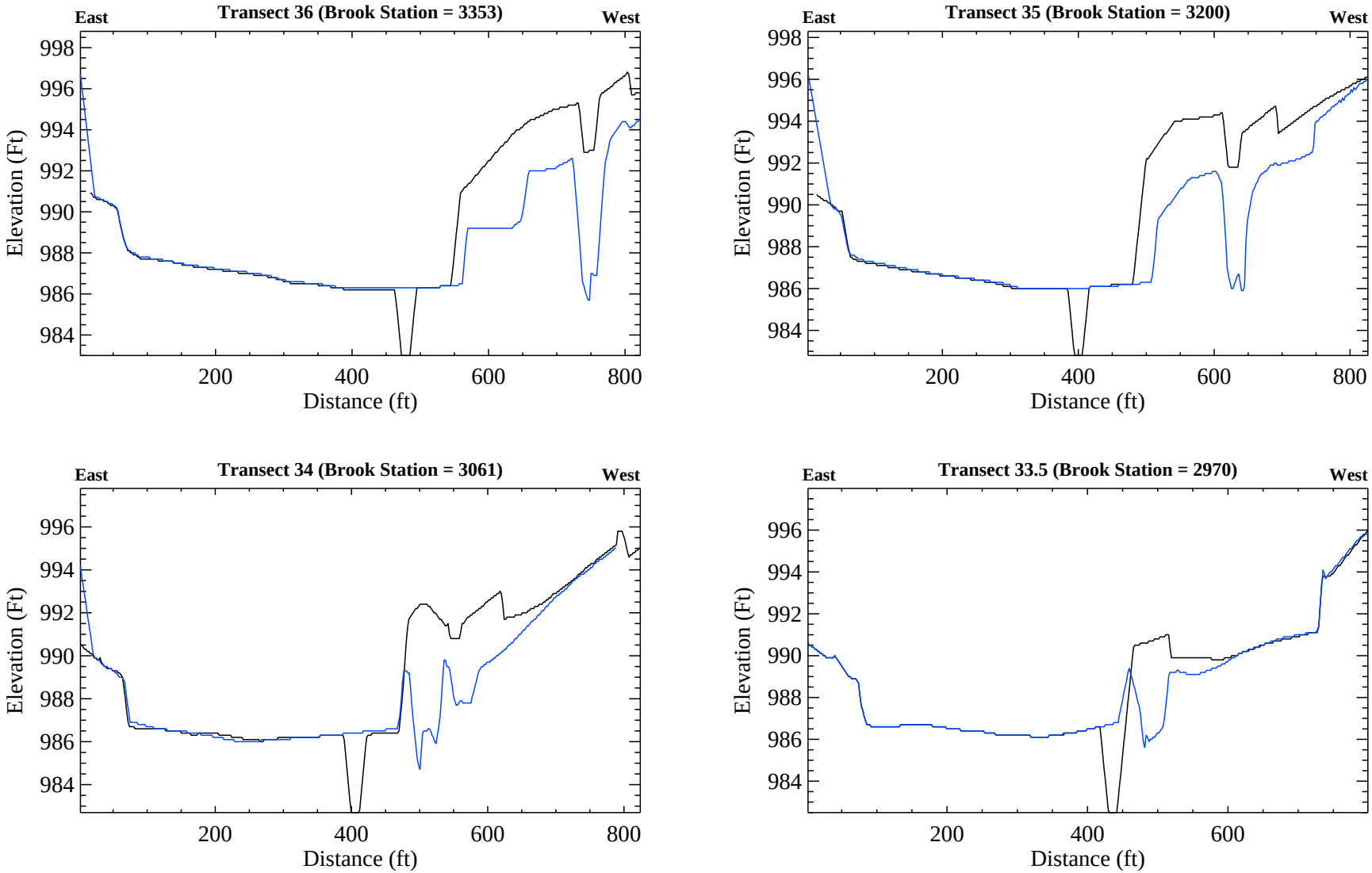


Figure F-4b

Transect Topography Comparison Plot Showing Modifications to Channel Alignment
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

Note: Transects 39, 38, and 34 do not completely align between existing and post-remediation conditions due to differences in transect lengths.

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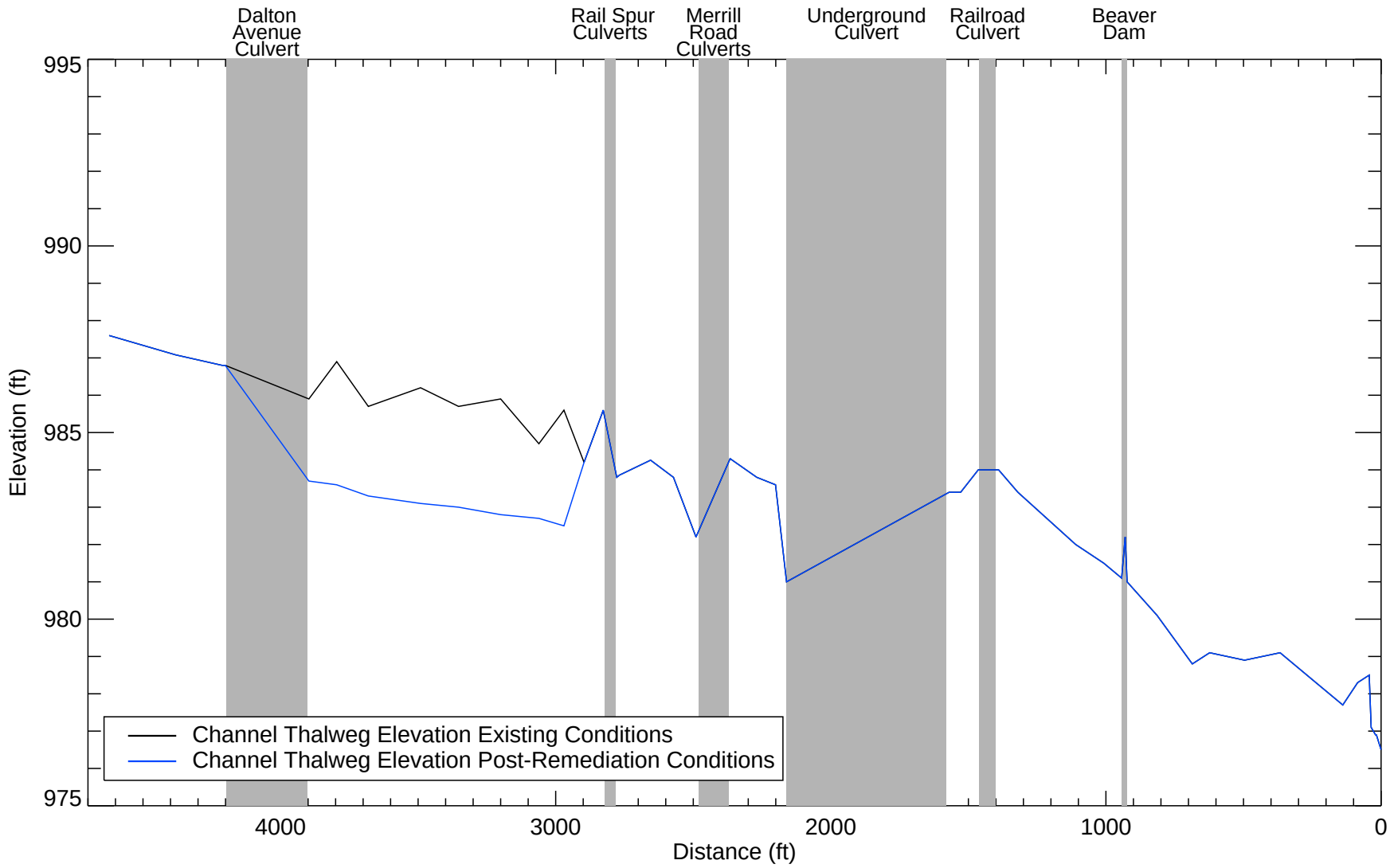


Figure F-5

Unkamet Brook Comparison of Existing and Post-Remediation Thalweg Elevations
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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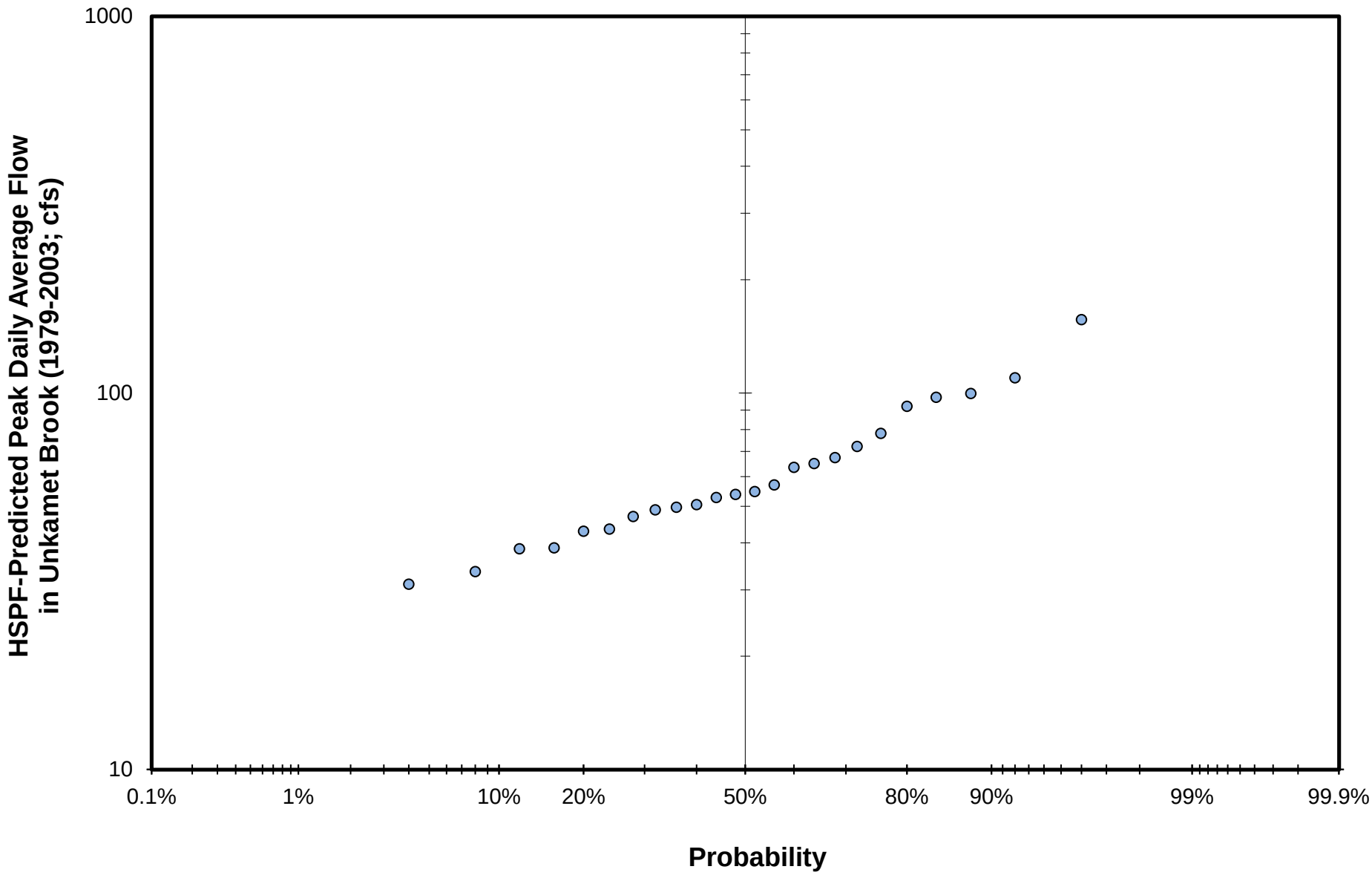


Figure F-6
Unkamet Brook Return Frequency Analysis Based on HSPF Model-Predicted Values
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company
Note: Values shown in distribution represent annual peak daily average flow rates for water years 1980 through 2003 predicted by the HSPF model developed for the Housatonic River watershed by EPA.

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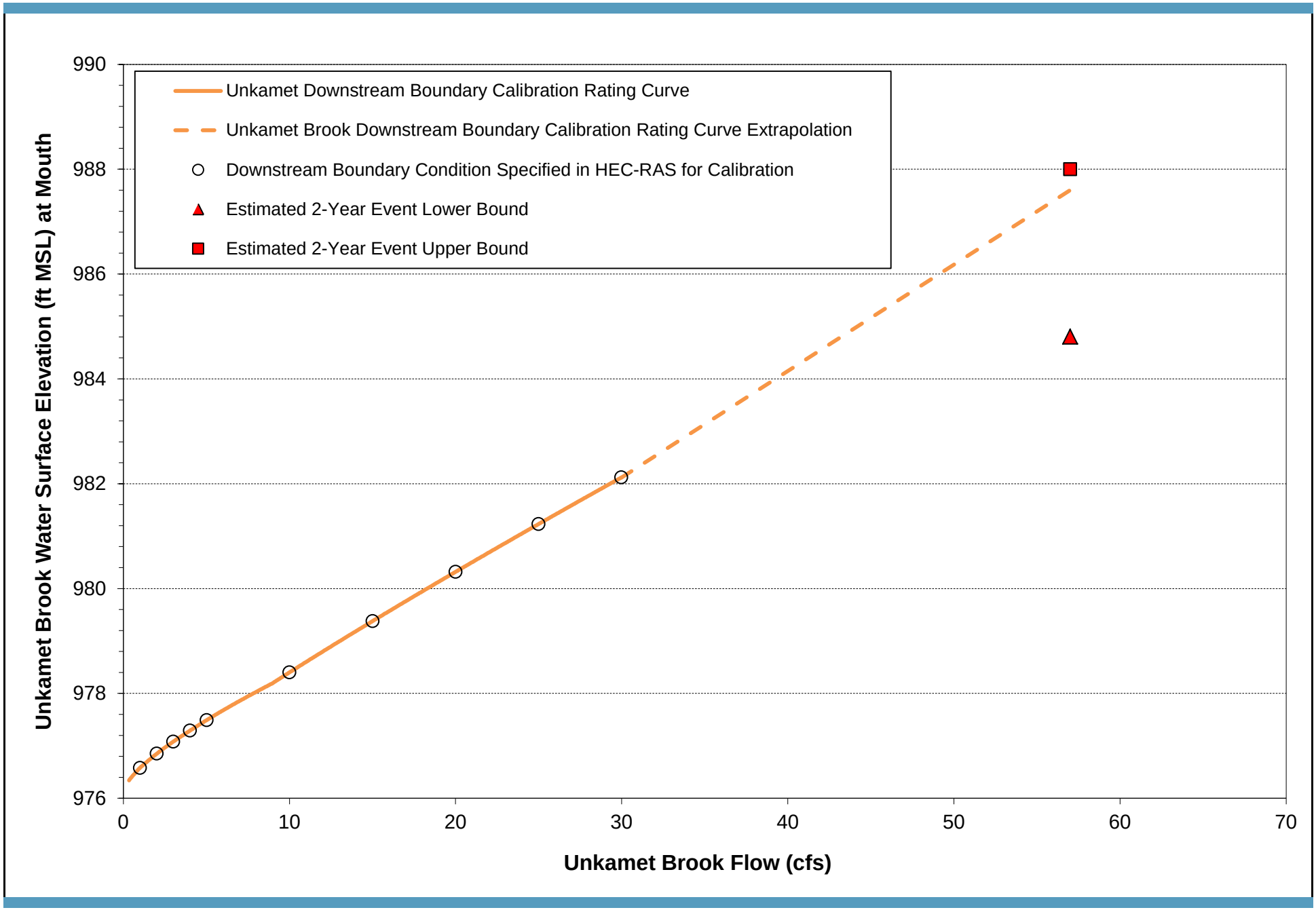


Figure F-7
Unkamet Brook Hydraulic Model Downstream Boundary Condition Rating Curve
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

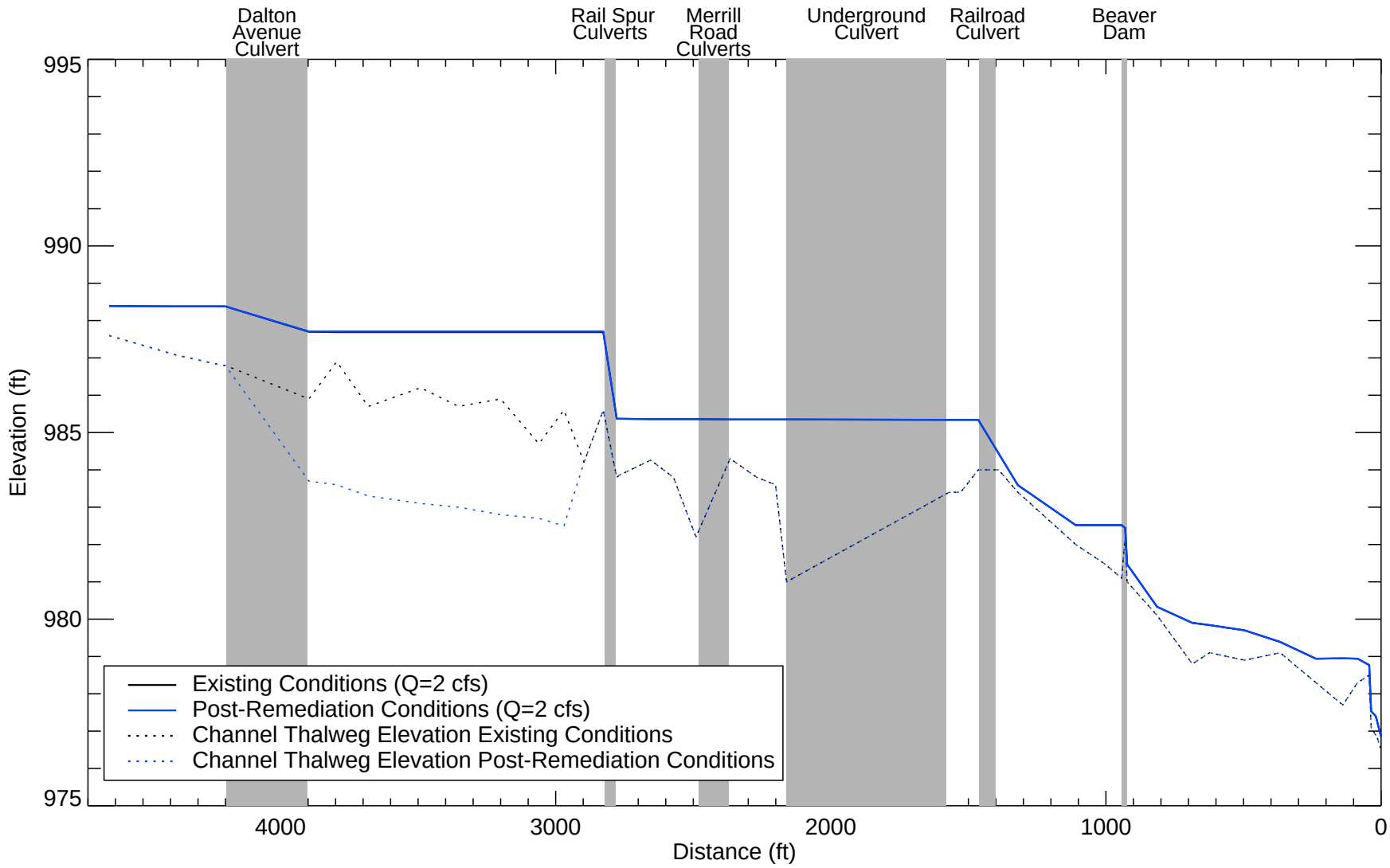


Figure F-8a

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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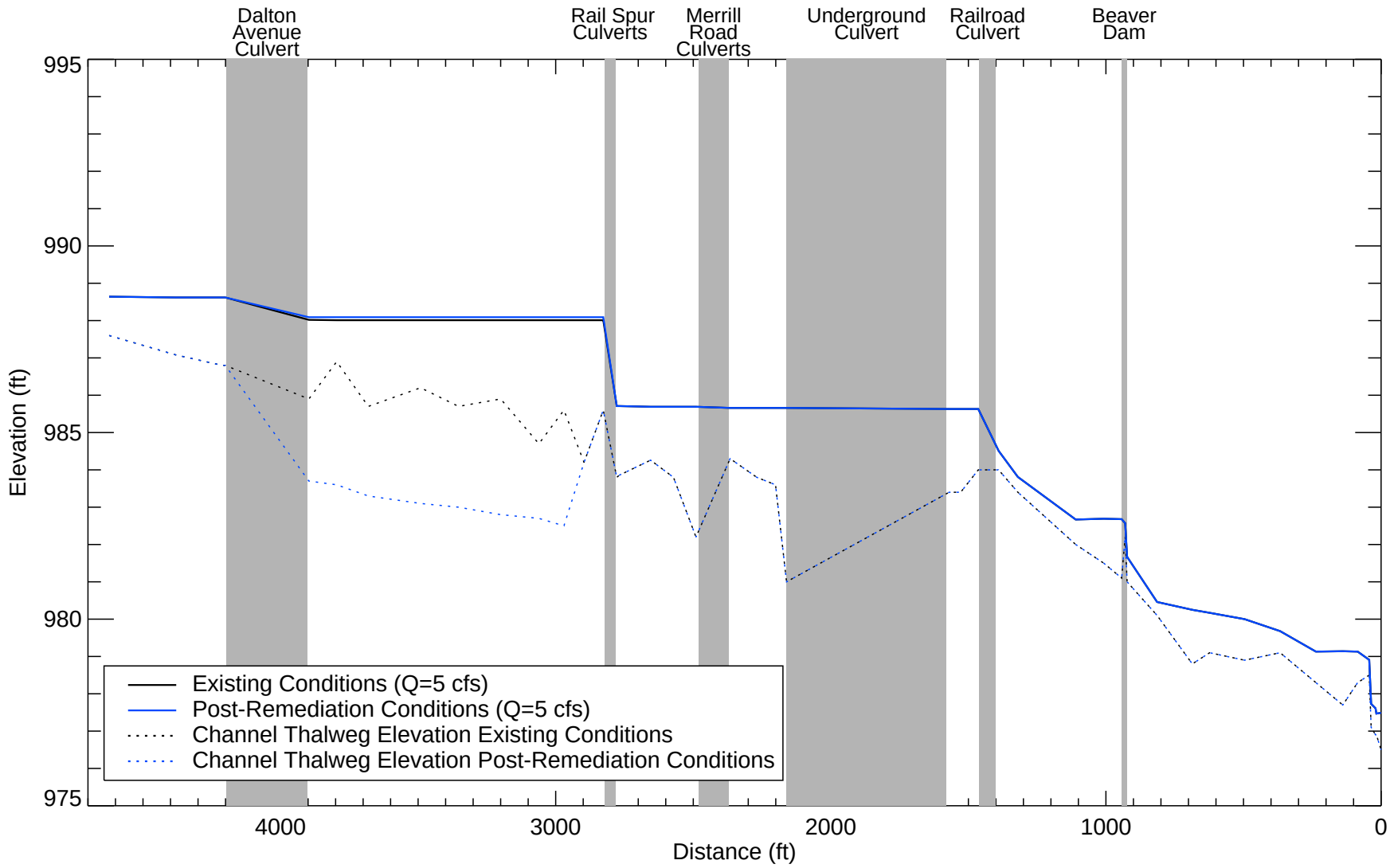


Figure F-8b

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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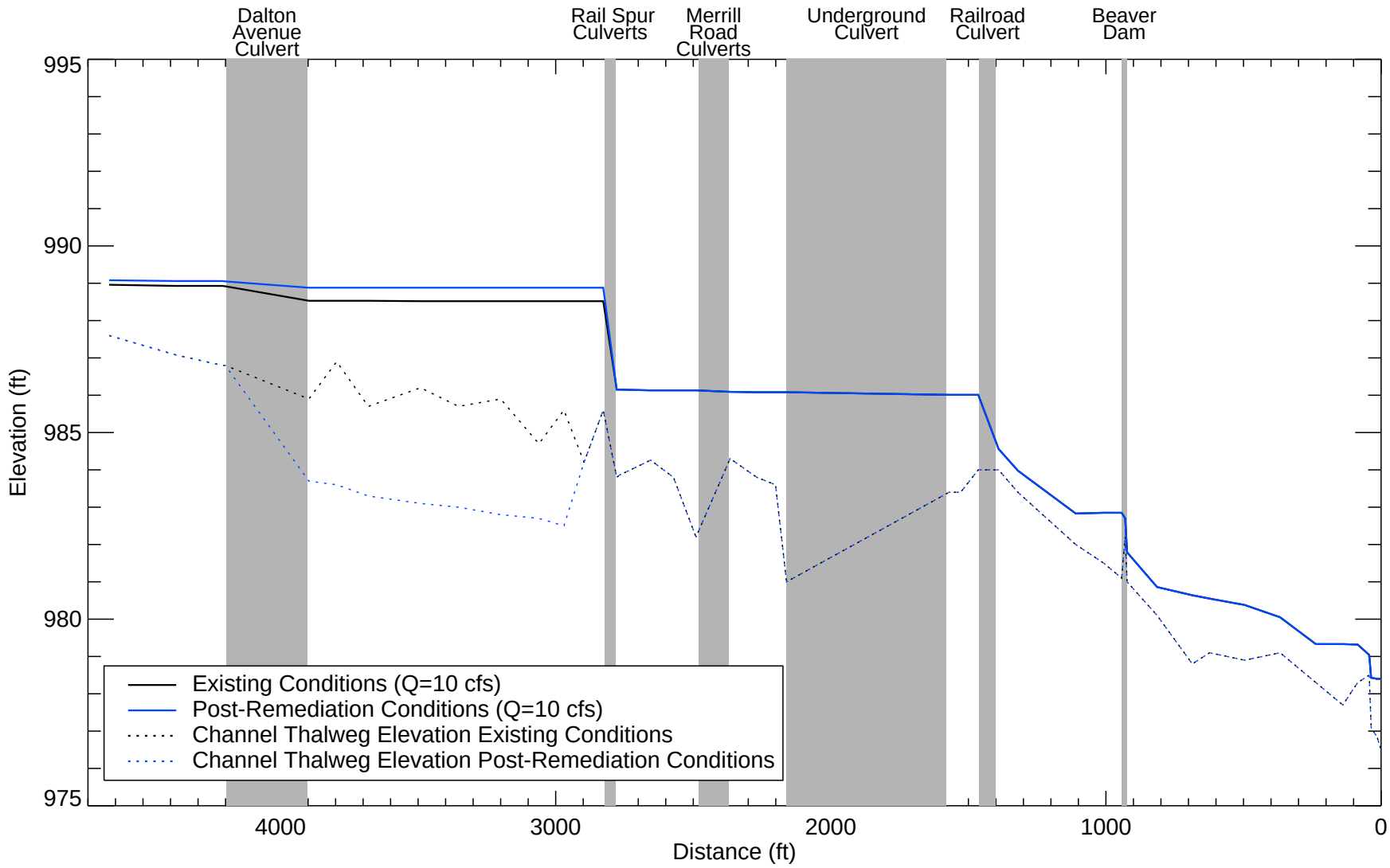


Figure F-8c

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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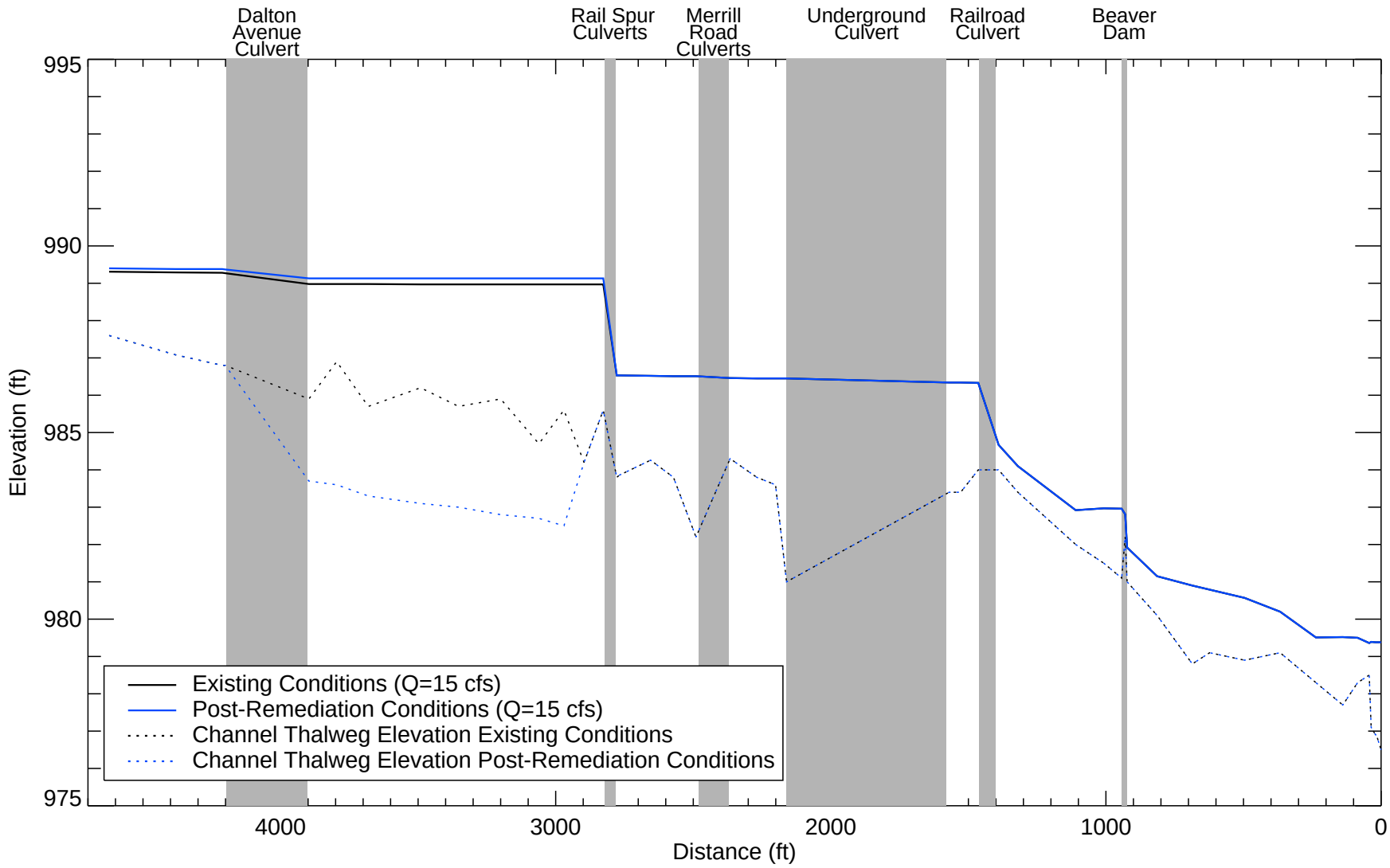


Figure F-8d

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

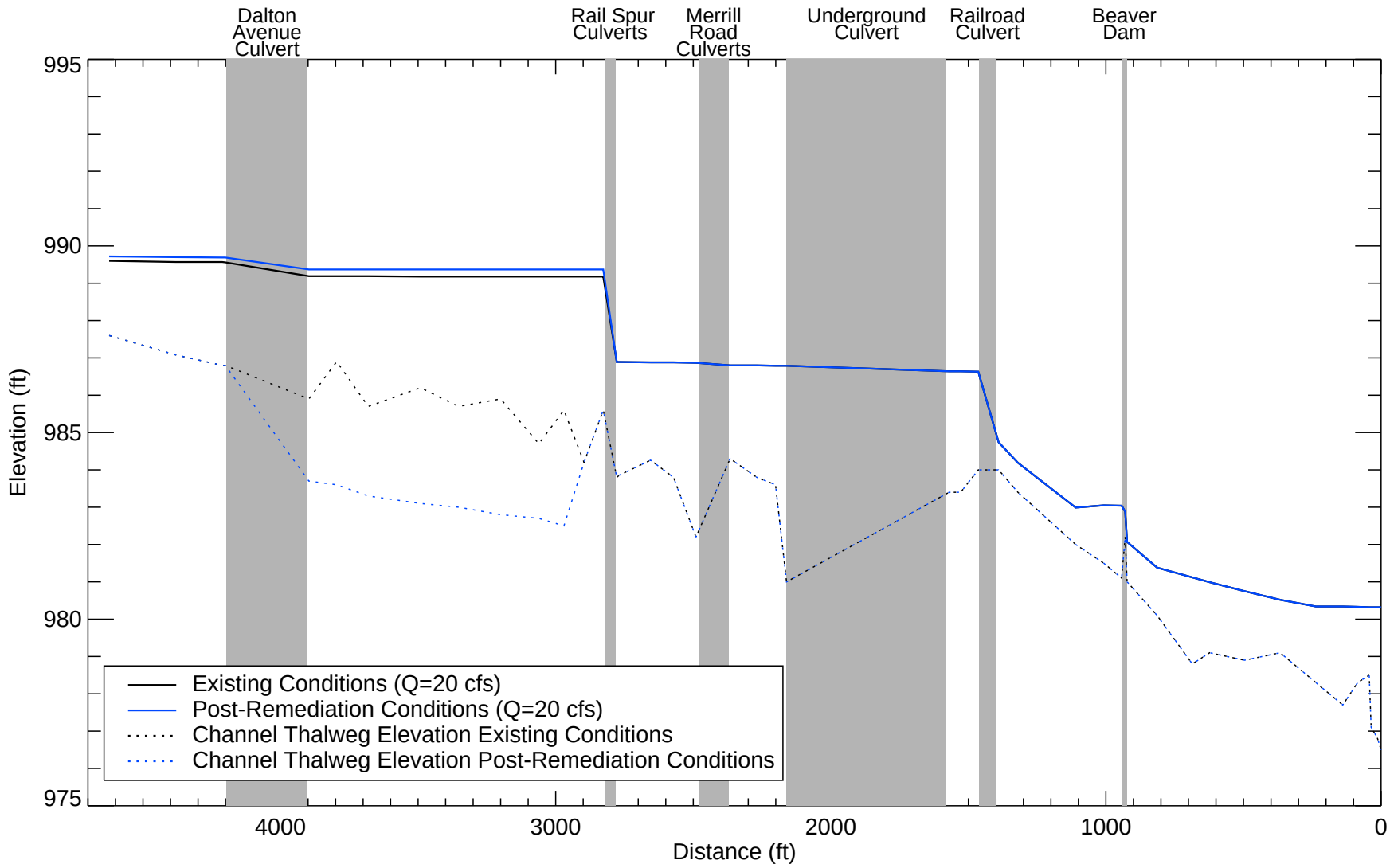


Figure F-8e

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

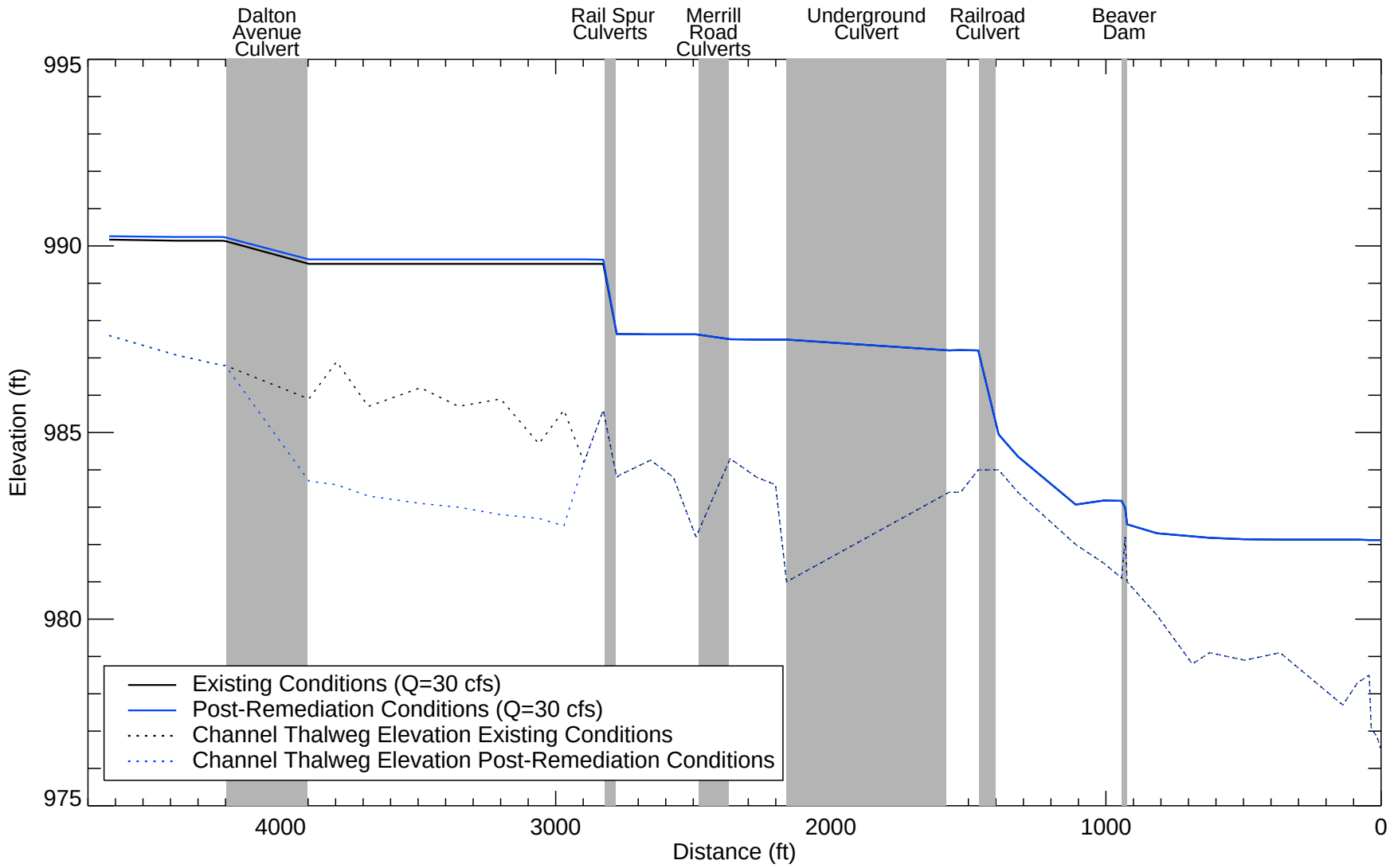


Figure F-8f

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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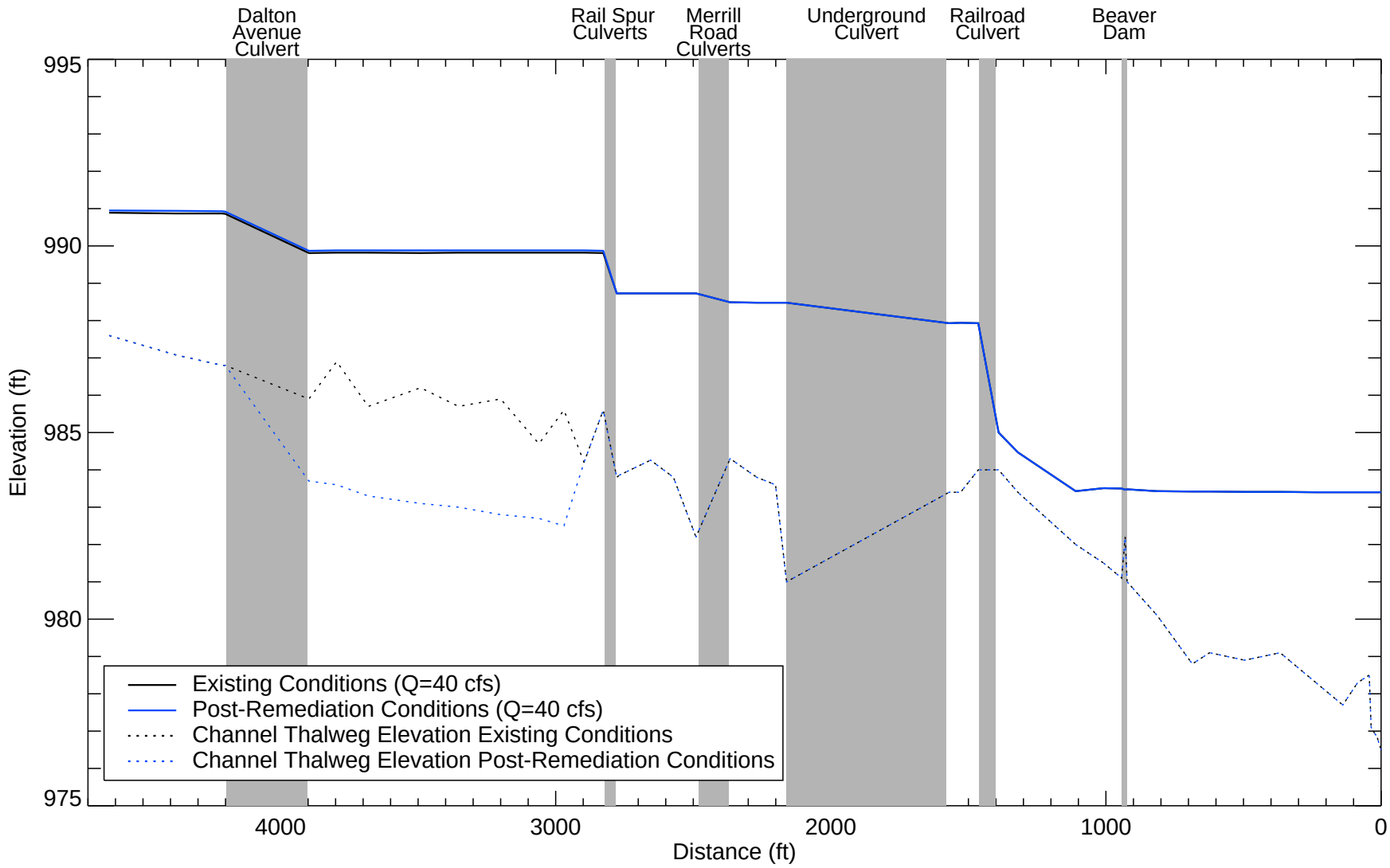


Figure F-8g

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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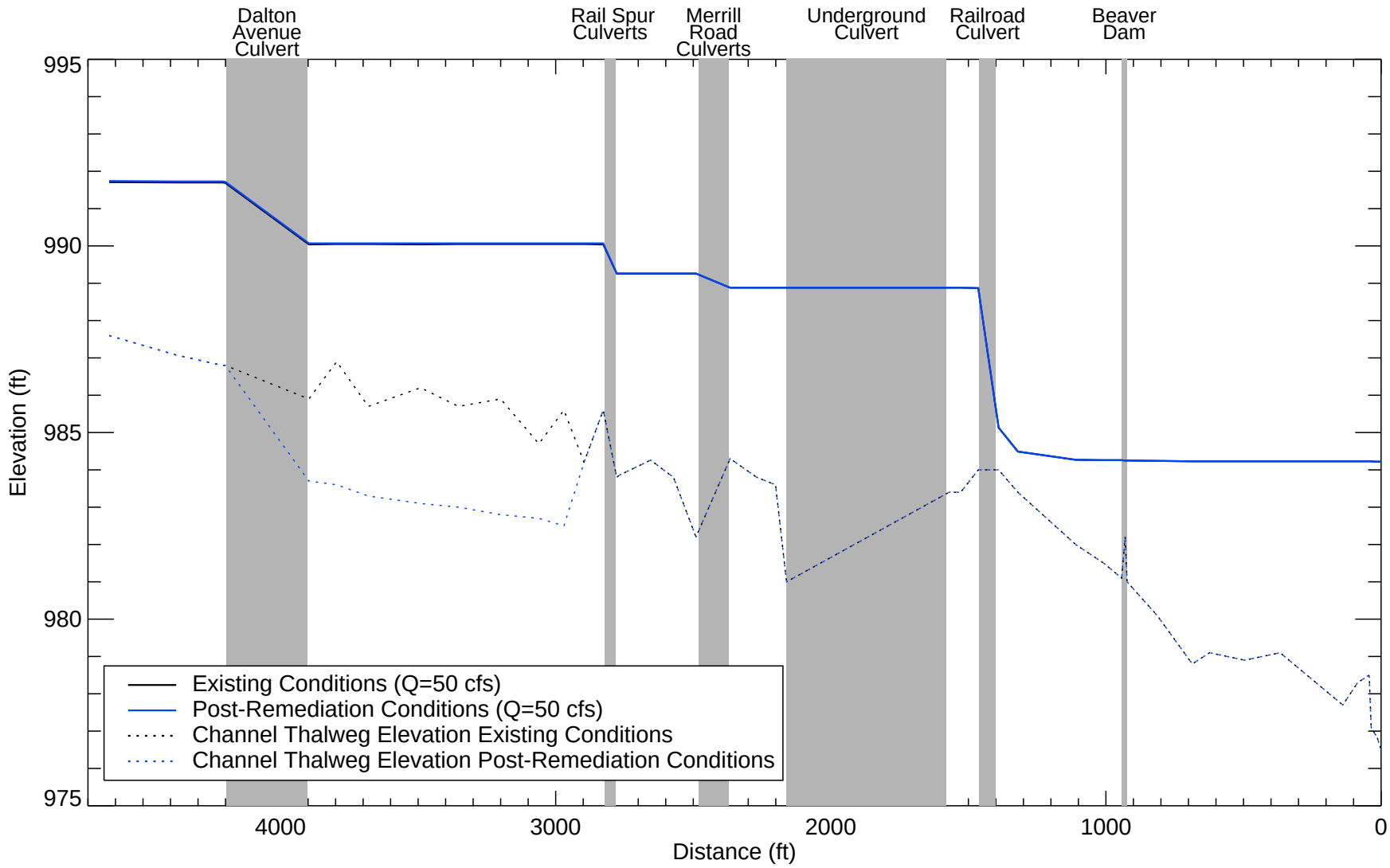


Figure F-8h

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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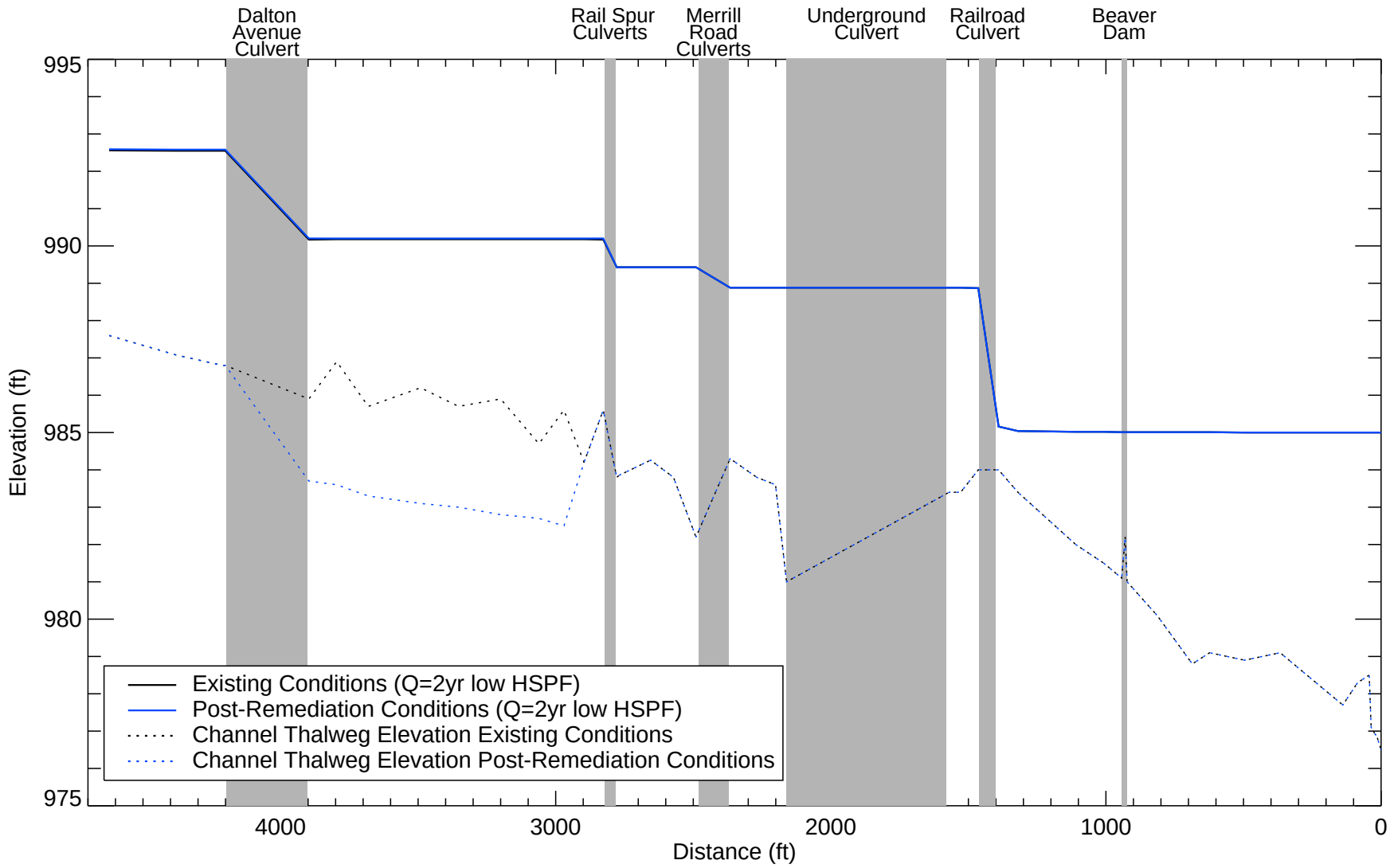


Figure F-8i

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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RRM/PS - \\helios\aq\D_Drive\Projects\GE\Unkamet_Brook(100469-03)\model\postprocess\April2014_Memo\Fig8i_ThalwegCompare_ExistvsPostRem.pro Thu Apr 10 10:16:06 2014

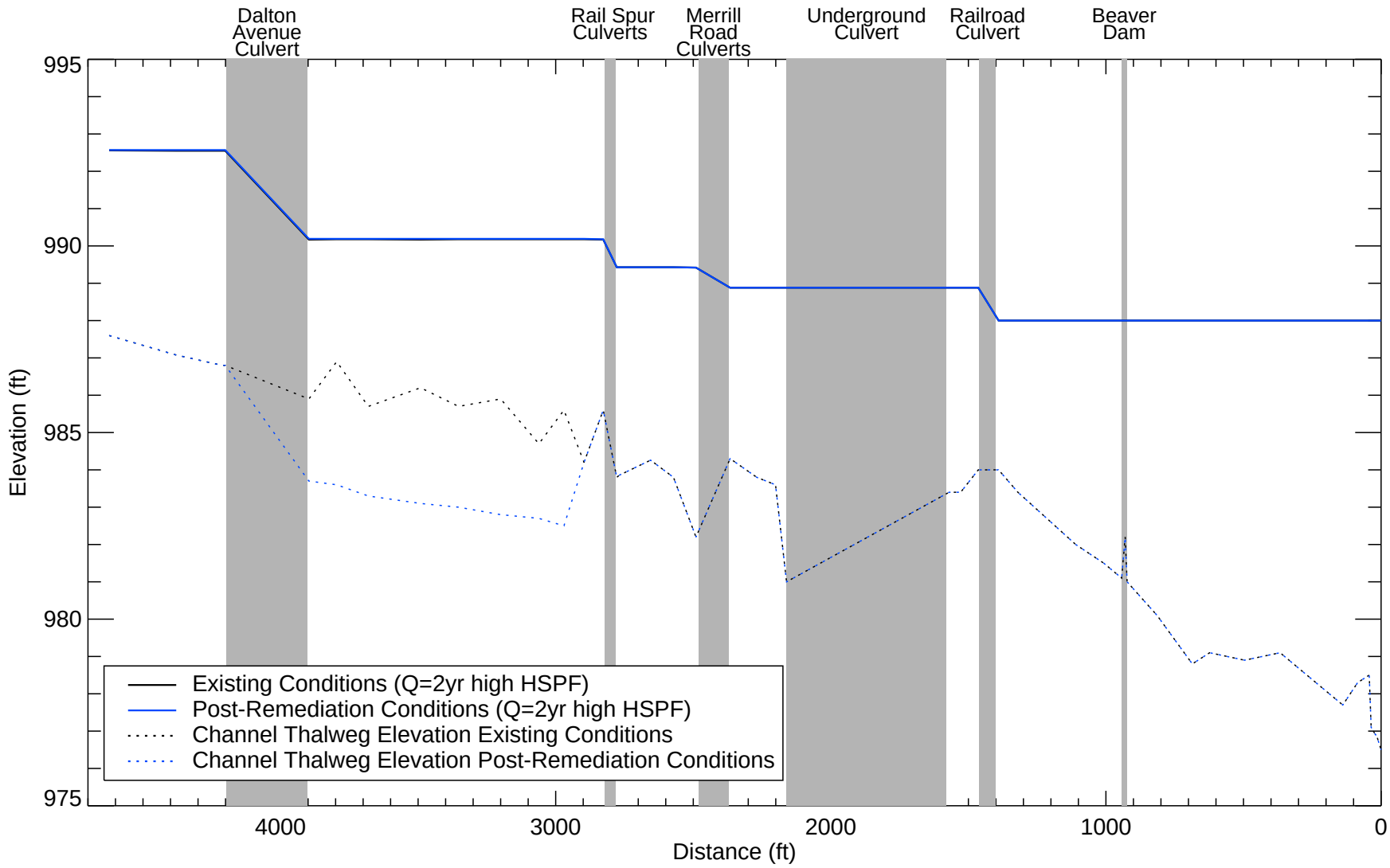


Figure F-8j

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

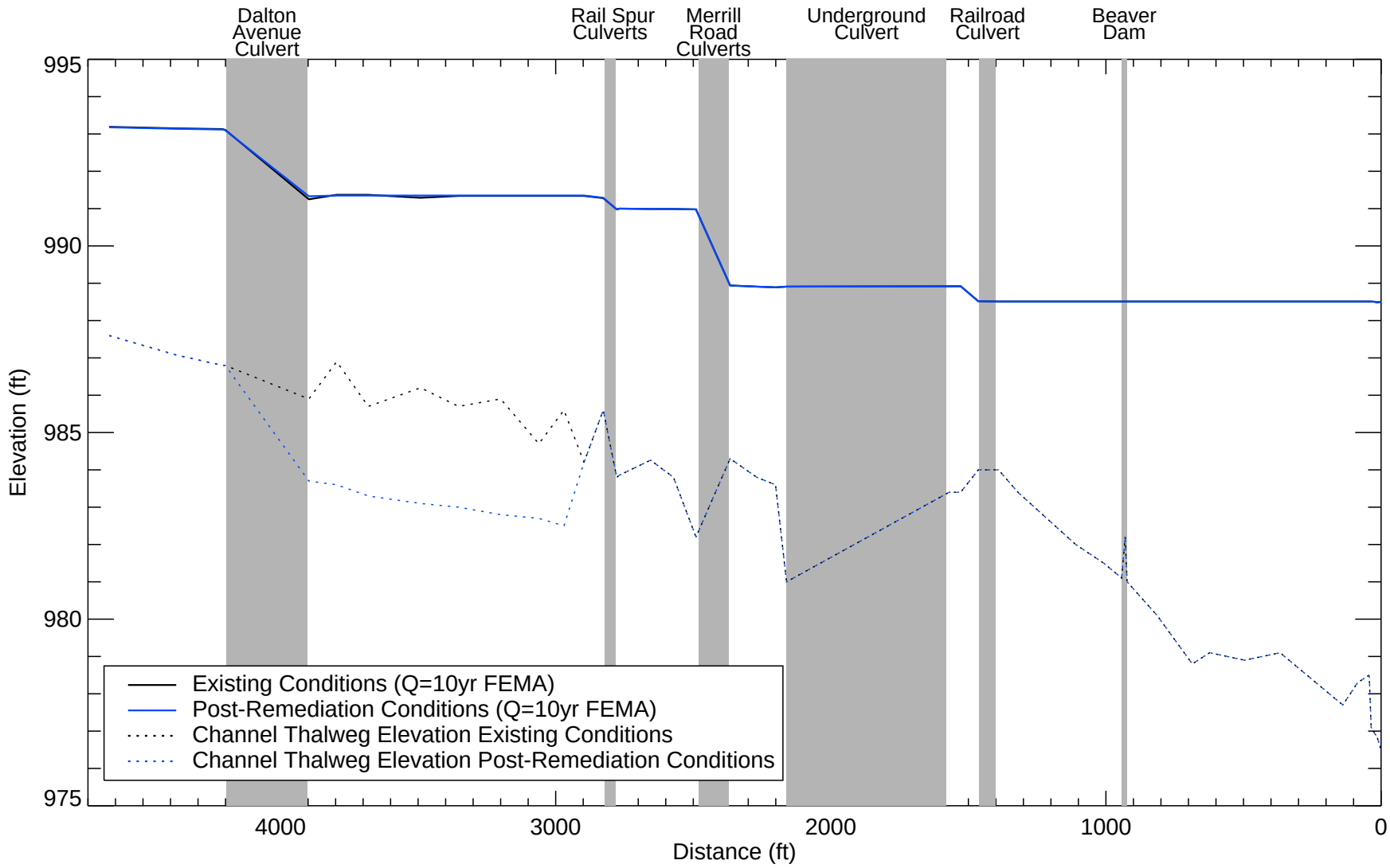


Figure F-8k

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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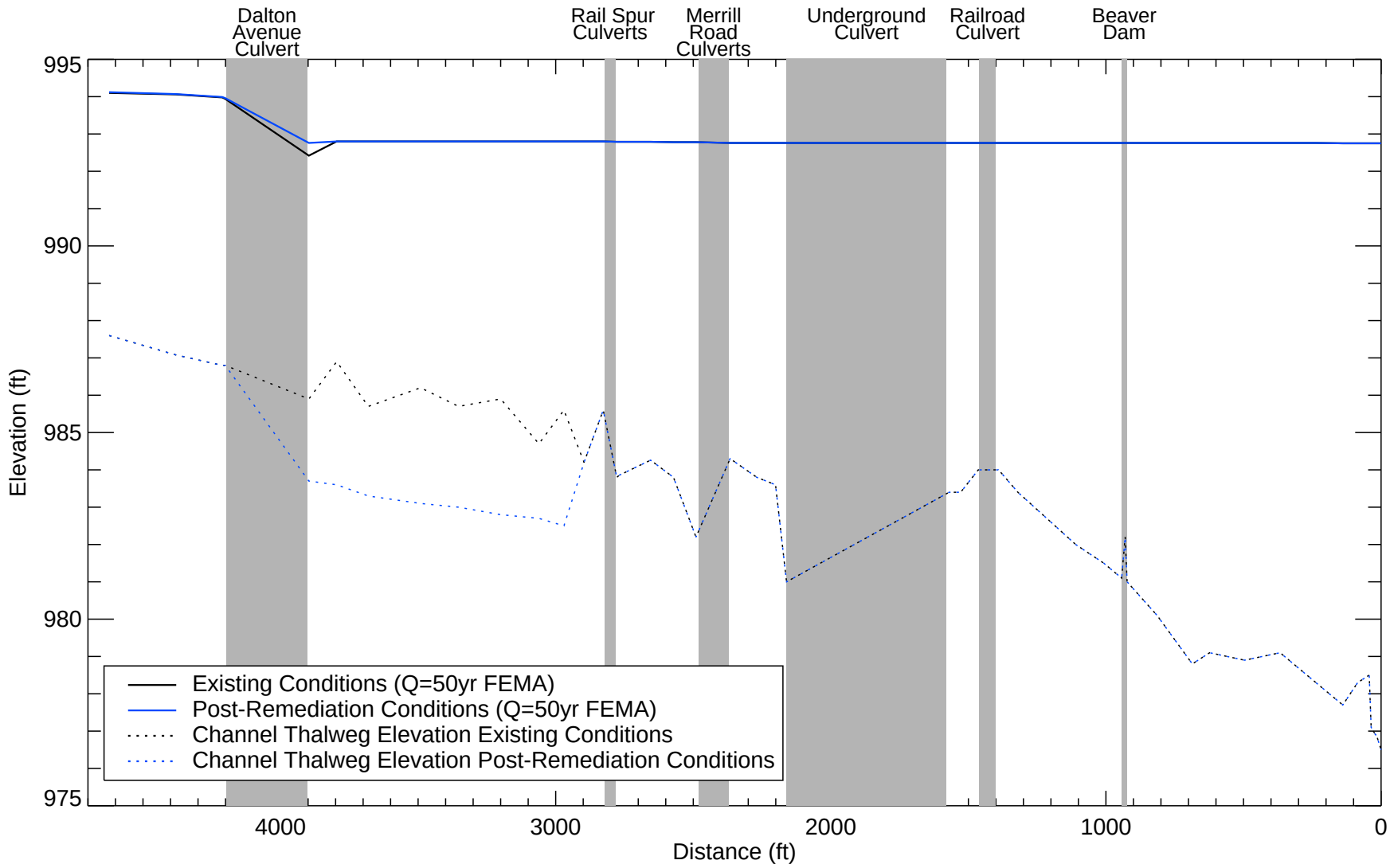


Figure F-8l

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

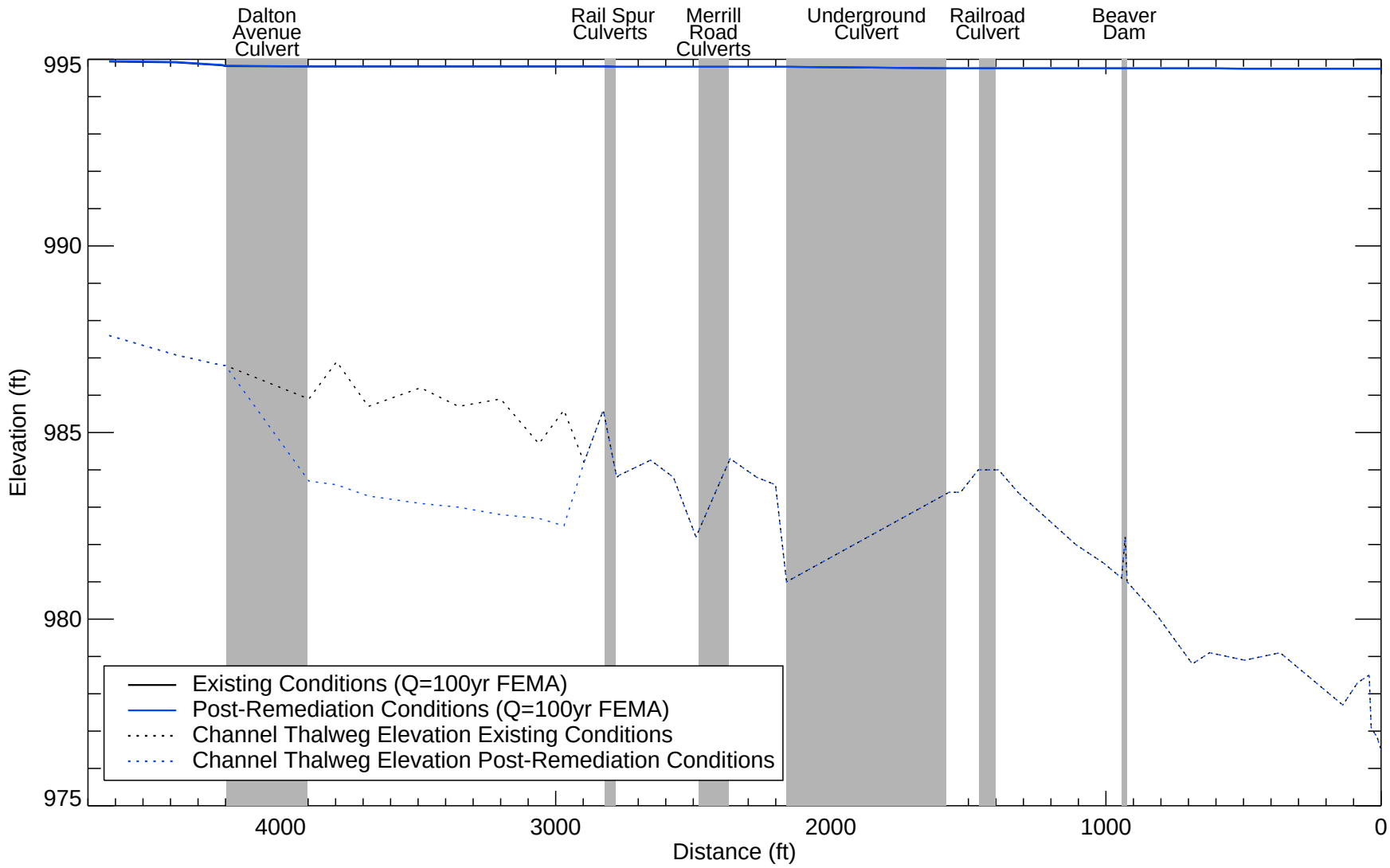


Figure F-8m

Water Surface Profile: Comparison of Model Results for Existing Conditions Model and Post-Remediation Conditions Model
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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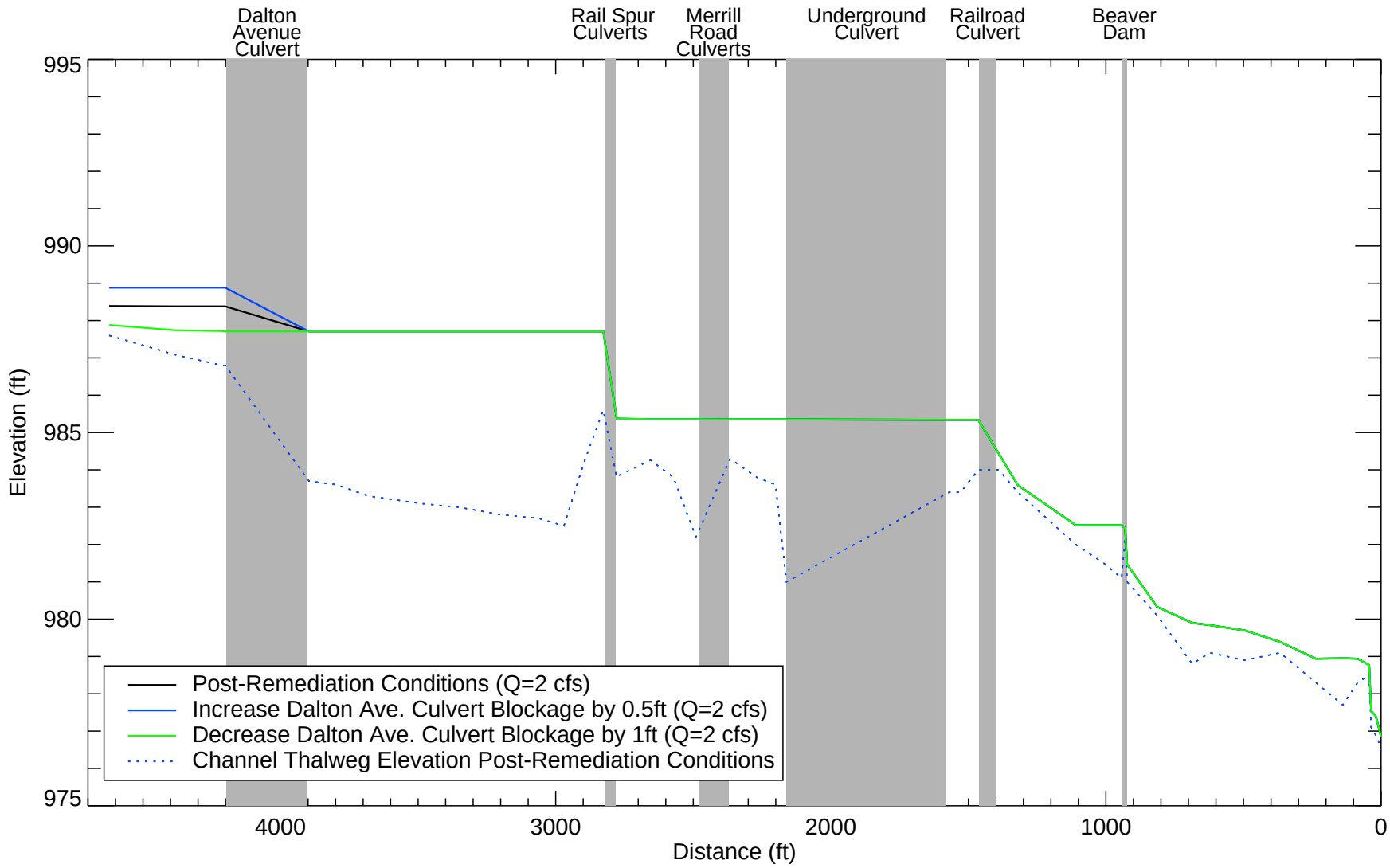


Figure F-9a

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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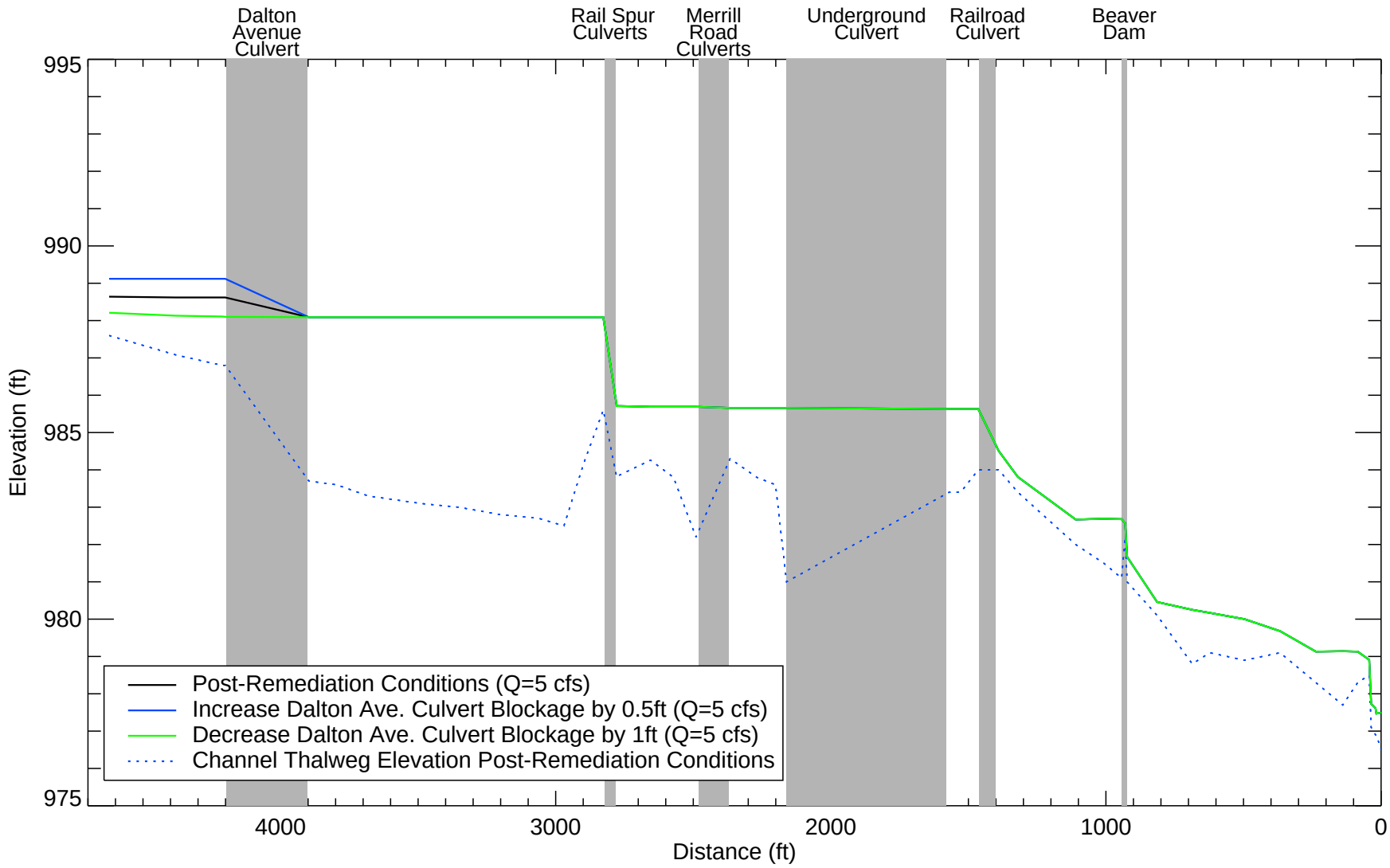


Figure F-9b

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

RRM/PS - \\helios\aq\D_Drive\Projects\GE\Unkamet_Brook(100469-03)\model\postprocess\April2014_Memo\Fig9_ThalwegCompare_ExistvsPostRem.pro Thu Apr 10 10:32:15 2014

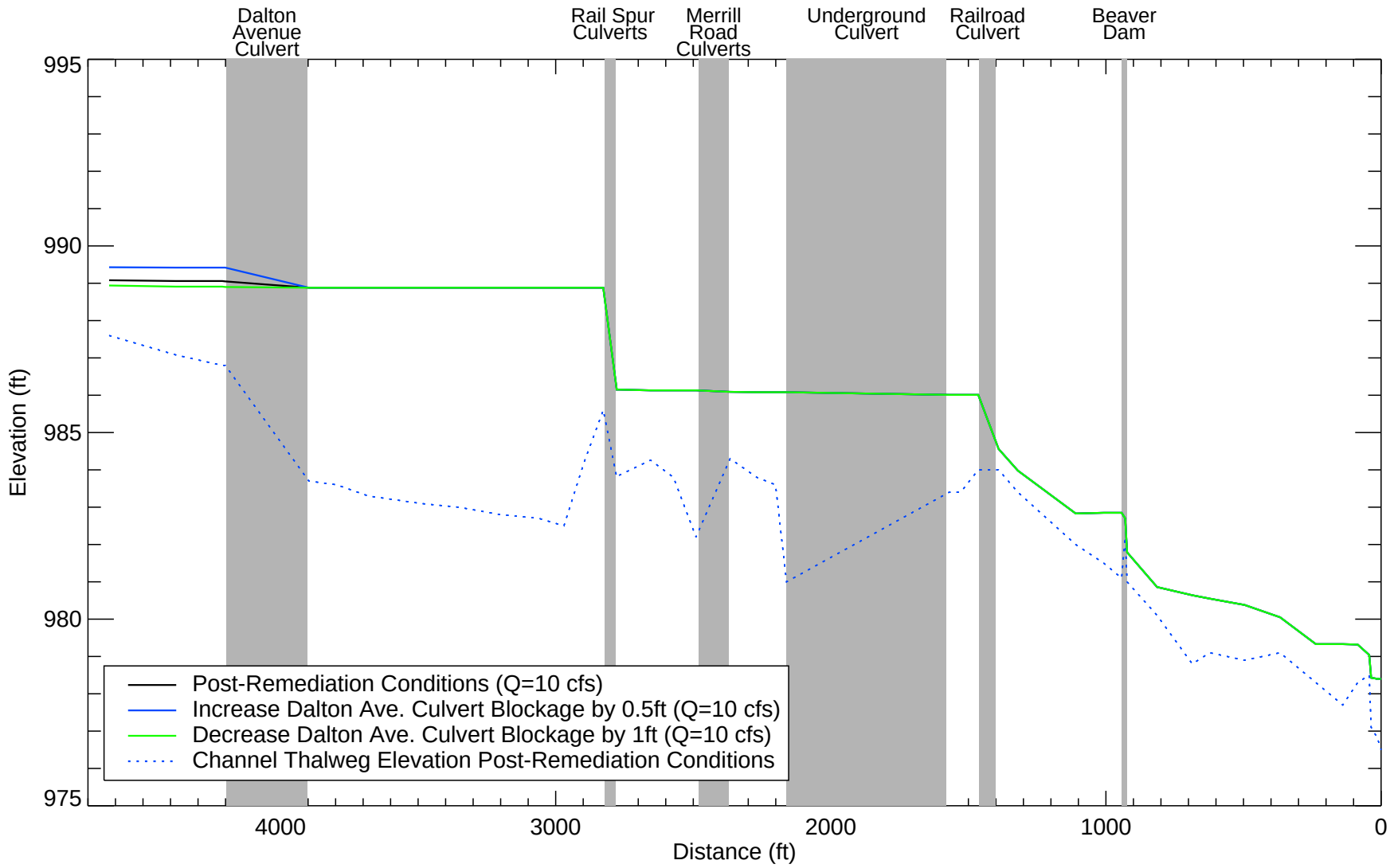


Figure F-9c

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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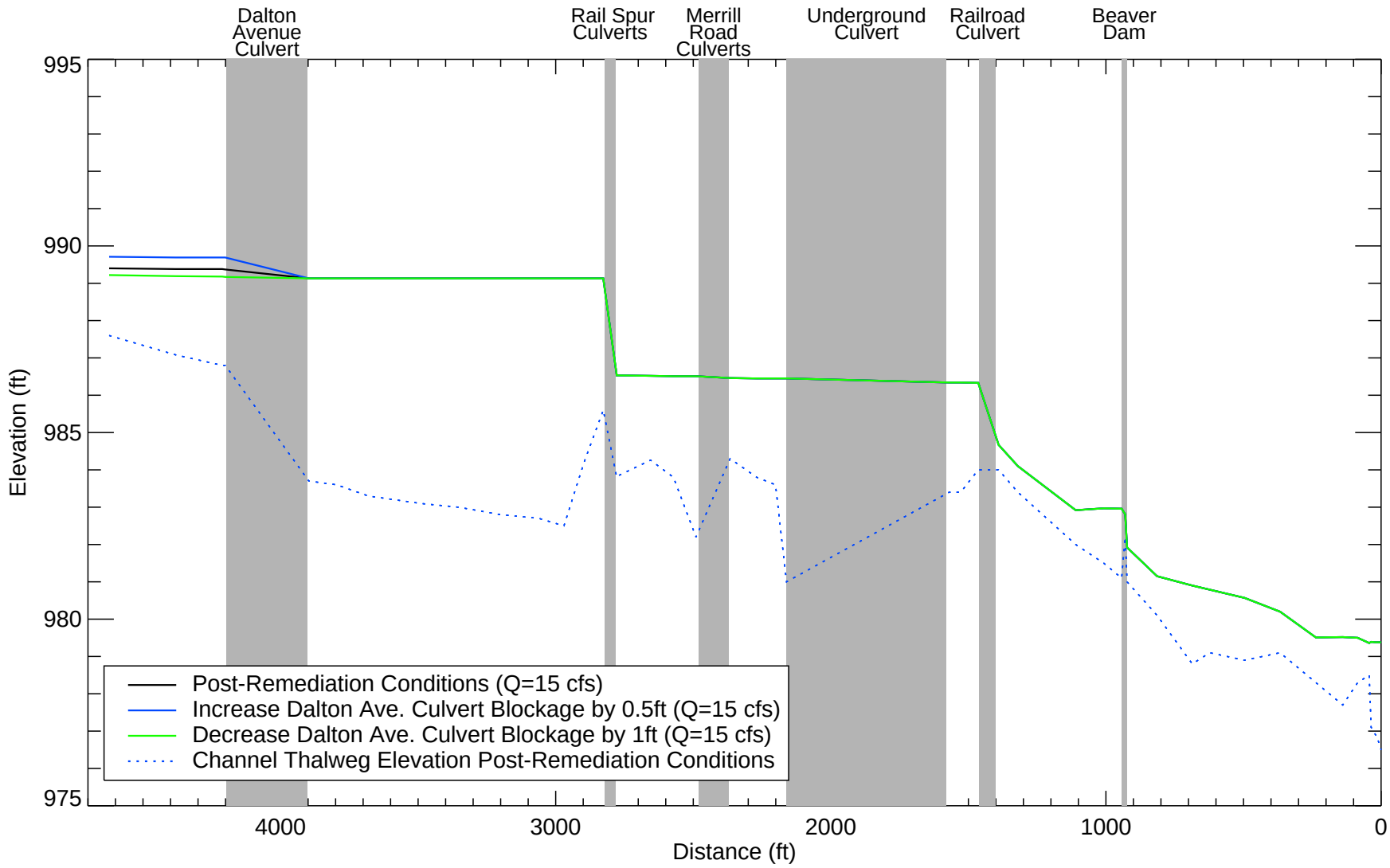


Figure F-9d

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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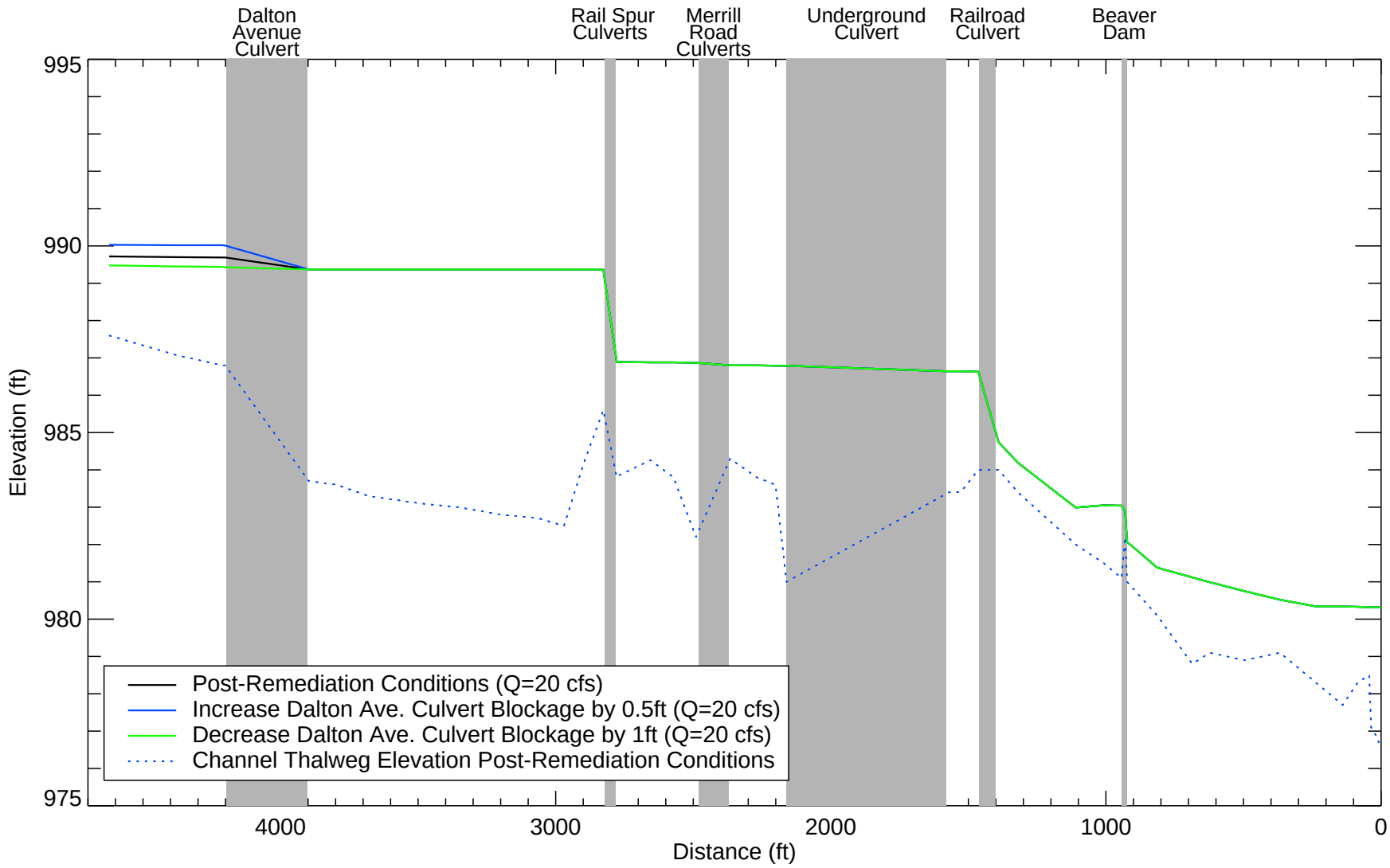


Figure F-9e

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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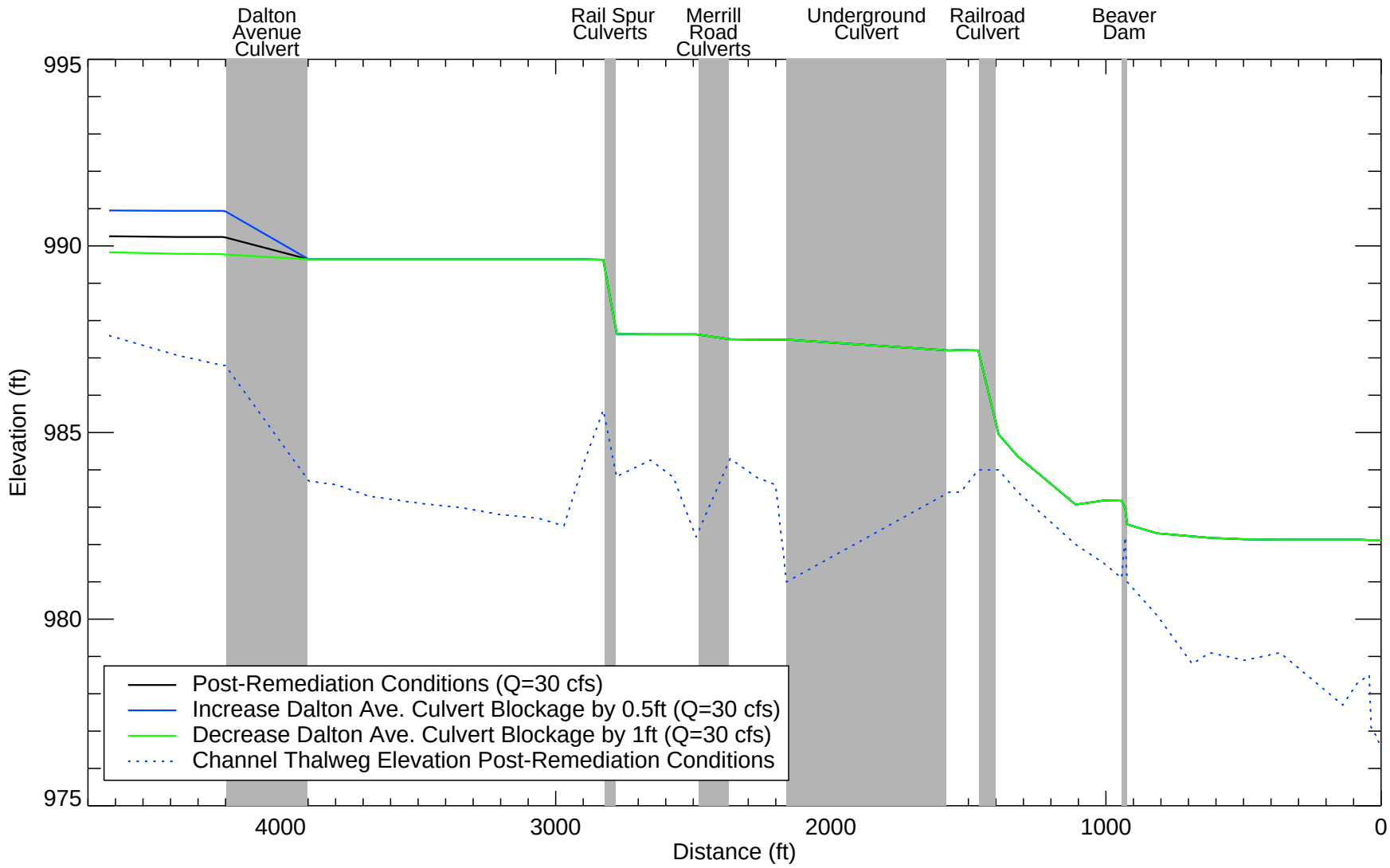


Figure F-9f

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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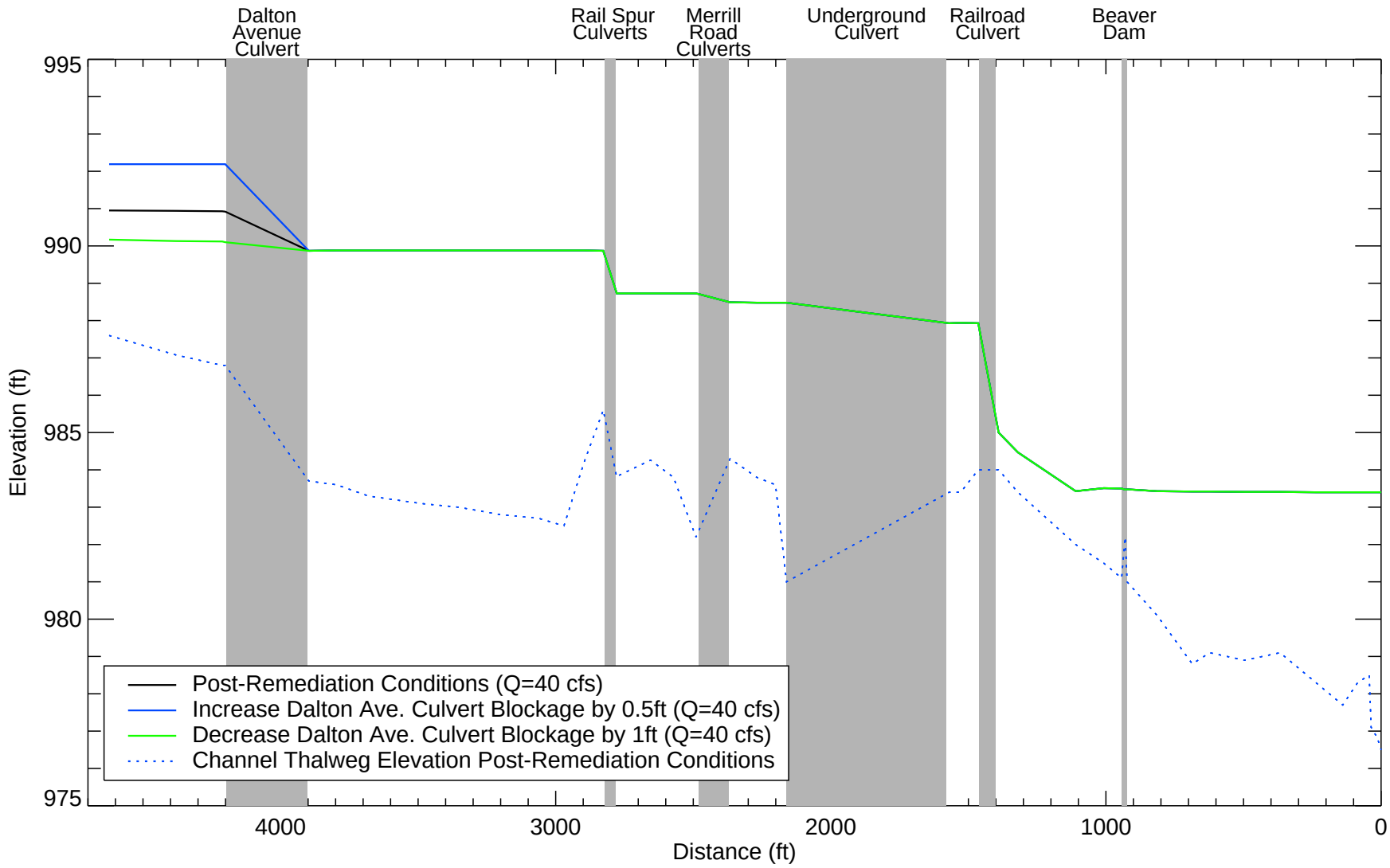


Figure F-9g

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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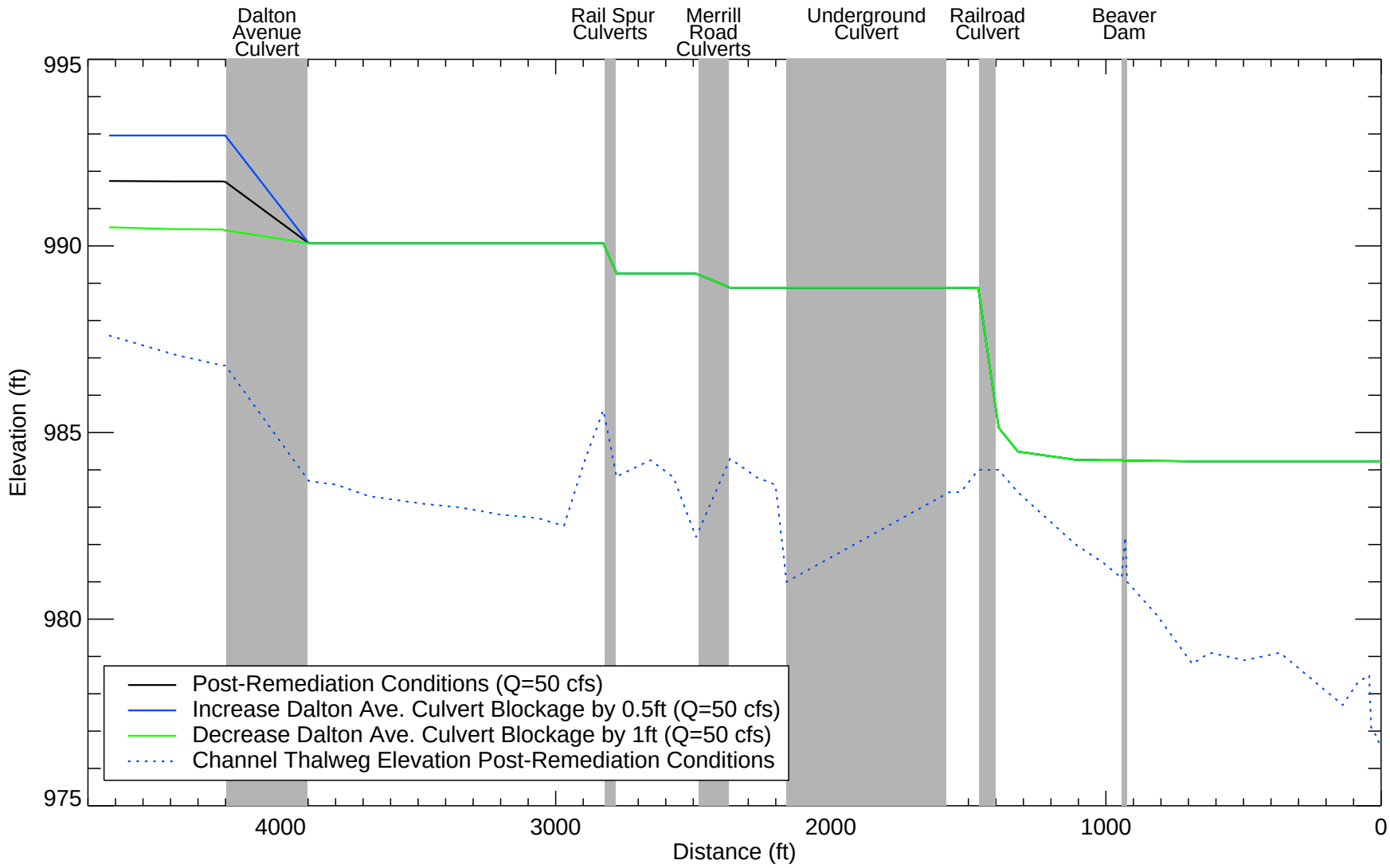


Figure F-9h

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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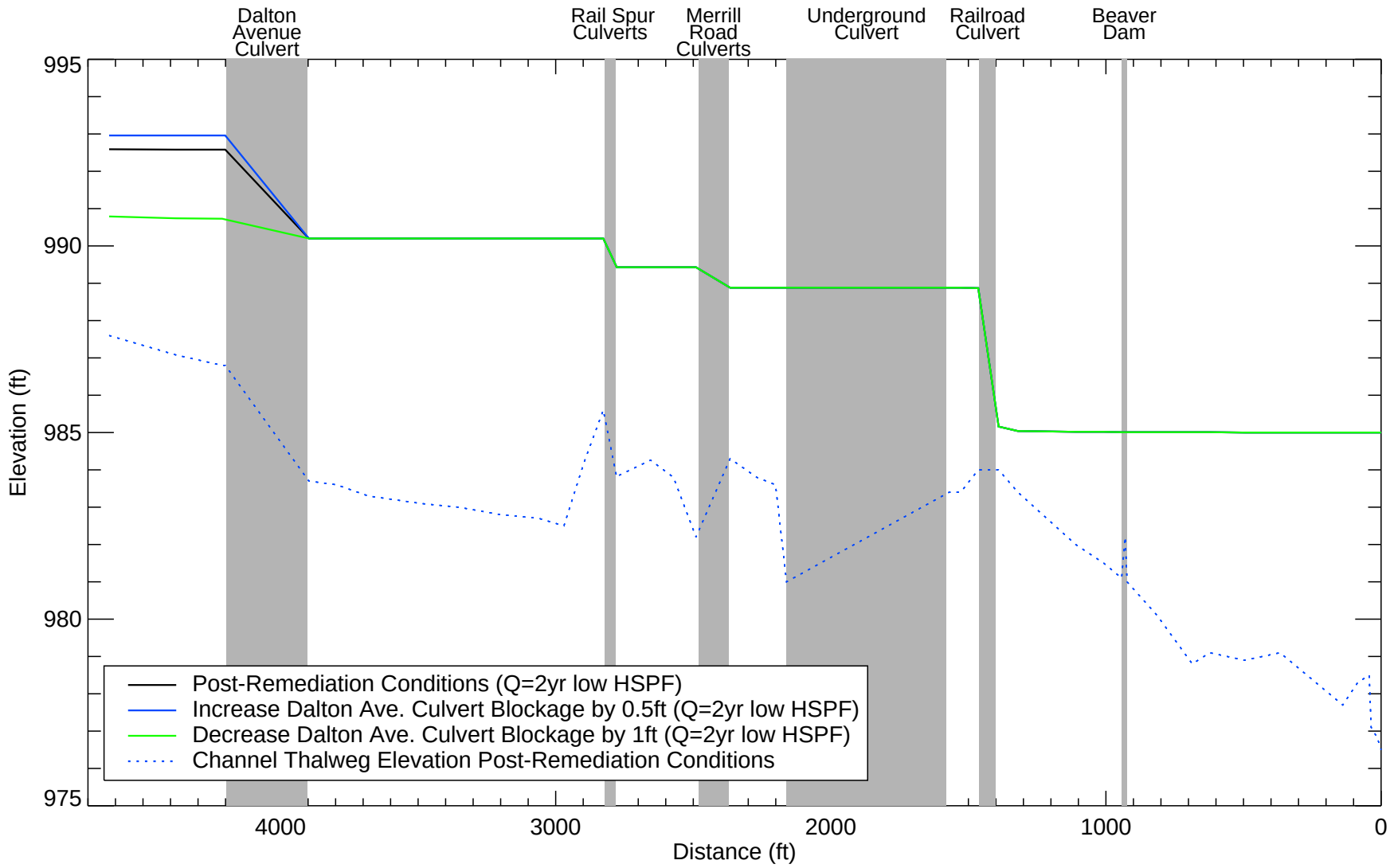


Figure F-9i

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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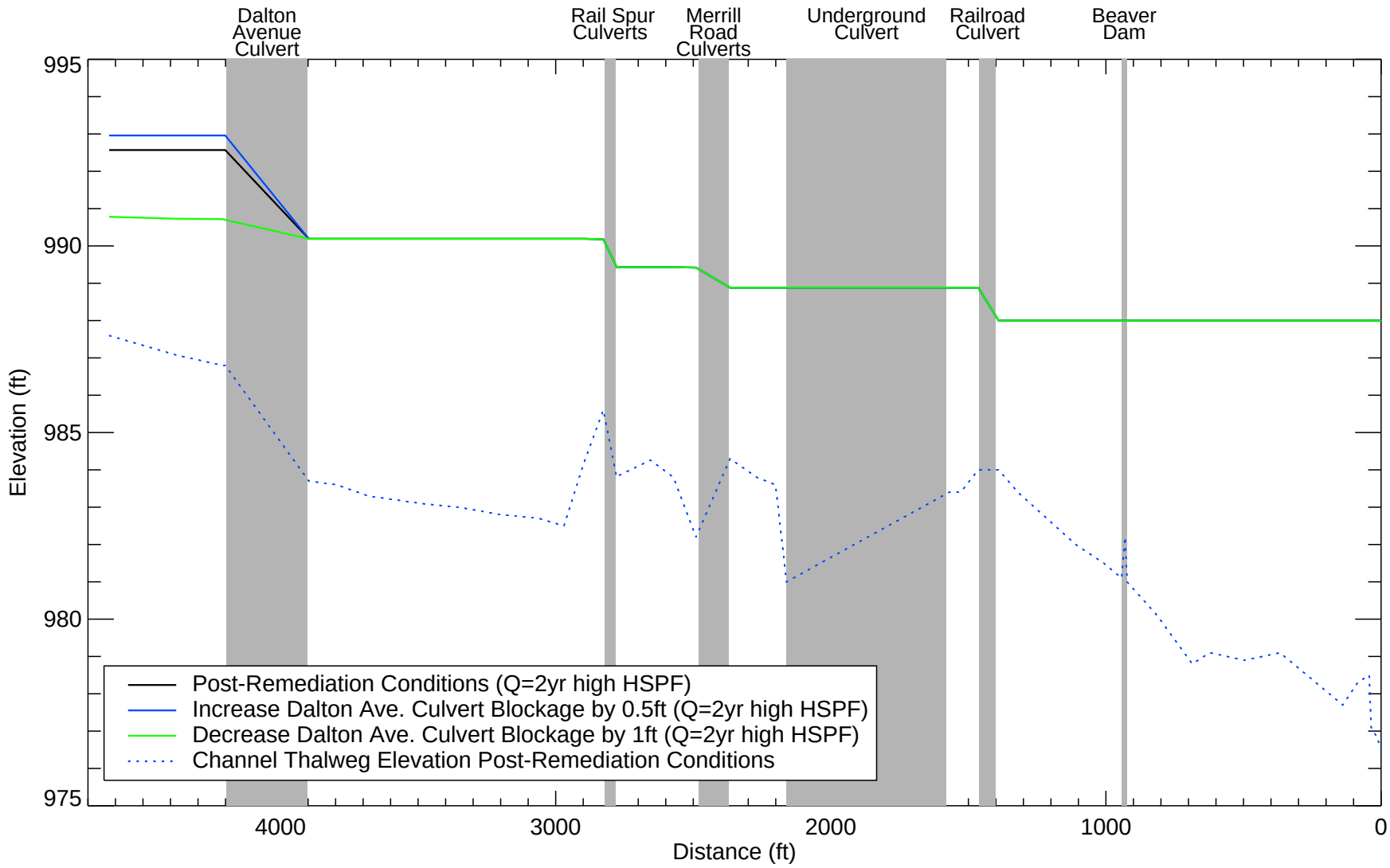


Figure F-9j

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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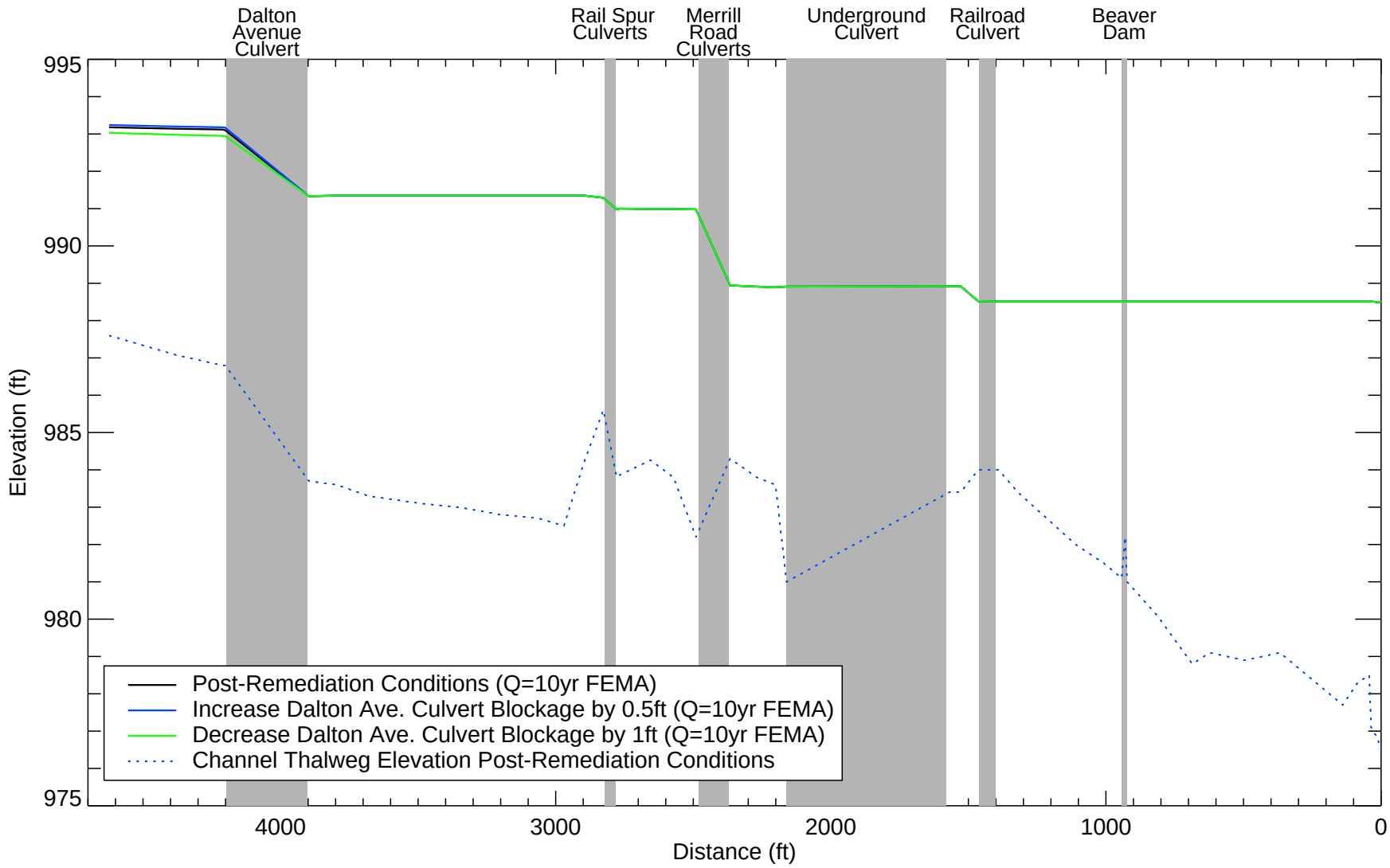


Figure F-9k

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

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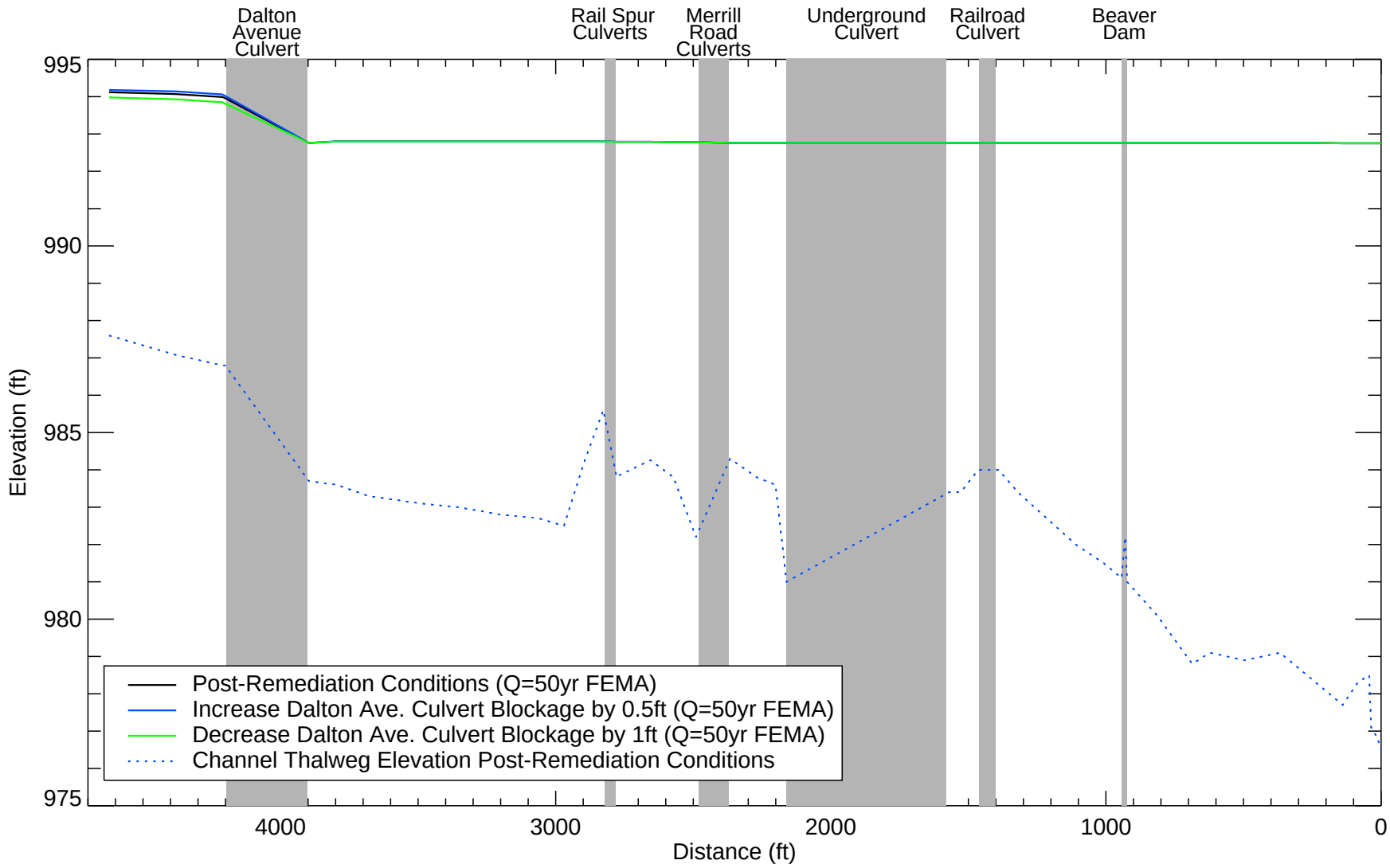


Figure F-9I

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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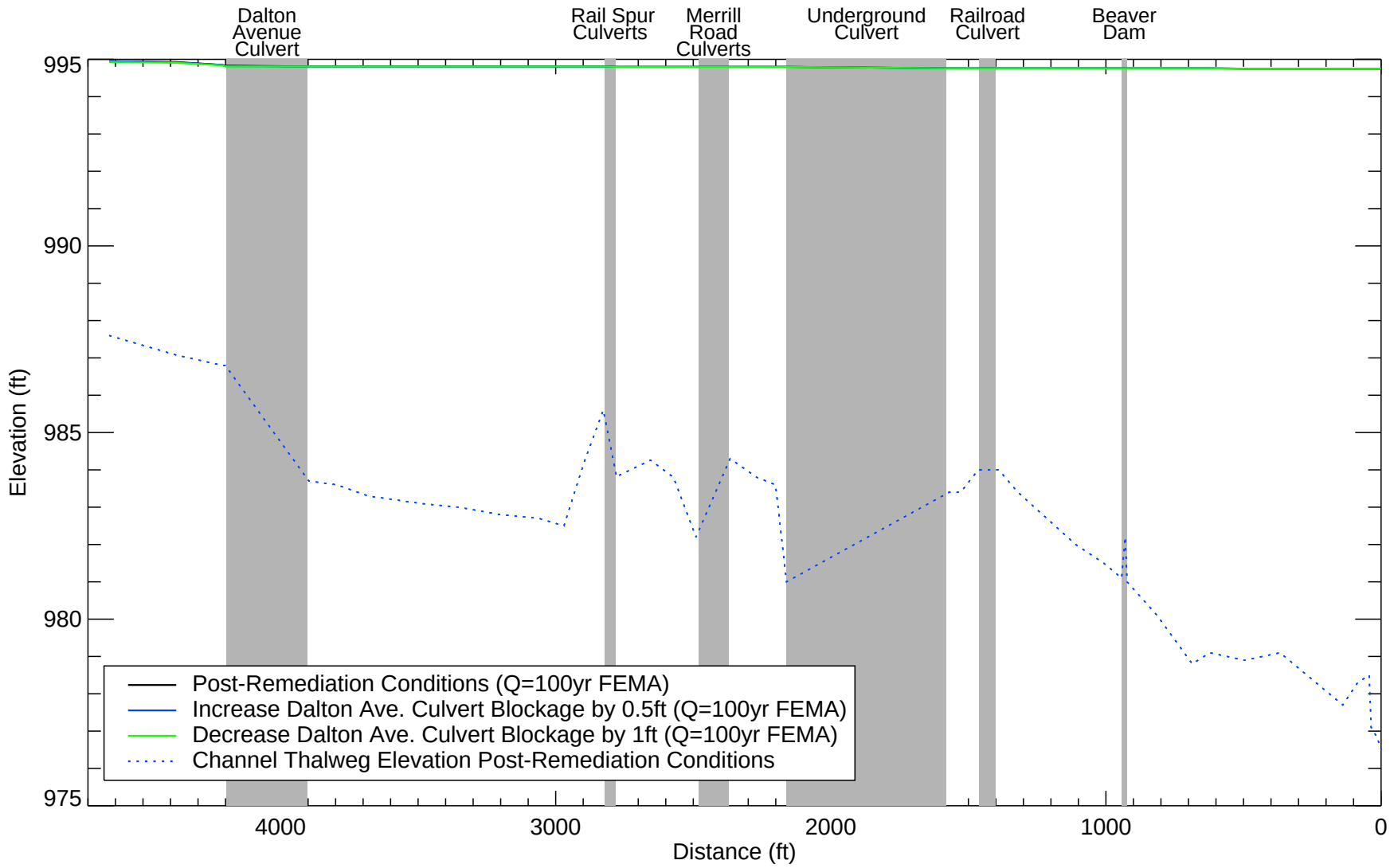


Figure F-9m

Water Surface Profile: Post-Remediation Conditions Model Results for Dalton Avenue Culvert Blockage Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

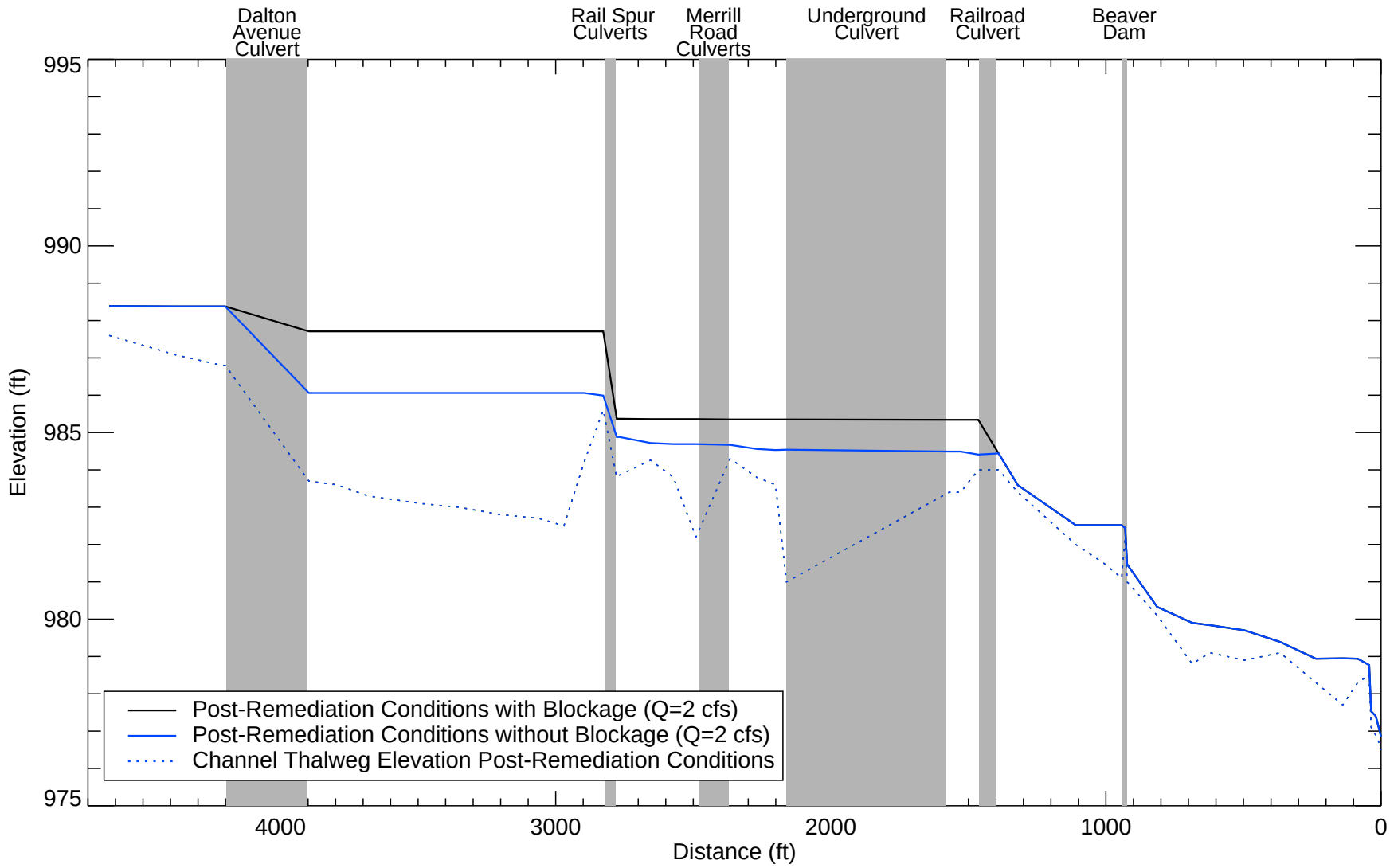


Figure F-10a

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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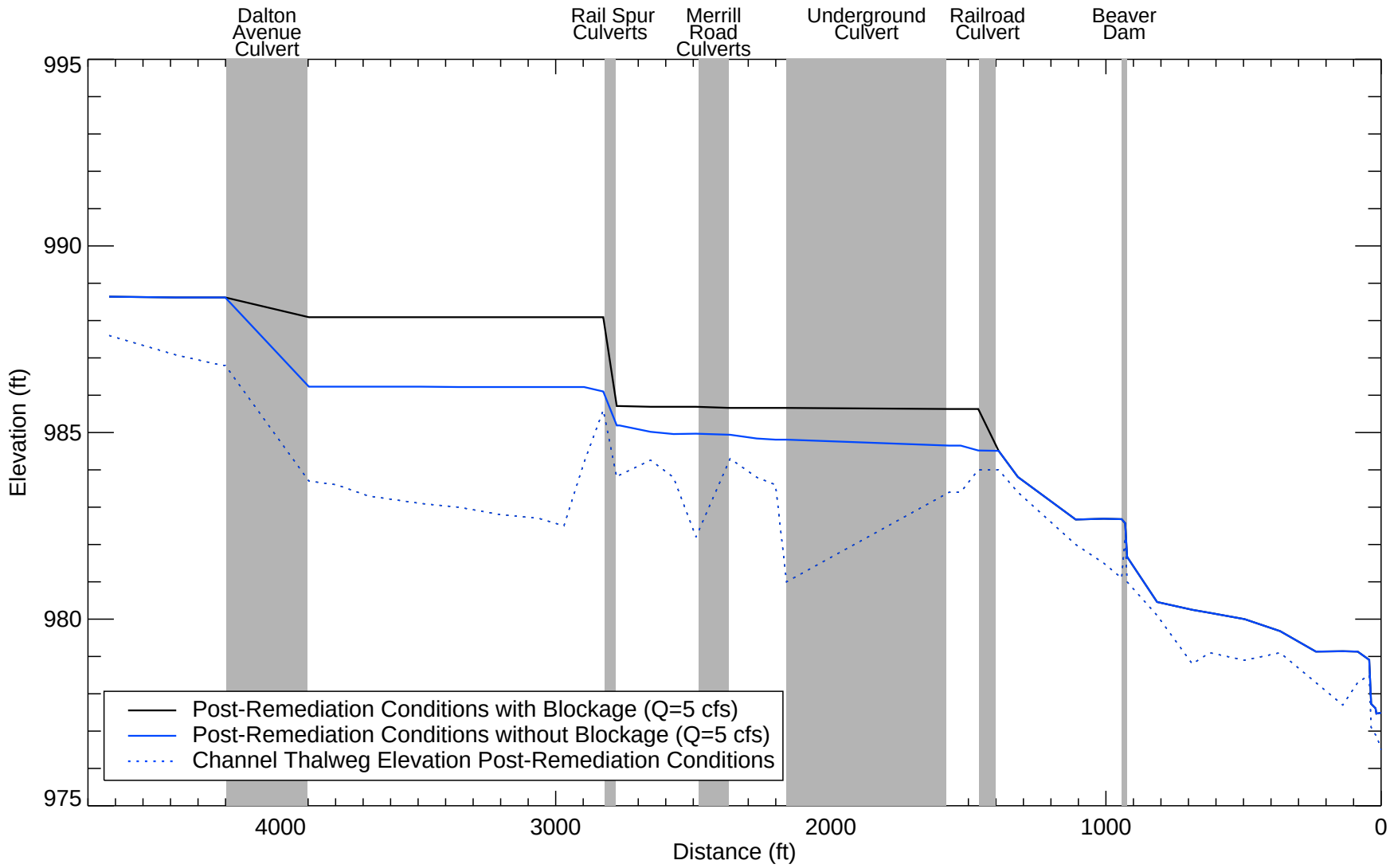


Figure F-10b

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

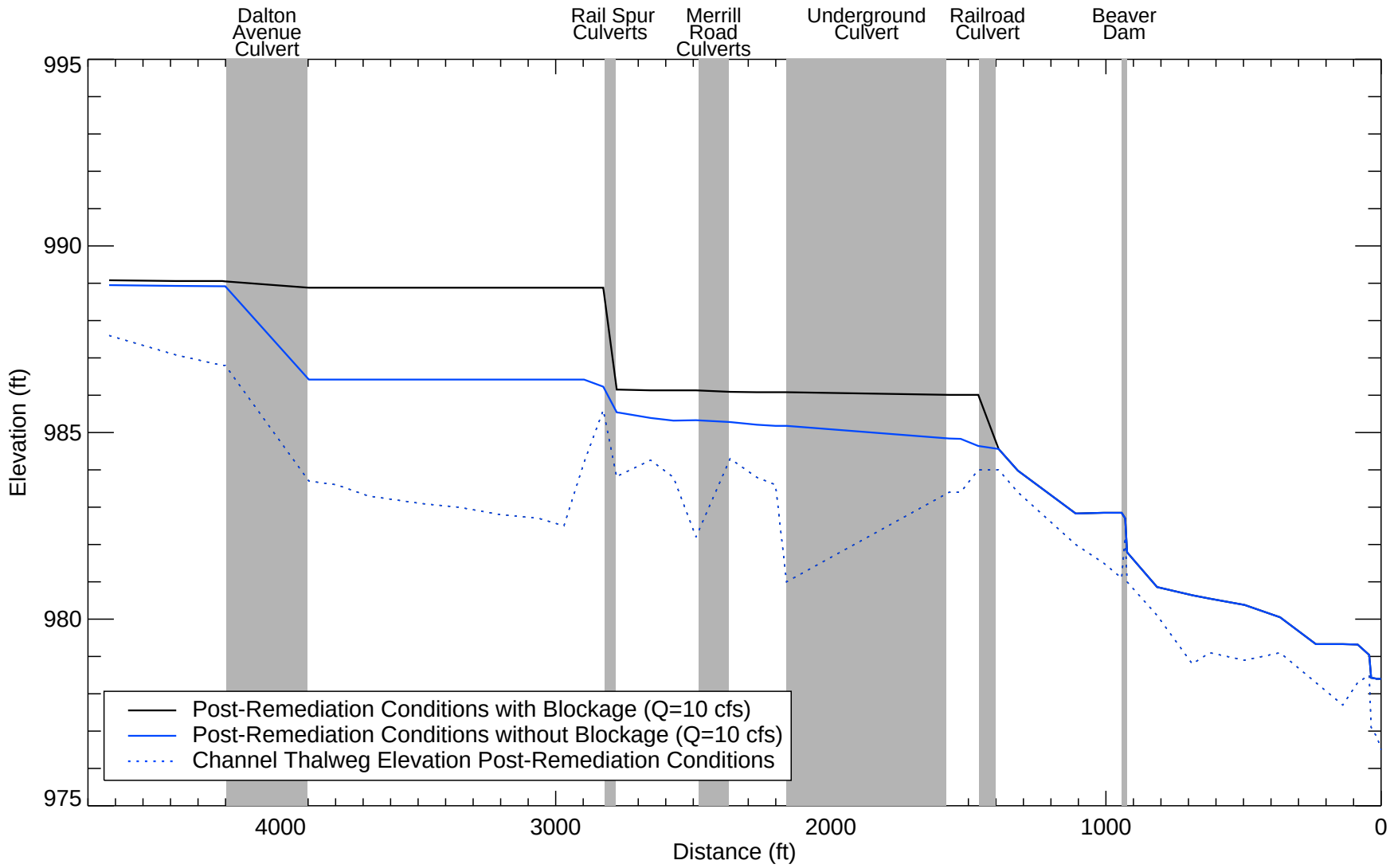


Figure F-10c

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

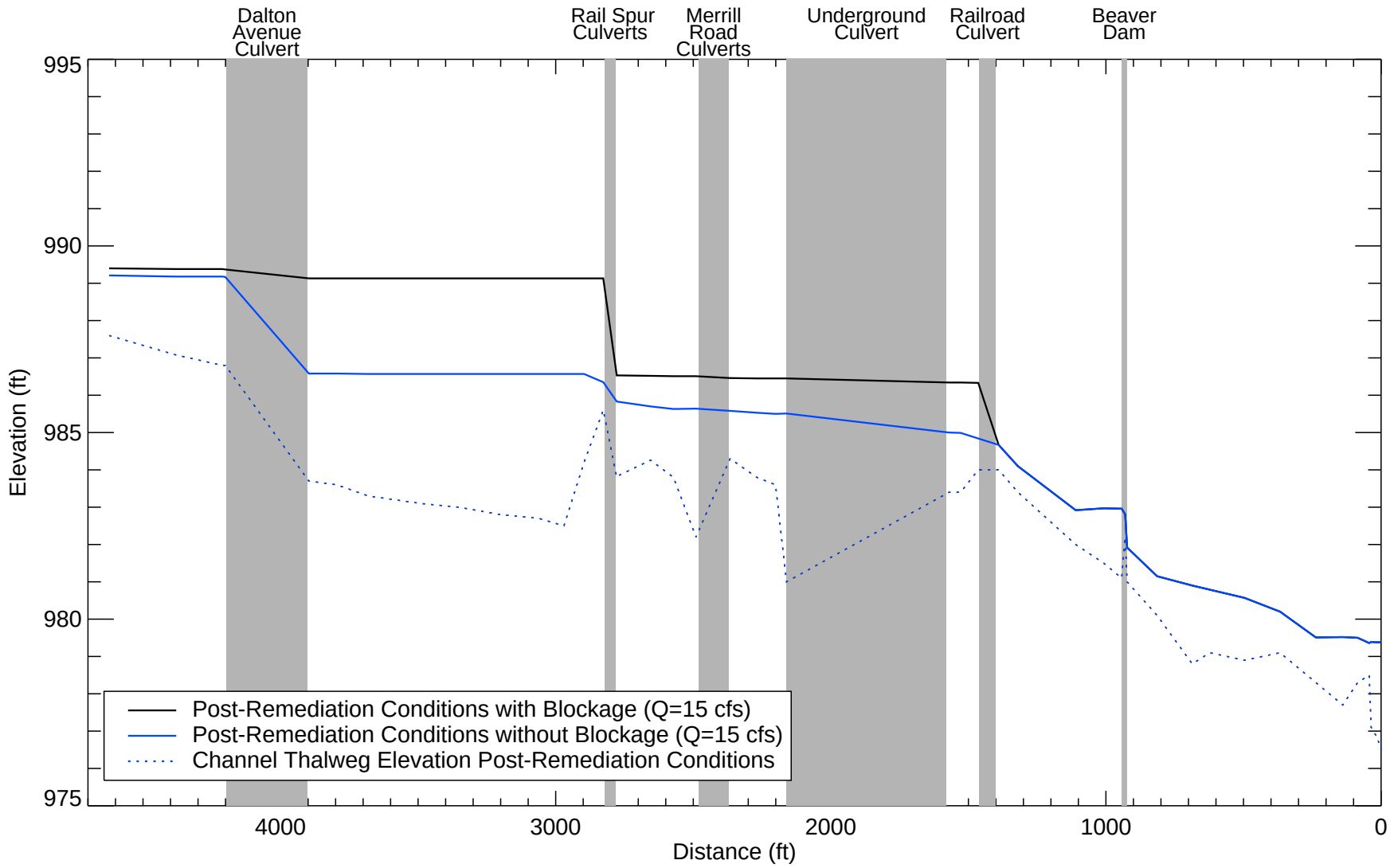


Figure F-10d

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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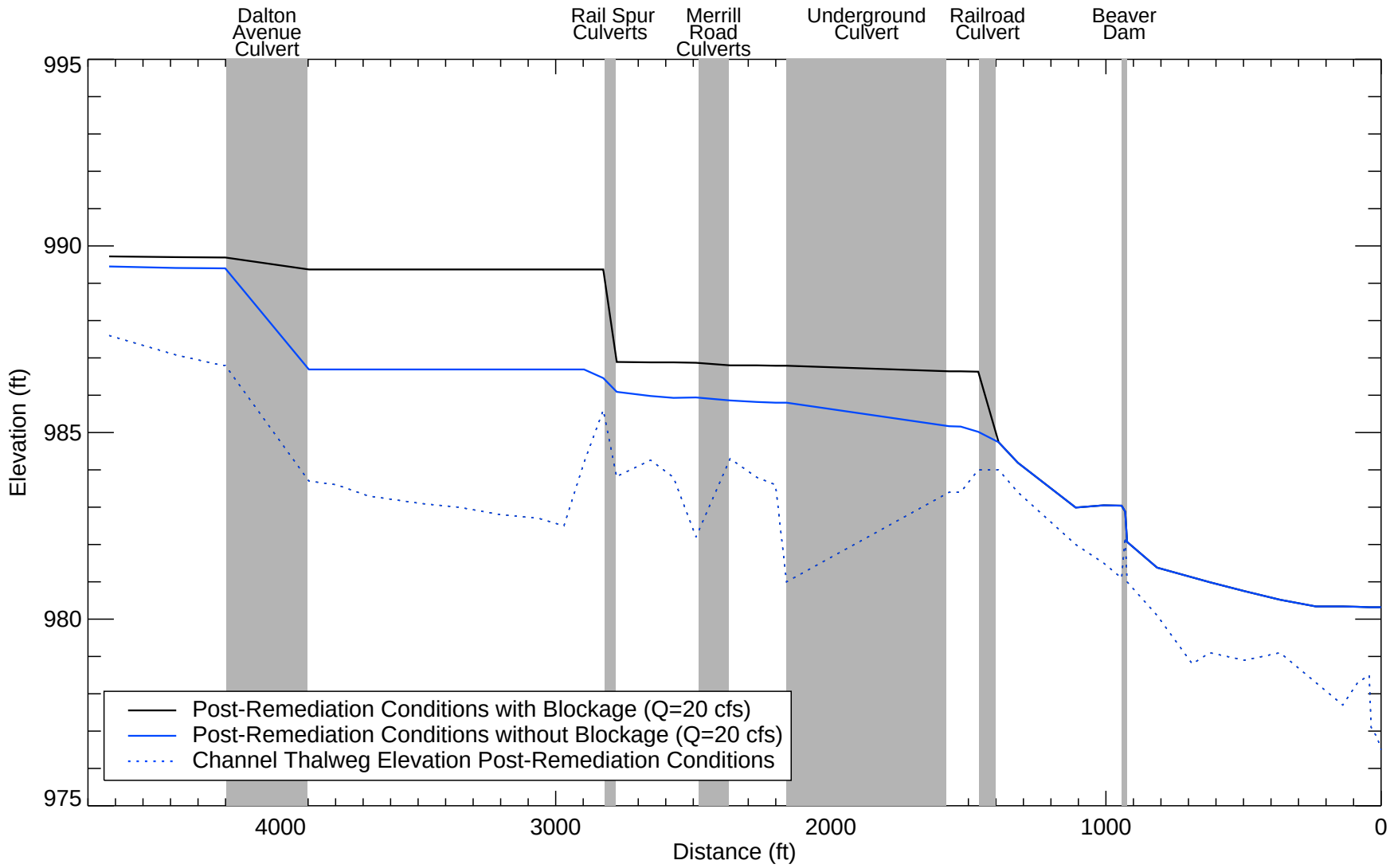


Figure F-10e

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

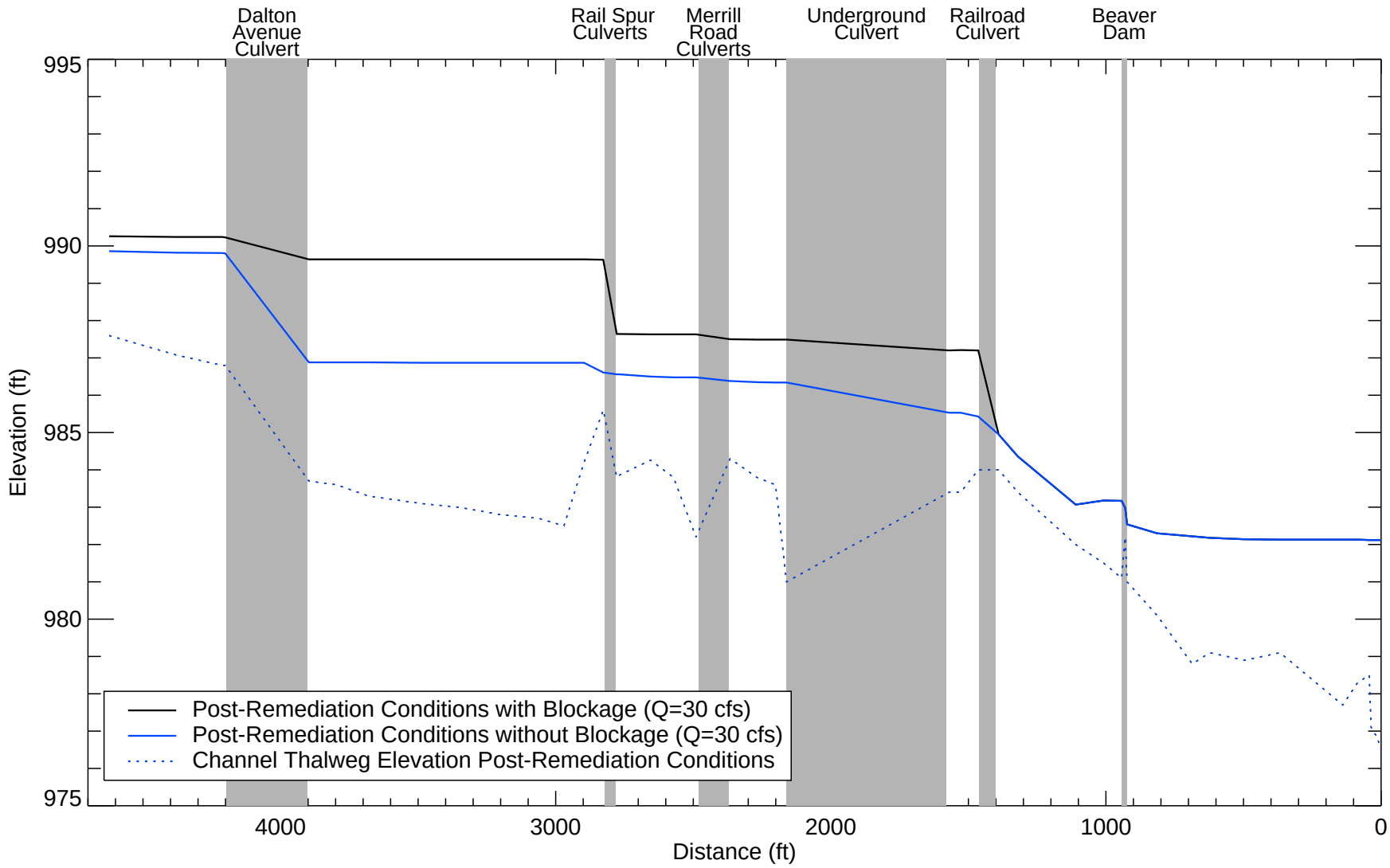


Figure F-10f

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

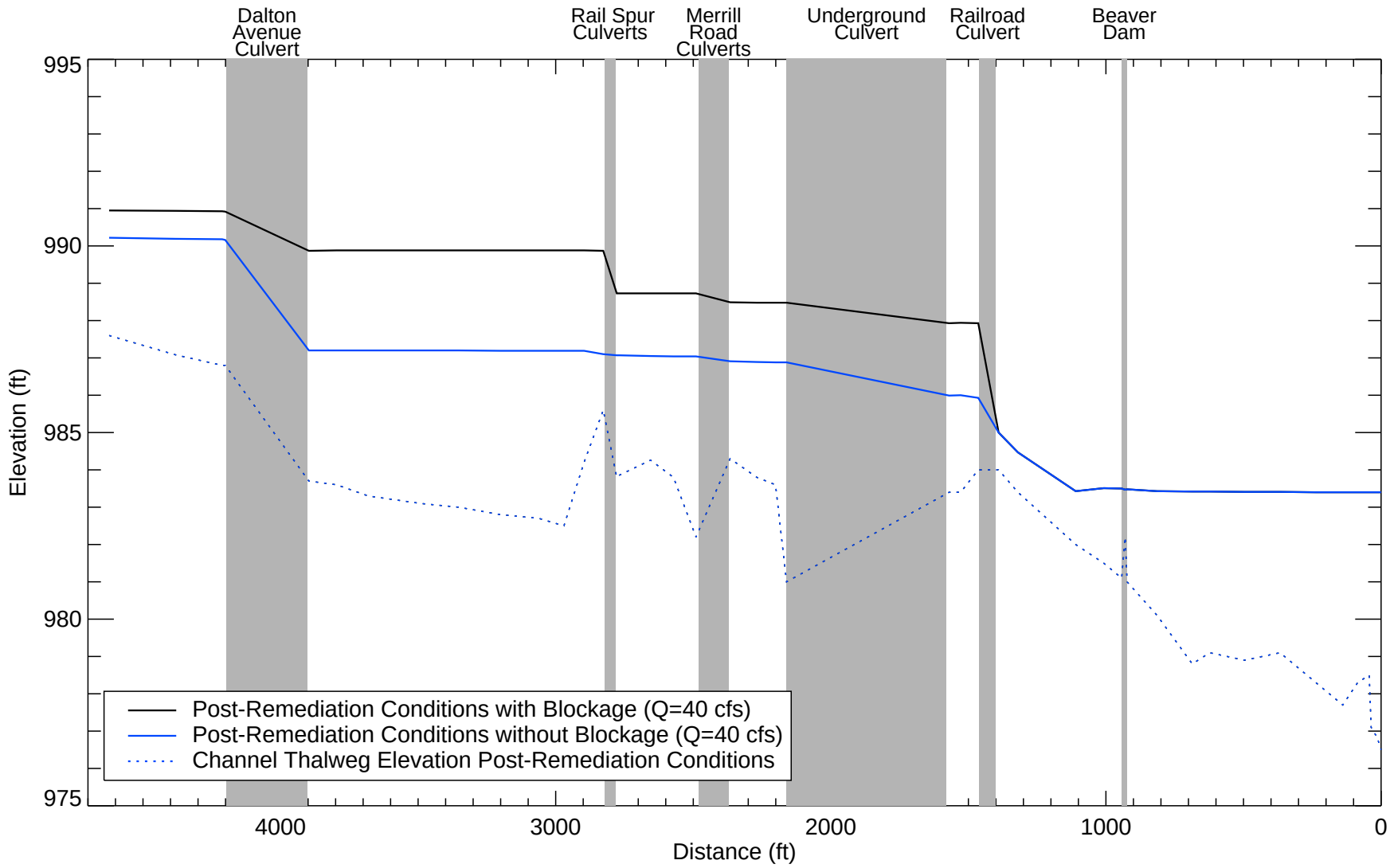


Figure F-10g

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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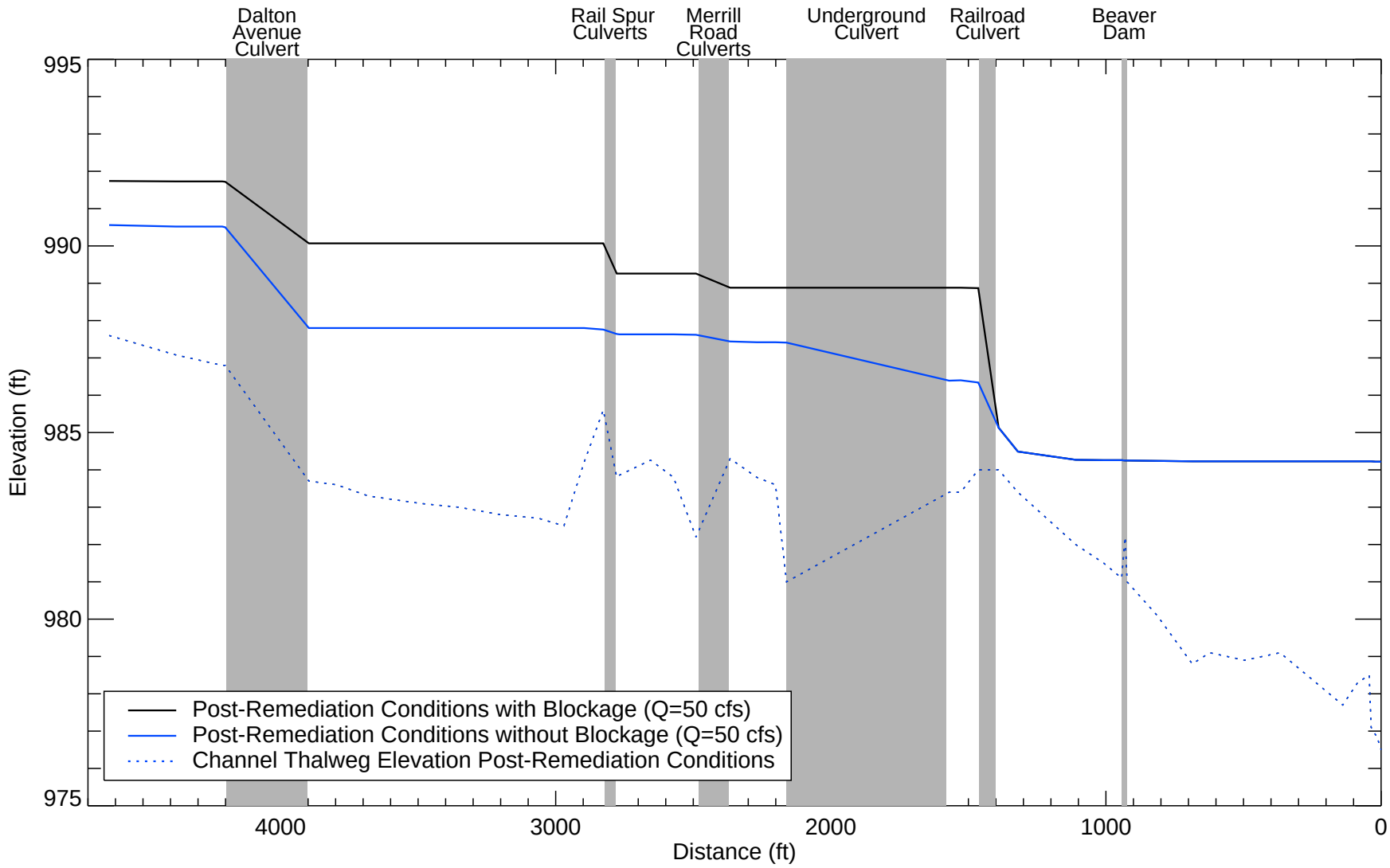


Figure F-10h

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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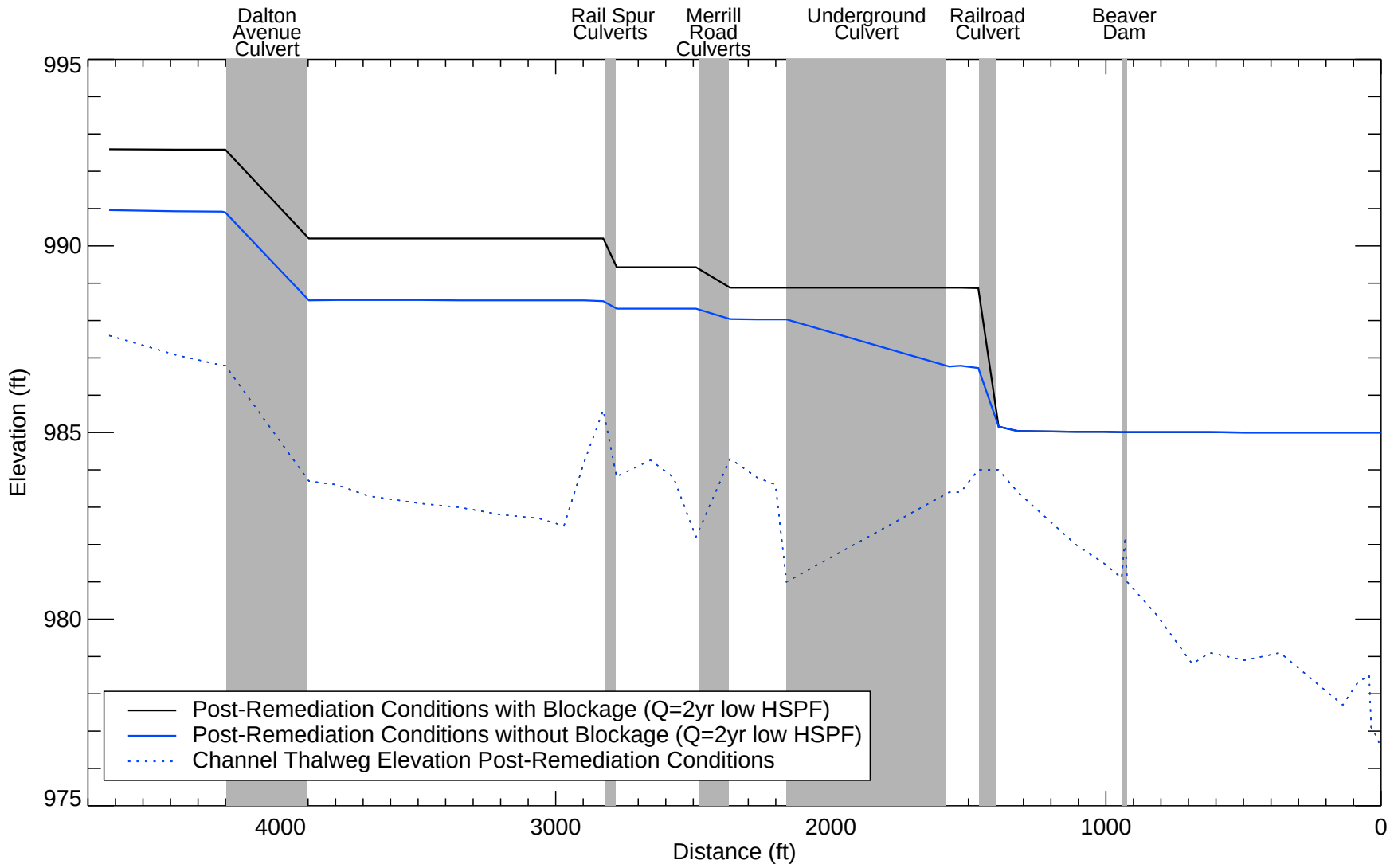


Figure F-10i

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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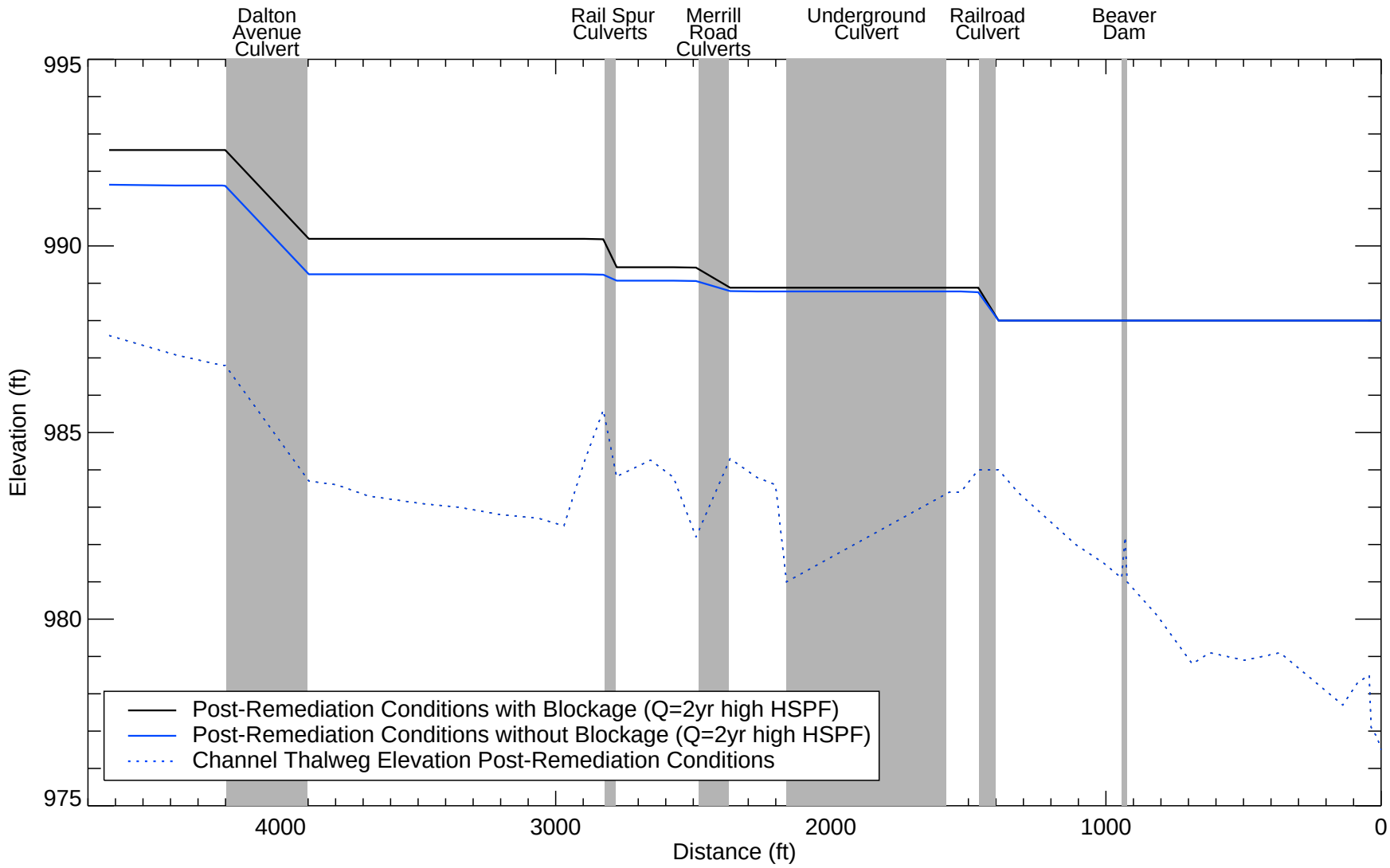


Figure F-10j

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

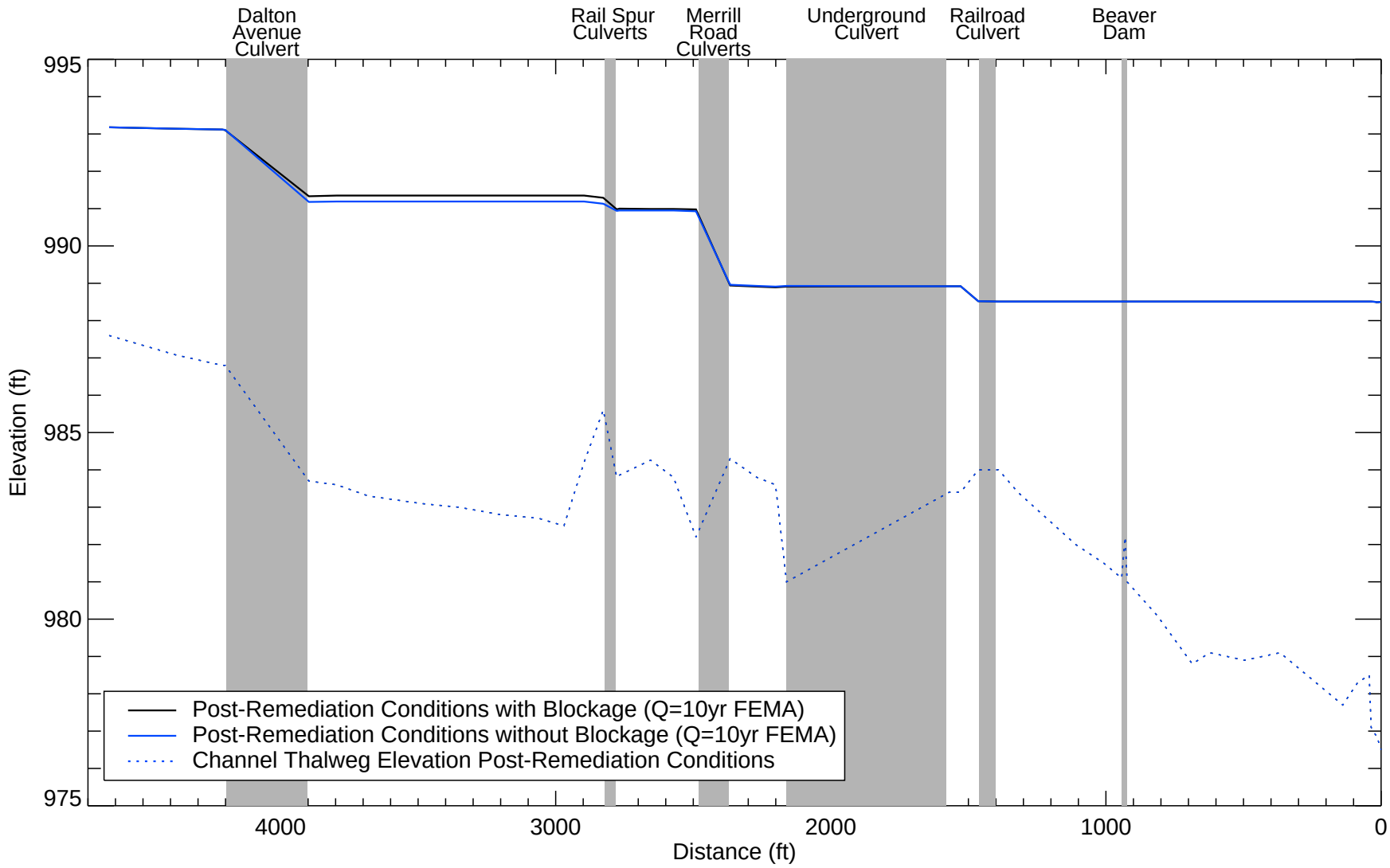


Figure F-10k

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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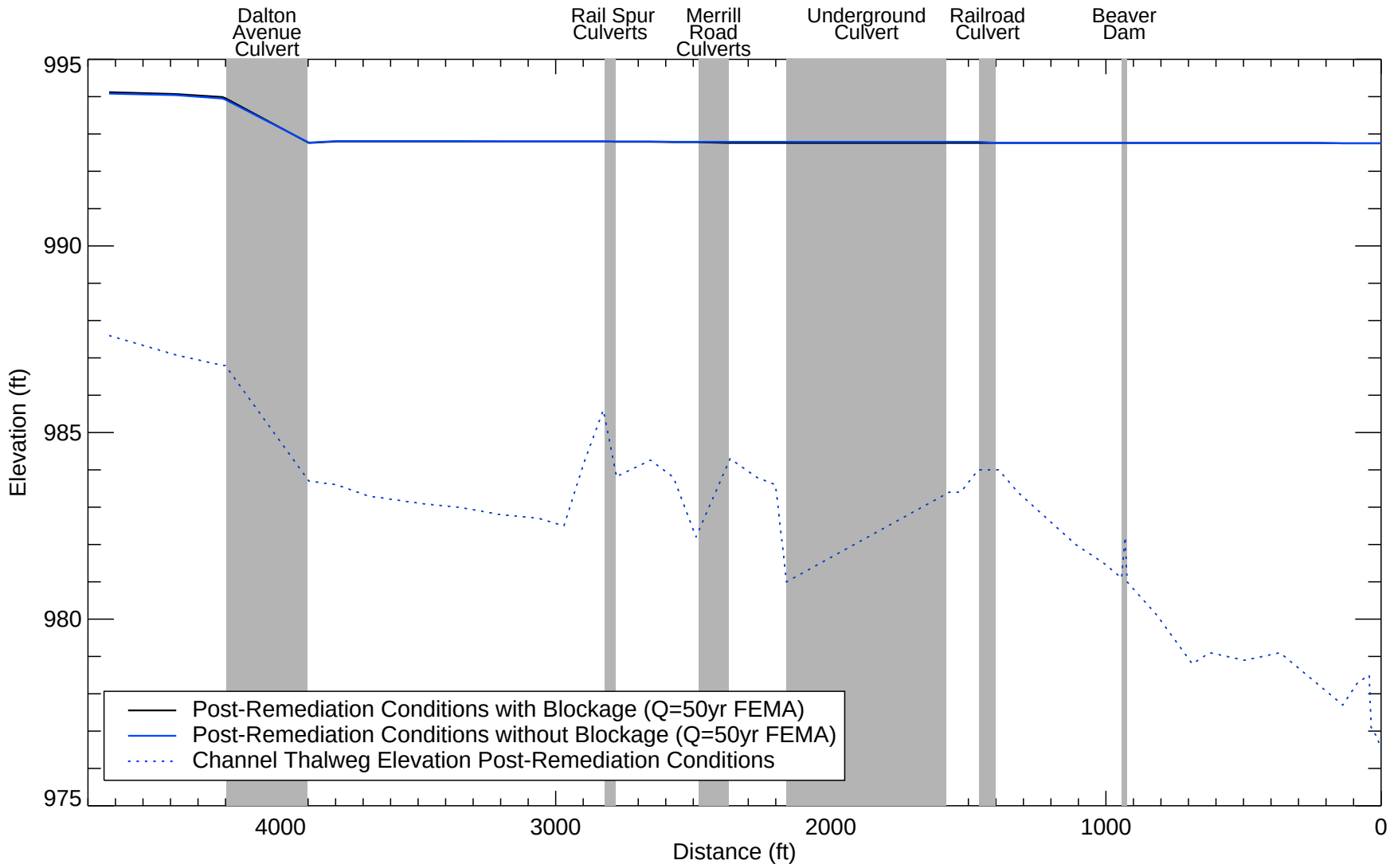


Figure F-10I

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

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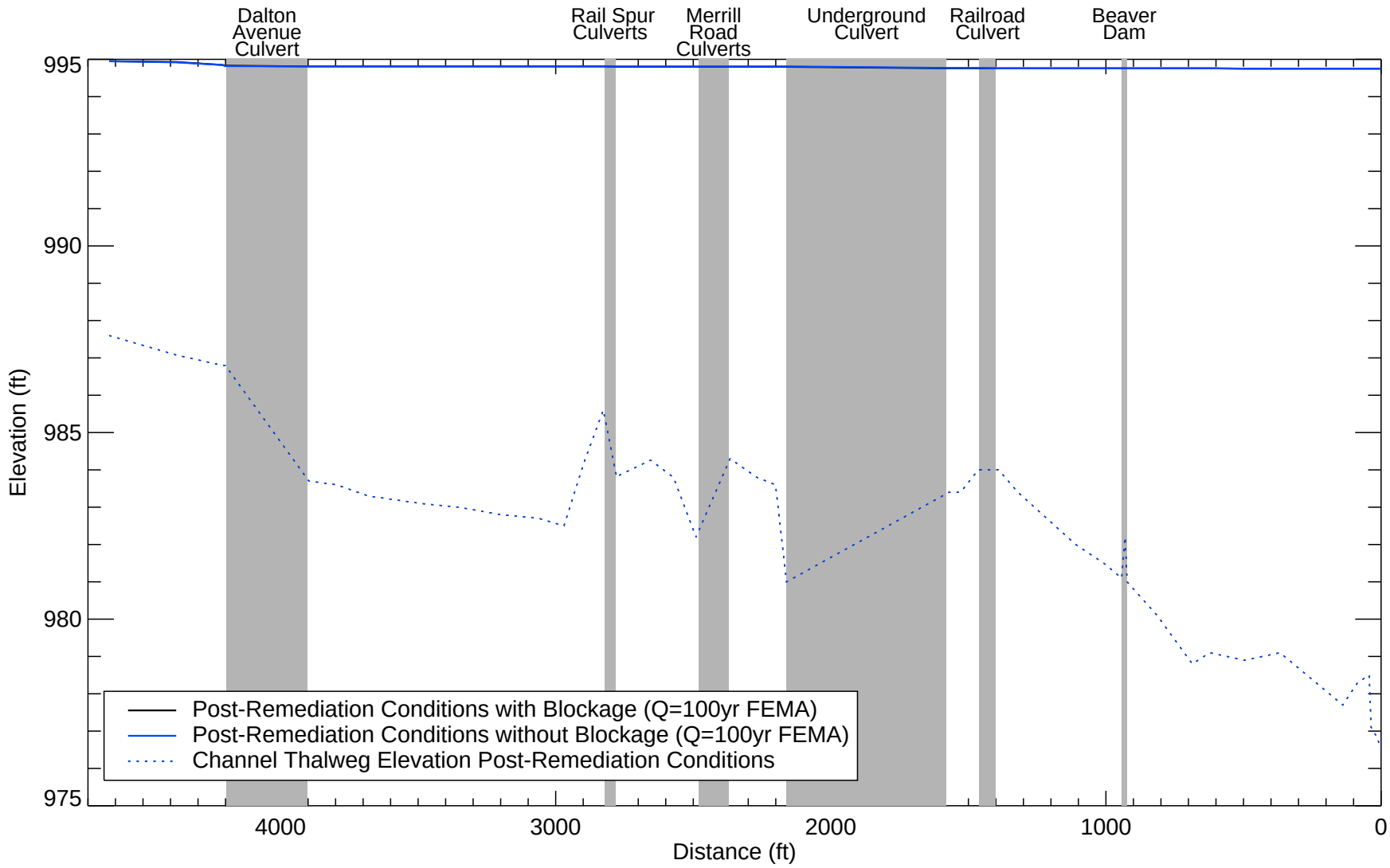


Figure F-10m

Water Surface Profile: Post-Remediation Conditions Model Results for Downstream Culvert Blockage Removal Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

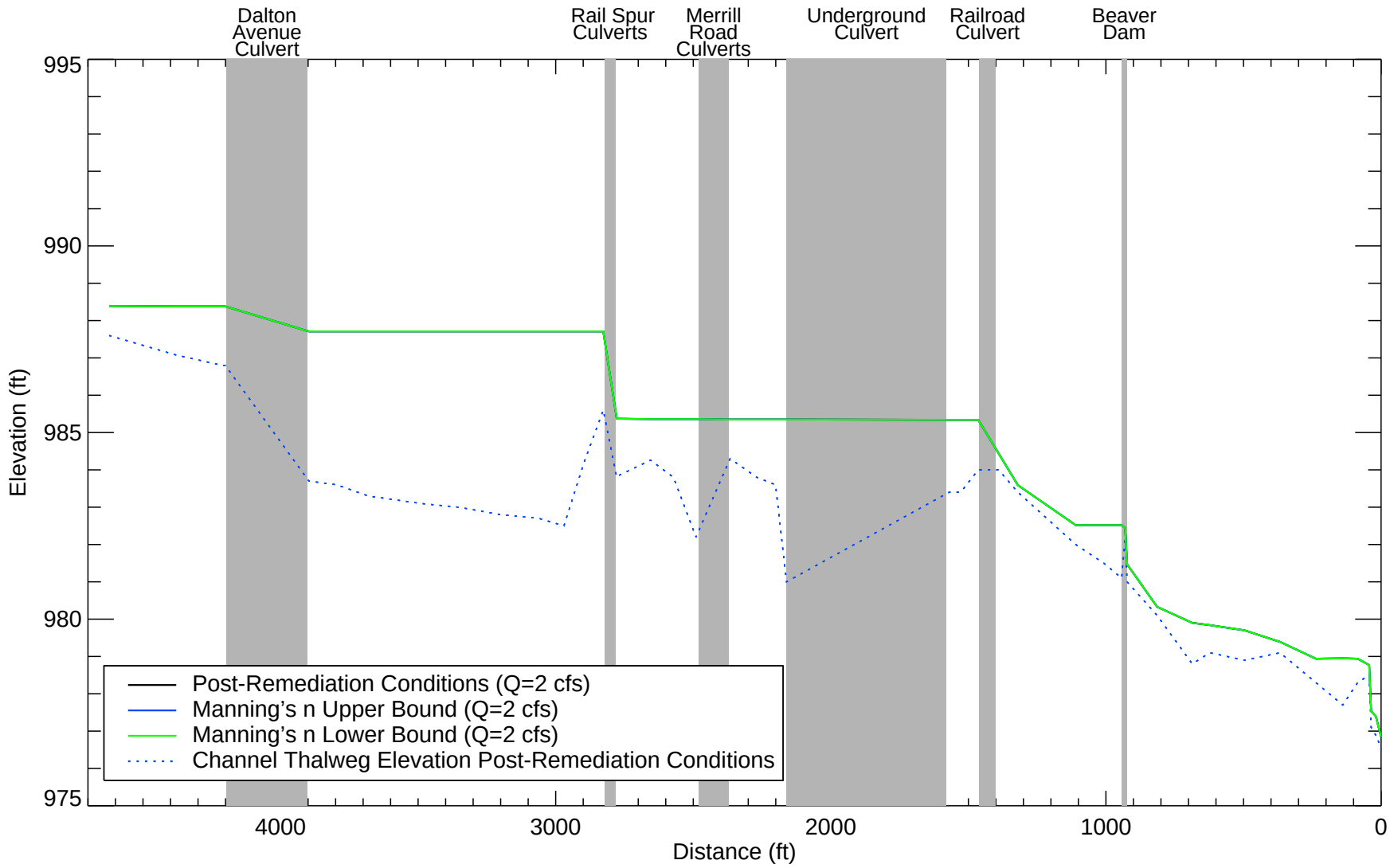


Figure F-11a

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

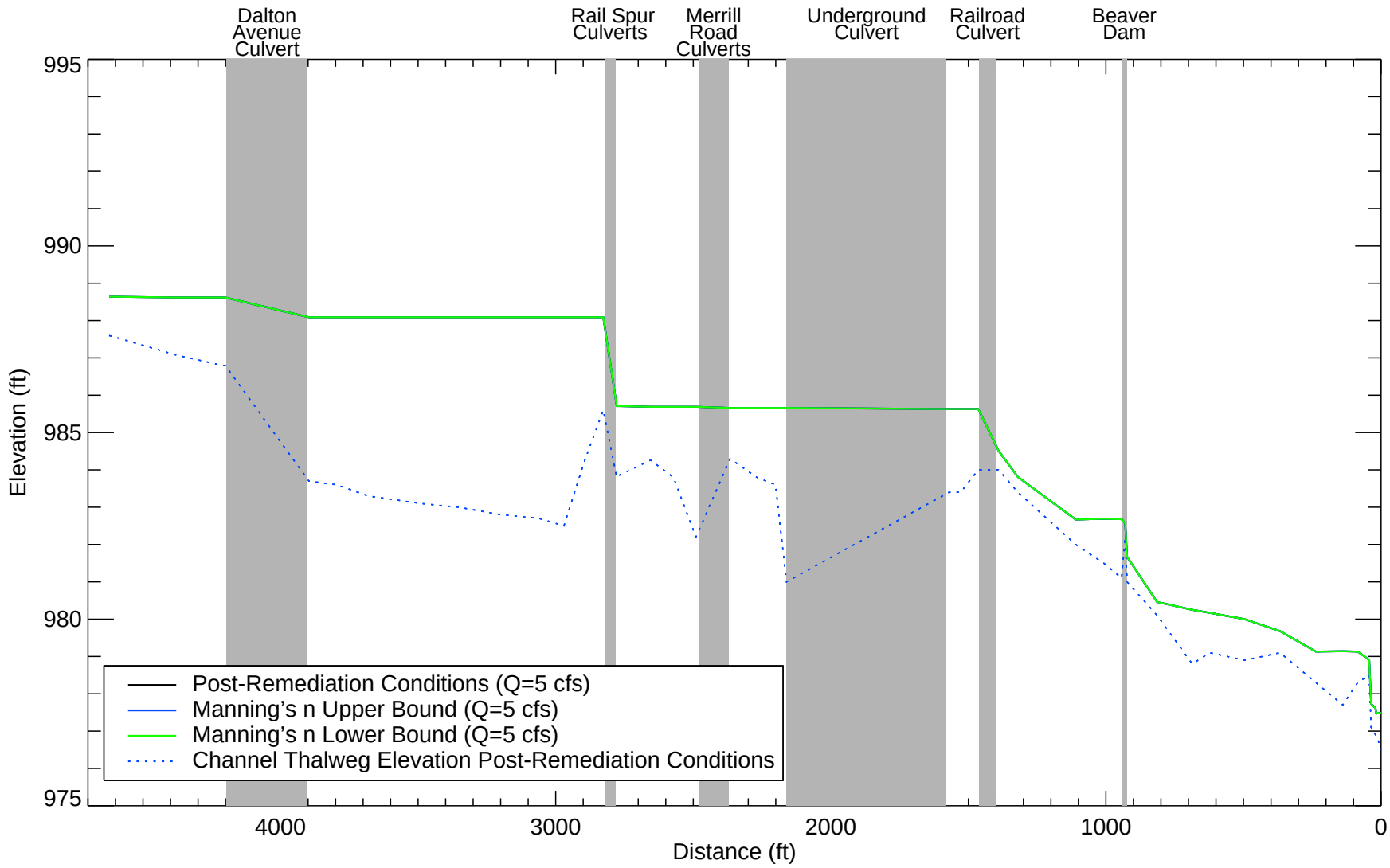


Figure F-11b

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

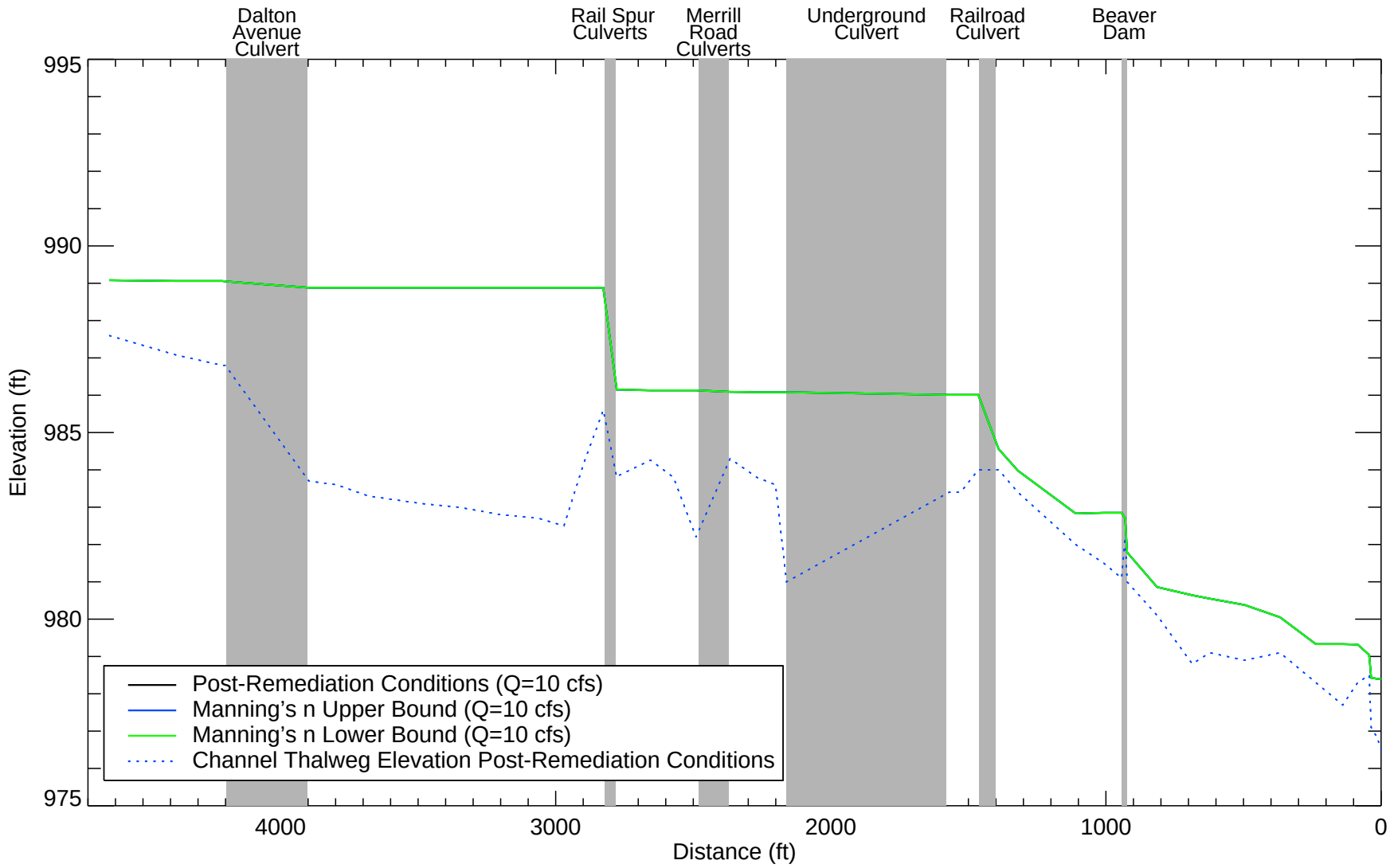


Figure F-11c

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

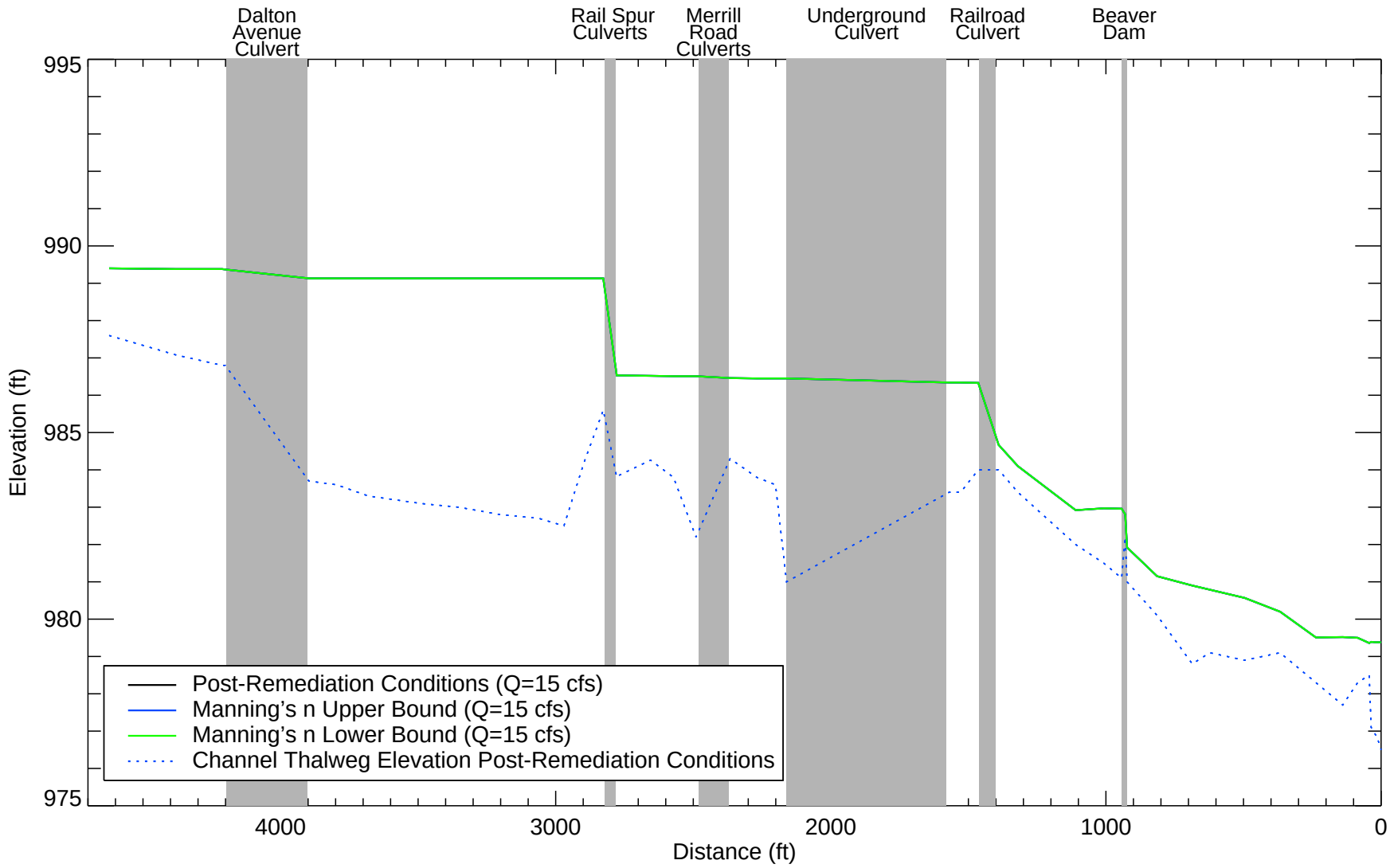


Figure F-11d

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

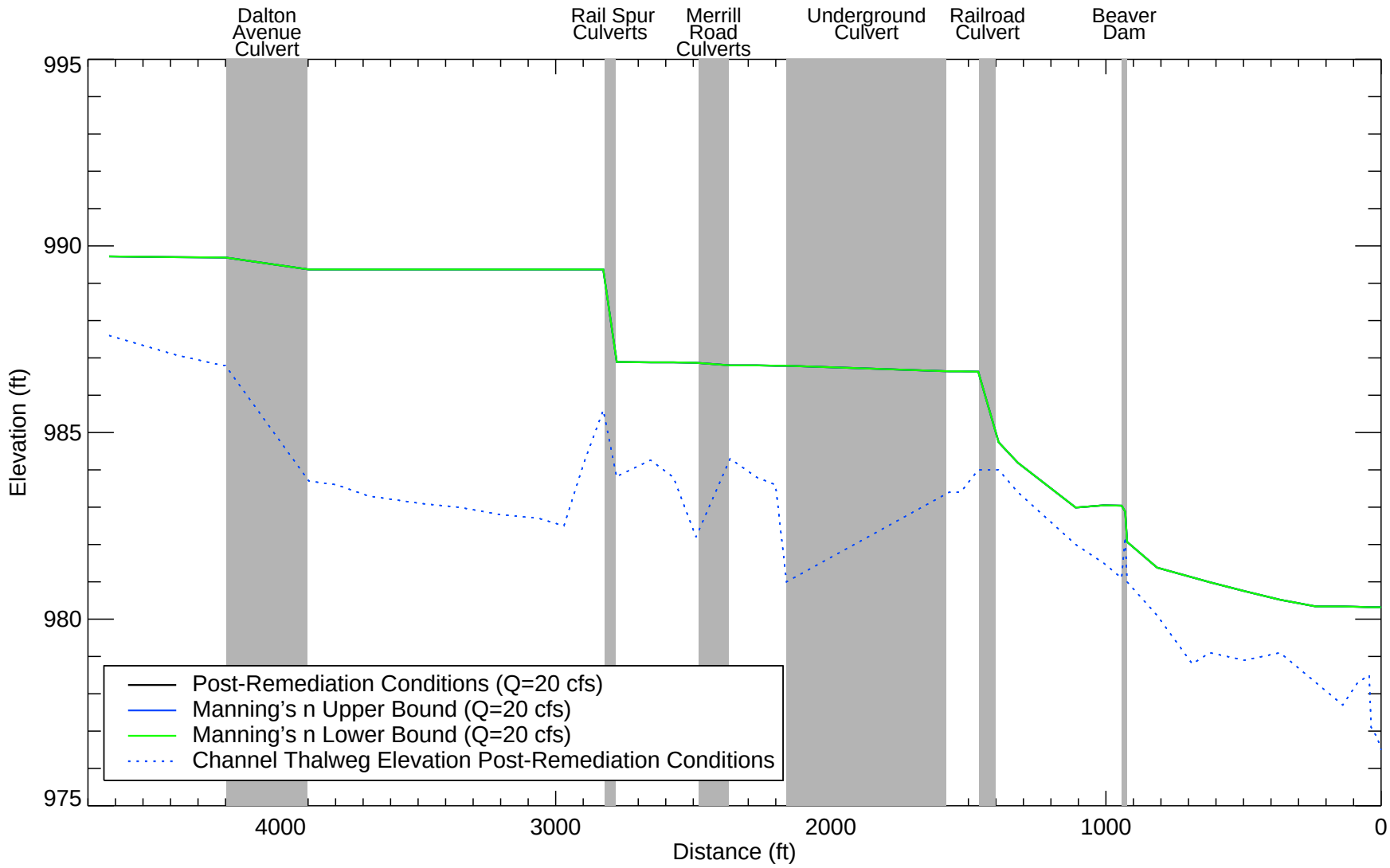


Figure F-11e

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

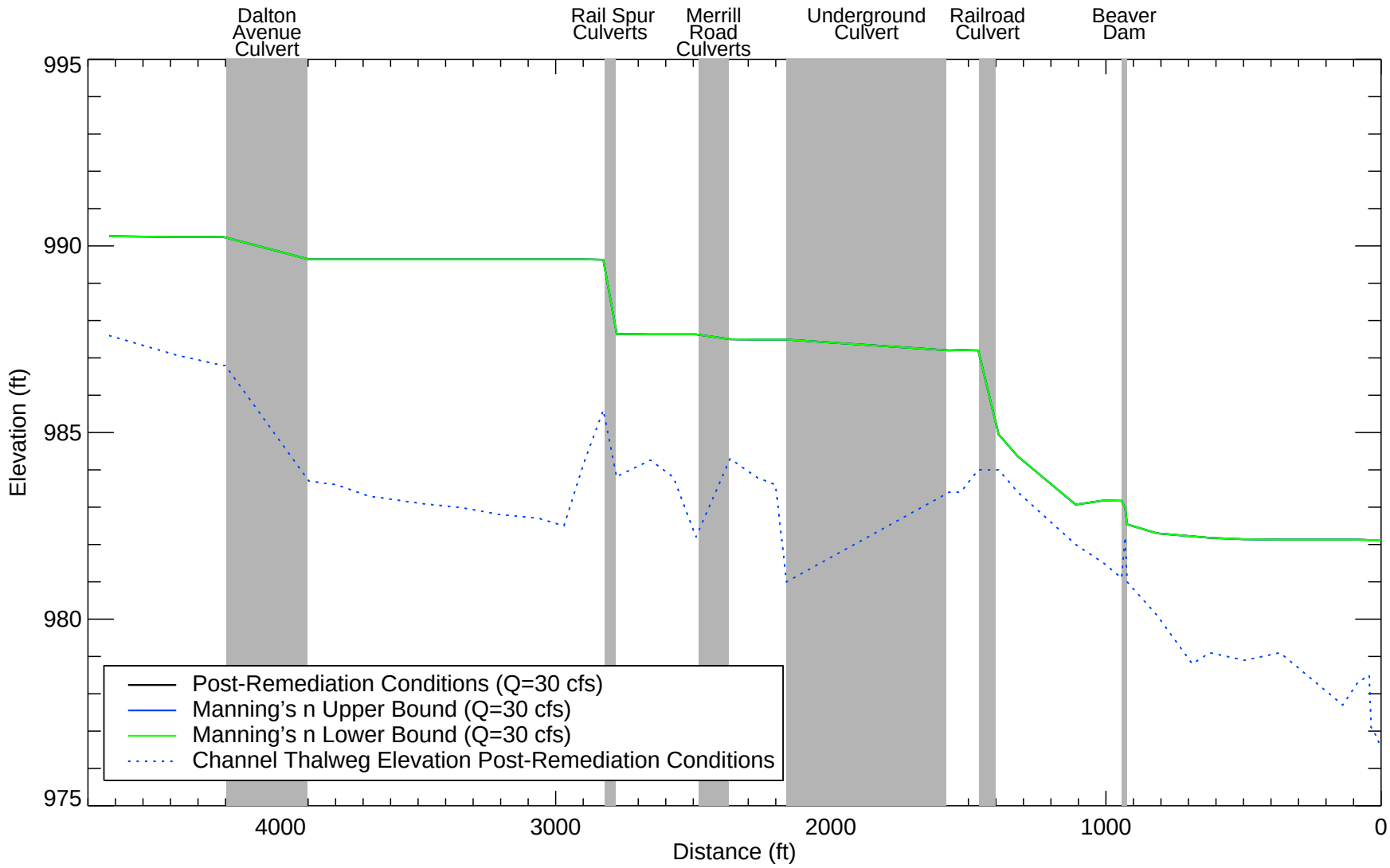


Figure F-11f

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

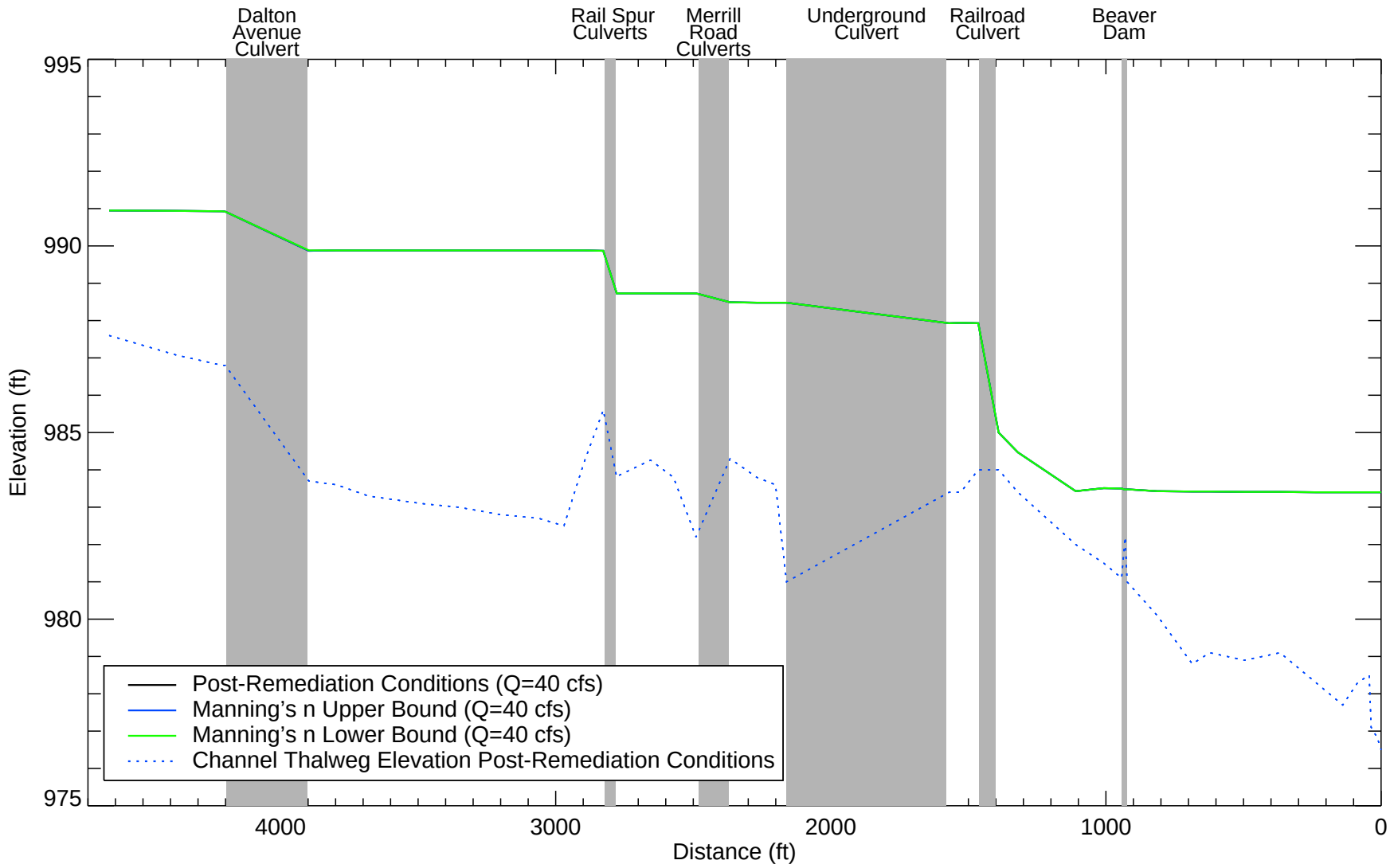


Figure F-11g

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

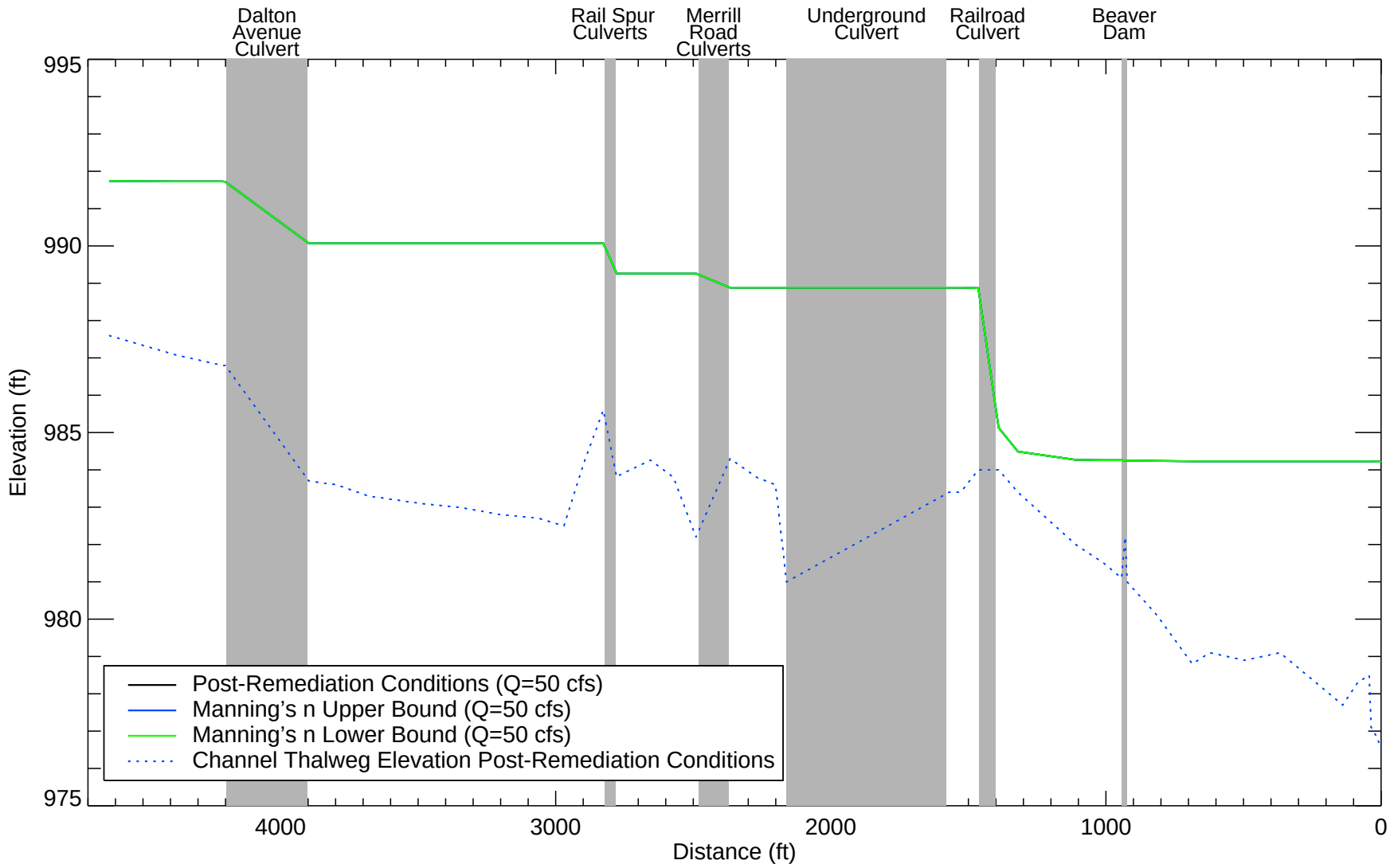


Figure F-11h

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

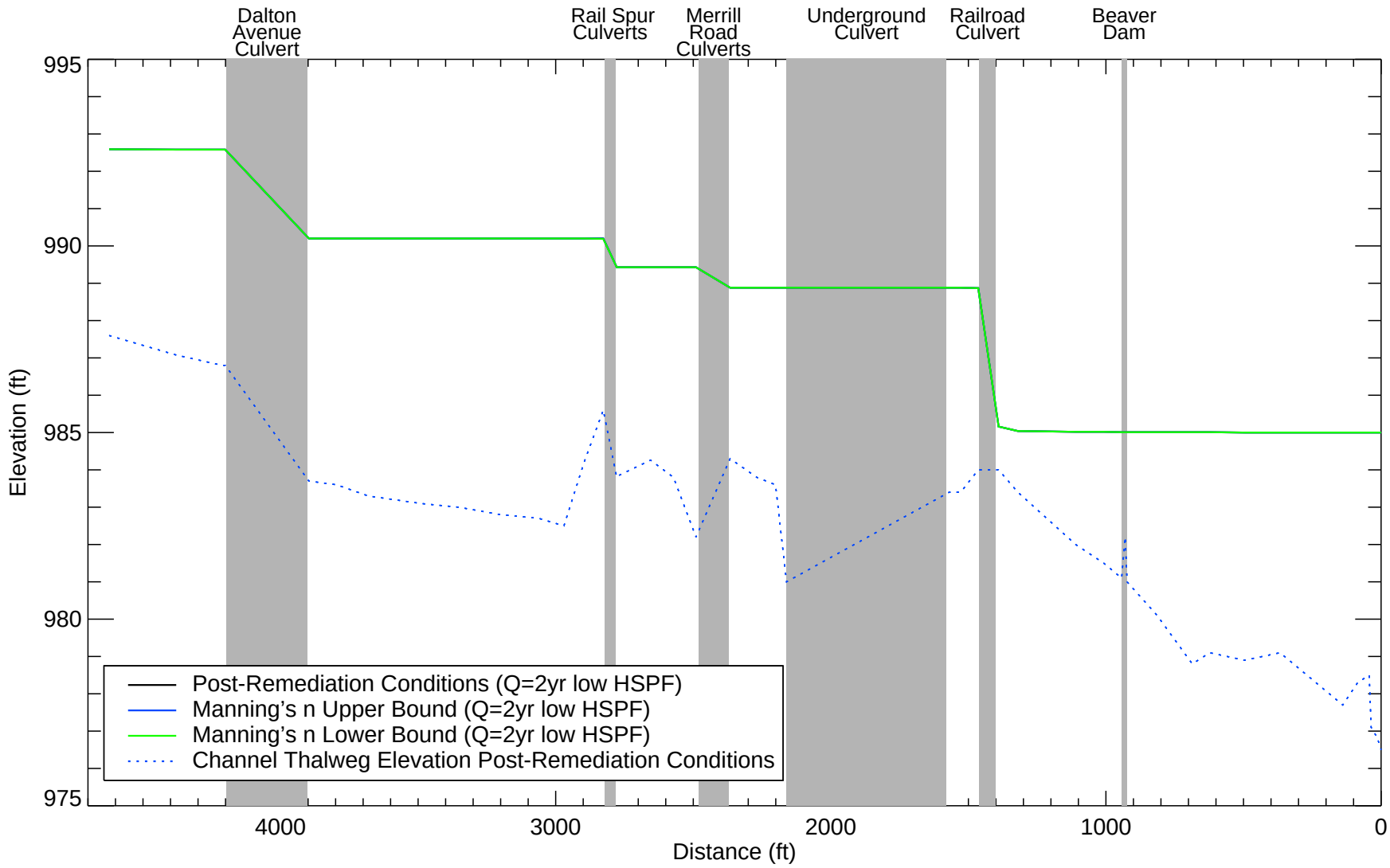


Figure F-11i

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

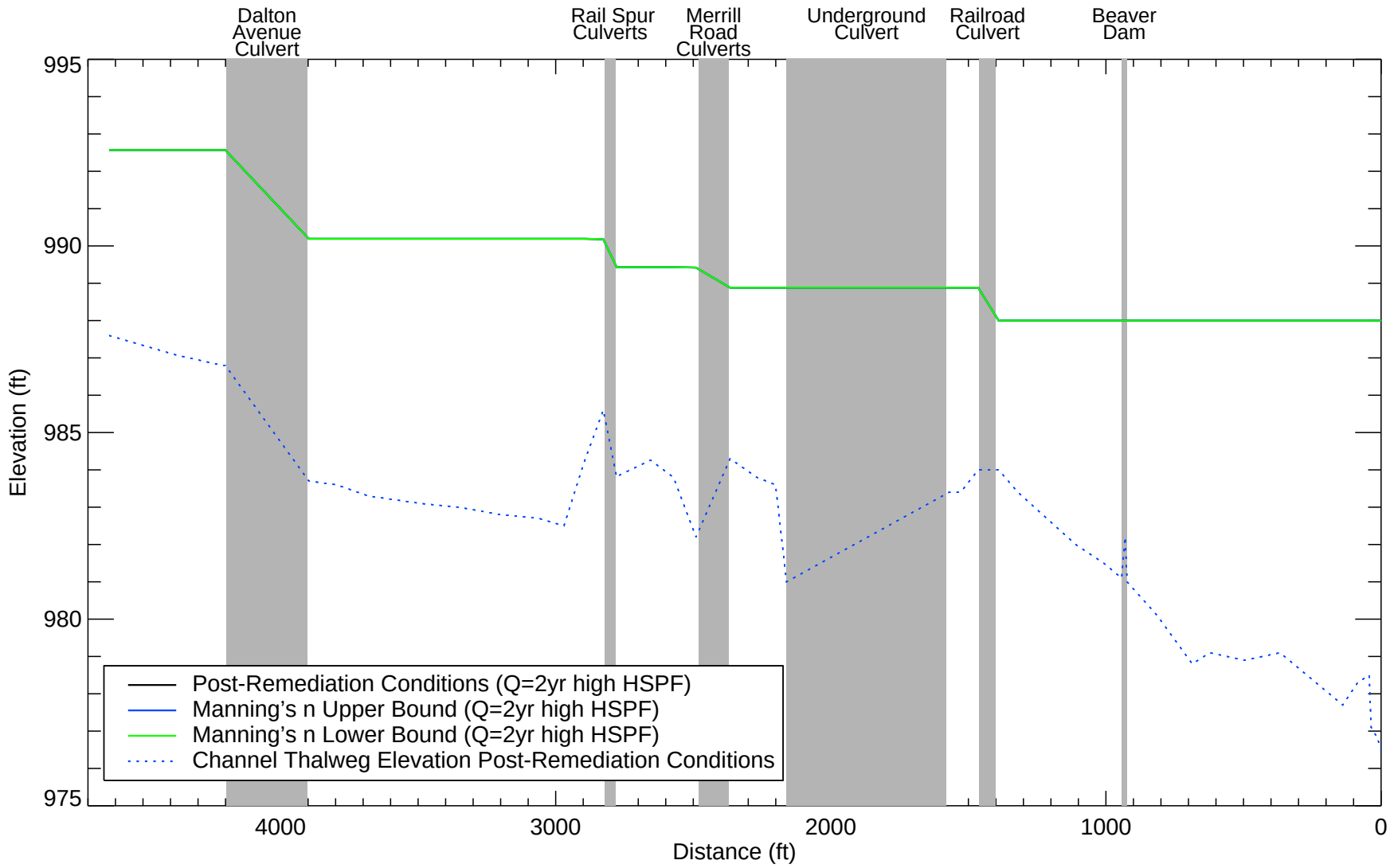


Figure F-11j

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

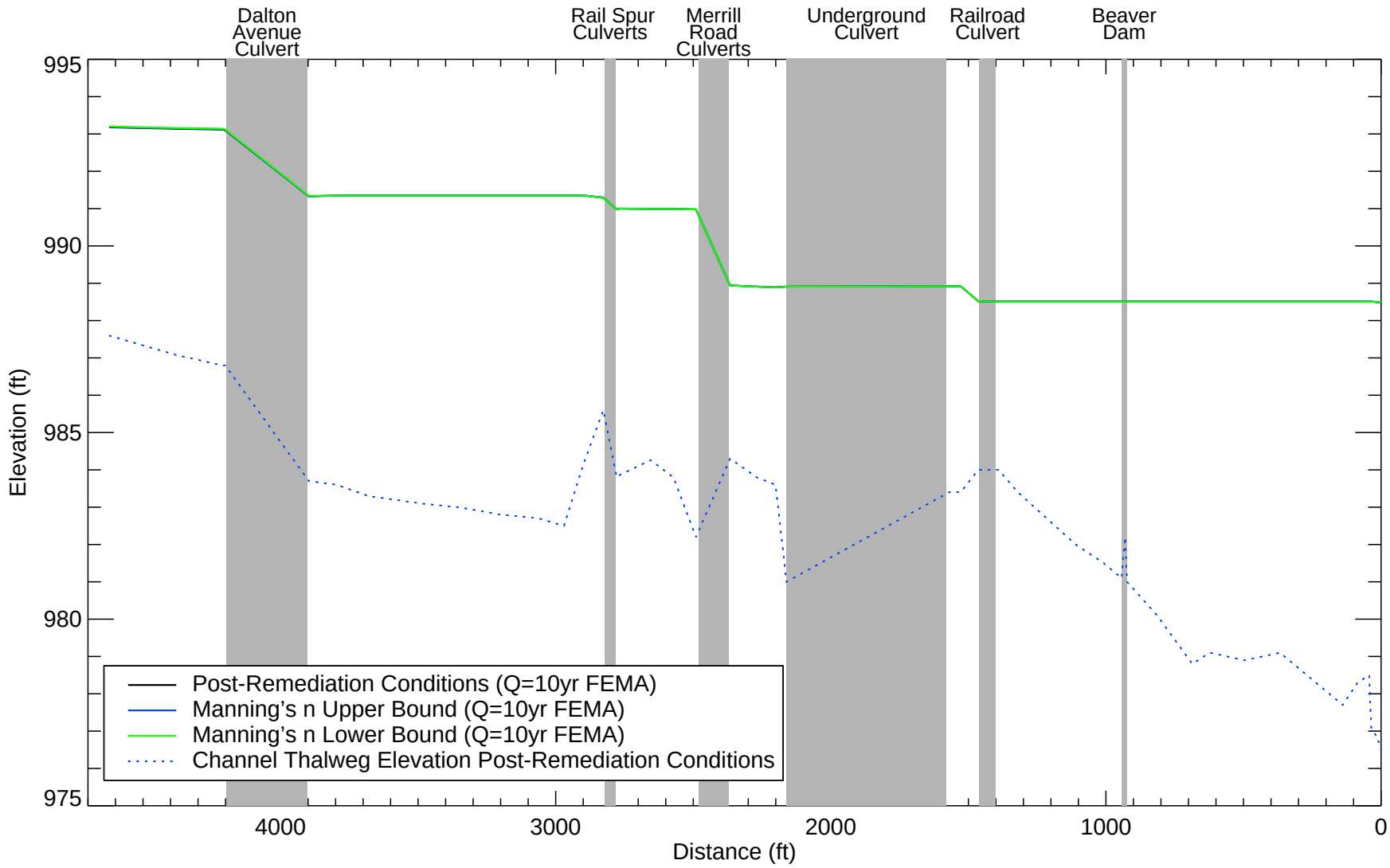


Figure F-11k

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

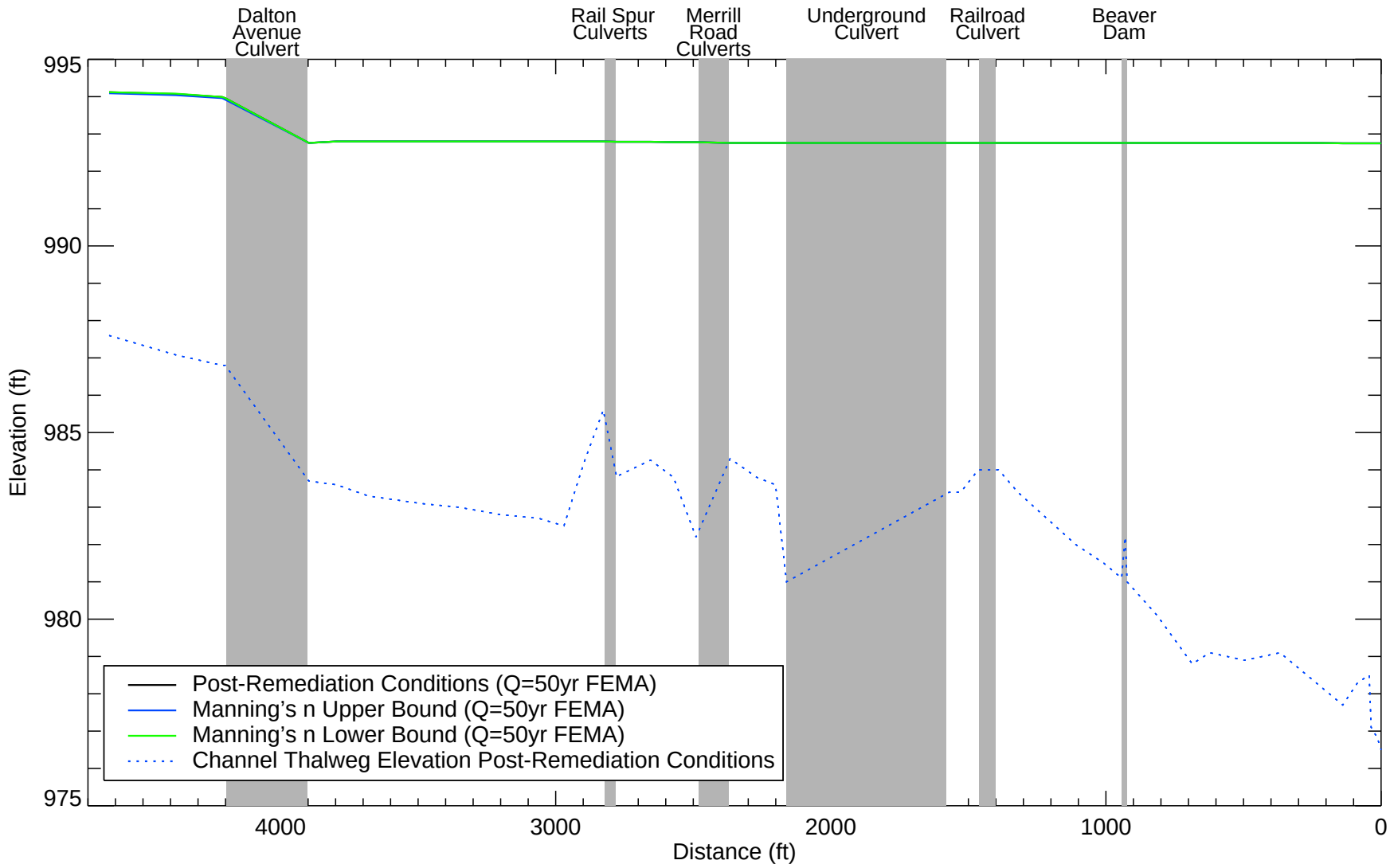


Figure F-11l

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

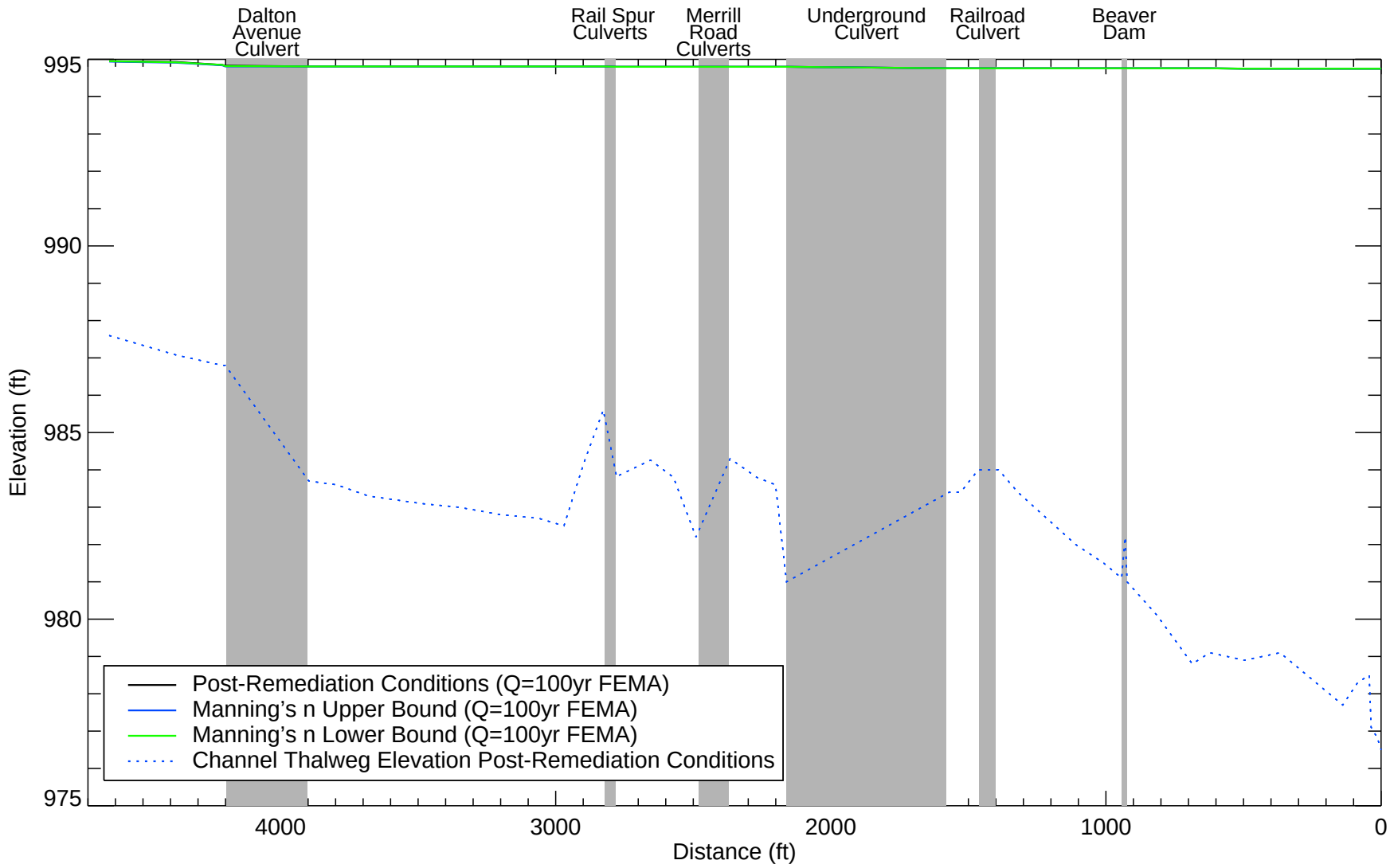


Figure F-11m

Water Surface Profile: Post-Remediation Conditions Model Results for Manning's n Sensitivity Analysis
Appendix F - Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions
General Electric Company

ANCHOR QEA

ATTACHMENT F-1
HEC-RAS OUTPUTS

Profile Output Table - Standard Table 1
HEC-RAS Plan: Post_Apr14_BseL River: RIVER-1 Reach: Reach-1

Rivers = 1
Hydraulic Reaches = 1
River Stations = 51
Plans = 1
Profiles = 8

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	4623	2 cfs	2.00	987.60	988.39	987.88	988.39	0.000223	0.38	5.20	10.86	0.10
Reach-1	4623	5 cfs	5.00	987.60	988.64	988.01	988.64	0.000397	0.61	8.14	12.96	0.14
Reach-1	4623	10 cfs	10.00	987.60	989.08	988.17	989.09	0.000314	0.68	14.65	16.66	0.13
Reach-1	4623	15 cfs	15.00	987.60	989.40	988.28	989.41	0.000366	0.72	20.70	24.18	0.14
Reach-1	4623	20 cfs	20.00	987.60	989.72	988.38	989.73	0.000288	0.67	29.71	32.45	0.12
Reach-1	4623	30 cfs	30.00	987.60	990.26	988.55	990.27	0.000176	0.57	52.72	86.37	0.10
Reach-1	4623	40 cfs	40.00	987.60	990.95	988.67	990.95	0.000069	0.42	96.15	117.69	0.06
Reach-1	4623	50 cfs	50.00	987.60	991.74	988.79	991.74	0.000026	0.30	164.86	159.13	0.04
Reach-1	4381	2 cfs	2.00	987.08	988.38	987.26	988.39	0.000010	0.12	16.36	18.16	0.02
Reach-1	4381	5 cfs	5.00	987.08	988.62	987.38	988.62	0.000031	0.24	20.84	19.86	0.04
Reach-1	4381	10 cfs	10.00	987.08	989.06	987.50	989.06	0.000043	0.33	30.28	22.92	0.05
Reach-1	4381	15 cfs	15.00	987.08	989.38	987.59	989.38	0.000050	0.40	37.80	24.09	0.06
Reach-1	4381	20 cfs	20.00	987.08	989.70	987.68	989.70	0.000050	0.44	45.66	25.25	0.06
Reach-1	4381	30 cfs	30.00	987.08	990.24	987.82	990.25	0.000053	0.50	59.97	28.22	0.06
Reach-1	4381	40 cfs	40.00	987.08	990.94	987.95	990.94	0.000051	0.47	84.26	41.79	0.06
Reach-1	4381	50 cfs	50.00	987.08	991.73	988.05	991.73	0.000034	0.40	125.54	103.11	0.05
Reach-1	4212	2 cfs	2.00	986.80	988.38		988.38	0.000005	0.09	21.99	24.01	0.02
Reach-1	4212	5 cfs	5.00	986.80	988.62		988.62	0.000015	0.19	27.85	26.07	0.03
Reach-1	4212	10 cfs	10.00	986.80	989.06		989.06	0.000021	0.28	40.85	41.03	0.04
Reach-1	4212	15 cfs	15.00	986.80	989.38		989.38	0.000024	0.33	55.00	46.01	0.04
Reach-1	4212	20 cfs	20.00	986.80	989.69		989.70	0.000024	0.36	70.20	49.73	0.04
Reach-1	4212	30 cfs	30.00	986.80	990.24		990.24	0.000023	0.41	98.64	54.32	0.04
Reach-1	4212	40 cfs	40.00	986.80	990.93		990.93	0.000017	0.40	138.38	60.57	0.04
Reach-1	4212	50 cfs	50.00	986.80	991.73		991.73	0.000011	0.38	189.51	68.01	0.03
Reach-1	4201	2 cfs	2.00	986.80	988.38	987.07	988.38	0.000020	0.17	11.75	16.48	0.03
Reach-1	4201	5 cfs	5.00	986.80	988.62	987.26	988.62	0.000060	0.33	14.93	17.77	0.06
Reach-1	4201	10 cfs	10.00	986.80	989.05	987.49	989.06	0.000080	0.47	21.29	20.18	0.07
Reach-1	4201	15 cfs	15.00	986.80	989.37	987.65	989.38	0.000092	0.58	26.27	22.00	0.08
Reach-1	4201	20 cfs	20.00	986.80	989.69	987.87	989.69	0.000093	0.65	31.35	30.09	0.08
Reach-1	4201	30 cfs	30.00	986.80	990.23	988.02	990.24	0.000095	0.77	40.03	44.98	0.08
Reach-1	4201	40 cfs	40.00	986.80	990.92	988.14	990.93	0.000077	0.80	51.11	56.03	0.08
Reach-1	4201	50 cfs	50.00	986.80	991.72	988.26	991.73	0.000058	0.80	63.80	63.38	0.07
Reach-1	4196		Culvert									
Reach-1	3897	2 cfs	2.00	983.70	987.71	983.78	987.71	0.000000	0.02	99.90	751.97	0.00

Reach-1	3897	5 cfs	5.00	983.70	988.09	983.85	988.09	0.000000	0.05	112.83	798.90	0.00
Reach-1	3897	10 cfs	10.00	983.70	988.88	983.93	988.88	0.000000	0.07	140.87	849.38	0.01
Reach-1	3897	15 cfs	15.00	983.70	989.13	984.01	989.13	0.000001	0.10	150.25	864.31	0.01
Reach-1	3897	20 cfs	20.00	983.70	989.37	984.07	989.37	0.000001	0.13	159.25	874.75	0.01
Reach-1	3897	30 cfs	30.00	983.70	989.64	984.18	989.64	0.000002	0.19	169.53	890.24	0.01
Reach-1	3897	40 cfs	40.00	983.70	989.87	984.27	989.88	0.000004	0.24	179.07	896.21	0.02
Reach-1	3897	50 cfs	50.00	983.70	990.07	984.36	990.07	0.000005	0.29	187.19	899.72	0.02
Reach-1	3796	2 cfs	2.00	983.60	987.71	983.74	987.71	0.000000	0.00	1718.08	1313.04	0.00
Reach-1	3796	5 cfs	5.00	983.60	988.09	983.84	988.09	0.000000	0.00	2059.90	1326.70	0.00
Reach-1	3796	10 cfs	10.00	983.60	988.88	983.94	988.88	0.000000	0.01	2765.50	1362.21	0.00
Reach-1	3796	15 cfs	15.00	983.60	989.13	984.02	989.13	0.000000	0.01	2992.86	1379.53	0.00
Reach-1	3796	20 cfs	20.00	983.60	989.37	984.08	989.37	0.000000	0.01	3209.43	1407.61	0.00
Reach-1	3796	30 cfs	30.00	983.60	989.64	984.22	989.64	0.000000	0.01	3459.16	1452.87	0.00
Reach-1	3796	40 cfs	40.00	983.60	989.88	984.32	989.88	0.000000	0.02	3693.97	1500.52	0.00
Reach-1	3796	50 cfs	50.00	983.60	990.07	984.42	990.07	0.000000	0.02	3894.26	1544.96	0.00
Reach-1	3681	2 cfs	2.00	983.30	987.71	983.45	987.71	0.000000	0.01	600.26	832.21	0.00
Reach-1	3681	5 cfs	5.00	983.30	988.09	983.55	988.09	0.000000	0.01	826.43	926.11	0.00
Reach-1	3681	10 cfs	10.00	983.30	988.88	983.65	988.88	0.000000	0.02	1335.43	979.61	0.00
Reach-1	3681	15 cfs	15.00	983.30	989.13	983.74	989.13	0.000000	0.02	1505.14	1002.78	0.00
Reach-1	3681	20 cfs	20.00	983.30	989.37	983.81	989.37	0.000000	0.03	1667.74	1021.19	0.00
Reach-1	3681	30 cfs	30.00	983.30	989.64	983.94	989.64	0.000000	0.03	1852.92	1043.38	0.00
Reach-1	3681	40 cfs	40.00	983.30	989.88	984.04	989.88	0.000000	0.04	2023.78	1061.75	0.00
Reach-1	3681	50 cfs	50.00	983.30	990.07	984.14	990.07	0.000000	0.05	2167.18	1077.85	0.00
Reach-1	3491	2 cfs	2.00	983.10	987.71	983.20	987.71	0.000000	0.01	590.54	427.37	0.00
Reach-1	3491	5 cfs	5.00	983.10	988.09	983.28	988.09	0.000000	0.01	777.41	524.36	0.00
Reach-1	3491	10 cfs	10.00	983.10	988.88	983.39	988.88	0.000000	0.02	1205.85	562.09	0.00
Reach-1	3491	15 cfs	15.00	983.10	989.13	983.47	989.13	0.000000	0.02	1349.59	575.39	0.00
Reach-1	3491	20 cfs	20.00	983.10	989.37	983.55	989.37	0.000000	0.03	1487.44	588.08	0.00
Reach-1	3491	30 cfs	30.00	983.10	989.64	983.67	989.64	0.000000	0.04	1645.03	601.94	0.00
Reach-1	3491	40 cfs	40.00	983.10	989.88	983.80	989.88	0.000000	0.05	1790.98	630.86	0.00
Reach-1	3491	50 cfs	50.00	983.10	990.07	983.88	990.07	0.000000	0.05	1913.84	648.60	0.00
Reach-1	3353	2 cfs	2.00	983.00	987.71	983.09	987.71	0.000000	0.01	514.21	459.20	0.00
Reach-1	3353	5 cfs	5.00	983.00	988.09	983.17	988.09	0.000000	0.02	693.95	476.46	0.00
Reach-1	3353	10 cfs	10.00	983.00	988.88	983.26	988.88	0.000000	0.02	1075.21	488.42	0.00
Reach-1	3353	15 cfs	15.00	983.00	989.13	983.35	989.13	0.000000	0.03	1198.66	491.01	0.00
Reach-1	3353	20 cfs	20.00	983.00	989.37	983.41	989.37	0.000000	0.03	1315.13	493.44	0.00
Reach-1	3353	30 cfs	30.00	983.00	989.64	983.55	989.64	0.000000	0.04	1446.17	496.06	0.00
Reach-1	3353	40 cfs	40.00	983.00	989.88	983.65	989.88	0.000000	0.05	1565.54	497.95	0.00
Reach-1	3353	50 cfs	50.00	983.00	990.07	983.75	990.07	0.000000	0.06	1664.58	499.92	0.00
Reach-1	3200	2 cfs	2.00	982.80	987.71	982.90	987.71	0.000000	0.01	599.90	421.93	0.00
Reach-1	3200	5 cfs	5.00	982.80	988.09	982.99	988.09	0.000000	0.01	762.71	425.78	0.00
Reach-1	3200	10 cfs	10.00	982.80	988.88	983.09	988.88	0.000000	0.02	1101.02	432.55	0.00
Reach-1	3200	15 cfs	15.00	982.80	989.13	983.18	989.13	0.000000	0.02	1210.32	434.71	0.00
Reach-1	3200	20 cfs	20.00	982.80	989.37	983.26	989.37	0.000000	0.03	1313.43	436.68	0.00
Reach-1	3200	30 cfs	30.00	982.80	989.64	983.38	989.64	0.000000	0.04	1429.36	438.87	0.00
Reach-1	3200	40 cfs	40.00	982.80	989.88	983.49	989.88	0.000000	0.05	1536.32	449.71	0.00

Reach-1	3200	50 cfs	50.00	982.80	990.07	983.59	990.07	0.000000	0.06	1626.59	458.56	0.00
Reach-1	3061	2 cfs	2.00	982.70	987.71	982.80	987.71	0.000000	0.01	634.97	404.56	0.00
Reach-1	3061	5 cfs	5.00	982.70	988.09	982.88	988.09	0.000000	0.01	790.85	407.03	0.00
Reach-1	3061	10 cfs	10.00	982.70	988.88	982.98	988.88	0.000000	0.02	1113.80	412.23	0.00
Reach-1	3061	15 cfs	15.00	982.70	989.13	983.06	989.13	0.000000	0.02	1218.06	416.04	0.00
Reach-1	3061	20 cfs	20.00	982.70	989.37	983.12	989.37	0.000000	0.03	1317.93	429.64	0.00
Reach-1	3061	30 cfs	30.00	982.70	989.64	983.25	989.64	0.000000	0.04	1434.25	443.89	0.00
Reach-1	3061	40 cfs	40.00	982.70	989.88	983.36	989.88	0.000000	0.05	1541.62	452.70	0.00
Reach-1	3061	50 cfs	50.00	982.70	990.07	983.46	990.07	0.000000	0.06	1632.45	460.06	0.00
Reach-1	2970	2 cfs	2.00	982.50	987.71	982.61	987.71	0.000000	0.01	573.24	379.88	0.00
Reach-1	2970	5 cfs	5.00	982.50	988.09	982.68	988.09	0.000000	0.01	719.70	382.65	0.00
Reach-1	2970	10 cfs	10.00	982.50	988.88	982.78	988.88	0.000000	0.02	1023.61	390.71	0.00
Reach-1	2970	15 cfs	15.00	982.50	989.13	982.87	989.13	0.000000	0.02	1124.49	404.48	0.00
Reach-1	2970	20 cfs	20.00	982.50	989.37	982.94	989.37	0.000000	0.03	1220.85	409.88	0.00
Reach-1	2970	30 cfs	30.00	982.50	989.64	983.07	989.64	0.000000	0.04	1330.18	415.84	0.00
Reach-1	2970	40 cfs	40.00	982.50	989.88	983.17	989.88	0.000000	0.05	1430.71	440.38	0.00
Reach-1	2970	50 cfs	50.00	982.50	990.07	983.27	990.07	0.000000	0.06	1517.22	538.07	0.00
Reach-1	2897	2 cfs	2.00	984.20	987.71	984.54	987.71	0.000000	0.01	446.64	389.71	0.00
Reach-1	2897	5 cfs	5.00	984.20	988.09	984.65	988.09	0.000000	0.01	597.44	396.03	0.00
Reach-1	2897	10 cfs	10.00	984.20	988.88	984.78	988.88	0.000000	0.02	916.85	414.38	0.00
Reach-1	2897	15 cfs	15.00	984.20	989.13	984.87	989.13	0.000000	0.02	1022.07	420.62	0.00
Reach-1	2897	20 cfs	20.00	984.20	989.37	984.96	989.37	0.000000	0.03	1122.36	427.05	0.00
Reach-1	2897	30 cfs	30.00	984.20	989.64	985.08	989.64	0.000000	0.04	1236.41	434.24	0.00
Reach-1	2897	40 cfs	40.00	984.20	989.88	985.20	989.88	0.000000	0.05	1341.79	457.75	0.00
Reach-1	2897	50 cfs	50.00	984.20	990.07	985.29	990.07	0.000000	0.06	1435.03	542.09	0.00
Reach-1	2827	2 cfs	2.00	985.60	987.71	985.99	987.71	0.000002	0.06	32.14	183.88	0.01
Reach-1	2827	5 cfs	5.00	985.60	988.09	986.10	988.09	0.000004	0.12	41.72	234.41	0.02
Reach-1	2827	10 cfs	10.00	985.60	988.88	986.23	988.88	0.000005	0.16	62.31	247.60	0.02
Reach-1	2827	15 cfs	15.00	985.60	989.13	986.35	989.13	0.000008	0.22	70.41	251.39	0.02
Reach-1	2827	20 cfs	20.00	985.60	989.37	986.46	989.37	0.000010	0.27	78.75	254.54	0.03
Reach-1	2827	30 cfs	30.00	985.60	989.63	986.61	989.64	0.000017	0.36	88.88	258.12	0.04
Reach-1	2827	40 cfs	40.00	985.60	989.87	986.73	989.88	0.000023	0.45	98.81	261.38	0.04
Reach-1	2827	50 cfs	50.00	985.60	990.07	986.82	990.07	0.000030	0.53	107.62	266.35	0.05
Reach-1	2822		Culvert									
Reach-1	2778	2 cfs	2.00	983.80	985.37	984.10	985.37	0.000023	0.17	12.09	15.57	0.03
Reach-1	2778	5 cfs	5.00	983.80	985.71	984.30	985.71	0.000048	0.29	17.49	16.31	0.05
Reach-1	2778	10 cfs	10.00	983.80	986.15	984.52	986.16	0.000068	0.40	24.97	17.28	0.06
Reach-1	2778	15 cfs	15.00	983.80	986.53	984.68	986.54	0.000077	0.47	31.65	18.10	0.06
Reach-1	2778	20 cfs	20.00	983.80	986.89	984.87	986.89	0.000080	0.52	38.20	18.74	0.06
Reach-1	2778	30 cfs	30.00	983.80	987.64	985.04	987.64	0.000073	0.57	52.68	19.84	0.06
Reach-1	2778	40 cfs	40.00	983.80	988.73	985.17	988.73	0.000049	0.53	77.55	199.54	0.05
Reach-1	2778	50 cfs	50.00	983.80	989.26	985.27	989.26	0.000046	0.54	112.55	352.07	0.05
Reach-1	2767.99*	2 cfs	2.00	983.86	985.37	984.17	985.37	0.000029	0.18	11.16	14.93	0.04
Reach-1	2767.99*	5 cfs	5.00	983.86	985.71	984.37	985.71	0.000057	0.31	16.34	15.70	0.05

Reach-1	2767.99*	10 cfs	10.00	983.86	986.15	984.59	986.16	0.000079	0.42	23.55	16.71	0.06
Reach-1	2767.99*	15 cfs	15.00	983.86	986.53	984.82	986.53	0.000089	0.50	30.02	17.56	0.07
Reach-1	2767.99*	20 cfs	20.00	983.86	986.89	984.93	986.89	0.000091	0.55	36.36	18.13	0.07
Reach-1	2767.99*	30 cfs	30.00	983.86	987.64	985.10	987.64	0.000082	0.60	50.39	19.27	0.06
Reach-1	2767.99*	40 cfs	40.00	983.86	988.73	985.23	988.73	0.000049	0.53	99.41	160.27	0.05
Reach-1	2767.99*	50 cfs	50.00	983.86	989.26	985.33	989.26	0.000028	0.42	236.02	343.62	0.04
Reach-1	2655	2 cfs	2.00	984.26	985.36	984.62	985.36	0.000157	0.37	5.45	9.05	0.08
Reach-1	2655	5 cfs	5.00	984.26	985.69	984.81	985.70	0.000272	0.57	8.86	11.90	0.11
Reach-1	2655	10 cfs	10.00	984.26	986.13	985.01	986.14	0.000234	0.69	15.12	16.30	0.11
Reach-1	2655	15 cfs	15.00	984.26	986.52	985.15	986.52	0.000131	0.63	38.75	77.59	0.09
Reach-1	2655	20 cfs	20.00	984.26	986.88	985.29	986.88	0.000067	0.51	67.56	82.46	0.07
Reach-1	2655	30 cfs	30.00	984.26	987.63	985.48	987.64	0.000024	0.38	136.67	100.68	0.04
Reach-1	2655	40 cfs	40.00	984.26	988.73	985.64	988.73	0.000007	0.27	261.45	193.35	0.02
Reach-1	2655	50 cfs	50.00	984.26	989.26	985.78	989.26	0.000006	0.26	328.48	221.38	0.02
Reach-1	2572	2 cfs	2.00	983.80	985.36	984.13	985.36	0.000019	0.18	10.98	10.56	0.03
Reach-1	2572	5 cfs	5.00	983.80	985.69	984.30	985.69	0.000051	0.34	14.64	12.76	0.05
Reach-1	2572	10 cfs	10.00	983.80	986.13	984.48	986.13	0.000077	0.50	25.02	83.34	0.07
Reach-1	2572	15 cfs	15.00	983.80	986.51	984.61	986.52	0.000050	0.45	57.61	91.03	0.06
Reach-1	2572	20 cfs	20.00	983.80	986.88	984.71	986.88	0.000032	0.39	88.64	96.05	0.05
Reach-1	2572	30 cfs	30.00	983.80	987.63	984.89	987.63	0.000015	0.31	154.64	121.58	0.03
Reach-1	2572	40 cfs	40.00	983.80	988.73	985.04	988.73	0.000005	0.20	317.64	137.56	0.02
Reach-1	2572	50 cfs	50.00	983.80	989.26	985.19	989.26	0.000004	0.20	391.77	141.47	0.02
Reach-1	2490	2 cfs	2.00	982.20	985.36	982.53	985.36	0.000000	0.04	48.01	25.15	0.01
Reach-1	2490	5 cfs	5.00	982.20	985.69	982.70	985.69	0.000002	0.09	56.10	25.62	0.01
Reach-1	2490	10 cfs	10.00	982.20	986.13	982.88	986.13	0.000003	0.15	67.04	26.62	0.02
Reach-1	2490	15 cfs	15.00	982.20	986.51	983.01	986.51	0.000005	0.20	76.67	28.21	0.02
Reach-1	2490	20 cfs	20.00	982.20	986.87	983.13	986.88	0.000006	0.24	85.74	29.49	0.02
Reach-1	2490	30 cfs	30.00	982.20	987.63	983.31	987.63	0.000007	0.30	104.90	57.80	0.03
Reach-1	2490	40 cfs	40.00	982.20	988.73	983.45	988.73	0.000006	0.32	132.96	85.10	0.02
Reach-1	2490	50 cfs	50.00	982.20	989.26	983.57	989.26	0.000007	0.36	146.60	93.37	0.03
Reach-1	2480		Culvert									
Reach-1	2366	2 cfs	2.00	984.30	985.35	984.49	985.35	0.000025	0.18	11.04	13.74	0.04
Reach-1	2366	5 cfs	5.00	984.30	985.66	984.59	985.67	0.000057	0.32	15.53	14.86	0.06
Reach-1	2366	10 cfs	10.00	984.30	986.09	984.71	986.09	0.000081	0.45	22.14	16.38	0.07
Reach-1	2366	15 cfs	15.00	984.30	986.46	984.81	986.46	0.000087	0.53	28.45	17.75	0.07
Reach-1	2366	20 cfs	20.00	984.30	986.80	984.90	986.81	0.000084	0.58	34.84	19.23	0.07
Reach-1	2366	30 cfs	30.00	984.30	987.50	985.05	987.50	0.000066	0.63	49.17	64.35	0.07
Reach-1	2366	40 cfs	40.00	984.30	988.49	985.17	988.49	0.000038	0.59	70.91	151.46	0.06
Reach-1	2366	50 cfs	50.00	984.30	988.88	985.28	988.89	0.000042	0.66	79.61	199.71	0.06
Reach-1	2269	2 cfs	2.00	983.80	985.35	984.20	985.35	0.000016	0.16	13.19	15.56	0.03
Reach-1	2269	5 cfs	5.00	983.80	985.66	984.38	985.66	0.000038	0.29	18.19	16.61	0.05
Reach-1	2269	10 cfs	10.00	983.80	986.08	984.55	986.08	0.000055	0.42	26.00	48.66	0.06
Reach-1	2269	15 cfs	15.00	983.80	986.45	984.67	986.45	0.000057	0.50	36.27	115.31	0.06
Reach-1	2269	20 cfs	20.00	983.80	986.80	984.77	986.80	0.000054	0.53	47.19	203.09	0.06
Reach-1	2269	30 cfs	30.00	983.80	987.49	984.92	987.50	0.000042	0.56	70.12	326.83	0.06

Reach-1	2269	40 cfs	40.00	983.80	988.48	985.05	988.49	0.000024	0.52	104.76	518.58	0.05
Reach-1	2269	50 cfs	50.00	983.80	988.88	985.18	988.88	0.000026	0.57	119.29	550.75	0.05
Reach-1	2201	2 cfs	2.00	983.60	985.35	983.93	985.35	0.000010	0.14	14.49	13.44	0.02
Reach-1	2201	5 cfs	5.00	983.60	985.66	984.08	985.66	0.000030	0.26	18.88	14.92	0.04
Reach-1	2201	10 cfs	10.00	983.60	986.08	984.25	986.08	0.000045	0.38	29.56	37.03	0.05
Reach-1	2201	15 cfs	15.00	983.60	986.45	984.39	986.45	0.000043	0.43	43.47	38.12	0.05
Reach-1	2201	20 cfs	20.00	983.60	986.79	984.50	986.80	0.000039	0.45	56.86	39.14	0.05
Reach-1	2201	30 cfs	30.00	983.60	987.49	984.68	987.50	0.000029	0.47	84.88	46.18	0.05
Reach-1	2201	40 cfs	40.00	983.60	988.48	984.82	988.49	0.000017	0.43	126.89	288.06	0.04
Reach-1	2201	50 cfs	50.00	983.60	988.88	984.96	988.88	0.000018	0.47	144.33	394.32	0.04
Reach-1	2161	2 cfs	2.00	981.00	985.35	981.49	985.35	0.000000	0.06	33.84	23.34	0.01
Reach-1	2161	5 cfs	5.00	981.00	985.66	981.70	985.66	0.000002	0.14	36.87	24.57	0.01
Reach-1	2161	10 cfs	10.00	981.00	986.08	981.93	986.08	0.000005	0.24	41.00	26.25	0.02
Reach-1	2161	15 cfs	15.00	981.00	986.45	982.08	986.45	0.000009	0.34	44.62	27.69	0.03
Reach-1	2161	20 cfs	20.00	981.00	986.79	982.21	986.80	0.000012	0.42	48.01	29.04	0.03
Reach-1	2161	30 cfs	30.00	981.00	987.49	982.44	987.49	0.000016	0.52	84.38	119.59	0.04
Reach-1	2161	40 cfs	40.00	981.00	988.48	982.61	988.49	0.000007	0.40	292.15	364.06	0.03
Reach-1	2161	50 cfs	50.00	981.00	988.88	982.78	988.88	0.000006	0.37	461.42	518.19	0.02
Reach-1	2160		Culvert									
Reach-1	1570	2 cfs	2.00	983.40	985.34	983.59	985.34	0.000005	0.13	16.00	12.37	0.02
Reach-1	1570	5 cfs	5.00	983.40	985.63	983.74	985.63	0.000017	0.26	18.90	12.90	0.03
Reach-1	1570	10 cfs	10.00	983.40	986.01	983.92	986.02	0.000038	0.44	22.70	55.39	0.05
Reach-1	1570	15 cfs	15.00	983.40	986.34	984.04	986.34	0.000054	0.58	25.96	189.61	0.06
Reach-1	1570	20 cfs	20.00	983.40	986.64	984.14	986.64	0.000067	0.69	28.94	318.12	0.07
Reach-1	1570	30 cfs	30.00	983.40	987.20	984.33	987.21	0.000084	0.87	34.59	575.92	0.08
Reach-1	1570	40 cfs	40.00	983.40	987.93	984.50	987.94	0.000079	0.95	41.89	740.80	0.08
Reach-1	1570	50 cfs	50.00	983.40	988.88	984.64	988.88	0.000001	0.11	1142.00	852.71	0.01
Reach-1	1528	2 cfs	2.00	983.40	985.34	983.61	985.34	0.000002	0.08	26.23	20.36	0.01
Reach-1	1528	5 cfs	5.00	983.40	985.63	983.72	985.63	0.000008	0.15	32.31	21.53	0.02
Reach-1	1528	10 cfs	10.00	983.40	986.01	983.86	986.01	0.000016	0.25	40.80	112.96	0.03
Reach-1	1528	15 cfs	15.00	983.40	986.34	983.96	986.34	0.000022	0.31	48.54	223.73	0.04
Reach-1	1528	20 cfs	20.00	983.40	986.64	984.05	986.64	0.000027	0.36	55.99	362.58	0.04
Reach-1	1528	30 cfs	30.00	983.40	987.21	984.20	987.21	0.000030	0.42	71.00	662.36	0.05
Reach-1	1528	40 cfs	40.00	983.40	987.94	984.34	987.94	0.000026	0.43	92.01	789.29	0.04
Reach-1	1528	50 cfs	50.00	983.40	988.88	984.46	988.88	0.000001	0.07	1285.71	884.49	0.01
Reach-1	1464	2 cfs	2.00	984.00	985.34	984.41	985.34	0.000014	0.15	13.03	25.00	0.03
Reach-1	1464	5 cfs	5.00	984.00	985.63	984.52	985.63	0.000037	0.29	17.05	155.87	0.05
Reach-1	1464	10 cfs	10.00	984.00	986.01	984.64	986.01	0.000060	0.45	22.32	454.44	0.06
Reach-1	1464	15 cfs	15.00	984.00	986.33	984.73	986.34	0.000073	0.56	26.83	625.09	0.07
Reach-1	1464	20 cfs	20.00	984.00	986.63	984.81	986.64	0.000080	0.65	30.96	678.29	0.08
Reach-1	1464	30 cfs	30.00	984.00	987.20	984.93	987.20	0.000085	0.77	38.81	761.53	0.08
Reach-1	1464	40 cfs	40.00	984.00	987.93	985.04	987.94	0.000070	0.82	48.97	872.68	0.08
Reach-1	1464	50 cfs	50.00	984.00	988.87	985.13	988.88	0.000049	0.81	62.16	951.64	0.07
Reach-1	1460		Culvert									

Reach-1	1390	2 cfs	2.00	984.00	984.44	984.29	984.46	0.005811	0.96	2.08	12.70	0.35
Reach-1	1390	5 cfs	5.00	984.00	984.51	984.42	984.56	0.017243	1.83	2.73	14.51	0.61
Reach-1	1390	10 cfs	10.00	984.00	984.56	984.56	984.71	0.044764	3.13	3.19	15.70	1.00
Reach-1	1390	15 cfs	15.00	984.00	984.67	984.67	984.83	0.043149	3.25	4.61	20.12	1.00
Reach-1	1390	20 cfs	20.00	984.00	984.74	984.74	984.94	0.040194	3.57	5.59	20.78	1.00
Reach-1	1390	30 cfs	30.00	984.00	984.95	984.95	985.08	0.016592	3.06	13.09	68.02	0.69
Reach-1	1390	40 cfs	40.00	984.00	985.00	985.00	985.16	0.019814	3.51	15.86	69.89	0.76
Reach-1	1390	50 cfs	50.00	984.00	985.13	985.13	985.23	0.011732	3.04	28.23	142.36	0.60
Reach-1	1320	2 cfs	2.00	983.40	983.59	983.57	983.63	0.036469	1.55	1.29	10.54	0.78
Reach-1	1320	5 cfs	5.00	983.40	983.81	983.66	983.83	0.007046	1.20	4.73	38.27	0.40
Reach-1	1320	10 cfs	10.00	983.40	983.98	983.78	983.99	0.004085	1.18	10.65	73.27	0.32
Reach-1	1320	15 cfs	15.00	983.40	984.10	983.87	984.11	0.003153	1.20	16.44	107.13	0.29
Reach-1	1320	20 cfs	20.00	983.40	984.19	983.92	984.21	0.002729	1.23	21.82	131.04	0.28
Reach-1	1320	30 cfs	30.00	983.40	984.36	984.00	984.37	0.002221	1.26	32.89	183.48	0.26
Reach-1	1320	40 cfs	40.00	983.40	984.47	984.07	984.48	0.002209	1.35	41.89	216.14	0.26
Reach-1	1320	50 cfs	50.00	983.40	984.49	984.09	984.51	0.003084	1.62	43.66	218.14	0.31
Reach-1	1110	2 cfs	2.00	982.00	982.52	982.22	982.53	0.001987	0.74	2.71	7.54	0.22
Reach-1	1110	5 cfs	5.00	982.00	982.67	982.37	982.70	0.004235	1.26	3.95	8.59	0.33
Reach-1	1110	10 cfs	10.00	982.00	982.83	982.54	982.88	0.007240	1.87	5.35	9.64	0.44
Reach-1	1110	15 cfs	15.00	982.00	982.92	982.67	983.01	0.010239	2.38	6.31	10.29	0.53
Reach-1	1110	20 cfs	20.00	982.00	982.99	982.78	983.11	0.013698	2.86	6.98	10.69	0.62
Reach-1	1110	30 cfs	30.00	982.00	983.07	982.95	983.29	0.021555	3.78	7.93	11.23	0.79
Reach-1	1110	40 cfs	40.00	982.00	983.43	983.11	983.59	0.011007	3.23	12.49	17.63	0.59
Reach-1	1110	50 cfs	50.00	982.00	984.27	983.23	984.28	0.000552	0.90	91.16	166.72	0.14
Reach-1	1008	2 cfs	2.00	981.50	982.52	980.60	982.52	0.000002	0.04	42.31	39.13	0.01
Reach-1	1008	5 cfs	5.00	981.50	982.69	980.73	982.69	0.000009	0.08	48.86	41.73	0.02
Reach-1	1008	10 cfs	10.00	981.50	982.85	980.88	982.85	0.000028	0.11	57.02	52.97	0.03
Reach-1	1008	15 cfs	15.00	981.50	982.97	980.99	982.97	0.000048	0.16	63.17	55.69	0.04
Reach-1	1008	20 cfs	20.00	981.50	983.05	981.06	983.05	0.000071	0.21	67.88	57.16	0.04
Reach-1	1008	30 cfs	30.00	981.50	983.18	981.24	983.19	0.000119	0.29	75.76	59.54	0.06
Reach-1	1008	40 cfs	40.00	981.50	983.51	981.37	983.51	0.000114	0.34	96.10	66.68	0.06
Reach-1	1008	50 cfs	50.00	981.50	984.26	981.47	984.26	0.000068	0.35	181.27	157.98	0.05
Reach-1	943	2 cfs	2.00	981.10	982.52	981.26	982.52	0.000005	0.06	30.90	35.75	0.01
Reach-1	943	5 cfs	5.00	981.10	982.68	981.37	982.68	0.000019	0.14	36.97	39.62	0.02
Reach-1	943	10 cfs	10.00	981.10	982.85	981.47	982.85	0.000046	0.23	43.74	41.93	0.04
Reach-1	943	15 cfs	15.00	981.10	982.96	981.55	982.96	0.000076	0.31	48.47	43.35	0.05
Reach-1	943	20 cfs	20.00	981.10	983.04	981.62	983.04	0.000111	0.38	52.03	44.40	0.06
Reach-1	943	30 cfs	30.00	981.10	983.17	981.72	983.18	0.000179	0.52	58.66	57.71	0.08
Reach-1	943	40 cfs	40.00	981.10	983.50	981.81	983.50	0.000139	0.52	84.79	86.16	0.07
Reach-1	943	50 cfs	50.00	981.10	984.26	981.89	984.26	0.000040	0.36	191.32	200.63	0.04
Reach-1	930	2 cfs	2.00	982.20	982.44	982.44	982.52	0.061086	2.20	0.91	6.46	1.03
Reach-1	930	5 cfs	5.00	982.20	982.57	982.57	982.67	0.049564	2.53	1.98	9.80	0.99
Reach-1	930	10 cfs	10.00	982.20	982.70	982.70	982.84	0.044278	2.92	3.43	14.51	0.98
Reach-1	930	15 cfs	15.00	982.20	982.81	982.81	982.95	0.036160	3.01	5.28	20.58	0.92
Reach-1	930	20 cfs	20.00	982.20	982.88	982.88	983.03	0.034407	3.09	7.00	24.48	0.91
Reach-1	930	30 cfs	30.00	982.20	982.98	982.98	983.15	0.034857	3.46	9.55	28.28	0.94

Reach-1	930	40 cfs	40.00	982.20	983.47	983.07	983.49	0.002520	1.37	36.94	71.39	0.28
Reach-1	930	50 cfs	50.00	982.20	984.25	983.17	984.26	0.000168	0.53	134.10	180.87	0.08
Reach-1	923	2 cfs	2.00	981.00	981.47	981.29	981.48	0.003968	0.85	2.36	9.06	0.29
Reach-1	923	5 cfs	5.00	981.00	981.67	981.41	981.69	0.004224	1.12	4.47	11.77	0.32
Reach-1	923	10 cfs	10.00	981.00	981.79	981.55	981.83	0.007393	1.67	5.98	13.10	0.44
Reach-1	923	15 cfs	15.00	981.00	981.92	981.66	981.98	0.007770	1.92	7.82	14.44	0.46
Reach-1	923	20 cfs	20.00	981.00	982.07	981.75	982.13	0.006959	2.00	9.98	15.87	0.45
Reach-1	923	30 cfs	30.00	981.00	982.54	981.89	982.57	0.002778	1.54	20.61	39.41	0.29
Reach-1	923	40 cfs	40.00	981.00	983.48	982.01	983.49	0.000213	0.65	77.52	75.31	0.09
Reach-1	923	50 cfs	50.00	981.00	984.25	982.12	984.26	0.000061	0.44	167.18	147.33	0.05
Reach-1	814	2 cfs	2.00	980.10	980.33	980.33	980.40	0.053692	2.23	0.90	5.69	0.99
Reach-1	814	5 cfs	5.00	980.10	980.46	980.46	980.59	0.047182	2.92	1.71	6.48	1.00
Reach-1	814	10 cfs	10.00	980.10	980.86	980.62	980.94	0.009348	2.21	4.52	7.41	0.50
Reach-1	814	15 cfs	15.00	980.10	981.15	980.75	981.23	0.006409	2.23	6.73	8.07	0.43
Reach-1	814	20 cfs	20.00	980.10	981.38	980.86	981.47	0.005415	2.30	8.69	8.60	0.40
Reach-1	814	30 cfs	30.00	980.10	982.30	981.06	982.34	0.001664	1.71	17.53	10.71	0.24
Reach-1	814	40 cfs	40.00	980.10	983.43	981.24	983.45	0.000439	1.23	43.86	59.60	0.13
Reach-1	814	50 cfs	50.00	980.10	984.24	981.39	984.25	0.000149	0.85	115.39	123.74	0.08
Reach-1	686	2 cfs	2.00	978.80	979.90	979.23	979.90	0.000338	0.45	4.44	6.40	0.10
Reach-1	686	5 cfs	5.00	978.80	980.25	979.40	980.25	0.000615	0.73	6.84	7.31	0.13
Reach-1	686	10 cfs	10.00	978.80	980.64	979.59	980.66	0.000879	1.00	9.95	8.50	0.16
Reach-1	686	15 cfs	15.00	978.80	980.90	979.74	980.92	0.001143	1.22	12.26	9.46	0.19
Reach-1	686	20 cfs	20.00	978.80	981.12	979.87	981.15	0.001324	1.39	14.42	10.25	0.21
Reach-1	686	30 cfs	30.00	978.80	982.22	980.10	982.23	0.000472	1.06	29.84	24.04	0.13
Reach-1	686	40 cfs	40.00	978.80	983.42	980.29	983.42	0.000091	0.64	113.48	106.70	0.06
Reach-1	686	50 cfs	50.00	978.80	984.23	980.47	984.24	0.000036	0.47	223.67	281.40	0.04
Reach-1	623	2 cfs	2.00	979.10	979.84	979.53	979.85	0.002757	0.85	2.34	6.55	0.25
Reach-1	623	5 cfs	5.00	979.10	980.17	979.72	980.19	0.002152	1.08	4.65	7.46	0.24
Reach-1	623	10 cfs	10.00	979.10	980.55	979.91	980.58	0.001968	1.30	7.70	8.52	0.24
Reach-1	623	15 cfs	15.00	979.10	980.79	980.04	980.82	0.002225	1.53	9.79	9.18	0.26
Reach-1	623	20 cfs	20.00	979.10	980.99	980.15	981.04	0.002369	1.70	11.73	9.75	0.27
Reach-1	623	30 cfs	30.00	979.10	982.18	980.35	982.20	0.000497	1.20	30.19	32.40	0.14
Reach-1	623	40 cfs	40.00	979.10	983.42	980.52	983.42	0.000067	0.59	151.07	144.26	0.05
Reach-1	623	50 cfs	50.00	979.10	984.23	980.68	984.23	0.000023	0.39	288.11	188.66	0.03
Reach-1	496	2 cfs	2.00	978.90	979.70	979.22	979.71	0.000616	0.52	3.85	7.35	0.13
Reach-1	496	5 cfs	5.00	978.90	980.00	979.38	980.01	0.000951	0.81	6.21	8.42	0.17
Reach-1	496	10 cfs	10.00	978.90	980.38	979.55	980.39	0.001083	1.04	9.58	9.52	0.18
Reach-1	496	15 cfs	15.00	978.90	980.57	979.68	980.59	0.001464	1.31	11.45	10.07	0.22
Reach-1	496	20 cfs	20.00	978.90	980.75	979.80	980.78	0.001708	1.51	13.30	11.25	0.24
Reach-1	496	30 cfs	30.00	978.90	982.14	980.00	982.16	0.000265	0.95	39.91	30.60	0.10
Reach-1	496	40 cfs	40.00	978.90	983.41	980.16	983.41	0.000065	0.62	138.44	141.85	0.06
Reach-1	496	50 cfs	50.00	978.90	984.23	980.32	984.23	0.000024	0.42	272.45	184.27	0.03
Reach-1	367	2 cfs	2.00	979.10	979.39	979.37	979.45	0.036355	1.96	1.02	5.79	0.82
Reach-1	367	5 cfs	5.00	979.10	979.68	979.51	979.73	0.009692	1.76	2.84	6.85	0.48
Reach-1	367	10 cfs	10.00	979.10	980.05	979.68	980.09	0.009196	1.51	6.60	19.45	0.46

Reach-1	367	15 cfs	15.00	979.10	980.20	979.81	980.24	0.007020	1.53	9.83	23.36	0.41
Reach-1	367	20 cfs	20.00	979.10	980.52	980.03	980.54	0.002004	1.15	17.36	24.50	0.24
Reach-1	367	30 cfs	30.00	979.10	982.13	980.15	982.14	0.000076	0.48	78.72	103.01	0.06
Reach-1	367	40 cfs	40.00	979.10	983.41	980.24	983.41	0.000012	0.26	230.86	140.83	0.02
Reach-1	367	50 cfs	50.00	979.10	984.23	980.31	984.23	0.000006	0.22	371.45	224.03	0.02
Reach-1	237	2 cfs	2.00	978.30	978.94	978.62	978.95	0.001329	0.63	3.17	8.12	0.18
Reach-1	237	5 cfs	5.00	978.30	979.13	978.76	979.15	0.002494	1.04	4.79	9.20	0.26
Reach-1	237	10 cfs	10.00	978.30	979.33	978.91	979.36	0.003811	1.50	6.68	10.23	0.33
Reach-1	237	15 cfs	15.00	978.30	979.51	979.03	979.55	0.004124	1.74	8.63	11.16	0.35
Reach-1	237	20 cfs	20.00	978.30	980.34	979.14	980.35	0.001061	0.99	20.14	21.77	0.18
Reach-1	237	30 cfs	30.00	978.30	982.13	979.31	982.13	0.000031	0.30	141.93	99.28	0.04
Reach-1	237	40 cfs	40.00	978.30	983.40	979.46	983.40	0.000010	0.23	287.50	156.10	0.02
Reach-1	237	50 cfs	50.00	978.30	984.23	979.60	984.23	0.000006	0.21	433.88	214.31	0.02
Reach-1	139	2 cfs	2.00	977.70	978.95	977.84	978.95	0.000005	0.08	26.49	25.85	0.01
Reach-1	139	5 cfs	5.00	977.70	979.14	977.89	979.14	0.000019	0.16	31.49	26.86	0.03
Reach-1	139	10 cfs	10.00	977.70	979.33	977.97	979.33	0.000047	0.27	36.89	27.84	0.04
Reach-1	139	15 cfs	15.00	977.70	979.52	978.03	979.52	0.000072	0.36	42.07	28.65	0.05
Reach-1	139	20 cfs	20.00	977.70	980.34	978.09	980.34	0.000032	0.30	67.09	32.56	0.04
Reach-1	139	30 cfs	30.00	977.70	982.13	978.19	982.13	0.000009	0.23	135.89	47.26	0.02
Reach-1	139	40 cfs	40.00	977.70	983.40	978.27	983.40	0.000005	0.21	255.26	153.73	0.02
Reach-1	139	50 cfs	50.00	977.70	984.23	978.35	984.23	0.000004	0.20	408.72	222.03	0.01
Reach-1	85	2 cfs	2.00	978.30	978.94	978.62	978.94	0.000747	0.37	5.44	20.24	0.13
Reach-1	85	5 cfs	5.00	978.30	979.13	978.74	979.13	0.000837	0.55	9.48	22.91	0.15
Reach-1	85	10 cfs	10.00	978.30	979.32	978.87	979.33	0.001011	0.75	13.98	24.46	0.17
Reach-1	85	15 cfs	15.00	978.30	979.50	978.93	979.51	0.000996	0.85	18.54	26.44	0.17
Reach-1	85	20 cfs	20.00	978.30	980.33	978.99	980.34	0.000146	0.48	44.62	35.99	0.07
Reach-1	85	30 cfs	30.00	978.30	982.13	979.09	982.13	0.000018	0.27	122.08	50.52	0.03
Reach-1	85	40 cfs	40.00	978.30	983.40	979.18	983.40	0.000009	0.23	209.58	110.75	0.02
Reach-1	85	50 cfs	50.00	978.30	984.23	979.26	984.23	0.000007	0.23	326.43	175.68	0.02
Reach-1	43	2 cfs	2.00	978.50	978.77	978.77	978.84	0.054839	2.19	0.91	5.99	0.99
Reach-1	43	5 cfs	5.00	978.50	978.91	978.91	979.02	0.048157	2.55	1.96	9.36	0.98
Reach-1	43	10 cfs	10.00	978.50	979.04	979.04	979.18	0.047102	3.06	3.27	11.64	1.02
Reach-1	43	15 cfs	15.00	978.50	979.36	979.14	979.41	0.009730	1.87	8.03	18.40	0.50
Reach-1	43	20 cfs	20.00	978.50	980.32	979.23	980.33	0.000310	0.59	33.88	32.55	0.10
Reach-1	43	30 cfs	30.00	978.50	982.12	979.35	982.13	0.000026	0.31	97.70	38.80	0.03
Reach-1	43	40 cfs	40.00	978.50	983.40	979.46	983.40	0.000012	0.27	154.92	65.96	0.02
Reach-1	43	50 cfs	50.00	978.50	984.23	979.55	984.23	0.000009	0.26	277.90	213.98	0.02
Reach-1	36	2 cfs	2.00	977.10	977.53		977.56	0.017636	1.47	1.36	6.90	0.59
Reach-1	36	5 cfs	5.00	977.10	977.73		977.78	0.011571	1.62	3.08	9.88	0.51
Reach-1	36	10 cfs	10.00	977.10	978.43		978.44	0.000802	0.75	13.42	18.58	0.15
Reach-1	36	15 cfs	15.00	977.10	979.39		979.39	0.000117	0.46	32.69	21.66	0.07
Reach-1	36	20 cfs	20.00	977.10	980.32		980.33	0.000046	0.37	54.37	24.51	0.04
Reach-1	36	30 cfs	30.00	977.10	982.12		982.13	0.000016	0.29	102.66	28.74	0.03
Reach-1	36	40 cfs	40.00	977.10	983.40		983.40	0.000011	0.28	143.22	42.62	0.02
Reach-1	36	50 cfs	50.00	977.10	984.23		984.23	0.000009	0.28	247.52	163.41	0.02
Reach-1	20	2 cfs	2.00	976.90	977.41	977.21	977.43	0.005048	1.04	1.92	6.43	0.33

Reach-1	20	5 cfs	5.00	976.90	977.61	977.37	977.65	0.006225	1.49	3.35	7.52	0.39
Reach-1	20	10 cfs	10.00	976.90	978.41	977.55	978.42	0.000879	0.97	10.32	9.77	0.17
Reach-1	20	15 cfs	15.00	976.90	979.38	977.67	979.39	0.000257	0.72	20.99	12.54	0.10
Reach-1	20	20 cfs	20.00	976.90	980.32	977.78	980.32	0.000108	0.60	34.86	16.65	0.07
Reach-1	20	30 cfs	30.00	976.90	982.12	977.98	982.13	0.000037	0.50	70.79	23.72	0.04
Reach-1	20	40 cfs	40.00	976.90	983.40	978.13	983.40	0.000026	0.49	102.20	25.35	0.04
Reach-1	20	50 cfs	50.00	976.90	984.22	978.27	984.23	0.000024	0.53	123.46	47.30	0.04
Reach-1	17	2 cfs	2.00	976.90	977.34	977.26	977.40	0.025303	1.91	1.05	4.66	0.71
Reach-1	17	5 cfs	5.00	976.90	977.47	977.45	977.60	0.038758	2.93	1.71	5.47	0.92
Reach-1	17	10 cfs	10.00	976.90	978.40		978.42	0.001635	1.10	9.06	11.30	0.22
Reach-1	17	15 cfs	15.00	976.90	979.38		979.39	0.000289	0.71	21.11	13.55	0.10
Reach-1	17	20 cfs	20.00	976.90	980.32		980.32	0.000114	0.58	35.45	16.98	0.07
Reach-1	17	30 cfs	30.00	976.90	982.12		982.13	0.000035	0.46	75.43	24.89	0.04
Reach-1	17	40 cfs	40.00	976.90	983.40		983.40	0.000023	0.45	107.50	25.31	0.03
Reach-1	17	50 cfs	50.00	976.90	984.22		984.23	0.000022	0.48	128.44	25.57	0.03
Reach-1	0	2 cfs	2.00	976.50	976.85	976.82	976.91	0.036867	2.08	0.96	5.00	0.84
Reach-1	0	5 cfs	5.00	976.50	977.49	976.98	977.50	0.001338	0.86	5.79	9.22	0.19
Reach-1	0	10 cfs	10.00	976.50	978.40	977.15	978.41	0.000306	0.64	15.72	12.55	0.10
Reach-1	0	15 cfs	15.00	976.50	979.38	977.26	979.38	0.000119	0.51	29.62	15.95	0.07
Reach-1	0	20 cfs	20.00	976.50	980.32	977.37	980.32	0.000062	0.43	46.04	18.86	0.05
Reach-1	0	30 cfs	30.00	976.50	982.12	977.56	982.12	0.000026	0.36	84.25	23.64	0.03
Reach-1	0	40 cfs	40.00	976.50	983.40	977.71	983.40	0.000019	0.34	116.61	93.74	0.03
Reach-1	0	50 cfs	50.00	976.50	984.22	977.86	984.23	0.000017	0.36	139.92	106.13	0.03

Profile Output Table - Standard Table 1
HEC-RAS Plan: Post_Apr14_BseF River: RIVER-1 Reach: Reach-1

Rivers = 1
Hydraulic Reaches = 1
River Stations = 51
Plans = 1
Profiles = 5

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	4623	2yr low HSPF	60.00	987.60	992.59	988.91	992.59	0.000010	0.24	253.52	183.52	0.03
Reach-1	4623	2yr high HSPF	60.00	987.60	992.57	988.91	992.58	0.000010	0.24	252.34	183.30	0.03
Reach-1	4623	10yr FEMA	275.00	987.60	993.18	990.18	993.19	0.000097	0.88	321.36	220.34	0.09
Reach-1	4623	50yr FEMA	600.00	987.60	994.12	990.91	994.14	0.000172	1.40	512.22	347.49	0.12
Reach-1	4623	100yr FEMA	700.00	987.60	994.95	991.09	994.97	0.000106	1.25	731.15	381.41	0.10
Reach-1	4381	2yr low HSPF	60.00	987.08	992.58	988.15	992.58	0.000017	0.32	191.48	177.41	0.04
Reach-1	4381	2yr high HSPF	60.00	987.08	992.57	988.15	992.57	0.000017	0.33	190.47	177.02	0.04
Reach-1	4381	10yr FEMA	275.00	987.08	993.14	989.40	993.16	0.000177	1.20	245.81	193.03	0.12
Reach-1	4381	50yr FEMA	600.00	987.08	994.07	990.71	994.10	0.000194	1.49	552.94	207.50	0.13
Reach-1	4381	100yr FEMA	700.00	987.08	994.93	991.04	994.95	0.000118	1.32	732.24	213.69	0.10
Reach-1	4212	2yr low HSPF	60.00	986.80	992.58		992.58	0.000008	0.36	250.69	75.60	0.03
Reach-1	4212	2yr high HSPF	60.00	986.80	992.57		992.57	0.000008	0.36	249.85	75.50	0.03
Reach-1	4212	10yr FEMA	275.00	986.80	993.12		993.14	0.000110	1.42	292.65	80.66	0.10
Reach-1	4212	50yr FEMA	600.00	986.80	993.99		994.06	0.000290	2.54	366.50	88.71	0.17
Reach-1	4212	100yr FEMA	700.00	986.80	994.85		994.91	0.000241	2.51	448.17	101.87	0.16
Reach-1	4201	2yr low HSPF	60.00	986.80	992.58	988.36	992.58	0.000014	0.43	201.44	71.46	0.03
Reach-1	4201	2yr high HSPF	60.00	986.80	992.57	988.36	992.57	0.000014	0.43	200.64	71.35	0.04
Reach-1	4201	10yr FEMA	275.00	986.80	993.10	989.84	993.14	0.000183	1.70	240.18	76.28	0.13
Reach-1	4201	50yr FEMA	600.00	986.80	993.96	991.29	994.05	0.000454	2.95	308.50	83.48	0.21
Reach-1	4201	100yr FEMA	700.00	986.80	994.83	991.67	994.91	0.000358	2.86	388.90	115.57	0.19
Reach-1	4196		Culvert									
Reach-1	3897	2yr low HSPF	60.00	983.70	990.20	984.44	990.20	0.000007	0.33	192.49	905.76	0.02
Reach-1	3897	2yr high HSPF	60.00	983.70	990.19	984.44	990.19	0.000007	0.34	192.03	905.15	0.02
Reach-1	3897	10yr FEMA	275.00	983.70	991.33	985.59	991.36	0.000074	1.27	251.66	1001.94	0.09
Reach-1	3897	50yr FEMA	600.00	983.70	992.76	986.75	992.82	0.000151	2.06	401.11	1367.63	0.13
Reach-1	3897	100yr FEMA	700.00	983.70	994.81	987.02	994.81	0.000000	0.13	9242.41	1449.28	0.01
Reach-1	3796	2yr low HSPF	60.00	983.60	990.20	984.51	990.20	0.000000	0.02	4024.41	1569.00	0.00
Reach-1	3796	2yr high HSPF	60.00	983.60	990.19	984.51	990.19	0.000000	0.02	4013.07	1563.02	0.00
Reach-1	3796	10yr FEMA	275.00	983.60	991.35	985.54	991.35	0.000000	0.08	5235.68	1749.82	0.01
Reach-1	3796	50yr FEMA	600.00	983.60	992.80	985.94	992.80	0.000000	0.10	9760.34	1805.24	0.01
Reach-1	3796	100yr FEMA	700.00	983.60	994.81	986.05	994.81	0.000000	0.08	13394.18	1812.50	0.00
Reach-1	3681	2yr low HSPF	60.00	983.30	990.20	984.23	990.20	0.000000	0.05	2260.03	1088.75	0.00

Reach-1	3681	2yr high HSPF	60.00	983.30	990.19	984.23	990.19	0.000000	0.05	2251.94	1087.80	0.00
Reach-1	3681	10yr FEMA	275.00	983.30	991.35	985.48	991.35	0.000001	0.17	3164.13	1250.21	0.01
Reach-1	3681	50yr FEMA	600.00	983.30	992.80	986.95	992.80	0.000002	0.25	4479.88	1601.94	0.02
Reach-1	3681	100yr FEMA	700.00	983.30	994.81	986.99	994.81	0.000000	0.14	10014.99	1792.38	0.01
Reach-1	3491	2yr low HSPF	60.00	983.10	990.20	983.99	990.20	0.000000	0.06	1993.34	658.66	0.00
Reach-1	3491	2yr high HSPF	60.00	983.10	990.19	983.99	990.19	0.000000	0.06	1986.41	657.80	0.00
Reach-1	3491	10yr FEMA	275.00	983.10	991.35	985.24	991.35	0.000002	0.19	2730.23	741.45	0.01
Reach-1	3491	50yr FEMA	600.00	983.10	992.80	986.52	992.80	0.000003	0.30	3702.70	840.86	0.02
Reach-1	3491	100yr FEMA	700.00	983.10	994.81	986.60	994.81	0.000001	0.25	5292.61	1101.47	0.01
Reach-1	3353	2yr low HSPF	60.00	983.00	990.20	983.84	990.20	0.000000	0.07	1728.28	503.63	0.00
Reach-1	3353	2yr high HSPF	60.00	983.00	990.19	983.84	990.19	0.000000	0.07	1722.73	501.47	0.00
Reach-1	3353	10yr FEMA	275.00	983.00	991.35	985.10	991.35	0.000002	0.22	2340.16	553.94	0.01
Reach-1	3353	50yr FEMA	600.00	983.00	992.80	986.75	992.80	0.000004	0.34	3171.43	591.97	0.02
Reach-1	3353	100yr FEMA	700.00	983.00	994.81	986.89	994.81	0.000002	0.28	4424.13	696.70	0.02
Reach-1	3200	2yr low HSPF	60.00	982.80	990.20	983.68	990.20	0.000000	0.07	1685.30	467.83	0.00
Reach-1	3200	2yr high HSPF	60.00	982.80	990.19	983.68	990.19	0.000000	0.07	1680.18	463.46	0.00
Reach-1	3200	10yr FEMA	275.00	982.80	991.35	984.94	991.35	0.000002	0.22	2234.74	481.95	0.01
Reach-1	3200	50yr FEMA	600.00	982.80	992.80	986.53	992.80	0.000004	0.36	2941.27	520.76	0.02
Reach-1	3200	100yr FEMA	700.00	982.80	994.81	986.67	994.81	0.000002	0.31	4177.64	739.55	0.02
Reach-1	3061	2yr low HSPF	60.00	982.70	990.20	983.55	990.20	0.000000	0.07	1691.30	467.00	0.00
Reach-1	3061	2yr high HSPF	60.00	982.70	990.19	983.55	990.19	0.000000	0.07	1686.16	464.74	0.00
Reach-1	3061	10yr FEMA	275.00	982.70	991.35	984.80	991.35	0.000002	0.22	2238.90	499.72	0.01
Reach-1	3061	50yr FEMA	600.00	982.70	992.80	985.94	992.80	0.000004	0.36	3099.08	681.26	0.02
Reach-1	3061	100yr FEMA	700.00	982.70	994.81	986.77	994.81	0.000002	0.28	4570.86	783.03	0.02
Reach-1	2970	2yr low HSPF	60.00	982.50	990.20	983.37	990.20	0.000000	0.07	1573.75	558.09	0.00
Reach-1	2970	2yr high HSPF	60.00	982.50	990.19	983.37	990.19	0.000000	0.07	1568.81	549.56	0.00
Reach-1	2970	10yr FEMA	275.00	982.50	991.35	984.63	991.35	0.000002	0.22	2352.95	726.78	0.01
Reach-1	2970	50yr FEMA	600.00	982.50	992.80	985.77	992.80	0.000003	0.33	3408.56	730.09	0.02
Reach-1	2970	100yr FEMA	700.00	982.50	994.81	986.05	994.81	0.000002	0.26	4903.37	769.43	0.01
Reach-1	2897	2yr low HSPF	60.00	984.20	990.20	985.38	990.20	0.000000	0.06	1499.81	610.01	0.01
Reach-1	2897	2yr high HSPF	60.00	984.20	990.19	985.38	990.19	0.000000	0.06	1494.12	585.03	0.01
Reach-1	2897	10yr FEMA	275.00	984.20	991.35	986.15	991.35	0.000002	0.20	2344.43	778.77	0.01
Reach-1	2897	50yr FEMA	600.00	984.20	992.80	986.78	992.80	0.000003	0.29	3498.74	812.35	0.02
Reach-1	2897	100yr FEMA	700.00	984.20	994.81	986.89	994.81	0.000001	0.22	5165.07	835.42	0.01
Reach-1	2827	2yr low HSPF	60.00	985.60	990.20	986.91	990.20	0.000038	0.61	113.98	278.06	0.06
Reach-1	2827	2yr high HSPF	60.00	985.60	990.18	986.91	990.19	0.000038	0.61	113.39	277.09	0.06
Reach-1	2827	10yr FEMA	275.00	985.60	991.29	987.99	991.34	0.000279	1.96	209.67	606.28	0.16
Reach-1	2827	50yr FEMA	600.00	985.60	992.80	989.11	992.80	0.000012	0.47	2450.74	816.92	0.03
Reach-1	2827	100yr FEMA	700.00	985.60	994.81	989.42	994.81	0.000003	0.30	4241.38	927.30	0.02
Reach-1	2822		Culvert									
Reach-1	2778	2yr low HSPF	60.00	983.80	989.43	985.37	989.43	0.000055	0.60	125.50	359.02	0.05
Reach-1	2778	2yr high HSPF	60.00	983.80	989.43	985.37	989.43	0.000055	0.60	125.40	358.97	0.05

Reach-1	2778	10yr FEMA	275.00	983.80	990.98	986.72	991.00	0.000239	1.41	321.78	525.10	0.11
Reach-1	2778	50yr FEMA	600.00	983.80	992.79	988.04	992.79	0.000017	0.45	2214.98	800.27	0.03
Reach-1	2778	100yr FEMA	700.00	983.80	994.80	988.40	994.80	0.000004	0.28	3836.80	819.54	0.02
Reach-1	2767.99*	2yr low HSPF	60.00	983.86	989.43	985.42	989.43	0.000027	0.41	292.49	350.99	0.04
Reach-1	2767.99*	2yr high HSPF	60.00	983.86	989.43	985.42	989.43	0.000027	0.42	292.03	350.92	0.04
Reach-1	2767.99*	10yr FEMA	275.00	983.86	991.00	986.80	991.00	0.000036	0.55	960.54	545.84	0.04
Reach-1	2767.99*	50yr FEMA	600.00	983.86	992.79	988.17	992.79	0.000018	0.48	2167.58	787.75	0.03
Reach-1	2767.99*	100yr FEMA	700.00	983.86	994.80	989.29	994.80	0.000005	0.29	3767.05	811.39	0.02
Reach-1	2655	2yr low HSPF	60.00	984.26	989.43	985.89	989.43	0.000007	0.29	349.95	236.42	0.02
Reach-1	2655	2yr high HSPF	60.00	984.26	989.43	985.89	989.43	0.000007	0.29	349.77	236.34	0.02
Reach-1	2655	10yr FEMA	275.00	984.26	990.99	986.98	990.99	0.000021	0.63	885.68	302.22	0.05
Reach-1	2655	50yr FEMA	600.00	984.26	992.79	987.53	992.79	0.000029	0.88	1701.15	577.78	0.06
Reach-1	2655	100yr FEMA	700.00	984.26	994.80	987.67	994.80	0.000008	0.53	3028.65	711.25	0.03
Reach-1	2572	2yr low HSPF	60.00	983.80	989.43	985.31	989.43	0.000005	0.23	415.65	142.50	0.02
Reach-1	2572	2yr high HSPF	60.00	983.80	989.43	985.31	989.43	0.000005	0.23	415.45	142.49	0.02
Reach-1	2572	10yr FEMA	275.00	983.80	990.99	986.76	990.99	0.000028	0.67	706.93	309.90	0.05
Reach-1	2572	50yr FEMA	600.00	983.80	992.78	987.29	992.79	0.000037	0.92	1497.51	508.35	0.06
Reach-1	2572	100yr FEMA	700.00	983.80	994.80	987.42	994.80	0.000010	0.57	2674.12	641.92	0.03
Reach-1	2490	2yr low HSPF	60.00	982.20	989.43	983.68	989.43	0.000009	0.42	150.90	95.53	0.03
Reach-1	2490	2yr high HSPF	60.00	982.20	989.42	983.68	989.43	0.000009	0.42	150.87	95.52	0.03
Reach-1	2490	10yr FEMA	275.00	982.20	990.98	984.98	990.99	0.000042	1.02	517.65	244.71	0.07
Reach-1	2490	50yr FEMA	600.00	982.20	992.78	986.07	992.78	0.000037	1.11	1448.32	635.31	0.06
Reach-1	2490	100yr FEMA	700.00	982.20	994.80	986.38	994.80	0.000008	0.61	2737.96	637.30	0.03
Reach-1	2480		Culvert									
Reach-1	2366	2yr low HSPF	60.00	984.30	988.88	985.39	988.89	0.000060	0.80	79.65	199.80	0.07
Reach-1	2366	2yr high HSPF	60.00	984.30	988.88	985.39	988.89	0.000060	0.80	79.62	199.73	0.07
Reach-1	2366	10yr FEMA	275.00	984.30	988.94	986.83	989.14	0.001191	3.59	80.97	211.86	0.31
Reach-1	2366	50yr FEMA	600.00	984.30	992.76	988.17	992.76	0.000015	0.63	2695.32	1139.55	0.04
Reach-1	2366	100yr FEMA	700.00	984.30	994.80	988.49	994.80	0.000003	0.32	5090.01	1203.40	0.02
Reach-1	2269	2yr low HSPF	60.00	983.80	988.88	985.29	988.89	0.000038	0.69	119.34	550.82	0.06
Reach-1	2269	2yr high HSPF	60.00	983.80	988.88	985.29	988.89	0.000038	0.69	119.29	550.75	0.06
Reach-1	2269	10yr FEMA	275.00	983.80	988.91	986.76	989.02	0.000775	3.12	120.27	552.15	0.26
Reach-1	2269	50yr FEMA	600.00	983.80	992.76	987.83	992.76	0.000004	0.34	3611.19	980.21	0.02
Reach-1	2269	100yr FEMA	700.00	983.80	994.80	988.10	994.80	0.000001	0.23	6075.10	1089.80	0.01
Reach-1	2201	2yr low HSPF	60.00	983.60	988.88	985.08	988.88	0.000026	0.56	144.37	394.37	0.05
Reach-1	2201	2yr high HSPF	60.00	983.60	988.88	985.08	988.88	0.000026	0.56	144.31	394.30	0.05
Reach-1	2201	10yr FEMA	275.00	983.60	988.89	986.63	988.97	0.000535	2.58	144.80	394.86	0.22
Reach-1	2201	50yr FEMA	600.00	983.60	992.76	987.56	992.76	0.000006	0.42	3042.62	891.14	0.03
Reach-1	2201	100yr FEMA	700.00	983.60	994.80	987.78	994.80	0.000002	0.27	5301.87	1038.26	0.01
Reach-1	2161	2yr low HSPF	60.00	981.00	988.88	982.94	988.88	0.000008	0.44	462.08	518.27	0.03
Reach-1	2161	2yr high HSPF	60.00	981.00	988.88	982.94	988.88	0.000009	0.44	461.42	518.19	0.03
Reach-1	2161	10yr FEMA	275.00	981.00	988.91	984.80	988.94	0.000177	2.01	476.08	566.89	0.13

Reach-1	2161	50yr FEMA	600.00	981.00	992.76	988.29	992.76	0.000004	0.36	3583.24	890.29	0.02
Reach-1	2161	100yr FEMA	700.00	981.00	994.80	988.63	994.80	0.000002	0.25	5612.87	1033.26	0.01
Reach-1	2160		Culvert									
Reach-1	1570	2yr low HSPF	60.00	983.40	988.88	984.78	988.88	0.000001	0.13	1142.37	852.75	0.01
Reach-1	1570	2yr high HSPF	60.00	983.40	988.88	984.78	988.88	0.000001	0.14	1141.45	852.67	0.01
Reach-1	1570	10yr FEMA	275.00	983.40	988.92	986.61	988.92	0.000024	0.60	1163.23	861.10	0.05
Reach-1	1570	50yr FEMA	600.00	983.40	992.76	988.57	992.76	0.000003	0.32	3480.03	1060.07	0.02
Reach-1	1570	100yr FEMA	700.00	983.40	994.76	988.77	994.76	0.000001	0.12	7755.70	1442.89	0.01
Reach-1	1528	2yr low HSPF	60.00	983.40	988.88	984.56	988.88	0.000001	0.09	1286.10	884.52	0.01
Reach-1	1528	2yr high HSPF	60.00	983.40	988.88	984.56	988.88	0.000001	0.09	1285.13	884.45	0.01
Reach-1	1528	10yr FEMA	275.00	983.40	988.92	985.86	988.92	0.000017	0.40	1307.92	891.11	0.04
Reach-1	1528	50yr FEMA	600.00	983.40	992.76	987.06	992.76	0.000003	0.22	3802.94	983.69	0.02
Reach-1	1528	100yr FEMA	700.00	983.40	994.76	987.36	994.76	0.000001	0.13	7478.67	1115.40	0.01
Reach-1	1464	2yr low HSPF	60.00	984.00	988.87	985.24	988.88	0.000071	0.97	62.09	951.37	0.08
Reach-1	1464	2yr high HSPF	60.00	984.00	988.88	985.24	988.88	0.000000	0.07	1669.71	952.29	0.01
Reach-1	1464	10yr FEMA	275.00	984.00	988.52	986.71	988.88	0.001961	4.81	57.21	921.06	0.42
Reach-1	1464	50yr FEMA	600.00	984.00	992.76	988.27	992.76	0.000002	0.24	4097.91	1020.47	0.01
Reach-1	1464	100yr FEMA	700.00	984.00	994.76	988.69	994.76	0.000001	0.12	8299.99	1078.31	0.01
Reach-1	1460		Culvert									
Reach-1	1390	2yr low HSPF	60.00	984.00	985.16	985.16	985.27	0.012887	3.26	32.08	147.00	0.64
Reach-1	1390	2yr high HSPF	60.00	984.00	988.00	985.16	988.00	0.000001	0.06	1832.07	1075.61	0.01
Reach-1	1390	10yr FEMA	275.00	984.00	988.51	985.49	988.51	0.000005	0.19	2370.55	1076.23	0.02
Reach-1	1390	50yr FEMA	600.00	984.00	992.76	985.69	992.76	0.000001	0.12	6828.94	1094.60	0.01
Reach-1	1390	100yr FEMA	700.00	984.00	994.76	985.83	994.76	0.000000	0.08	9293.42	1148.17	0.00
Reach-1	1320	2yr low HSPF	60.00	983.40	985.04	984.18	985.05	0.000465	0.70	118.72	421.94	0.12
Reach-1	1320	2yr high HSPF	60.00	983.40	988.00	984.18	988.00	0.000000	0.04	2234.18	877.58	0.00
Reach-1	1320	10yr FEMA	275.00	983.40	988.51	984.77	988.51	0.000003	0.14	2684.24	878.70	0.01
Reach-1	1320	50yr FEMA	600.00	983.40	992.76	985.14	992.76	0.000001	0.12	6495.55	939.55	0.01
Reach-1	1320	100yr FEMA	700.00	983.40	994.76	985.21	994.76	0.000000	0.10	8385.85	955.48	0.01
Reach-1	1110	2yr low HSPF	60.00	982.00	985.02	983.35	985.02	0.000057	0.39	227.79	333.46	0.05
Reach-1	1110	2yr high HSPF	60.00	982.00	988.00	983.35	988.00	0.000000	0.04	2392.91	935.89	0.00
Reach-1	1110	10yr FEMA	275.00	982.00	988.51	984.28	988.51	0.000002	0.15	2872.46	937.06	0.01
Reach-1	1110	50yr FEMA	600.00	982.00	992.76	984.58	992.76	0.000001	0.11	7347.67	1092.23	0.01
Reach-1	1110	100yr FEMA	700.00	982.00	994.76	984.66	994.76	0.000000	0.10	9577.30	1144.53	0.01
Reach-1	1008	2yr low HSPF	60.00	981.50	985.02	981.58	985.02	0.000026	0.28	329.25	275.33	0.03
Reach-1	1008	2yr high HSPF	60.00	981.50	988.00	981.58	988.00	0.000000	0.04	2306.66	913.13	0.00
Reach-1	1008	10yr FEMA	275.00	981.50	988.51	982.62	988.51	0.000002	0.16	2781.24	976.47	0.01
Reach-1	1008	50yr FEMA	600.00	981.50	992.76	983.44	992.76	0.000001	0.12	7180.93	1078.60	0.01
Reach-1	1008	100yr FEMA	700.00	981.50	994.76	983.61	994.76	0.000000	0.10	9408.67	1142.20	0.01
Reach-1	943	2yr low HSPF	60.00	981.10	985.01	981.96	985.02	0.000014	0.25	353.31	308.08	0.03
Reach-1	943	2yr high HSPF	60.00	981.10	988.00	981.96	988.00	0.000000	0.05	1925.03	597.64	0.00

Reach-1	943	10yr FEMA	275.00	981.10	988.51	982.92	988.51	0.000003	0.19	2231.57	600.86	0.01
Reach-1	943	50yr FEMA	600.00	981.10	992.76	983.82	992.76	0.000001	0.17	5090.05	700.12	0.01
Reach-1	943	100yr FEMA	700.00	981.10	994.76	983.85	994.76	0.000001	0.15	6516.51	773.52	0.01
Reach-1	930	2yr low HSPF	60.00	982.20	985.01	983.26	985.02	0.000033	0.31	271.60	261.23	0.04
Reach-1	930	2yr high HSPF	60.00	982.20	988.00	983.26	988.00	0.000000	0.05	1744.93	557.20	0.00
Reach-1	930	10yr FEMA	275.00	982.20	988.51	983.83	988.51	0.000004	0.18	2030.26	558.66	0.01
Reach-1	930	50yr FEMA	600.00	982.20	992.76	984.27	992.76	0.000001	0.17	4720.81	686.33	0.01
Reach-1	930	100yr FEMA	700.00	982.20	994.76	984.36	994.76	0.000001	0.15	6109.21	735.76	0.01
Reach-1	923	2yr low HSPF	60.00	981.00	985.01	982.23	985.02	0.000021	0.30	295.14	197.05	0.03
Reach-1	923	2yr high HSPF	60.00	981.00	988.00	982.23	988.00	0.000000	0.06	1641.96	539.10	0.00
Reach-1	923	10yr FEMA	275.00	981.00	988.51	983.24	988.51	0.000004	0.22	1917.82	539.97	0.02
Reach-1	923	50yr FEMA	600.00	981.00	992.76	983.78	992.76	0.000001	0.19	4458.71	683.25	0.01
Reach-1	923	100yr FEMA	700.00	981.00	994.76	984.10	994.76	0.000001	0.16	5833.26	691.60	0.01
Reach-1	814	2yr low HSPF	60.00	980.10	985.01	981.53	985.01	0.000050	0.56	238.09	274.17	0.05
Reach-1	814	2yr high HSPF	60.00	980.10	988.00	981.53	988.00	0.000000	0.07	1554.16	514.54	0.00
Reach-1	814	10yr FEMA	275.00	980.10	988.51	983.84	988.51	0.000005	0.28	1817.32	515.83	0.02
Reach-1	814	50yr FEMA	600.00	980.10	992.76	984.68	992.76	0.000002	0.22	4130.06	610.26	0.01
Reach-1	814	100yr FEMA	700.00	980.10	994.76	984.79	994.76	0.000001	0.19	5417.34	626.20	0.01
Reach-1	686	2yr low HSPF	60.00	978.80	985.01	980.63	985.01	0.000014	0.33	426.57	495.51	0.03
Reach-1	686	2yr high HSPF	60.00	978.80	988.00	980.63	988.00	0.000000	0.05	2125.57	545.80	0.00
Reach-1	686	10yr FEMA	275.00	978.80	988.51	982.95	988.51	0.000003	0.20	2404.87	548.16	0.01
Reach-1	686	50yr FEMA	600.00	978.80	992.76	983.70	992.76	0.000001	0.19	4890.86	655.28	0.01
Reach-1	686	100yr FEMA	700.00	978.80	994.76	983.95	994.76	0.000001	0.17	6237.08	683.40	0.01
Reach-1	623	2yr low HSPF	60.00	979.10	985.01	980.83	985.01	0.000012	0.31	456.38	258.80	0.02
Reach-1	623	2yr high HSPF	60.00	979.10	988.00	980.83	988.00	0.000000	0.07	2061.75	686.91	0.00
Reach-1	623	10yr FEMA	275.00	979.10	988.51	982.97	988.51	0.000003	0.24	2413.16	690.01	0.01
Reach-1	623	50yr FEMA	600.00	979.10	992.76	983.60	992.76	0.000001	0.19	5578.16	824.03	0.01
Reach-1	623	100yr FEMA	700.00	979.10	994.76	983.73	994.76	0.000001	0.16	7230.32	829.77	0.01
Reach-1	496	2yr low HSPF	60.00	978.90	985.00	980.44	985.01	0.000011	0.32	426.54	215.25	0.02
Reach-1	496	2yr high HSPF	60.00	978.90	988.00	980.44	988.00	0.000001	0.10	1227.90	299.30	0.01
Reach-1	496	10yr FEMA	275.00	978.90	988.51	982.19	988.51	0.000008	0.38	1381.03	301.86	0.02
Reach-1	496	50yr FEMA	600.00	978.90	992.76	983.74	992.76	0.000005	0.38	2907.22	489.91	0.02
Reach-1	496	100yr FEMA	700.00	978.90	994.75	983.88	994.76	0.000003	0.33	3888.90	491.50	0.01
Reach-1	367	2yr low HSPF	60.00	979.10	985.00	980.37	985.00	0.000004	0.18	552.92	242.13	0.01
Reach-1	367	2yr high HSPF	60.00	979.10	988.00	980.37	988.00	0.000000	0.07	1335.95	279.44	0.00
Reach-1	367	10yr FEMA	275.00	979.10	988.51	981.39	988.51	0.000004	0.27	1478.39	280.52	0.02
Reach-1	367	50yr FEMA	600.00	979.10	992.76	982.59	992.76	0.000003	0.30	2690.37	292.09	0.01
Reach-1	367	100yr FEMA	700.00	979.10	994.75	982.70	994.76	0.000002	0.29	3274.99	651.40	0.01
Reach-1	237	2yr low HSPF	60.00	978.30	985.00	979.70	985.00	0.000003	0.18	602.01	224.26	0.01
Reach-1	237	2yr high HSPF	60.00	978.30	988.00	979.70	988.00	0.000000	0.08	1330.74	256.46	0.00
Reach-1	237	10yr FEMA	275.00	978.30	988.51	981.22	988.51	0.000005	0.31	1461.25	257.36	0.02
Reach-1	237	50yr FEMA	600.00	978.30	992.76	981.89	992.76	0.000004	0.37	2571.63	265.61	0.02
Reach-1	237	100yr FEMA	700.00	978.30	994.75	982.03	994.75	0.000003	0.35	3106.19	433.57	0.02

Reach-1	139	2yr low HSPF	60.00	977.70	985.00	978.42	985.00	0.000003	0.18	584.65	230.98	0.01
Reach-1	139	2yr high HSPF	60.00	977.70	988.00	978.42	988.00	0.000000	0.08	1317.36	259.28	0.00
Reach-1	139	10yr FEMA	275.00	977.70	988.51	979.46	988.51	0.000005	0.34	1449.15	260.32	0.02
Reach-1	139	50yr FEMA	600.00	977.70	992.75	980.49	992.76	0.000004	0.40	2571.50	268.18	0.02
Reach-1	139	100yr FEMA	700.00	977.70	994.75	980.75	994.75	0.000003	0.38	3110.94	550.69	0.02
Reach-1	85	2yr low HSPF	60.00	978.30	985.00	979.33	985.00	0.000005	0.22	489.28	234.14	0.02
Reach-1	85	2yr high HSPF	60.00	978.30	988.00	979.33	988.00	0.000001	0.09	1239.66	275.50	0.01
Reach-1	85	10yr FEMA	275.00	978.30	988.51	980.32	988.51	0.000008	0.39	1379.54	276.62	0.02
Reach-1	85	50yr FEMA	600.00	978.30	992.75	981.21	992.76	0.000006	0.43	2574.11	322.38	0.02
Reach-1	85	100yr FEMA	700.00	978.30	994.75	981.45	994.75	0.000004	0.41	3184.29	365.65	0.02
Reach-1	43	2yr low HSPF	60.00	978.50	985.00	979.63	985.00	0.000006	0.24	448.48	225.55	0.02
Reach-1	43	2yr high HSPF	60.00	978.50	988.00	979.63	988.00	0.000001	0.10	1239.23	299.95	0.01
Reach-1	43	10yr FEMA	275.00	978.50	988.51	980.60	988.51	0.000009	0.41	1392.00	304.16	0.02
Reach-1	43	50yr FEMA	600.00	978.50	992.75	981.49	992.76	0.000006	0.44	2767.34	348.39	0.02
Reach-1	43	100yr FEMA	700.00	978.50	994.75	981.72	994.75	0.000004	0.41	3487.62	364.30	0.02
Reach-1	36	2yr low HSPF	60.00	977.10	985.00		985.00	0.000007	0.27	377.49	170.93	0.02
Reach-1	36	2yr high HSPF	60.00	977.10	988.00		988.00	0.000001	0.12	992.14	221.53	0.01
Reach-1	36	10yr FEMA	275.00	977.10	988.51		988.51	0.000013	0.49	1104.36	222.65	0.03
Reach-1	36	50yr FEMA	600.00	977.10	992.75		992.76	0.000010	0.55	2147.00	256.77	0.03
Reach-1	36	100yr FEMA	700.00	977.10	994.75		994.75	0.000007	0.51	2671.63	269.02	0.02
Reach-1	20	2yr low HSPF	60.00	976.90	985.00	978.40	985.00	0.000023	0.55	143.98	88.17	0.04
Reach-1	20	2yr high HSPF	60.00	976.90	988.00	978.40	988.00	0.000002	0.23	692.66	206.33	0.01
Reach-1	20	10yr FEMA	275.00	976.90	988.50	980.25	988.51	0.000036	0.89	796.43	207.80	0.05
Reach-1	20	50yr FEMA	600.00	976.90	992.75	981.85	992.75	0.000019	0.82	1761.82	235.96	0.04
Reach-1	20	100yr FEMA	700.00	976.90	994.75	982.26	994.75	0.000013	0.73	2244.05	246.13	0.03
Reach-1	17	2yr low HSPF	60.00	976.90	985.00		985.00	0.000021	0.50	148.38	25.80	0.03
Reach-1	17	2yr high HSPF	60.00	976.90	988.00		988.00	0.000004	0.28	444.81	187.00	0.02
Reach-1	17	10yr FEMA	275.00	976.90	988.49		988.51	0.000060	1.12	539.70	196.16	0.06
Reach-1	17	50yr FEMA	600.00	976.90	992.75		992.75	0.000029	0.98	1421.43	212.10	0.04
Reach-1	17	100yr FEMA	700.00	976.90	994.75		994.75	0.000019	0.87	1851.04	221.69	0.04
Reach-1	0	2yr low HSPF	60.00	976.50	985.00	977.97	985.00	0.000016	0.37	167.36	125.60	0.03
Reach-1	0	2yr high HSPF	60.00	976.50	988.00	977.97	988.00	0.000001	0.14	847.33	186.17	0.01
Reach-1	0	10yr FEMA	275.00	976.50	988.50	979.64	988.50	0.000019	0.56	940.66	187.25	0.03
Reach-1	0	50yr FEMA	600.00	976.50	992.75	981.10	992.75	0.000015	0.64	1757.00	195.80	0.03
Reach-1	0	100yr FEMA	700.00	976.50	994.75	981.45	994.75	0.000011	0.60	2148.60	195.80	0.03

Appendix G

Miscellaneous Design Calculations

ARCADIS

Brook and Sanitary Sewer Realignment Structural Design Calculations

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design
10"/12"/14" Lead

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Objective: To determine the capacity of proposed helical pile. Helical piles required for support of sanitary sewer.

Reference: Chance Product Catalog

Chance Design Guidelines (see attached)

Loading: Vertical Pile Load, Fv $Fv := 36000 \cdot lb$ per Structural Group

Stratigraphy:

Stratigraphy based upon observations from CPT soundings and historic borings (B-101 and B-102). Stratigaphy shown represents shallowest depth to bearing stratum (sand), most conservative condition.

_____	Existing Grade, El. 987 (in Brook)
Fill/Granular Brook Deposits	
----------	El. 983 +/-
Soft Clay, Clayey Silt to Organic Silt	
_____	El. 966 +/-
Medium Dense to Dense Sand	

Soil Properties: Piles to bear within Medium Dense to Dense Sand unit.

Fill

El. Top of Fill/Granular Brook Dep $Elf := 987 \cdot ft$

Unit Weight, γ_F $\gamma_F := 120 \cdot \frac{lb}{ft^3}$

Clay/Silt

El. Top of Clay/Silt $Elcs := 983 \cdot ft$

Unit Weight, γ_{CS} $\gamma_{CS} := 115 \cdot \frac{lb}{ft^3}$

Medium Dense to Dense Sand:

El. Top of Sand $Els := 966ft$ (shallowest at CPT-04A)

N values in Sand from SPT Borings 101 and 102: range from 10 to 28, with an average of 18 bpf

Interpreted N values from CPT soundings: range from 15 to greater than 65, with typical values between 16 and 20

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design
10"/12"/14" Lead

CALCULATION BY: MSG DATE: 3/25/14
CHECKED BY: EJL DATE: 3/31/14

Unit Weight, γ_S $\gamma_S := 120 \cdot \frac{lb}{ft^3}$

Internal Friction Angle, ϕ_S $\phi_S := 35 \cdot deg$ Cohesion, c_S $c_S := 0$

Note: Friction Angle estimated from CPT data between 37 and 39 degrees.

Water:

Unit Weight of Water, γ_w $\gamma w := 62.4 \frac{lb}{ft^3}$

Assume water surface at grade.

Helical Pile Dimensions and Properties:

Top Helix:

Diameter, Dt: $Dt := 14 \cdot in$ Area, At: $At := 1.049 \cdot ft^2$ (per Chance manual)

Radius, Rt: $Rt := \frac{Dt}{2}$ $Rt = 0.58\,ft$

Middle Helix:

Diameter, Dm: $Dm := 12 \cdot in$ Area, Am: $Am := 0.771 \cdot ft^2$ (per Chance manual)

Radius, Rm: $Rm := \frac{Dm}{2}$ $Rm = 0.5\,ft$

Bottom Helix:

Diameter, Db: $Db := 10 \cdot in$ Area, Ab: $Ab := 0.531 \cdot ft^2$ (per Chance manual)

Radius, Rb: $Rb := \frac{Db}{2}$ $Rb = 0.42\,ft$

Average Helix Radius, R: $R := \frac{Rt + Rm + Rb}{3}$ $R = 0.5\,ft$

Shaft Diameter, d: $d := 2.88 \cdot in$

Helix Spacing, S: $S := 3 \cdot Dm$ $S = 3\,ft$

Total Spacing Between all Helices, L: $L := 2 \cdot S$ $L = 6\,ft$

Pile Spacing:

Parallel to Pipe: 14 ft at pipe joints

Perpendicular to Pipe: $4 \cdot Dt = 4.67\,ft$ say 5 ft. (range of spacing recommendations vary from 3xD to 5xD)

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design
10"/12"/14" Lead

CALCULATION BY: MSG DATE: 3/25/14
CHECKED BY: EJL DATE: 3/31/14

Estimate Ultimate Bearing Capacity, $q_{ult,}$ by "Individual Bearing" Method:

Capacity of a pier with multiple helixes developed from the capacity of each blade. Each helical blade displacing the soil is the assumed failure mechanism. Capacity of the blade is projected based on classic bearing capacity equation.

Bearing Capacity Factor, Nq: $Nq := 0.5\left[12\cdot\left(\phi_S\right)\right]^{\frac{\phi_S}{54}}$ (Chance recommends using Meyerhof Factors for Driven Piles, see attached)

$Nq := 0.5\,(12\cdot 35)^{\frac{35}{54}}$

$Nq = 25.07$

Existing Overburden Pressures, q:

At Top Helix, qtop: assume top helix positioned at top of sand

$qtop := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + (Elcs - Els)\cdot\left(\gamma_{CS} - \gamma w\right)$

$qtop = 1124.6\,\frac{lb}{ft^2}$

At mid-point between helices, qmid:

$qmid := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + (Elcs - Els)\cdot\left(\gamma_{CS} - \gamma w\right) + \left(\frac{L}{2}\right)\cdot\left(\gamma_S - \gamma w\right)$

$qmid = 1297.4\,\frac{lb}{ft^2}$

At bottom helix, qbot:

$qbot := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + (Elcs - Els)\cdot\left(\gamma_{CS} - \gamma w\right) + (L)\cdot\left(\gamma_S - \gamma w\right)$

$qbot = 1470.2\,\frac{lb}{ft^2}$

Ultimate Pile Capacity, qult:

$qult := At\cdot qtop\cdot Nq + Am\cdot qmid\cdot Nq + Ab\cdot qbot\cdot Nq$

$qult = 74236.11\,lb$

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design
10"/12"/14" Lead

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Allowable Pile Capacity, q_{all}:

Using an $FOSbearing := 2$

$$qall := \frac{qult}{FOSbearing}$$

$qall = 37118\,lb$ **>** $Fv = 36000\,lb$

Conclusion:

Pile capactiy acceptable.

Recommend pile spacing of 5 ft to limit interference between piles.

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Objective: To estimate the immediate settlement of bearing stratum (sand layer) under given loading conditions. Settlement of bearing layer estimated for following load conditions: 1. from placement of fill, and 2. from helical pile load.

References:

Chance Design Guidelines

Pier Tech Systems Engineering Manual

Holtz and Kovacs, An Introduction to Geotechnical Engineering, 1981.

Bowles, Foundation Analysis and Design, 4th Edition, 1988.

Stratigraphy:

Stratigraphy based upon observations from CPT soundings and historic borings (B-101 and B-102). Stratigaphy shown represents shallowest depth to bearing stratum (sand), most conservative condition.

_____	Existing Grade, El. 987 (in Brook)
Fill/Granular Brook Deposits	
----------	El. 983 +/-
Soft Clay, Clayey Silt to Organic Silt	
_____	El. 966 ft to El. 937
Medium Dense to Dense Sand	

Soil Properties: Piles to bear within Medium Dense to Dense Sand unit.

Fill — El. Top of Fill $Elf := 987 \cdot ft$ — Unit Weight, γ_F $\gamma_F := 120 \cdot \frac{lb}{ft^3}$

Clay/Silt — El. Top of Clay/Silt $Elcs := 983 \cdot ft$ — Unit Weight, γ_{CS} $\gamma_{CS} := 115 \cdot \frac{lb}{ft^3}$

Medium Dense to Dense Sand:

El. Top of Sand, shallow $Els := 966ft$ — El Top of Sand, deep $Elsd := 937 \cdot ft$

N values in Sand from SPT Borings 101 and 102: range from 10 to 28, with an average of 18 bpf

Interpreted N values from CPT soundings: range from 15 to greater than 65, with typical values between 16 and 20

Unit Weight, γ_S $\gamma_S := 120 \cdot \frac{lb}{ft^3}$ — Internal Friction Angle, ϕ_S $\phi_S := 35 \cdot deg$

Poissons Ratio, μ $\mu := 0.3$ — At-rest Coefficient, Ko $Ko := 1 - \sin(\phi_S)$ $Ko = 0.43$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Development of Modulus of Elasticity, Es:

From CPT data: - average Es and q_c values within sand layer summarized below

- evaluate Es based on Es = 2 to 4q_c (ref. Bowles, Table 5-5)

CPT-01 $Esavg1 := 478000 \cdot \frac{lb}{ft^2}$ as estimated by ConeTech in CPT summary

$qcavg1 := 201400 \cdot \frac{lb}{ft^2}$ $Es1 := 3 \cdot qcavg1$ $Es1 = 604200 \frac{lb}{ft^2}$

CPT-04A $Esavg4a := 346000 \cdot \frac{lb}{ft^2}$ as estimated by ConeTech in CPT summary

$qcavg4a := 135840 \cdot \frac{lb}{ft^2}$ $Es4a := 3 \cdot qcavg4a$ $Es4a = 407520 \frac{lb}{ft^2}$

CPT-06A $Esavg6a := 365460 \cdot \frac{lb}{ft^2}$

$qcavg6a := 161480 \cdot \frac{lb}{ft^2}$ $Es6a := 3 \cdot qcavg6a$ $Es6a = 484440 \frac{lb}{ft^2}$

CPT-07A $qcavg7a := 127610 \cdot \frac{lb}{ft^2}$ $Es7a := 3 \cdot qcavg7a$ $Es7a = 382830 \frac{lb}{ft^2}$

Select an average from above:

$$Esavg := \frac{(Esavg1 + Es1 + Esavg4a + Es4a + Esavg6a + Es6a + Es7a)}{6} \qquad Esavg = 511408.33 \frac{lb}{ft^2}$$

assume Es for Sand = $Es := 500000 \cdot \frac{lb}{ft^2}$

Water: Unit Weight of Water, γ_w $\gamma w := 62.4 \frac{lb}{ft^3}$ Assume water surface at grade.

Helical Pile Dimensions and Properties:

Top Helix: Diameter, Dt: $Dt := 14 \cdot in$ $Rt := \frac{Dt}{2}$ $Rt = 0.58\,ft$

Middle Helix: Diameter, Dm: $Dm := 12 \cdot in$ $Rm := \frac{Dm}{2}$ $Rm = 0.5\,ft$

Bottom Helix: Diameter, Db: $Db := 10 \cdot in$ $Rb := \frac{Db}{2}$ $Rb = 0.42\,ft$

Helix Spacing, S: $S := 3 \cdot Dm$ $S = 3\,ft$ Total Spacing Between all Helices, L: $L := 2 \cdot S$ $L = 6\,ft$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Existing Overburden Pressures, q:

Depth to Sand Layer 21 ft (shallow conditions)

At Top Helix, qtop: assume top helix positioned at top of sand

$$qtop := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Els)\cdot(\gamma_{CS} - \gamma w)$$

$$qtop = 1124.6\,\frac{lb}{ft^2}$$

At mid-point between helices, qmid:

$$qmid := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Els)\cdot(\gamma_{CS} - \gamma w) + \left(\frac{L}{2}\right)\cdot(\gamma_S - \gamma w)$$

$$qmid = 1297.4\,\frac{lb}{ft^2}$$

At bottom helix, qbot:

$$qbot := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Els)\cdot(\gamma_{CS} - \gamma w) + (L)\cdot(\gamma_S - \gamma w)$$

$$qbot = 1470.2\,\frac{lb}{ft^2}$$

Depth to Sand Layer 50 ft (deep conditions)

At Top Helix, qtop: assume top helix positioned at top of sand

$$qtopd := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Elsd)\cdot(\gamma_{CS} - \gamma w)$$

$$qtopd = 2650\,\frac{lb}{ft^2}$$

At mid-point between helices, qmid:

$$qmidd := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Elsd)\cdot(\gamma_{CS} - \gamma w) + \left(\frac{L}{2}\right)\cdot(\gamma_S - \gamma w)$$

$$qmidd = 2822.8\,\frac{lb}{ft^2}$$

At bottom helix, qbot:

$$qbotd := (Elf - Elcs)\cdot(\gamma_F - \gamma w) + (Elcs - Elsd)\cdot(\gamma_{CS} - \gamma w) + (L)\cdot(\gamma_S - \gamma w)$$

$$qbotd = 2995.6\,\frac{lb}{ft^2}$$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Estimate Settlement of Sand Layer from Fill Placement:

The fill placed directly over the pipe will be supported by the structural slab and helical piles. Fill will be placed along either side of the pipe. This fill will not be supported by the pipe foundation, and will increase the vertical effective stress in the underlying soils. The limits of fill are best demonstrated on Detail 4 of Design Drawing No. 29.

Simplify loading as an embankment, and develop Influence value, I, using the following figure from Holtz and Kovacs (1981). Evaluate I at the depth of the top of the sand stratum where it is the shallowest. Assume the greatest fill thickness of 5 ft.

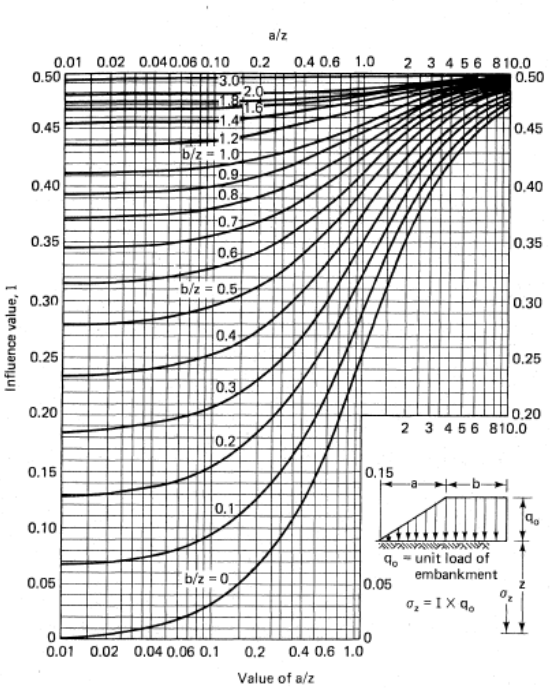


Fig. 8.23 Influence values for vertical stress under a very long embankment; length = ∞ (from U.S. Navy, 1971, after Osterberg, 1957).

Assume the following dimensions for the embankment loading: $a := 10 \cdot ft$ $b := 3 \cdot ft$ $z := 21 \cdot ft$

$\frac{a}{z} = 0.48$ $\frac{b}{z} = 0.14$ then $I := 0.22$

Maximum Thickness of Fill: $Hf := 5ft$

and additional vertical stress at top of sand: $\Delta q := I \cdot Hf \cdot \gamma_F$ $\Delta q = 132 \frac{lb}{ft^2}$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

For estimating the settlement of the sand bearing layer beneath the pipe, assume the additional vertical stress loading is applied across a width B equal to the width of the structural slab.

Width of structural slab, B $B := 6 \cdot ft$

Settlement of Sand from Fill Placement, Hsf

$$Hsf := \Delta q \cdot B \cdot \left(\frac{1 - \mu^2}{Es} \right)$$

$Hsf = 0.02 \cdot in$ Negligible settement from fill placement.

Estimate Settlement of Sand Layer from Helical Pile Load:

To estimate the settlement of the bearing layer beneath the helical pile lead, several assumptions were made because a published method for estimating settlement is not available.

First estimate the bearing pressure at the bottom helix assuming shallow sand conditions.

Assume that the cylindrical shaft of the helical lead will develop frictional resistance and reduce the load at the bottom helix.

From Pier Tech System Manual, the cylindrical resistance mobilized between the blades can be estimated.

Cylindrical resistance between middle and upper blade:

$$Qsupper := \left[2 \cdot \pi \cdot \left(\frac{Rt + Rm}{2} \right) \cdot S \right] \cdot \left[Ko \cdot \left(\frac{qtop + qmid}{2} \right) \cdot \tan\left(\phi_S \right) \right]$$

$Qsupper = 3691.86\,lb$

Cylindrical resistance between middle and lower blade:

$$Qsmid := \left[2 \cdot \pi \cdot \left(\frac{Rm + Rb}{2} \right) \cdot S \right] \cdot \left[Ko \cdot \left(\frac{qmid + qbot}{2} \right) \cdot \tan\left(\phi_S \right) \right]$$

$Qsmid = 3569.64\,lb$

Vertical Pile Load, Fv $Fv := 36000 \cdot lb$

Area Bottom Helix, Ab: $Ab := 0.531 \cdot ft^2$

Estimated bearing pressure at bottom helix:

$$qbot := \frac{(Fv - Qsupper - Qsmid)}{Ab}$$

$$qbot = 54121.48 \frac{lb}{ft^2}$$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

For estimating the settlement, incorporate the stress distribution beneath a helical pile as shown in literature provided by Chance and as shown below:

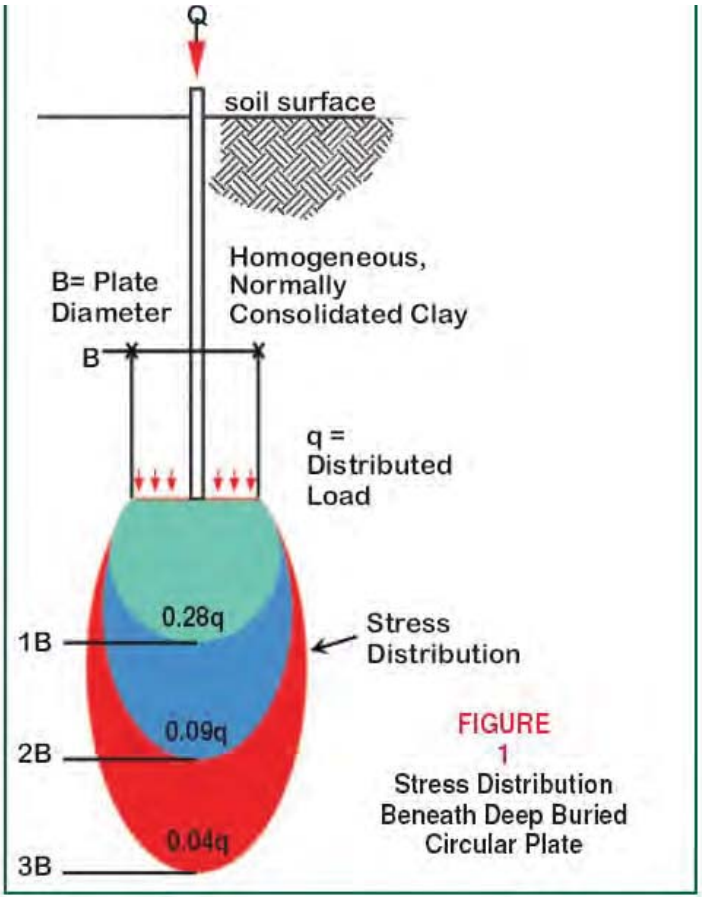


FIGURE 1
Stress Distribution Beneath Deep Buried Circular Plate

Subdivide sand layer below the helical pile into the sublayers and estimate stress increase in center of each sublayer.

Sublayer Thickness, Thsub $Thsub := Db$ $Thsub = 0.83\,ft$

Average Pressure Increase in Sublayer 1B: $\Delta q1b := \frac{(qbot + 0.28 \cdot qbot)}{2}$

$\Delta q1b = 34637.74 \frac{lb}{ft^2}$

Average Pressure Increase in Sublayer 2B: $\Delta q2b := \frac{(0.28 \cdot qbot + 0.09 \cdot qbot)}{2}$

$\Delta q2b = 10012.47 \frac{lb}{ft^2}$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Average Pressure Increase in Sublayer 3B: $\Delta q3b := \frac{(0.09 \cdot qbot + 0.04 \cdot qbot)}{2}$

$\Delta q3b = 3517.9 \frac{lb}{ft^2}$

Settlement of Sublayer 1B, S1B $S1B := \Delta q1b \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S1B = 0.63 \cdot in$

Settlement of Sublayer 2B, S2B $S2B := \Delta q2b \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S2B = 0.18 \cdot in$

Settlement of Sublayer 3B, S3B $S3B := \Delta q3b \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S3B = 0.06 \cdot in$

Total Settlement Beneath Pile $Stpile := S1B + S2B + S3B$

$Stpile = 0.88 \cdot in$ for shallow sand conditions

Estimate settlement from helical pile load for deep sand layer conditions.

Again estimate the bearing pressure at the bottom helix.

Cylindrical resistance between middle and upper blade:

$$Qsupperd := \left[2 \cdot \pi \cdot \left(\frac{Rt + Rm}{2} \right) \cdot S \right] \cdot \left[Ko \cdot \left(\frac{qtopd + qmidd}{2} \right) \cdot \tan\left(\phi_S \right) \right]$$

$Qsupperd = 8342.2\,lb$

Cylindrical resistance between middle and lower blade:

$$Qsmidd := \left[2 \cdot \pi \cdot \left(\frac{Rm + Rb}{2} \right) \cdot S \right] \cdot \left[Ko \cdot \left(\frac{qmidd + qbotd}{2} \right) \cdot \tan\left(\phi_S \right) \right]$$

$Qsmidd = 7504.54\,lb$

Estimated bearing pressure at bottom helix: $qbotd := \frac{(Fv - Qsupperd - Qsmidd)}{Ab}$

$qbotd = 37953.4 \frac{lb}{ft^2}$

Unkamet Brook and Sanitary Sewer Realignment

Pile Settlement Analysis - Fill and Pipe Loads

CALCULATION BY: MSG DATE: 3/25/14

CHECKED BY: EJL DATE: 3/31/14

Subdivide sand layer below the helical pile into the sublayers and estimate stress increase in center of each sublayer.

Average Pressure Increase in Sublayer 1B: $\Delta q1bd := \frac{(qbotd + 0.28 \cdot qbotd)}{2}$

$\Delta q1bd = 24290.18 \frac{lb}{ft^2}$

Average Pressure Increase in Sublayer 2B: $\Delta q2bd := \frac{(0.28 \cdot qbotd + 0.09 \cdot qbotd)}{2}$

$\Delta q2bd = 7021.38 \frac{lb}{ft^2}$

Average Pressure Increase in Sublayer 3B: $\Delta q3bd := \frac{(0.09 \cdot qbotd + 0.04 \cdot qbotd)}{2}$

$\Delta q3bd = 2466.97 \frac{lb}{ft^2}$

Settlement of Sublayer 1B, S1B $S1Bd := \Delta q1bd \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S1Bd = 0.44 \cdot in$

Settlement of Sublayer 2B, S2B $S2Bd := \Delta q2bd \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S2Bd = 0.13 \cdot in$

Settlement of Sublayer 3B, S3B $S3Bd := \Delta q3bd \cdot Db \cdot \left(\frac{1 - \mu^2}{Es} \right)$ $S3Bd = 0.04 \cdot in$

Total Settlement Beneath Pile $Stpiledeep := S1Bd + S2Bd + S3Bd$

$Stpiledeep = 0.61 \cdot in$

Settlement of helical pile ranges from

$Stpile = 0.88 \cdot in$ to $Stpiledeep = 0.61 \cdot in$

for a differential settlement of $Stdif := Stpile - Stpiledeep$

$Stdif = 0.26 \cdot in$

Conclusion:

Based upon review of the CPT soundings, the distance between the probes with the shallowest and deepest depths to sand is about 175 ft. (between CPT-4A and CPT-2).

A differential settlement of 0.26 in. over 175 ft is considered to be acceptable for the slab and utility.

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Objective: To estimate the settlement of soft clay/silt layer from placement of fill to evaluate potential for downdrag on helical piles. Settlement estimated beneath edge of concrete slab.

References:

Holtz and Kovacs, An Introduction to Geotechnical Engineering, 1981.

Bowles, Foundation Analysis and Design, 4th Edition, 1988.

Stratigraphy:

Stratigraphy based upon observations from CPT soundings and historic borings (B-101 and B-102). Stratigaphy shown represents shallowest depth to bearing stratum (sand), most conservative condition.

Existing Grade, El. 987 (in Brook) and El. 992 (avg. top of Bank)

Fill/Granular Brook Deposits

El. 983 +/-

Soft Clay, Clayey Silt to Organic Silt

El. 966 ft to El. 937

Medium Dense to Dense Sand

Soil Properties:

Fill — El. Top of Fill $Elf := 987 \cdot ft$ $Elgrbank := 992 \cdot ft$ — Unit Weight, γ_F $\gamma_F := 120 \cdot \frac{lb}{ft^3}$

Clay/Silt — El. Top of Clay/Silt $Elcs := 983 \cdot ft$ — Unit Weight, γ_{CS} $\gamma_{CS} := 115 \cdot \frac{lb}{ft^3}$

Estimated Consolidation Properties: select range of values to represent org silt and clay

$Cc := 0.6$ (ref. Holtz and Kovacs, Table 8-3, for clay)

Initial Void Ratio, eo: $eo := 1.2$ (assumed)

Medium Dense to Dense Sand:

El. Top of Sand, shallow $Els := 966ft$ El Top of Sand, deep $Elsd := 937 \cdot ft$

Unit Weight, γ_S $\gamma_S := 120 \cdot \frac{lb}{ft^3}$ Internal Friction Angle, ϕ_S $\phi_S := 35 \cdot deg$

Estimate Es for soft soils $Esclay := 150000 \cdot \frac{lb}{ft^2}$ (ref. Bowles, Table 2-7)

Water: Unit Weight of Water, γ_w $\gamma w := 62.4 \frac{lb}{ft^3}$

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14

CHECKED BY: EJL DATE: 4/7/14

Estimate Settlement of Soft Clay/Silt Layer from Fill Placement:

The fill placed directly over the pipe will be supported by the structural slab and helical piles. Fill will be placed along either side of the pipe. This fill will not be supported by the pipe foundation, and will increase the vertical effective stress in the underlying soils. The limits of fill are best demonstrated on Detail 4 of Design Drawing No. 29.

Beyond the Unkamet Brook limits, the site will be covered with an Engineered Barrier.

Within the Unkamet Brook, simplify loading as an embankment, and develop Influence value, I, using the following figure from Holtz and Kovacs (1981). Evaluate I at midlayer depth of the soft clay/silt stratum for both shallow and deep sand conditions (i.e., thinnest and thickness clay/silt layer). Assume the greatest fill thickness for this estimate.

Maximum Thickness for Embankment Fill model: $Hf := 5.ft$

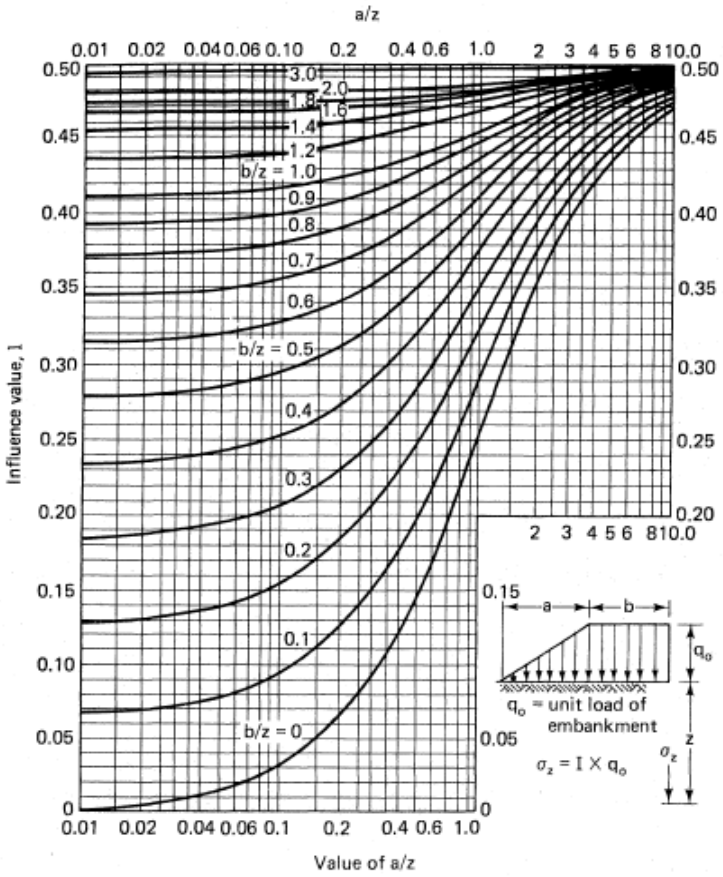


Fig. 8.23 Influence values for vertical stress under a very long embankment; length = ∞ (from U.S. Navy, 1971, after Osterberg, 1957).

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Estimate settlement at edge of concrete slab (for pipe support):

For shallow sand conditions (minimin thickness of soft clay/silt layer)

Divide layer into 2 sublayers, with thicknesses of: $Hs1 := 10\cdot ft$ $Hs2 := 7\cdot ft$

Estimate Settlement at Depth of Midpoint of Sublayer 1: $z1 := 9\cdot ft$

Assume the following dimensions for the embankment loading: $a := 10\cdot ft$ $b := 3\cdot ft$

$\frac{a}{z1} = 1.11$ $\frac{b}{z1} = 0.33$ then $I1 := 0.37$

and additional vertical stress at mid point of Sublayer 1:

$$\Delta q1 := I1\cdot Hf\cdot \gamma_F \quad \Delta q1 = 222\ \frac{lb}{ft^2}$$

Estimate Immediate Settlement

$$Sis1 := \frac{\Delta q1}{Esclay}\cdot Hs1 \quad Sis1 = 0.18\cdot in$$

Estimate Consolidation

$$qsub1 := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + \left(\frac{Hs1}{2}\right)\cdot\left(\gamma_{CS} - \gamma w\right) \quad qsub1 = 493.4\ \frac{lb}{ft^2}$$

$$Scs1 := Cc\cdot\frac{Hs1}{1 + eo}\cdot\log\left(\frac{qsub1 + \Delta q1}{qsub1}\right) \quad Scs1 = 5.28\cdot in$$

Estimate Settlement at Depth of Midpoint of Sublayer 2: $z2 := 17.5\cdot ft$

Assume the following dimensions for the embankment loading: $a := 10\cdot ft$ $b := 3\cdot ft$

$\frac{a}{z2} = 0.57$ $\frac{b}{z2} = 0.17$ then $I2 := 0.24$

and additional vertical stress at mid point of Sublayer 2:

$$\Delta q2 := I2\cdot Hf\cdot \gamma_F \quad \Delta q2 = 144\ \frac{lb}{ft^2}$$

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Estimate Immediate Settlement

$$Sis2 := \frac{\Delta q2}{Esclay} \cdot Hs2 \qquad Sis2 = 0.08 \cdot in$$

Estimate Consolidation

$$qsub2 := (Elf - Elcs) \cdot (\gamma_F - \gamma w) + \left(Hs1 + \frac{Hs2}{2}\right) \cdot (\gamma_{CS} - \gamma w)$$

$$qsub2 = 940.5 \frac{lb}{ft^2}$$

$$Scs2 := Cc \cdot \frac{Hs2}{1 + eo} \cdot \log\left(\frac{qsub2 + \Delta q2}{qsub2}\right) \qquad Scs2 = 1.42 \cdot in$$

Settlement summary shallow sand scenario:

Total settlement in Unkamet Brook from fill placement over pipe

$$Ssbe := Sis1 + Sis2 + Scs1 + Scs2 \qquad Ssbe = 6.96 \cdot in$$

For deep sand conditions (maximum thickness of soft clay/silt layer)

Divide layer into 4 sublayers, with thicknesses of: $Hs1 := 10 \cdot ft$ $Hs2 := 10 \cdot ft$
$Hs3 := 12 \cdot ft$ $Hs4 := 14 \cdot ft$

Estimate Settlement at Depth of Midpoint of Sublayer 1: $z1 := 9 \cdot ft$

Assume the following dimensions for the embankment loading: $a := 10 \cdot ft$ $b := 3 \cdot ft$

$\frac{a}{z1} = 1.11$ $\frac{b}{z1} = 0.33$ then $I1 := 0.37$

and additional vertical stress at mid point of Sublayer 1:

$$\Delta q1 := I1 \cdot Hf \cdot \gamma_F \qquad \Delta q1 = 222 \frac{lb}{ft^2}$$

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Estimate Immediate Settlement

$$Sid1 := \frac{\Delta q1}{Esclay}\cdot Hs1 \qquad Sid1 = 0.18\cdot in$$

Estimate Consolidation

$$qsub1 := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + \left(\frac{Hs1}{2}\right)\cdot\left(\gamma_{CS} - \gamma w\right) \qquad qsub1 = 493.4\,\frac{lb}{ft^2}$$

$$Scd1 := Cc\cdot\frac{Hs1}{1 + eo}\cdot\log\left(\frac{qsub1 + \Delta q1}{qsub1}\right) \qquad Scd1 = 5.28\cdot in$$

Estimate Settlement at Depth of Midpoint of Sublayer 2: $z2 := 19\cdot ft$

Assume the following dimensions for the embankment loading: $a := 10\cdot ft$ $b := 3\cdot ft$

$\frac{a}{z2} = 0.53$ $\frac{b}{z2} = 0.16$ then $I2 := 0.23$

and additional vertical stress at mid point of Sublayer 2:

$$\Delta q2 := I2\cdot Hf\cdot\gamma_F \qquad \Delta q2 = 138\,\frac{lb}{ft^2}$$

Estimate Immediate Settlement

$$Sid2 := \frac{\Delta q2}{Esclay}\cdot Hs2 \qquad Sid2 = 0.11\cdot in$$

Estimate Consolidation

$$qsub2 := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + \left(Hs1 + \frac{Hs2}{2}\right)\cdot\left(\gamma_{CS} - \gamma w\right)$$

$$qsub2 = 1019.4\,\frac{lb}{ft^2}$$

$$Scd2 := Cc\cdot\frac{Hs2}{1 + eo}\cdot\log\left(\frac{qsub2 + \Delta q2}{qsub2}\right) \qquad Scd2 = 1.8\cdot in$$

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Fill Placement within Brook Limits

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Estimate Settlement at Depth of Midpoint of Sublayer 3: $z3 := 30\cdot ft$

Assume the following dimensions for the embankment loading: $a := 10\cdot ft$ $b := 3\cdot ft$

$\frac{a}{z3} = 0.33$ $\frac{b}{z3} = 0.1$ then $I3 := 0.16$

and additional vertical stress at mid point of Sublayer 3:

$$\Delta q3 := I3\cdot Hf\cdot \gamma_F \quad \Delta q3 = 96\,\frac{lb}{ft^2}$$

Estimate Immediate Settlement

$$Sid3 := \frac{\Delta q3}{Esclay}\cdot Hs3 \qquad Sid3 = 0.09\cdot in$$

Estimate Consolidation

$$qsub3 := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + \left(Hs1 + Hs2 + \frac{Hs3}{2}\right)\cdot\left(\gamma_{CS} - \gamma w\right)$$

$$qsub3 = 1598\,\frac{lb}{ft^2}$$

$$Scd3 := Cc\cdot\frac{Hs3}{1 + eo}\cdot\log\left(\frac{qsub3 + \Delta q3}{qsub3}\right) \qquad Scd3 = 1\cdot in$$

Estimate Settlement at Depth of Midpoint of Sublayer 4: $z4 := 43\cdot ft$

Assume the following dimensions for the embankment loading: $a := 10\cdot ft$ $b := 3\cdot ft$

$\frac{a}{z4} = 0.23$ $\frac{b}{z4} = 0.07$ then $I4 := 0.11$

and additional vertical stress at mid point of Sublayer 4:

$$\Delta q4 := I4\cdot Hf\cdot \gamma_F \quad \Delta q4 = 66\,\frac{lb}{ft^2}$$

Estimate Immediate Settlement

$$Sid4 := \frac{\Delta q4}{Esclay}\cdot Hs4 \qquad Sid4 = 0.07\cdot in$$

Estimate Consolidation

$$qsub4 := (Elf - Elcs)\cdot\left(\gamma_F - \gamma w\right) + \left(Hs1 + Hs2 + Hs3 + \frac{Hs4}{2}\right)\cdot\left(\gamma_{CS} - \gamma w\right)$$

$$qsub4 = 2281.8\,\frac{lb}{ft^2}$$

$$Scd4 := Cc\cdot\frac{Hs4}{1 + eo}\cdot\log\left(\frac{qsub4 + \Delta q4}{qsub4}\right) \qquad Scd4 = 0.57\cdot in$$

Settlement summary deep sand scenario:

Total settlement in Unkamet Brook from fill placement over pipe

$$Sdbe := Sid1 + Sid2 + Sid3 + Sid4 + Scd1 + Scd2 + Scd3 + Scd4 \qquad Sdbe = 9.1\cdot in$$

Conclusions:

Estimated settlement ranges:

Brook settlement ranges from $Ssbe = 6.96\cdot in$ to $Sdbe = 9.1\cdot in$

Note actual settlements may be greater than estimated due to the presense of organics/peat noted in explorations completed at the site.

Given the settlement of the soft soils from fill placement, the potential for a downdrag load along the pile shaft exists. A downdrag load will be considered in the design of the piles.

With respect to the geomembrane of the Engineered Barrier, it is anticipated that tension will not be developed in the membrane. Instead as the side slopes settle, a slack in the membrane will develop, reducing tension along the soil and concrete edge.

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design - Downdrag
Shaft Diameter 2.88"

CALCULATION BY: MSG DATE: 4/1/14
CHECKED BY: EJL DATE: 4/7/14

Objective: To estimate the additional pile load from negative skin friction (downdrag) from placement of fill.

Reference:

Chance Product Catalog

Das, Principles of Foundation Engineer, 3rd Edition, 1995.

Bowles, Foundation Analysis and Design, 4th Edition, 1988.

Stratigraphy:

Stratigraphy based upon observations from CPT soundings and historic borings (B-101 and B-102). Stratigaphy shown represents shallowest depth to bearing stratum (sand), most conservative condition.

_____	Existing Grade, El. 987 (in Brook)
Fill/Granular Brook Deposits	
----------	El. 983 +/-
Soft Clay, Clayey Silt to Organic Silt	
_____	El. 966 +/- to El. 937 +/-
Medium Dense to Dense Sand	

Soil Properties: Piles to bear within Medium Dense to Dense Sand unit.

Fill — El. Top of Fill/Granular Brook Dep: $Elf := 987 \cdot ft$

Unit Weight, γ_F: $\gamma_F := 120 \cdot \frac{lb}{ft^3}$

Clay/Silt — El. Top of Clay/Silt: $Elcs := 983 \cdot ft$

Unit Weight, γ_{CS}: $\gamma_{CS} := 115 \cdot \frac{lb}{ft^3}$

Medium Dense to Dense Sand:

El. Top of Sand: $Els := 966ft$ (shallowest at CPT-04A)

N values in Sand from SPT Borings 101 and 102: range from 10 to 28, with an average of 18 bpf

Interpreted N values from CPT soundings: range from 15 to greater than 65, with typical values between 16 and 20

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design - Downdrag
Shaft Diameter 2.88"

CALCULATION BY: MSG DATE: 4/1/14
CHECKED BY: EJL DATE: 4/7/14

Unit Weight, γ_S $\gamma_S := 120 \cdot \frac{lb}{ft^3}$

Internal Friction Angle, ϕ_S $\phi_S := 35 \cdot deg$ Cohesion, c_S $c_S := 0$

Note: Friction Angle estimated from CPT data between 37 and 39 degrees.

Water:

Unit Weight of Water, γ_w $\gamma w := 62.4 \frac{lb}{ft^3}$

Assume water surface at grade.

Helical Pile Dimensions and Properties:

Top Helix:

Diameter, Dt: $Dt := 14 \cdot in$ Area, At: $At := 1.049 \cdot ft^2$

Radius, Rt: $Rt := \frac{Dt}{2}$ $Rt = 0.58\,ft$

Middle Helix:

Diameter, Dm: $Dm := 12 \cdot in$ Area, Am: $Am := 0.771 \cdot ft^2$

Radius, Rm: $Rm := \frac{Dm}{2}$ $Rm = 0.5\,ft$

Bottom Helix:

Diameter, Db: $Db := 10 \cdot in$ Area, Ab: $Ab := 0.531 \cdot ft^2$

Radius, Rb: $Rb := \frac{Db}{2}$ $Rb = 0.42\,ft$

Average Helix Radius, R: $R := \frac{Rt + Rm + Rb}{3}$ $R = 0.5\,ft$

Shaft Diameter, d: $d := 2.88 \cdot in$

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design - Downdrag
Shaft Diameter 2.88"

CALCULATION BY: MSG DATE: 4/1/14
CHECKED BY: EJL DATE: 4/7/14

Determine Downdrag Force for Helical Pile - short pile length:

Estimate Neutral Depth for Helical Pile:

From Das (1995) estimate depth to neutral plan L1 for short pile, where

Pile Length, Lp $Lps := 21ft$ to top of bearing stratum

Height of Fill, Hf $Hf := 2.5 \cdot ft$ (assume uniform fill, average depth)

Unit Weight of Fill, γfp $\gamma fp := 120 \cdot \frac{lb}{ft^3}$

Initial Guess $L1s := 5 \cdot ft$

Given

$$L1s = \frac{(Lps - Hf)}{L1s} \cdot \left[\frac{Lps - Hf}{2} + \frac{\gamma fp \cdot Hf}{(\gamma_{CS} - \gamma w)} \right] - \frac{2 \cdot \gamma fp \cdot Hf}{(\gamma_{CS} - \gamma w)}$$

$L1s := Find(L1s)$

$L1s = 11.88\,ft$

Determine Downdrag Force for Helical Pile:

From Das (1995) estimate depth to downdrag force, Qn, along pile shaft

Assume clay-pile friction angle, δ $\delta cp := 11 \cdot deg$

Assume interface friction angle for clay, ϕc $\phi c := 25 \cdot deg$

$Ko := 1 - \sin(\phi c)$ $Ko = 0.58$

Pile Perimeter for Shaft $pshaft := \pi \cdot d$ $pshaft = 0.75\,ft$

then

$$Qns := (pshaft \cdot Ko \cdot \gamma fp \cdot Hf \cdot \tan(\delta cp)) \cdot L1s + \frac{L1s^2 \cdot pshaft \cdot Ko \cdot (\gamma_{CS} - \gamma w) \cdot \tan(\delta cp)}{2}$$

$Qns = 615.67\,lb$

Unkamet Brook and Sanitary Sewer Realignment

Helical Pile Design - Downdrag
Shaft Diameter 2.88"

CALCULATION BY: MSG DATE: 4/1/14
CHECKED BY: EJL DATE: 4/7/14

Determine Downdrag Force for Helical Pile - long pile length:

Estimate Neutral Depth for Helical Pile:

From Das (1995) estimate depth to neutral plan L1 for short pile, where

Pile Length, Lp $Lpl := 50ft$ to top of bearing stratum

Height of Fill, Hf $Hf := 2.5 \cdot ft$ (assume uniform fill, average depth)

Unit Weight of Fill, γfp $\gamma fp := 120 \cdot \frac{lb}{ft^3}$

Initial Guess $L1l := 5 \cdot ft$

Given

$$L1l = \frac{(Lpl - Hf)}{L1l} \cdot \left[\frac{Lpl - Hf}{2} + \frac{\gamma fp \cdot Hf}{(\gamma_{CS} - \gamma w)} \right] - \frac{2 \cdot \gamma fp \cdot Hf}{(\gamma_{CS} - \gamma w)}$$

$L1l := Find(L1l)$

$L1l = 32.13\,ft$

Determine Downdrag Force for Helical Pile:

From Das (1995) estimate depth to downdrag force, Qn, along pile shaft

Assume clay-pile friction angle, δ $\delta cp := 11 \cdot deg$

Assume interface friction angle for clay, ϕc $\phi c := 25 \cdot deg$

$Ko := 1 - \sin(\phi c)$ $Ko = 0.58$

Pile Perimeter for Shaft $pshaft := \pi \cdot d$ $pshaft = 0.75\,ft$

then

$$Qnl := (pshaft \cdot Ko \cdot \gamma fp \cdot Hf \cdot \tan(\delta cp)) \cdot L1l + \frac{L1l^2 \cdot pshaft \cdot Ko \cdot (\gamma_{CS} - \gamma w) \cdot \tan(\delta cp)}{2}$$

$Qnl = 3113.59\,lb$

Conclusions

Downdrag load varies along alignment of pipe between $Qns = 615.67\,lb$ to $Qnl = 3113.59\,lb$

Add 3 kip downdrag load to structural load.

Total structural load = 39 kips < Structural capacity of pile = 49 kips.

Structural capacity of pile OK when considering additional downdrag load.

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Site Wide Engineered Barrier

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Objective: To estimate the settlement of soft clay/silt layer from placement of fill across site for the engineered barrier. Subsurface conditions vary and were assumed to be representative of conditions observed in CPT soundings along Unkamet Brook.

References:

Holtz and Kovacs, An Introduction to Geotechnical Engineering, 1981.

Bowles, Foundation Analysis and Design, 4th Edition, 1988.

Stratigraphy:

Stratigraphy based upon observations from CPT soundings and historic borings (B-101 and B-102). Stratigaphy shown represents shallowest depth to bearing stratum (sand), most conservative condition.

Existing Grade, El. 992 (avg.)

Fill

El. 983 +/-

Soft Clay, Clayey Silt to Organic Silt

El. 966 ft to El. 937

Medium Dense to Dense Sand

Soil Properties:

Fill — El. Top of Fill $Elgr := 992 \cdot ft$ — Unit Weight, γ_F $\gamma_F := 120 \cdot \frac{lb}{ft^3}$

Estimate Es for Fill $Esfill := 500000 \cdot \frac{lb}{ft^2}$ (ref. Bowles, Table 2-7, loose sand)

Clay/Silt — El. Top of Clay/Silt $Elcs := 983 \cdot ft$ — Unit Weight, γ_{CS} $\gamma_{CS} := 115 \cdot \frac{lb}{ft^3}$

Estimated Consolidation Properties: select range of values to represent org silt and clay

$Cc := 0.6$ (ref. Holtz and Kovacs, Table 8-3, for clays)

Initial Void Ratio, eo: $eo := 1.2$ (assumed)

Medium Dense to Dense Sand:

El. Top of Sand, shallow $Els := 966ft$ — El Top of Sand, deep $Elsd := 937 \cdot ft$

Unit Weight, γ_S $\gamma_S := 120 \cdot \frac{lb}{ft^3}$ — Internal Friction Angle, ϕ_S $\phi_S := 35 \cdot deg$

Estimate Es for soft soils $Esclay := 150000 \cdot \frac{lb}{ft^2}$ (ref. Bowles, Table 2-7)

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Site Wide Engineered Barrier

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Water: Unit Weight of Water, γ_w $\gamma w := 62.4 \frac{lb}{ft^3}$

Estimate Settlement of Soft Clay/Silt Layer from Fill Placement for Engineered Barrier:

The fill placed directly over the pipe will be supported by the structural slab and helical piles. Fill will be placec along either side of the pipe. This fill will not be supported by the pipe foundation, and will increase the vertica effective stress in the underlying soils. The limits of fill are best demonstrated on Detail 4 of Design Drawing No. 29.

Beyond the Unkamet Brook limits the site will be covered with an engineered barrier. Consider this uniform loading across the site in the settlement analysis.

Thickness of Soft Soils varies from $Hsofts := 17 \cdot ft$ to $Hsoftd := 46 \cdot ft$

Existing Vertical Effective Stress at Mid-point of Soft Soil Layer:

for shallow sand conditions:

$$qmids := (Elgr - Elcs) \cdot (\gamma_F) + \left(\frac{Hsofts}{2}\right) \cdot (\gamma_{CS} - \gamma w) \qquad qmids = 1527.1 \frac{lb}{ft^2}$$

for deep sand conditions:

$$qmidd := (Elgr - Elcs) \cdot (\gamma_F) + \left(\frac{Hsoftd}{2}\right) \cdot (\gamma_{CS} - \gamma w) \qquad qmidd = 2289.8 \frac{lb}{ft^2}$$

For 2 ft Vegetative Cover Soil:

$Hfsite := 2 \cdot ft$ $\Delta qsite := Hfsite \cdot \gamma_F$ $\Delta qsite = 240 \frac{lb}{ft^2}$

Immediate Settlement of Fill Layer

$$Sifillveg := \frac{\Delta qsite}{Esfill} \cdot (Elgr - Elcs) \quad Sifillveg = 0.05 \cdot in$$

Immediate Settlement of Soft Clay/Silt Layer

$$Sisveg := \frac{\Delta qsite}{Esclay} \cdot Hsofts \qquad Sisveg = 0.33 \cdot in \quad \text{for shallow sand}$$

$$Sdsveg := \frac{\Delta qsite}{Esclay} \cdot Hsoftd \qquad Sdsveg = 0.88 \cdot in \quad \text{for deep sand}$$

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Site Wide Engineered Barrier

CALCULATION BY: MSG DATE: 4/3/14
CHECKED BY: EJL DATE: 4/7/14

Consolidation Settlement

$$Scsveg := Cc\cdot\frac{Hsofts}{1+eo}\cdot\log\left(\frac{qmids+\Delta qsite}{qmids}\right) \qquad Scsveg = 3.53\cdot in$$ for shallow sand

$$Scdveg := Cc\cdot\frac{Hsoftd}{1+eo}\cdot\log\left(\frac{qmidd+\Delta qsite}{qmidd}\right) \qquad Scdveg = 6.52\cdot in$$ for shallow sand

Total Settlement:

$Sstveg := Sifillveg + Sisveg + Scsveg$ $Sstveg = 3.91\cdot in$ for shallow sand

$Sdtveg := Sifillveg + Sdsveg + Scdveg$ $Sdtveg = 7.45\cdot in$ for deep sand

For 1 ft Asphalt Barrier Cover Soil: $Hfsite := 1\cdot ft$ $\Delta qsite := Hfsite\cdot\gamma_F$ $\Delta qsite = 120\ \frac{lb}{ft^2}$

Immediate Settlement of Fill Layer

$$Sifillveg := \frac{\Delta qsite}{Esfill}\cdot(Elgr - Elcs) \qquad Sifillveg = 0.03\cdot in$$

Immediate Settlement of Soft Clay/Silt Layer

$$Sisasp := \frac{\Delta qsite}{Esclay}\cdot Hsofts \qquad Sisasp = 0.16\cdot in$$ for shallow sand

$$Sdsasp := \frac{\Delta qsite}{Esclay}\cdot Hsoftd \qquad Sdsasp = 0.44\cdot in$$ for deep sand

Consolidation Settlement

$$Scsasp := Cc\cdot\frac{Hsofts}{1+eo}\cdot\log\left(\frac{qmids+\Delta qsite}{qmids}\right) \qquad Scsasp = 1.83\cdot in$$ for shallow sand

$$Scdasp := Cc\cdot\frac{Hsoftd}{1+eo}\cdot\log\left(\frac{qmidd+\Delta qsite}{qmidd}\right) \qquad Scdasp = 3.34\cdot in$$ for shallow sand

Total Settlement:

$Sstasp := Sisasp + Scsasp + Sifillveg$ $Sstasp = 2.02\cdot in$ for shallow sand

$Sdtasp := Sdsasp + Scdasp + Sifillveg$ $Sdtasp = 3.81\cdot in$ for deep sand

Unkamet Brook and Sanitary Sewer Realignment

Settlement Analysis - Soft Clay and Silt
Site Wide Engineered Barrier

CALCULATION BY: MSG DATE: 4/3/14

CHECKED BY: EJL DATE: 4/7/14

Conclusions:

Estimated settlement ranges for Engineered Barrier:

Vegetative Cover	$Sstveg = 3.91 \cdot in$	to	$Sdtveg = 7.45 \cdot in$
Asphalt Cover	$Sstasp = 2.02 \cdot in$	to	$Sdtasp = 3.81 \cdot in$

Note actual settlements may be greater than estimated due to the presense of organics/peat noted in explorations completed at the site.

The estimated settlements are acceptable for the design of the Engineered Barrier considering that the finished site grading slope is 3 percent and deemed adequate to continue to promote site drainage with settlement.

ARCADIS
1100 Superior Ave Suite 1250
Cleveland, OH
Phone

JOB TITLE Unkamet Brook

JOB NO. B0040190.0002 SHEET NO. 1

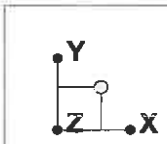
CALCULATED BY CMW DATE 3.04.14

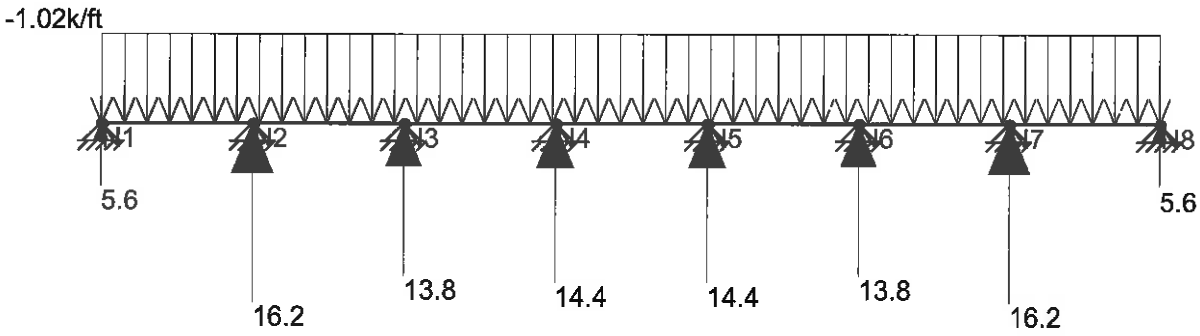
CHECKED BY JPR DATE 03/27/2014

Input

Trial Pile Spacing	14 ft	Assumes an 8" slab (requires #7 @ 8" c/c for flexural reinforcement)		
Soil Depth	5 ft	Soil Depth	max	5 ft
Soil Density	115 pcf	Soil Depth	min	5 ft
Sand Depth	0.5 ft			
Sand Density	105 pcf			
Pipe Weight	25 plf			
Pipe ID	30 in			
Percent Pipe Full	100.00%			
Concrete Width	5 ft			
Concrete Length	20 ft			
Concrete Depth	0.833 ft			

Loads	Unit Weight	Length Between Piles	Total Weight	Factor	Factored Weight
30" Sewer Pipe	25 plf	14 ft	350 lb	1.2	420
Soil Fill	115 pcf	14 ft	40250 lb	1.2	48300
Sand Bedding	105 pcf	14 ft	3675 lb	1.2	4410
Concrete Footing	150 pcf	14 ft	8746.5 lb	1.2	10496
Water Weight	62.4 pcf	14 ft	1715 lb	1.6	2744
Surcharge	45 pcf	14 ft	3150 lb	1.6	5040
		UNF.Total	57887 lb		71410
		Load per Pile	28943 lb	Load per Pile	35705





Loads shown are per ft of slab width.

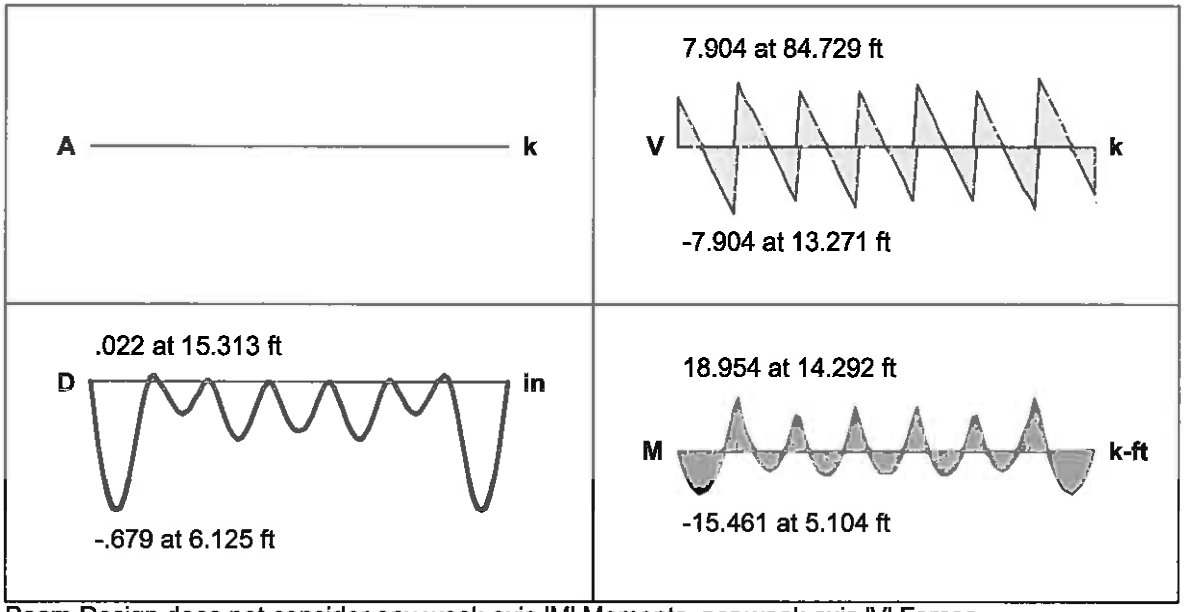
Loads: BLC 1, Factored
Results for LC 1, Factored
Z-moment Reaction units are k and k-ft

ARCADIS	GE - Unkamet Brook	SK - 1
CMW		Mar 21, 2014 at 9:03 AM
		Slab Design.r2d

Beam: ***M1***

Shape:	**CRECT8X12**	Concrete Stress Block:	**Rectangular**
Material:	**Conc4000NW**	Cracked Sections Used:	**Yes**
Length:	**98 ft**	Cracked 'I' Factor:	**.35**
I Joint:	**N1**	Effective 'I':	**179.2 in^4**
J Joint:	**N8**		

Code Check: **0.995 (shear)**
Report Based On 97 Sections



Beam Design does not consider any weak axis 'M' Moments, nor weak axis 'V' Forces.

ACI 318-05 Code Check

Top Bending Check	**0.958**	Bot Bending Check	**0.782**	Shear Check	**0.995 (y)**
Location	**14.292 ft**	Location	**5.104 ft**	Location	**28.583 ft**
Gov Mu Top	**18.954 k-ft**	Gov Mu Bot	**-15.461 k-ft**	Gov Vu	**6.445 k**
phi*Mn Top	**19.782 k-ft**	phi*Mn Bot	**19.782 k-ft**	phi*Vn	**6.475 k**
Tension Bar Fy	**60 ksi**	Concrete Weight	**.145 k/ft^3**	Top Cover	**1.5 in**
Shear Bar Fy	**60 ksi**	Concrete Type	**Normal WT**	Bottom Cover	**1.5 in**
F'c	**4 ksi**	E_Concrete	**3644 ksi**	Side Cover	**1.5 in**
Flex. Rebar Set	**ASTM A615**	Min 1 Bar Dia Spac.	**No**	Legs/Stirrup	**2**
Shear Rebar Set	**ASTM A615**				

Span Information

Span	Span Length (ft)	I-Face Dist. (in)	J-Face Dist. (in)
1	**0 - 14**	**0**	**0**
2	**14 - 28**	**0**	**0**
3	**28 - 42**	**0**	**0**
4	**42 - 56**	**0**	**0**
5	**56 - 70**	**0**	**0**
6	**70 - 84**	**0**	**0**
7	**84 - 98**	**0**	**0**

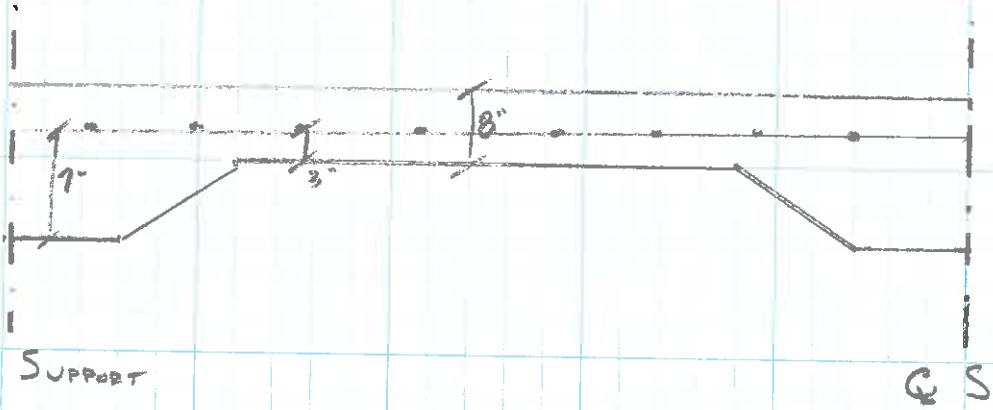
TOTAL FACTORED LOAD = 71,410# ÷ 14 = 5.1K (ASSUMES 10" AVG. THICKNESS)

1.02 KSF - FAC
0.827 KSF - UNF
} LOADS SPREADSHEET ON PG 1

INPUT TO RISA

V_{MAX} = 7.9K
$M_{(+)}$ = 15.5 FT-K
$M_{(-)}$ = 18.954 FT-K
R_{MAX} = 14.4 x 3 = 43.2 K (PUNCHING SHEAR)
} FROM RISA OUTPUT ON PAGE 2

PROPOSED CROSS SECTION:



SHEAR CHECK:

$\phi V_c = 0.75 \times 2 \times \sqrt{f'_c} \times b \times d = 0.75 \times 2 \times \sqrt{4{,}500\ psi} \times 12^{IN} \times 7^{IN} = 8.45^K$

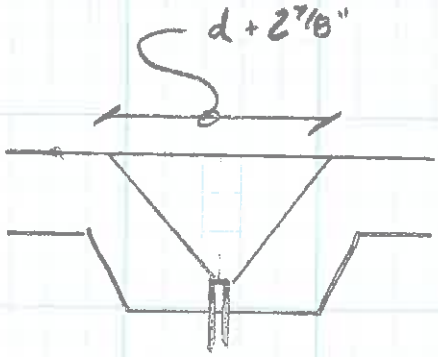
$\phi V_c = 8.45^K > V_{MAX} = 7.9^K$

PUNCHING SHEAR CHECK:

ACI 11.11.2.1 (a): $\phi V_c = (2 + 4/\beta)\sqrt{f'_c}\, b_o d$

ASSUME 3" EMBEDMENT OF PILE INTO CONTINUOUS FOOTING

PILE SHAFT HAS 27/8" O.D.



CHECK W/O BEARING PL:

$b_o = 2\pi r = 2\pi(d/2)$

$b_o = 2\pi \times \left(\frac{7" + 2\,7/8"}{2}\right) = 2.58^{FT} \cdot 31^{IN}$

(a) $\phi V_c = 0.75 \times (2 + 4/1) \times \sqrt{4{,}500\,psi} \times 31^{IN} \times 12^{IN}$

$\phi V_c = 112.3^K$

(b) $\phi V_c = \left(\frac{\alpha_s d}{b_o} + 2\right) \times \sqrt{f'_c} \times b_o \times d$ $\qquad \alpha_s = 30$ (EDGE)

$= \left(\frac{30 \times 7^{IN}}{31^{IN}} + 2\right) \times \sqrt{4{,}500\,psi} \times 31^{IN} \times 12^{IN} = 218.96^K$

(c) $\phi V_c = 4\sqrt{f'_c} \times b_o \times d = 4 \times \sqrt{4500\,psi} \times 31^{IN} \times 12^{IN} = 99.8^K$ ←

$\phi V_c = 99.8^K > R_{MAX} = 8.1^K$

* DESIGN OPTION: FOR BETTER BEARING AREA, WELD 6" ϕ PL TO END OF 27/8" ϕ SHAFT. *

CHECK BENDING:

$M_{(+)} = 15.5^{Ft-K}$ $\quad d_{(+)} = 5^{IN}$

$$M_u/\phi bd^2 = \frac{15.5^{Ft-K} \times 12^{IN}/_{Ft} \times 1000^{\#}/_{KIP}}{0.9 \times 12^{IN} \times 5^{IN^2}} = 688.9 \rightarrow \rho = 0.0130$$

$A_{ST(12)} = \rho bd_{(+)} = 0.0130 \times 12^{IN} \times 5^{IN} = 0.78\ in^2$ (#7 @ 8" c/c = 0.90 in²)

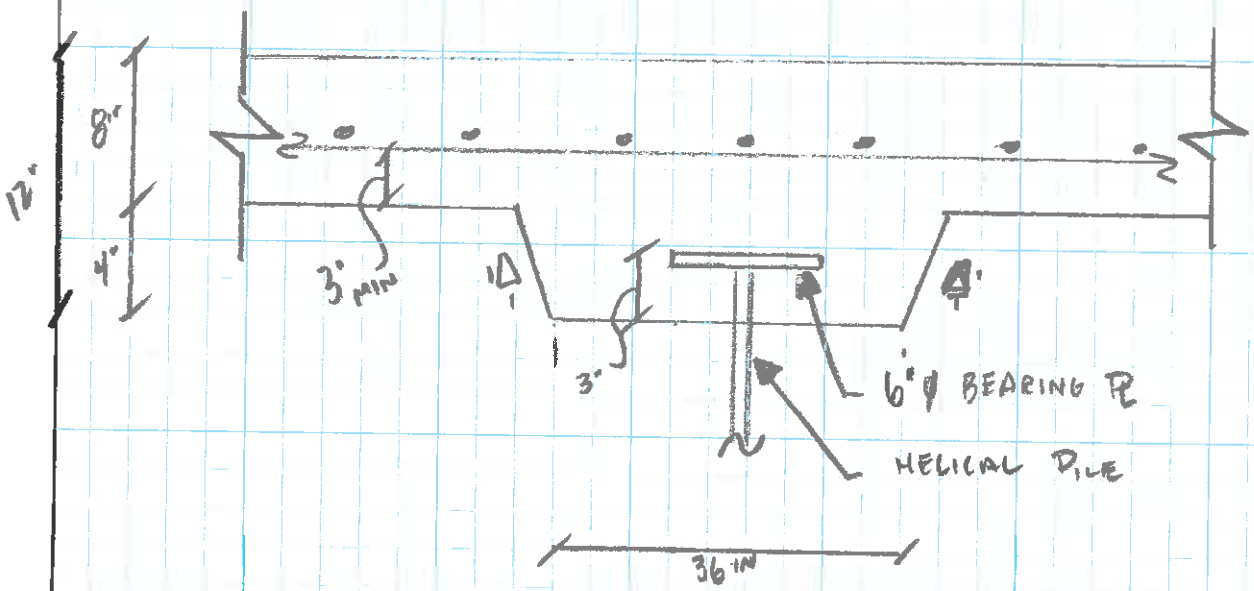
$M_{(-)} = 18.954^{Ft-K}$ $\quad d_{(-)} = 7^{IN}$

$$M_u/\phi bd^2 = \frac{18.954^{Ft-K} \times 12^{IN}/_{Ft} \times 1000^{\#}/_{KIP}}{0.9 \times 12^{IN} \times 7^{IN^2}} = 429.8 \rightarrow \rho = 0.0077$$

$A_{ST(12)} = \rho bd_{(-)} = 0.0077 \times 12^{IN} \times 7^{IN} = 0.6468\ in^2$ ($A_{s,(+)}$ CONTROLS)

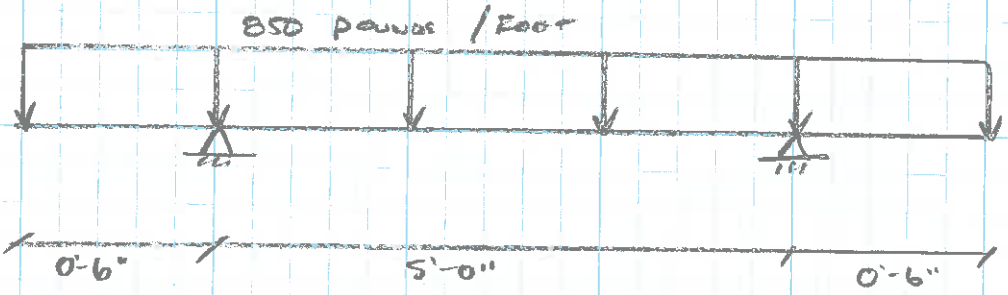
TEMPERATURE / SHRINKAGE REQUIREMENTS:

$A_{ST(T/S)} = \rho bd = 0.0018 \times 12^{IN} \times 12^{IN} = 0.26\ in^2$ (#4 @ 8") = 0.28 in²



Design Widened Slab @ Pile Locations (Assumes 5'-0" c/c Spacing)

Total Load = 71.5^{K} ÷ 14^{FT} = 5.1^{K}/$_{FT}$ ÷ 6^{FT} = 850$^{\#}$/$_{FT}$



$V_{FACTORED}$ = 2.125^{K}

$M_{FACTORED(-)}$ = 2.55$^{FT\text{-}K}$

d = 5" (See Sht 3 - Sketch)

Check Shear:

$\phi V_c = 0.75 \times 2\sqrt{f'_c} \times b \times d = 0.75 \times 2 \times \sqrt{4500 psi} \times 12^{IN} \times 5^{IN}$

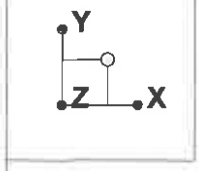
ϕV_c = 6.04^{K} > 2.125^{K} OK ✓

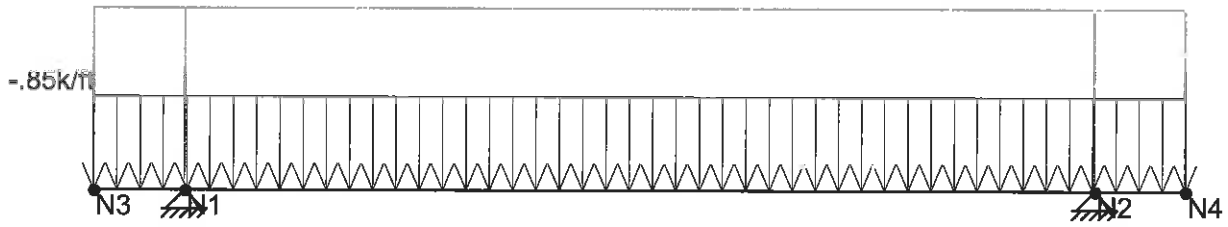
Check Bending:

$M_u/\phi bd^2 = \frac{2.55^{FT\text{-}K} \times 12^{IN}/_{FT} \times 1000^{\#}/_{KIP}}{0.9 \times 12^{IN} \times (5^{IN})^2}$ = 113.3 → ρ = 0.0020

4/3 × ρ = 0.0027 < 0.0037 ∴ ρ = 0.0027

$A_{ST(REQ'D)} = \rho \times b \times d = 0.0027 \times 12^{IN} \times 5^{IN}$ = 0.16 in^2 < 0.28 in^2 (Provided) OK ✓





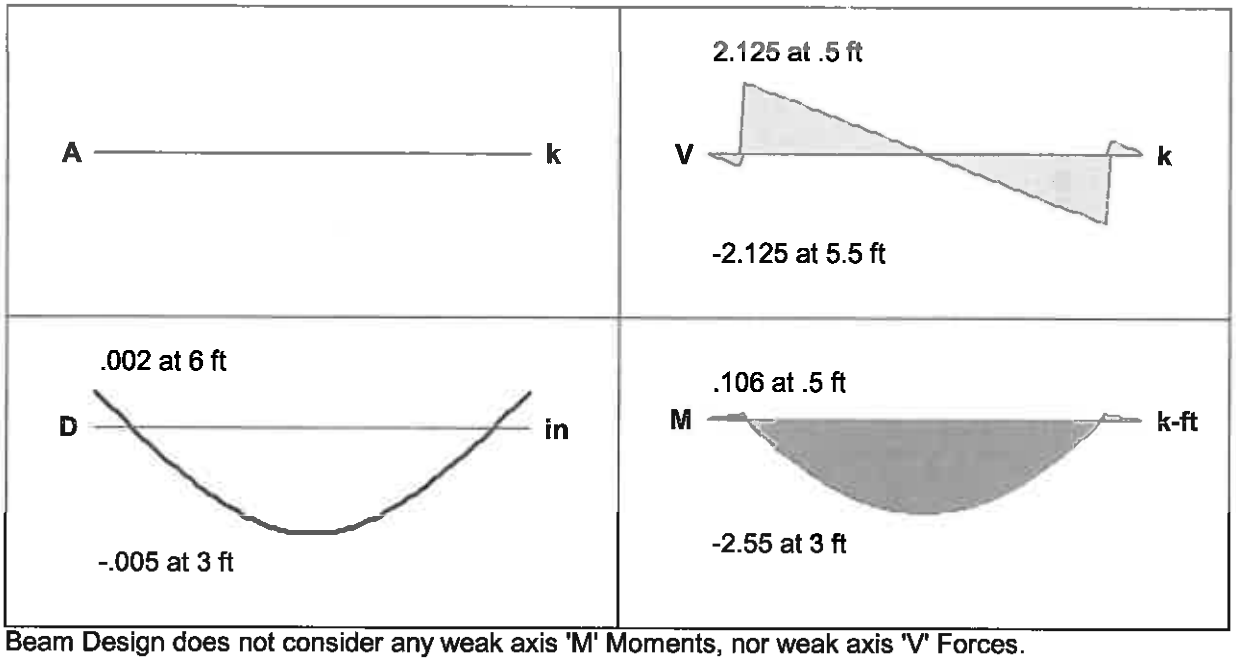
Loads: LC 1, Factored
Results for LC 1, Factored

ARCADIS	Mayport Naval Station - Angled Tie Back Bearing Angle	SK - 1
CMW		Mar 27, 2014 at 10:34 AM
TO000610.B001		untitled.r2d

Beam: ***M1***

Shape:	**CRECT12X12**	Concrete Stress Block:	**Rectangular**
Material:	**Conc4000NW**	Cracked Sections Used:	**Yes**
Length:	**6 ft**	Cracked 'I' Factor:	**.35**
I Joint:	**N3**	Effective 'I':	**604.8 in^4**
J Joint:	**N4**		

Code Check: **0.135 (shear)**
Report Based On 97 Sections



Beam Design does not consider any weak axis 'M' Moments, nor weak axis 'V' Forces.

Warning: No design for spans less than 1 ft.

ACI 318-05 Code Check

Top Bending Check	**0.004**	Bot Bending Check	**0.100**	Shear Check	**0.135 (y)**
Location	**.5 ft**	Location	**3 ft**	Location	**1.25 ft**
Gov Mu Top	**.106 k-ft**	Gov Mu Bot	**-2.55 k-ft**	Gov Vu	**1.488 k**
phi*Mn Top	**25.503 k-ft**	phi*Mn Bot	**25.503 k-ft**	phi*Vn	**11.028 k**
Tension Bar Fy	**60 ksi**	Concrete Weight	**.145 k/ft^3**	Top Cover	**1.5 in**
Shear Bar Fy	**60 ksi**	Concrete Type	**Normal WT**	Bottom Cover	**1.5 in**
F'c	**4 ksi**	E_Concrete	**3644 ksi**	Side Cover	**1.5 in**
Flex. Rebar Set	**ASTM A615**	Min 1 Bar Dia Spac.	**No**	Legs/Stirrup	**2**
Shear Rebar Set	**ASTM A615**				

Span Information

Span	Span Length (ft)	I-Face Dist. (in)	J-Face Dist. (in)
1	**0 - .5**	**0**	**0**
2	**.5 - 5.5**	**0**	**0**
3	**5.5 - 6**	**0**	**0**

ARCADIS

Brook Channel Conveyance and Riprap Design Calculations

ARCADIS
Infrastructure, environment, buildings

Calculation Sheet

Client: General Electric Company

Project Location: Pittsfield, Mass

Project: Unkamet Brook Revised Final RD/RA Work Plan **Project:** B0040190.0002

Subject: Unkamet Brook Channel Re-routing Analysis

Prepared by: JEM **Date:** March 29, 2013

Reviewed By: JEM **Date:** April 01, 2013

Checked By: PHB **Date:** April 02, 2013

OBJECTIVE:

Compare the flow characteristics of the existing Unkamet Brook channel to the proposed re-routed channel to confirm that the re-routed channel flow conveyance capacity will match or exceed the existing channel flow capacity. Analyze the proposed re-routed channel lining material for stability under evaluated flow capacity conditions.

REFERENCES:

1. Terramodel® (Trimble Navigation Limited) V10.52 terrain modeling software, 2007.
2. Flowmaster (Bentley Systems, Inc.) V8i hydrologic modeling software, November 2009.
3. Hydraulic Toolbox (Federal Highway Administration [FHWA]) V4.0 hydraulic channel stability software, December 2012.
4. Unkamet Brook Area Remainder - Final Removal Design/Removal Action Work Plan, Design Drawings, ARCADIS, April, 2013.

ASSUMPTIONS:

1. The alignment, bed slope and cross section of the existing Unkamet Brook channel was determined from supplemental site topographic survey by Hill Engineers, Architects and Planners dated October 6, 2010 and Existing Site Plan drawings for North of Merrill Road (Reference 4) using Terramodel (Reference 1).
2. The alignment, bed slope and cross section of the proposed Unkamet Brook was determined from the Unkamet Brook Re-routing Plan, Profile and Detail drawings in Reference 4.
3. The Manning “n” value of 0.045 for the existing Unkamet Brook drainage channel bed and side slope lining is based on the value for a natural stream with weeds found in the Flowmaster materials library (Reference 2).
4. The Manning “n” value of 0.036 for the proposed Unkamet Brook drainage channel bed and side slope lining was calculated for Type 1 riprap lining using the riprap analysis module in the FHWA Toolbox (Reference 3).

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Infrastructure, environment, buildings

Calculation Sheet

METHOD:

1. The channel conveyance flow capacity used for the comparative analysis is based on the average channel cross section determined from Assumptions 1 and 2 and a channel flow depth of 3 feet which is the approximate maximum confined bank flow condition.

2. Based on the resulting flow capacities estimated for the existing and proposed channel alignments, determine if the proposed re-routed channel has sufficient capacity (at a 3-foot flow depth) to convey the flow estimated for the existing channel.

3. Use the FHWA Hydroalic Toolbox program to determine if the proposed re-routed channel lining materials are sufficiently stable based on the estimated flow conditions (at a 3-foot flow depth) for the re-routed channel.

CALCULATIONS:

1. Channel Conveyance Flow Capacity Analysis

Calculations for the conveyance flow capacity of the existing and proposed Unkamet Brook channel were performed using Flowmaster software (Reference 2). Flowmaster is an integrated program for hydraulic analysis of open and closed channel flow and pressure piping. Manning's Formula was used for the analysis of the channel hydraulics. The results of the calculations are summarized below. Flowmaster output is included in Attachment 1.

Table 1 –Existing and Proposed Channel Flow Characteristics

Channel	Channel Bottom Width [ft]	Channel Side Slope	Channel Slope [ft/ft]	Manning "n"	Conveyance Flow Capacity [cfs]	Flow Depth [ft]	Flow Velocity [ft/s]
Existing Unkamet Brook Channel	22	3H:1V	0.0006	0.045	129.92	3.0	1.40
Re-routed Unkamet Brook Channel	12	3H:1V	0.0010	0.036	132.01	3.0	2.10

2. Channel Lining Stability Analysis

The channel lining stability analysis was performed for the re-routed Unkamet Brook channel using FHWA Hydraulic Toolbox software (Reference 3). This software analyzes four major types of flexible lining: 1) vegetative linings; 2) manufactured linings (RECPs); 3) riprap, cobble, and 4) gravel linings based on the procedures found in HEC-15 "Design of Roadside Channels with Flexible Linings".

The results of the calculations are summarized below. FHWA Hydraulic Toolbox output is included in Attachment 2.

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Infrastructure, environment, buildings

Calculation Sheet

Table 2 - Shear Stresses on Bed and Side Slopes

Channel Section	Riprap Type	Channel Component	Conveyance Flow Capacity [cfs]	Average Flow Depth at Peak Storage [ft]	Resulting Shear Stress [lb/ft^2]	Allowable Shear Stress [lb/ft^2]	Factor of Safety
Straight Channel (Radius >100 feet)	Type 1	Bed	132	3.025	0.19	0.77	4.05
		Side Slope	132	3.025	0.19	0.67	3.52
Bend (Radius = 60 feet)	Type 2	Bed	132	3.025	0.40	1.20	3.00
		Side Slope	132	3.025	0.35	1.06	3.02

SUMMARY:

Based on the above assumptions, methods, and calculations, the proposed Unkamet Brook re-routed channel alignment provides a conveyance flow capacity equivelant to or greater that the conveyance flow capacity of the existing channel. The channel lining materials proposed for the re-routed channel bed and side slope are shown to be stable under the flow conditions evaluated in this calculation.

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Attachment 1

Flowmaster Channel Analysis
Output

Unkamet Existing Channel

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.045	
Channel Slope	0.00060	ft/ft
Normal Depth	3.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	22.00	ft

Results

Discharge	129.92	ft^3/s
Flow Area	93.00	ft^2
Wetted Perimeter	40.97	ft
Hydraulic Radius	2.27	ft
Top Width	40.00	ft
Critical Depth	0.98	ft
Critical Slope	0.03130	ft/ft
Velocity	1.40	ft/s
Velocity Head	0.03	ft
Specific Energy	3.03	ft
Froude Number	0.16	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	3.00	ft
Length	1080.00	ft
Number Of Steps	25	

GVF Output Data

Upstream Depth	3.00	ft
Profile Description	Uniform Flow	
Profile Headloss	0.65	ft
Downstream Velocity	1.40	ft/s
Upstream Velocity	1.40	ft/s
Normal Depth	3.00	ft
Critical Depth	0.98	ft
Channel Slope	0.00060	ft/ft

Unkamet Existing Channel

GVF Output Data

Critical Slope	0.03130	ft/ft

Unkamet Re-routed Channel

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.036	
Channel Slope	0.00100	ft/ft
Normal Depth	3.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	12.00	ft

Results

Discharge	132.01	ft^3/s
Flow Area	63.00	ft^2
Wetted Perimeter	30.97	ft
Hydraulic Radius	2.03	ft
Top Width	30.00	ft
Critical Depth	1.38	ft
Critical Slope	0.01885	ft/ft
Velocity	2.10	ft/s
Velocity Head	0.07	ft
Specific Energy	3.07	ft
Froude Number	0.25	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	3.00	ft
Length	1280.00	ft
Number Of Steps	25	

GVF Output Data

Upstream Depth	3.00	ft
Profile Description	Uniform Flow	
Profile Headloss	1.28	ft
Downstream Velocity	2.10	ft/s
Upstream Velocity	2.10	ft/s
Normal Depth	3.00	ft
Critical Depth	1.38	ft
Channel Slope	0.00100	ft/ft

Unkamet Re-routed Channel

GVF Output Data

Critical Slope	0.01885	ft/ft

ARCADIS

Attachment 1

Flowmaster Channel Analysis Output

Hydraulic Analysis Report

Project Data

Project Title: Unkamet Brook Reroute

Designer: JEM

Project Date: Thursday, March 28, 2013

Project Units: U.S. Customary Units

Notes: Unkamet Brook Re-routing

Channel Lining Analysis: Channel Lining Design Analysis

Notes: This analysis applies to straight portions of the channel where radius is greater than 100 feet and Type 1 riprap will be used.

Lining Input Parameters

Channel Lining Type: Riprap, Cobble, or Gravel

D50: 0.16 (ft)

Riprap Specific Weight: 165 (lb/ft^3)

Water Specific Weight: 62.4 (lb/ft^3)

Riprap Shape is Crushed

Riprap shape is used with D50 to compute the angle of repose (Reference HEC-15, Figure 6.1)

Safety Factor: 2

Calculated Safety Factor: 1.00016

Lining Results

Angle of Repose: 41.6 (degrees)

Relative Flow Depth: 13.2142 (ft)

Manning's n method: Blodgett

Manning's n: 0.0365857

Channel Bottom Shear Results

V*: 0.312078

Reynold's Number: 4102.92

Shield's Parameter: 0.047

shear stress on channel bottom: 0.188736 (lb/ft^2)

Permissible shear stress for channel bottom: 0.771552 (lb/ft^2)

channel bottom is stable

Stable D50: 0.0782781 (ft)

Channel Side Shear Results

K1: 0.868

K2: 0.879283

Kb: 1.53576

shear stress on side of channel: 0.188736 (lb/ft^2)

Permissible shear stress for side of channel: 0.678413 (lb/ft^2)

Stable Side D50: 0.0772737 (lb/ft^2)

side of channel is stable

Channel Bend Shear Results

Curvature Radius: 150 (ft)

No further correction will occur once R/T > 10

shear stress on bottom of channel in bend: 0.289854 (lb/ft^2)

bottom of bend of the channel is stable

Length of Protection beyond PT: 37.8407 (ft)

Additional Freeboard required because of Superelevation: 0.0267902 (ft)

Channel Bend Side Shear Results

shear stress on side of channel in bend: 0.251594 (lb/ft^2)

The side of the bend of the channel is stable

Channel Lining Stability Results

the channel is stable

Channel Summary

Name of Selected Channel: Proposed Channel

Hydraulic Analysis Report

Project Data

Project Title: Unkamet Brook Reroute

Designer: JEM

Project Date: Thursday, March 28, 2013

Project Units: U.S. Customary Units

Notes: Unkamet Brook Re-routing

Channel Lining Analysis: Channel Lining Design Bend

Notes: This analysis applies to channel bends with a radius of less than 100 feet where Type 2 riprap will be used..

Lining Input Parameters

Channel Lining Type: Riprap, Cobble, or Gravel

D50: 0.25 (ft) - **Type 2 Riprap**

Riprap Specific Weight: 165 (lb/ft^3)

Water Specific Weight: 62.4 (lb/ft^3)

Riprap Shape is Crushed

Riprap shape is used with D50 to compute the angle of repose (Reference HEC-15, Figure 6.1)

Safety Factor: 2

Calculated Safety Factor: 1.00016

Lining Results

Angle of Repose: 41.6 (degrees)

Relative Flow Depth: 8.91218 (ft)

Manning's n method: Blodgett

Manning's n: 0.0414808

Channel Bottom Shear Results

V*: 0.322103

Reynold's Number: 6616.75

Shield's Parameter: 0.047

shear stress on channel bottom: 0.201057 (lb/ft^2)

Permissible shear stress for channel bottom: 1.20555 (lb/ft^2)

channel bottom is stable

Stable D50: 0.0833881 (ft)

Channel Side Shear Results

K1: 0.868

K2: 0.879283

Kb: 2

shear stress on side of channel: 0.201057 (lb/ft^2)

Permissible shear stress for side of channel: 1.06002 (lb/ft^2)

Stable Side D50: 0.0823181 (lb/ft^2)

side of channel is stable

Channel Bend Shear Results

Curvature Radius: 60 (ft)

No further correction will occur once R/T > 10

shear stress on bottom of channel in bend: 0.402114 (lb/ft^2)

bottom of bend of the channel is stable

Length of Protection beyond PT: 35.4471 (ft)

Additional Freeboard required because of Superelevation: 0.0580297 (ft)

Channel Bend Side Shear Results

shear stress on side of channel in bend: 0.349035 (lb/ft^2)

The side of the bend of the channel is stable

Channel Lining Stability Results

the channel is stable

Channel Summary

Name of Selected Channel: Proposed Channel

ARCADIS

Culvert and Outfall Outlet Protection Design Calculations

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 03/29/14
TITLE: Dalton Avenue Culvert Outfall Protection Reviewed By: TLC Date: 03/31/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:

Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook culvert outfall at Dalton Avenue culvert outfall (i.e., the Dalton Avenue culvert).

REFERENCES:

1. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.

2. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:

1. The Dalton Avenue culvert is a 6-foot (ft) by 4.5-ft concrete box culvert (Diameter = 4.5 ft).

2. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions.

3. Reference 1 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the ground onto which the outfall discharges. Reference 1 is considered appropriate for designing an outfall protection system for the Dalton Avenue culvert.

4. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 2.

CALCULATIONS:

1. Maximum Expected Flow

The maximum expected flow for the Dalton Avenue culvert is calculated to be approximately 50 cfs. This flow was determined using HEC-RAS modeling for various situations/input parameters.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 1 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For situations in which the modeled discharge flow is less than the range available (on the nomograph) for the specific outfall diameter, the minimum recommended rock size and apron dimension are assumed. For the Dalton Avenue culvert a D_{50} riprap size of approximately 3.0 inches and an apron length (L_a) of 19 ft was determined appropriate.

3. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, a thickness for the apron for the Dalton Avenue culvert is calculated to be approximately 0.6 ft.

SUMMARY:

A summary of the outfall protection system is below. The riprap apron will extend from top of bank to top of bank for the entire length of the apron.

D_{50} (inches)	Thickness (ft)	Length (ft)
3.0	0.6	19

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 03/29/14
TITLE: Railroad Spur Culvert Outfall Protection Reviewed By: TLC Date: 03/31/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Railroad Spur culvert outfall (Outfall #1).

REFERENCES:
1. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.

2. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Railroad Spur culvert is comprised of two 4-foot (ft) diameter corrugated metal pipes (Diameter = 4 ft).

2. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions.

3. Reference 1 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the ground onto which the outfall discharges. Reference 1 is considered appropriate for designing an outfall protection system for the Railroad Spur culvert outfall.

4. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 2.

CALCULATIONS:
1. Maximum Expected Flow
The maximum expected flow for the Railroad Spur culvert is calculated to be approximately 36 cfs. This flow was determined using HEC-RAS modeling for various situations/input parameters.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)
The Rock Outlet Protection design provided in Reference 1 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For situations in which the modeled discharge flow is less than the range available (on the nomograph) for the specific outfall diameter, the minimum recommended rock size and apron dimension are assumed. For the Railroad Spur culvert a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 17 ft was determined appropriate.

3. Thickness
The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, a thickness for the apron for the Railroad Spur culvert outfall is calculated to be approximately 0.5 ft.

SUMMARY:
A summary of the outfall protection system is below.

D_{50} (inches)	Thickness (ft)	Length (ft)
2.4	0.5	17

However, as the restoration proposed for the Unkamet Brook channel in the area near the Railroad Spur culvert calls for a 6-inch layer of riprap with a D_{50} of 2.5 inches (Assumption 4), it has been determined that the restoration material will be sufficient to protect against the maximum expected flow from the Railroad Spur culvert, and no additional armor protection thickness or length is needed.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 03/29/14
TITLE: Merrill Road Culvert Outfall Protection Reviewed By: TLC Date: 03/31/14
SUBJECT: Culvert/Outfall Protection Design

OBJECTIVE:

Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Merrill Road culvert outfall (Culvert #2).

REFERENCES:

1. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.

2. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:

1. The Merrill Road culvert is comprised of two 4-foot (ft) diameter corrugated metal pipes (Diameter = 4 ft).

2. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions.

3. Reference 1 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the ground onto which the outfall discharges. Reference 1 is considered appropriate for designing an outfall protection system for the Merrill Road culvert.

4. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 2.

CALCULATIONS:

1. Maximum Expected Flow

The maximum expected flow for the Merrill Road culvert is calculated to be approximately 80 cfs. This flow was determined using HEC-RAS modeling for various situations/input parameters.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 1 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For situations in which the modeled discharge flow is less than the range available (on the nomograph) for the specific outfall diameter, the minimum recommended rock size and apron dimension are assumed. For the Merrill Road culvert a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 17 ft was determined appropriate.

3. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, a thickness for the apron for the Merrill Road culvert is calculated to be approximately 0.5 ft.

SUMMARY:

A summary of the outfall protection system is below.

D_{50} (inches)	Thickness (ft)	Length (ft)
2.4	0.5	17

However, as the restoration proposed for the Unkamet Brook channel in the area near the Merrill Road culvert calls for a 6-inch layer of riprap with a D_{50} of 2.5 inches (Assumption 4), it has been determined that the restoration material will be sufficient to protect against the maximum expected flow from the Merrill Road culvert, and no additional armor protection thickness or length is needed.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 03/29/14
TITLE: Underground Culvert Outfall Protection Reviewed By: TLC Date: 03/31/14
SUBJECT: Culvert/Outfall Protection Design

OBJECTIVE:

Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Underground culvert outfall (Outfall #3).

REFERENCES:

1. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.

2. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:

1. The Underground culvert is comprised of a 4-foot (ft) diameter corrugated metal pipe (Diameter = 4 ft).

2. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions.

3. Reference 1 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the ground onto which the outfall discharges. Reference 1 is considered appropriate for designing an outfall protection system for the Underground culvert.

4. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 2.

CALCULATIONS:

1. Maximum Expected Flow

The maximum expected flow for the Underground culvert is calculated to be approximately 60 cfs. This flow was determined using HEC-RAS modeling for various situations/input parameters.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 1 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For situations in which the modeled discharge flow is less than the range available (on the nomograph) for the specific outfall diameter, the minimum recommended rock size and apron dimension are assumed. For the Underground culvert a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 17 ft was determined appropriate.

3. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, a thickness for the apron for the Underground culvert is calculated to be approximately 0.5 ft.

SUMMARY:

A summary of the outfall protection system is below.

D_{50} (inches)	Thickness (ft)	Length (ft)
2.4	0.5	17

However, as the restoration proposed for the Unkamet Brook channel in the area near the Underground culvert calls for a 6-inch layer of riprap with a D_{50} of 2.5 inches (Assumption 4), it has been determined that the restoration material will be sufficient to protect against the maximum expected flow from the Underground culvert, and no additional armor protection thickness or length is needed.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 03/29/14
TITLE: Railroad Culvert Outfall Protection Reviewed By: TLC Date: 03/31/14
SUBJECT: Culvert/Outfall Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Railroad culvert outfall (Outfall #4).

REFERENCES:
1. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.

2. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Railroad culvert is comprised of a 4-foot (ft) diameter concrete pipe (Diameter = 4 ft).

2. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions.

3. Reference 1 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the ground onto which the outfall discharges. Reference 1 is considered appropriate for designing an outfall protection system for the Railroad culvert.

4. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 2.

CALCULATIONS:

1. Maximum Expected Flow

The maximum expected flow for the Underground culvert is calculated to be approximately 60 cfs. This flow was determined using HEC-RAS modeling for various situations/input parameters.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 1 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For situations in which the modeled discharge flow is less than the range available (on the nomograph) for the specific outfall diameter, the minimum recommended rock size and apron dimension are assumed. For the Railroad culvert a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 17 ft was determined appropriate.

3. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, a thickness for the apron for the Railroad culvert is calculated to be approximately 0.5 ft.

SUMMARY:

A summary of the outfall protection system is below.

D_{50} (inches)	Thickness (ft)	Length (ft)
2.4	0.5	17

However, as the restoration proposed for the Unkamet Brook channel in the area near the Railroad culvert calls for a 6-inch layer of riprap with a D_{50} of 2.5 inches (Assumption 4), it has been determined that the restoration material will be sufficient to protect against the maximum expected flow from the Railroad culvert, and no additional armor protection thickness or length is needed.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall YD10 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall YD10.

REFERENCES:
1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall YD10 is comprised of four 18-inch diameter concrete pipes (Diameter = 1.5 feet (ft)).
2. The Manning's n-value for a concrete pipe is 0.011 (Reference 1).
3. The slope of the Outfall YD10 is assumed to be 0.015 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall YD10.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 18-inch diameter pipe for the Outfall YD10, R_h is calculated to be 0.38 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall YD10 is calculated to be approximately 15 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall YD10, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 20 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 4.5 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 9.5 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall YD10 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall YD10 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	4.5	9.5	20

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall YD12 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall YD12.

REFERENCES:

1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall YD12 is comprised of a 32-inch diameter corrugated metal pipe (CMP) (Diameter = 2.67 feet (ft)).
2. The Manning's n-value for a CMP is 0.024 (Reference 1).
3. The slope of the Outfall YD12 is assumed to be 0.03 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall YD12.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 32-inch diameter pipe for the Outfall YD12, R_h is calculated to be 0.67 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall YD12 is calculated to be approximately 46 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall YD12, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 19 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 8.0 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 10 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall YD12 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall YD12 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	8.0	10	19

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 09C Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall 09C.

REFERENCES:
1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall 09C is comprised of a 40-inch diameter concrete pipe (Diameter = 3.33 feet (ft)).
2. The Manning's n-value for a concrete pipe is 0.011 (Reference 1).
3. The slope of the Outfall 09C is assumed to be 0.006 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall 09C.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 40-inch diameter pipe for the Outfall 09C, R_h is calculated to be 0.83 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall 09C is calculated to be approximately 81 cfs.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 09C Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall 09C, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 20 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 10 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 11 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall 09C will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall 09C is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	10	11	20

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 09 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall 09.

REFERENCES:
1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall 09 is comprised of a 30-inch diameter concrete pipe (Diameter = 2.5 feet (ft)).
2. The Manning's n-value for a concrete pipe is 0.011 (Reference 1).
3. The slope of the Outfall 09 is assumed to be 0.008 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall 09.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 30-inch diameter pipe for the Outfall 09, R_h is calculated to be 0.63 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall 09 is calculated to be approximately 43 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall 09, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 21 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 7.5 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 11 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall 09 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall 09 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	7.5	11	21

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: 10-inch diameter Unknown Outfall, N. of Culvert #3 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook 10-inch diameter Unknown Outfall, N. of Culvert #3.

REFERENCES:

1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The 10-inch diameter Unknown Outfall, N. of Culvert #3 is comprised of a 10-inch diameter corrugated metal pipe (CMP) (Diameter = 0.83 feet (ft)).
2. The Manning's n-value for a CMP is 0.024 (Reference 1).
3. The slope of the 10-inch diameter Unknown Outfall, N. of Culvert #3 is assumed to be 0.10 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the 10-inch diameter Unknown Outfall, N. of Culvert #3.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 10-inch diameter pipe for the 10-inch diameter Unknown Outfall, N. of Culvert #3, R_h is calculated to be 0.21 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the 10-inch diameter Unknown Outfall, N. of Culvert #3 is calculated to be approximately 4 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the 10-inch diameter Unknown Outfall, N. of Culvert #3, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 22 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 2.5 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 9.6 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the 10-inch diameter Unknown Outfall, N. of Culvert #3 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for 10-inch diameter Unknown Outfall, N. of Culvert #3 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	2.5	9.6	22

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: 6-inch diameter Unknown Outfall, N. of Culvert #3 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook 6-inch diameter Unknown Outfall, N. of Culvert #3.

REFERENCES:

1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The 6-inch diameter Unknown Outfall, N. of Culvert #3 is comprised of a 6-inch diameter corrugated metal pipe (CMP) (Diameter = 0.50 feet (ft)).
2. The Manning's n-value for a CMP is 0.024 (Reference 1).
3. The slope of the 6-inch diameter Unknown Outfall, N. of Culvert #3 is assumed to be 0.10 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the 6-inch diameter Unknown Outfall, N. of Culvert #3.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 6-inch diameter pipe for the 6-inch diameter Unknown Outfall, N. of Culvert #3, R_h is calculated to be 0.13 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the 6-inch diameter Unknown Outfall, N. of Culvert #3 is calculated to be approximately 1 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the 6-inch diameter Unknown Outfall, N. of Culvert #3, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 22 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 1.5 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 9.3 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the 6-inch diameter Unknown Outfall, N. of Culvert #3 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for 6-inch diameter Unknown Outfall, N. of Culvert #3 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	1.5	9.3	22

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: 12-inch diameter Unknown Outfall, N. of Culvert #3 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook 12-inch diameter Unknown Outfall, N. of Culvert #3.

REFERENCES:

1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The 12-inch diameter Unknown Outfall, N. of Culvert #3 is comprised of a 12-inch diameter concrete pipe (Diameter = 1.0 feet (ft)).
2. The Manning's n-value for a concrete pipe is 0.011 (Reference 1).
3. The slope of the 12-inch diameter Unknown Outfall, N. of Culvert #3 is assumed to be 0.03 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the 12-inch diameter Unknown Outfall, N. of Culvert #3.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 12-inch diameter pipe for the 12-inch diameter Unknown Outfall, N. of Culvert #3, R_h is calculated to be 0.25 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the 12-inch diameter Unknown Outfall, N. of Culvert #3 is calculated to be approximately 7 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the 12-inch diameter Unknown Outfall, N. of Culvert #3, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 20 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 3.0 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 9.0 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the 12-inch diameter Unknown Outfall, N. of Culvert #3 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for 12-inch diameter Unknown Outfall, N. of Culvert #3 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	3.0	9.0	20

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 4A, S. of Culver #3 Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall 4A, S. of Culvert #3.

REFERENCES:
1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall 4A, S. of Culvert #3 is comprised of a 24-inch diameter steel pipe (Diameter = 2.0 feet (ft)).
2. The Manning's n-value for a steel pipe is 0.012 (Reference 1).
3. The slope of the Outfall 4A, S. of Culvert #3 is assumed to be 0.011 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall 4A, S. of Culvert #3.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 24-inch diameter pipe for the Outfall 4A, S. of Culvert #3, R_h is calculated to be 0.50 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall 4A, S. of Culvert #3 is calculated to be approximately 26 cfs.

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall 4A, S. of Culvert #3, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 21 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 6.0 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 10 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall 4A, S. of Culvert #3 will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall 4A, S. of Culvert #3 is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	6.0	10	21

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 15'' RCP Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

OBJECTIVE:
Determine the need for and design riprap outlet protection (i.e., armor stone size, apron dimensions, etc.) for the Unkamet Brook Outfall 15'' RCP.

REFERENCES:

1. US Army Corps of Engineers, Hydraulic Engineering Center. "HEC-RAS River Analysis System; Hydraulic Reference Manual." Version 4.0, March, 2008.
2. New York Standards and Specifications for Erosion and Sediment Control. August, 2005.
3. ARCADIS. "Revised Final Removal Design/Removal Action Work Plan." April 2014.

ASSUMPTIONS:
1. The Outfall 15'' RCP is comprised of a 15-inch diameter concrete pipe (Diameter = 1.25 feet (ft)).
2. The Manning's n-value for a concrete pipe is 0.011 (Reference 1).
3. The slope of the Outfall 15'' RCP is assumed to be 0.016 ft/ft in the absence of as-built information.
4. The proposed riprap outlet protection has been designed to accommodate pipe-full flow with maximum tailwater conditions. This conservative assumption results in scour protection for flows approaching the theoretical maximum capacity discharge from this location.
5. Reference 2 is generally applicable for designing outfall protection systems for outlets on slopes with grades at or less than 10%. It should be noted that this criteria does not refer to the slope of the pipe, but to the slope of the bank onto which the outfall discharges. Reference 2 is considered appropriate for designing an outfall protection system for the Outfall 15'' RCP.
6. The typical restoration for the Unkamet Brook channel requires a 6-inch layer of Type I riprap (a D_{50} of approximately 2.5 inches), per Reference 3.

CALCULATIONS:

1. Maximum Expected Flow

The hydraulic radius is defined as the ratio of the cross-sectional area of the flow to its wetted perimeter (the portion of the cross-section's perimeter that is "wet"):

$$R_h = \frac{A}{P}$$

Where:
R_h = hydraulic radius (ft)
A = cross-sectional area (sf)
P = wetted perimeter (ft)

Given a 15-inch diameter pipe for the Outfall 15'' RCP, R_h is calculated to be 0.31 ft. The maximum expected flow can then be calculated numerically using Manning's formula:

$$Q = A * \left(\frac{k}{n} * {R_h}^{2/3} * S^{1/2}\right)$$

Where:
Q = Maximum expected flow (cubic feet per second (cfs))
k = conversion constant equal to 1.486 for US customary units
n = Manning's n-value
S = slope of the water surface (ft/ft); assumed to be equal to the slope of the pipe at pipe-full conditions

Therefore, the maximum expected flow for the Outfall 15'' RCP is calculated to be approximately 10 cfs.

PROJECT NO.: B0040190

CLIENT: General Electric PROJECT: Unkamet Brook Prepared By: LJP Date: 04/11/14
TITLE: Outfall 15'' RCP Scour Protection Reviewed By: TLC Date: 04/11/14
SUBJECT: Culvert/Outlet Protection Design

2. Rock Size (D_{50}) and Minimum Length of Apron (L_a)

The Rock Outlet Protection design provided in Reference 2 provides a chart or nomograph for maximum tailwater conditions (Figure 5B.13) that, based on two design parameters (i.e., outfall diameter and flow), dictates the appropriate rock size and apron dimensions. For the Outfall 15'' RCP, a D_{50} riprap size of approximately 2.4 inches and an apron length (L_a) of 20 ft was determined appropriate.

3. Apron Size

In Reference 2, the width of the upstream end of the apron (A), adjacent to the pipe, is designed to have a width three (3) times the diameter of the outlet pipe. The width at the upstream end of the apron will therefore be approximately 3.8 ft.

The downstream end of the apron is designed to be the sum of the outlet pipe diameter plus 40% of the minimum length of the apron (L_a). The width at the downstream end of the apron (W) will therefore be approximately 9.1 ft.

4. Thickness

The minimum thickness of the riprap layer is designed to be 1.5 times the maximum stone diameter for D_{50} of 15 inches or less, and 1.2 times the maximum stone size for D_{50} greater than 15 inches. (The diameter of the maximum stone size is 1.5 times the D_{50} size.) Therefore, the thickness of the apron for the Outfall 15'' RCP will be approximately 0.45 ft.

SUMMARY:

A summary of the outfall protection system designed for Outfall 15'' RCP is below.

D_{50} (inches)	Thickness (ft)	Upstream Width (ft)	Downstream Width (ft)	Length (ft)
2.4	0.45	3.8	9.1	20

Apron construction will be blended to meet the edge of fill/restoration material in the Unkamet Brook channel. At a minimum, the apron length will reach to the fill/restoration material the channel.

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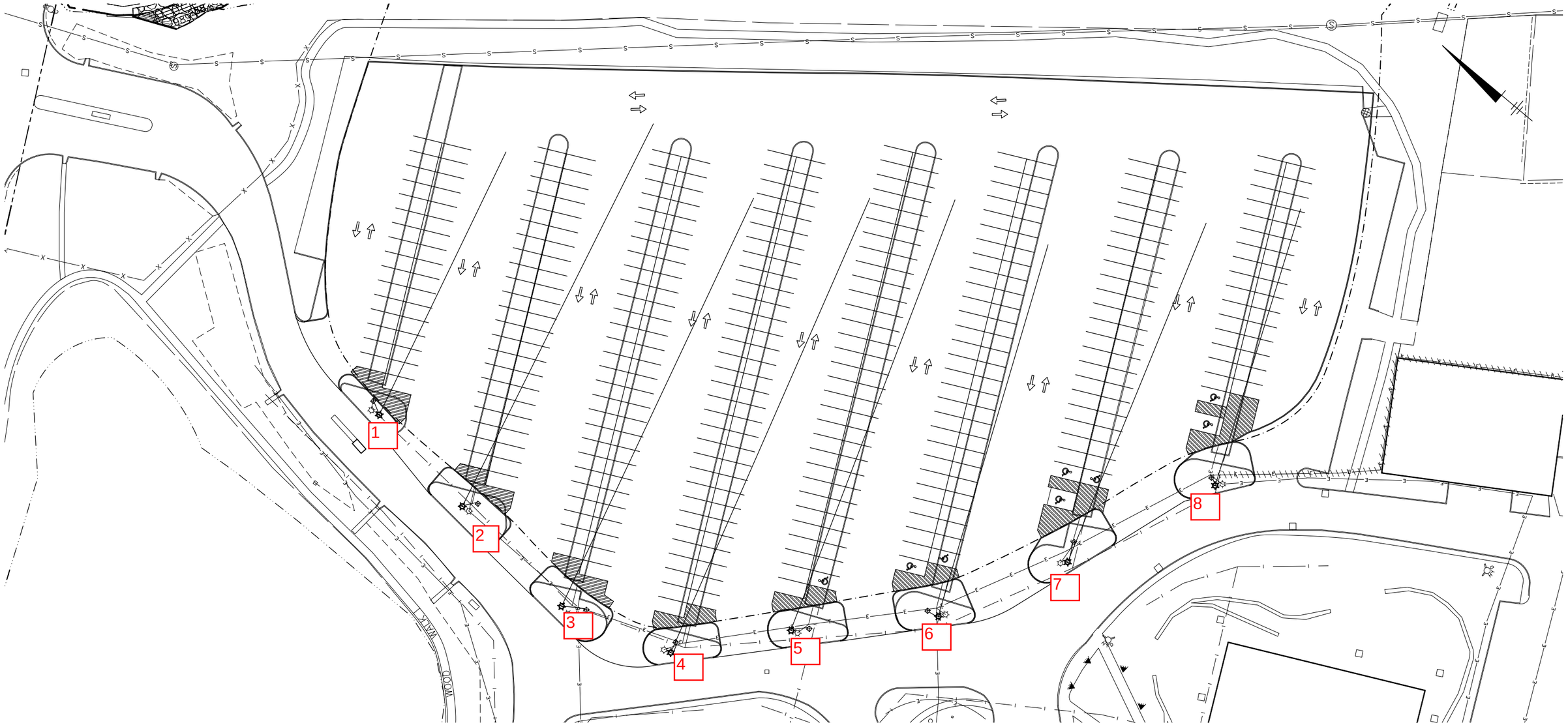
Parking Lot Lighting Design Calculations

LUMINAIRE LOCATIONS

No.	Label	Location X	Location Y	Location Z	MH	Orientation	Tilt	Aim X	Aim Y	Aim Z
1 9	B	209.8	-92.4	30.0	30.0	67.1	80.3	372.0	-24.0	0.0
2 6	B	40.0	-14.0	30.0	30.0	66.5	82.7	256.0	80.0	0.0
3 5	B	-24.5	48.3	30.0	30.0	70.9	83.9	240.0	140.0	0.0
4 4	B	-85.2	102.6	30.0	30.0	74.5	84.4	208.0	184.0	0.0
5 3	B	-104.9	156.9	30.0	30.0	74.2	83.8	160.0	232.0	0.0
6 2	B	-96.8	247.5	30.0	30.0	76.5	83.4	156.0	308.0	0.0
7 1	B	-87.9	332.3	30.0	30.0	75.7	80.4	84.0	376.0	0.0
8 8	B	108.0	-48.0	30.0	30.0	72.2	82.3	320.0	20.0	0.0

Please note that the numbers in the left most column are arbitrary. The numbers I have in red are from left to right on the site plan (see page 2 of this PDF).

CITY: SYRACUSE DIV/GROUP: 141/ENV DB: L. FORAKER, K.WOOD, B.GETTS LD: B.GETTS PIC: PM:A CORBIN TM: T LEEMHUIS LYR:ON=*;OFF=*REF*
G:\Dept\Electrical\Work for Other Offices\Syracuse\GE Unkamet Brook\40190G14.dwg LAYOUT: 14 SAVED: 3/18/2013 9:49 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: M-LD2B-PDF PLOTSTYLETABLE: PLTCONT1.CTB PLOTTED: 3/18/2013 10:12 PM BY: KASHEN, MO



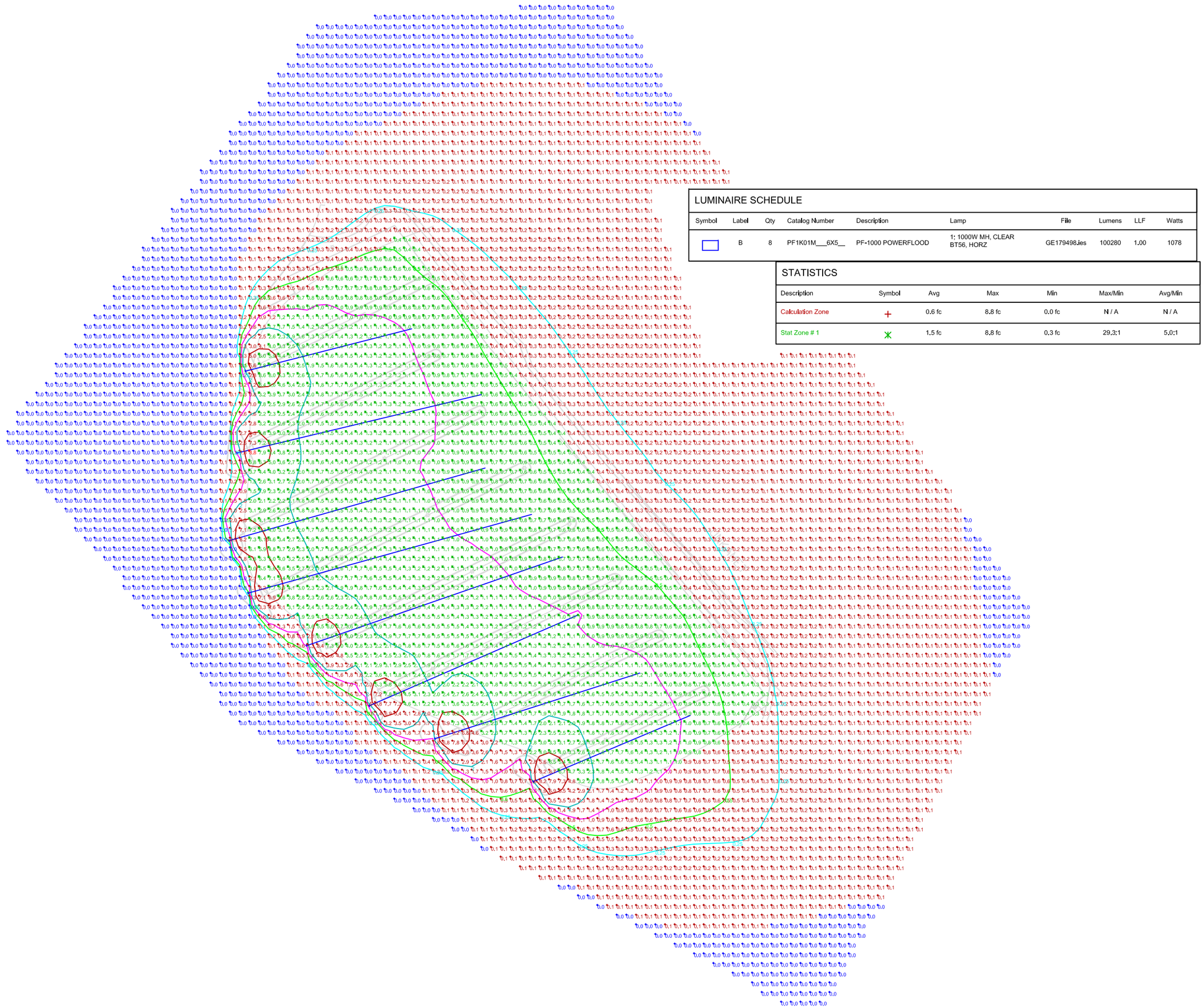
LEGEND:

- NEW CONDUIT
- PROPOSED ANGLE OF NEW LIGHTS
- EXISTING CONDUIT
- EXISTING LIGHT POLE
- PROPOSED LIGHT POLE
- EXISTING ELECTRICAL JUNCTION BOX

NOTES:

1. NEW CONDUIT FROM NEW POLES TO EXISTING JUNCTION BOXES SHALL BE 3/4" PVC AND SHALL CONTAIN 2#10, 1#10 GROUND.
2. HOLES FOR NEW LIGHT POLES SHALL BE DRILLED AND SURROUNDING SOIL SHALL BE COMPACTED AROUND NEW FOUNDATIONS.

FORMER INTERIOR LANDFILL - POWER AND LIGHTING PLAN



LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
▭	B	8	PF1K01M___6X5__	PF-1000 POWERFLOOD	1; 1000W MH, CLEAR BT56, HORZ	GE179498.ies	100280	1.00	1078

STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calculation Zone	+	0.6 fc	8.8 fc	0.0 fc	N / A	N / A
Stat Zone # 1	×	1.5 fc	8.8 fc	0.3 fc	29.3:1	5.0:1

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Parking Lot Stormwater Runoff
Design Calculations

Hydrologic Soil Group—Berkshire County, Massachusetts
(Unkamet Brook RD/RA Work Plan)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:2,390 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Berkshire County, Massachusetts
Survey Area Data: Version 7, Sep 22, 2012

Date(s) aerial images were photographed: 7/29/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Berkshire County, Massachusetts (MA003)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
34A	Fredon fine sandy loam, 0 to 3 percent slopes	C	0.9	5.0%
58A	Palms and Carlisle mucks, 0 to 1 percent slopes	A/D	6.4	34.8%
602	Urban land		11.0	60.3%
Totals for Area of Interest			**18.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

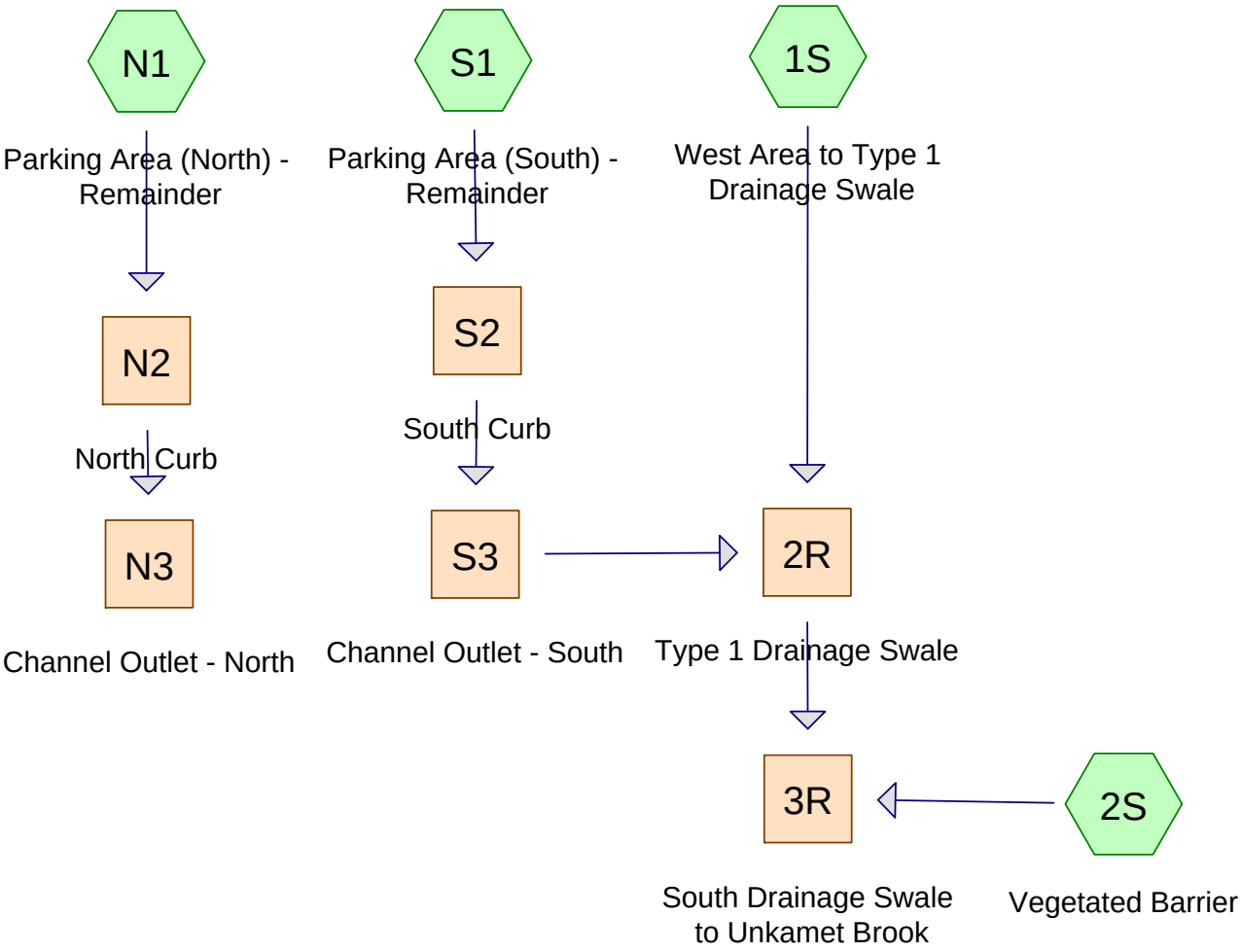
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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Attachment 1

HydroCAD Output



Subcat Reach Pond Link

Drainage Diagram for Unkamet Brook Remainder Area Drainage
Prepared by ARCADIS, Printed 4/11/2014
HydroCAD® 8.50 s/n 005598 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.080	79	50-75% Grass cover, Fair, HSG C (1S)
0.500	80	>75% Grass cover, Good, HSG D (2S)
4.518	98	Paved parking & roofs (1S,N1,S1)
5.099		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.080	HSG C	1S
0.500	HSG D	2S
4.518	Other	1S, N1, S1
5.099		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: West Area to Type 1 Runoff Area=29,564 sf 88.16% Impervious Runoff Depth=3.74"
Flow Length=245' Tc=5.0 min CN=96 Runoff=2.81 cfs 0.211 af

Subcatchment 2S: Vegetated Barrier Runoff Area=0.500 ac 0.00% Impervious Runoff Depth=2.21"
Flow Length=370' Tc=10.9 min CN=80 Runoff=1.10 cfs 0.092 af

Subcatchment N1: Parking Area (North) - Runoff Area=2.470 ac 100.00% Impervious Runoff Depth=3.96"
Flow Length=560' Slope=0.0140 '/' Tc=5.0 min CN=98 Runoff=10.45 cfs 0.816 af

Subcatchment S1: Parking Area (South) - Runoff Area=1.450 ac 100.00% Impervious Runoff Depth=3.96"
Flow Length=525' Tc=5.0 min CN=98 Runoff=6.14 cfs 0.479 af

Reach 2R: Type 1 Drainage Swale Avg. Depth=0.51' Max Vel=2.72 fps Inflow=8.57 cfs 0.690 af
n=0.024 L=172.0' S=0.0121 '/' Capacity=8.09 cfs Outflow=8.44 cfs 0.690 af

Reach 3R: South Drainage Swale to Unkamet Avg. Depth=0.46' Max Vel=1.14 fps Inflow=9.51 cfs 0.782 af
n=0.052 L=95.0' S=0.0056 '/' Capacity=82.70 cfs Outflow=9.33 cfs 0.782 af

Reach N2: North Curb Avg. Depth=0.29' Max Vel=3.77 fps Inflow=10.45 cfs 0.816 af
n=0.013 L=320.0' S=0.0148 '/' Capacity=45.14 cfs Outflow=10.13 cfs 0.816 af

Reach N3: Channel Outlet - North Avg. Depth=0.62' Max Vel=2.37 fps Inflow=10.13 cfs 0.816 af
n=0.080 L=85.0' S=0.0435 '/' Capacity=54.62 cfs Outflow=10.03 cfs 0.816 af

Reach S2: South Curb Avg. Depth=0.23' Max Vel=3.44 fps Inflow=6.14 cfs 0.479 af
n=0.013 L=265.0' S=0.0166 '/' Capacity=47.68 cfs Outflow=6.00 cfs 0.479 af

Reach S3: Channel Outlet - South Avg. Depth=0.15' Max Vel=6.01 fps Inflow=6.00 cfs 0.479 af
n=0.024 L=14.1' S=0.1270 '/' Capacity=45.60 cfs Outflow=5.99 cfs 0.479 af

Total Runoff Area = 5.099 ac Runoff Volume = 1.599 af Average Runoff Depth = 3.76"
11.38% Pervious = 0.580 ac 88.62% Impervious = 4.518 ac

Summary for Subcatchment 1S: West Area to Type 1 Drainage Swale

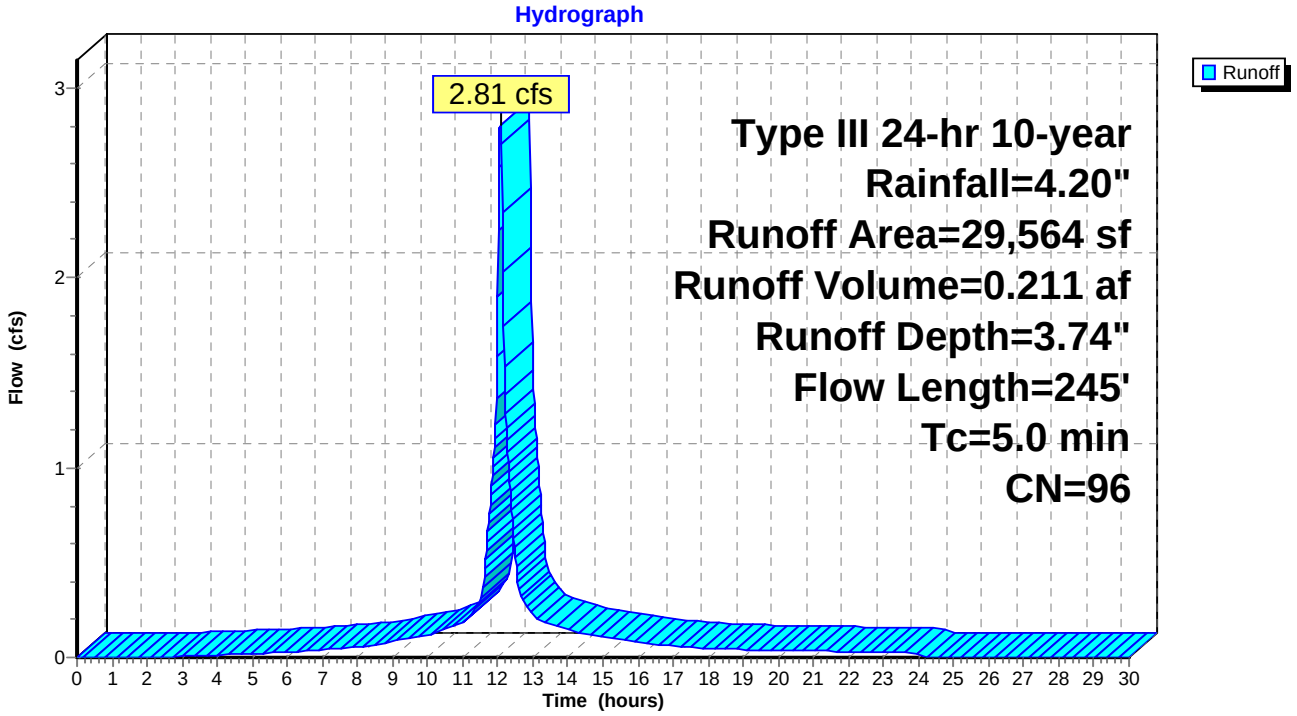
Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.211 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.20"

Area (sf)	CN	Description
26,064	98	Paved parking & roofs
3,500	79	50-75% Grass cover, Fair, HSG C
29,564	96	Weighted Average
3,500		Pervious Area
26,064		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0056	0.62		**Sheet Flow, Pavement to swale - W. side B-120X** Smooth surfaces n= 0.011 P2= 2.40"
0.8	145	0.0100	2.98	29.77	**Channel Flow, Swale to outlet** Area= 10.0 sf Perim= 30.0' r= 0.33' n= 0.024
0.2	50	0.0170	4.59	13.77	**Trap/Vee/Rect Channel Flow, Swale to outlet** Bot.W=6.00' D=0.50' n= 0.024
2.3	245	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: West Area to Type 1 Drainage Swale



Summary for Subcatchment 2S: Vegetated Barrier

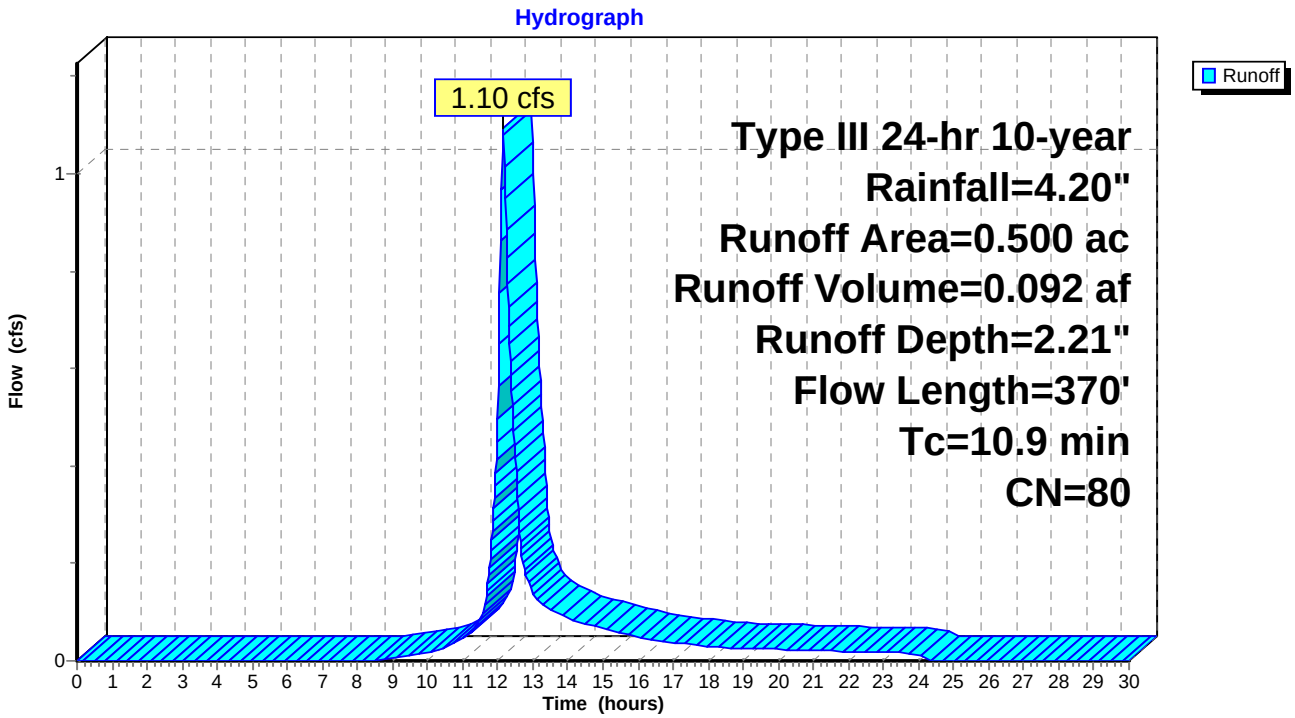
Runoff = 1.10 cfs @ 12.15 hrs, Volume= 0.092 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
0.500	80	>75% Grass cover, Good, HSG D
0.500		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	65	0.0300	0.16		**Sheet Flow, Slope to Cover over Sewer** Grass: Short n= 0.150 P2= 2.40"
4.1	305	0.0070	1.25		**Shallow Concentrated Flow, Flow to South Swale** Grassed Waterway Kv= 15.0 fps
10.9	370	Total			

Subcatchment 2S: Vegetated Barrier



Summary for Subcatchment N1: Parking Area (North) - Remainder

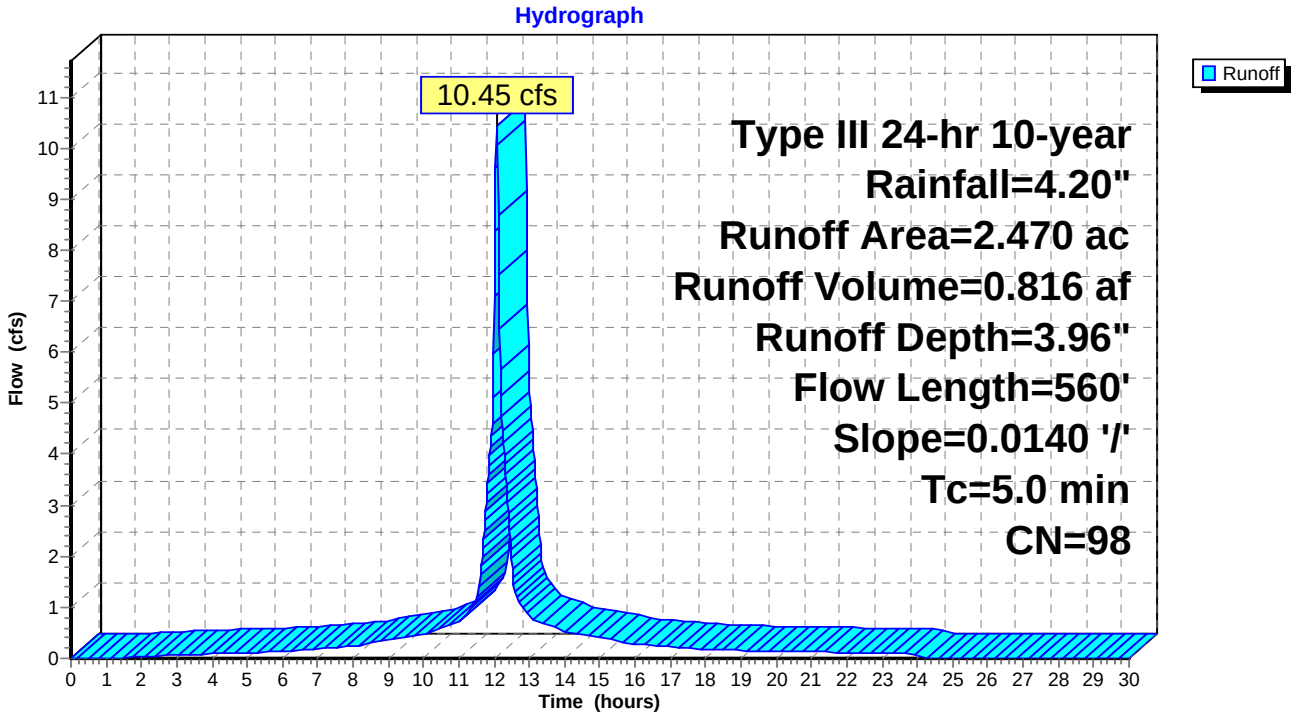
Runoff = 10.45 cfs @ 12.07 hrs, Volume= 0.816 af, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
2.470	98	Paved parking & roofs
2.470		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	240	0.0140	1.23		**Sheet Flow, High Point to Curb** Smooth surfaces n= 0.011 P2= 2.40"
1.6	320	0.0140	3.38	30.43	**Channel Flow, Curb Flow** Area= 9.0 sf Perim= 72.0' r= 0.13' n= 0.013 Asphalt, smooth
4.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment N1: Parking Area (North) - Remainder



Summary for Subcatchment S1: Parking Area (South) - Remainder

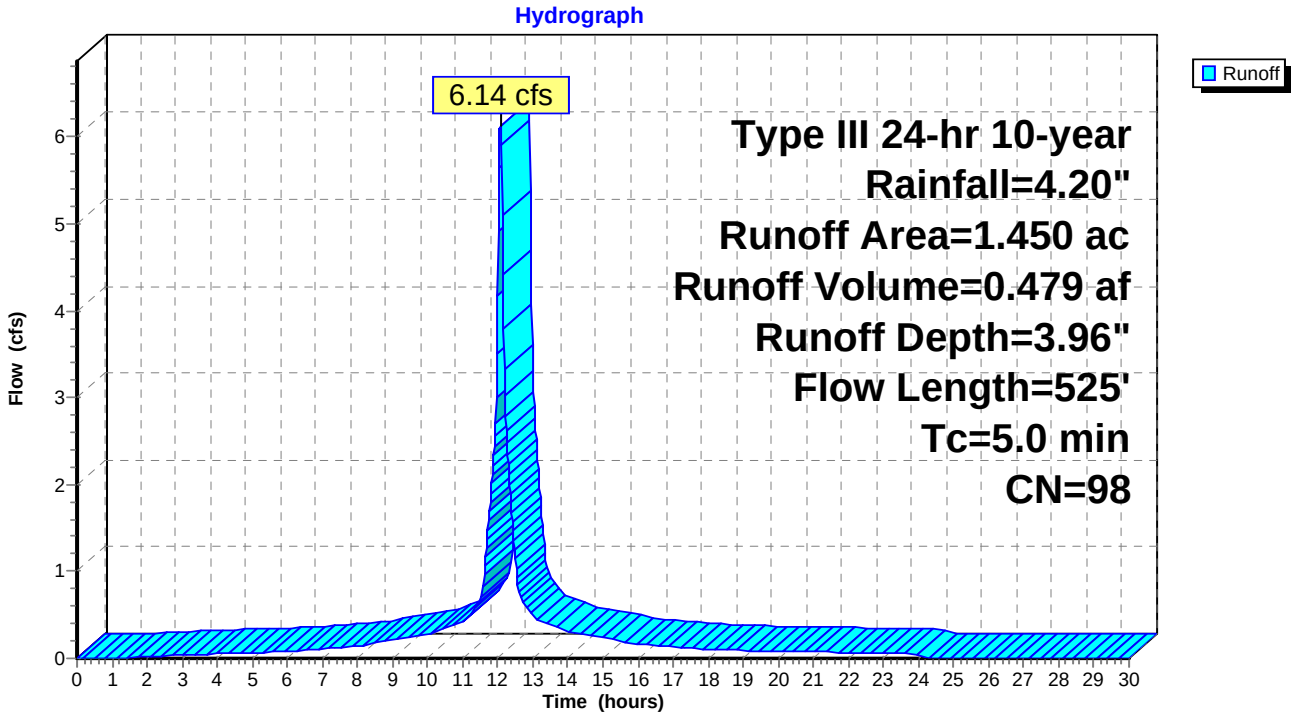
Runoff = 6.14 cfs @ 12.07 hrs, Volume= 0.479 af, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
1.450	98	Paved parking & roofs
1.450		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	240	0.0140	1.23		**Sheet Flow, High Point to Curb** Smooth surfaces n= 0.011 P2= 2.40"
1.1	285	0.0250	4.52	40.67	**Channel Flow, Curb Flow** Area= 9.0 sf Perim= 72.0' r= 0.13' n= 0.013 Asphalt, smooth
4.4	525	Total, Increased to minimum Tc = 5.0 min			

Subcatchment S1: Parking Area (South) - Remainder



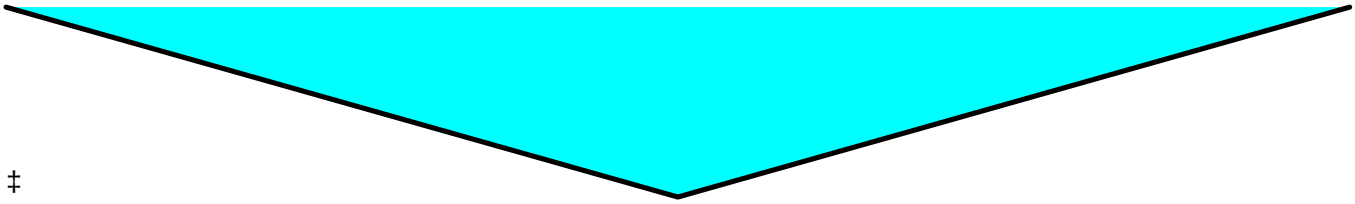
Summary for Reach 2R: Type 1 Drainage Swale

Inflow Area = 2.129 ac, 96.23% Impervious, Inflow Depth = 3.89" for 10-year event
Inflow = 8.57 cfs @ 12.10 hrs, Volume= 0.690 af
Outflow = 8.44 cfs @ 12.13 hrs, Volume= 0.690 af, Atten= 2%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 2.9 min

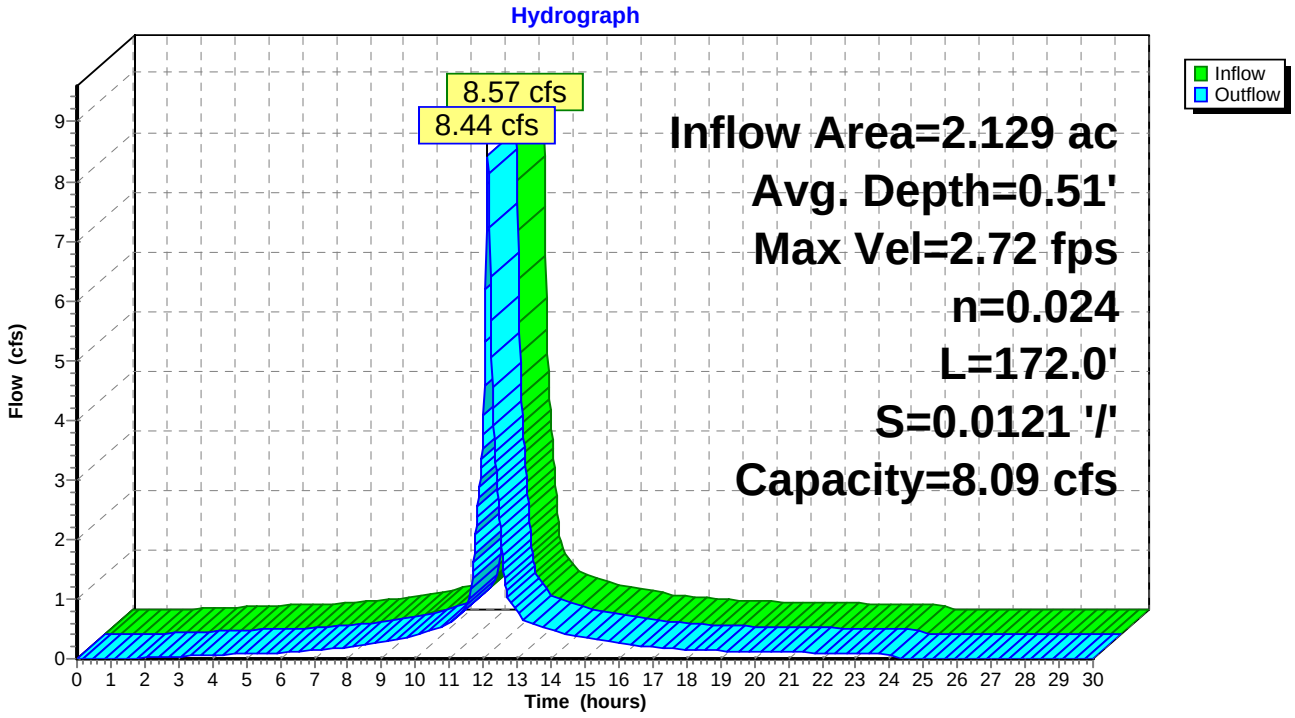
Peak Storage= 534 cf @ 12.11 hrs, Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 8.09 cfs

0.00' x 0.50' deep channel, n= 0.024
Side Slope Z-value= 12.0 '/' Top Width= 12.00'
Length= 172.0' Slope= 0.0121 '/'
Inlet Invert= 990.75', Outlet Invert= 988.67'

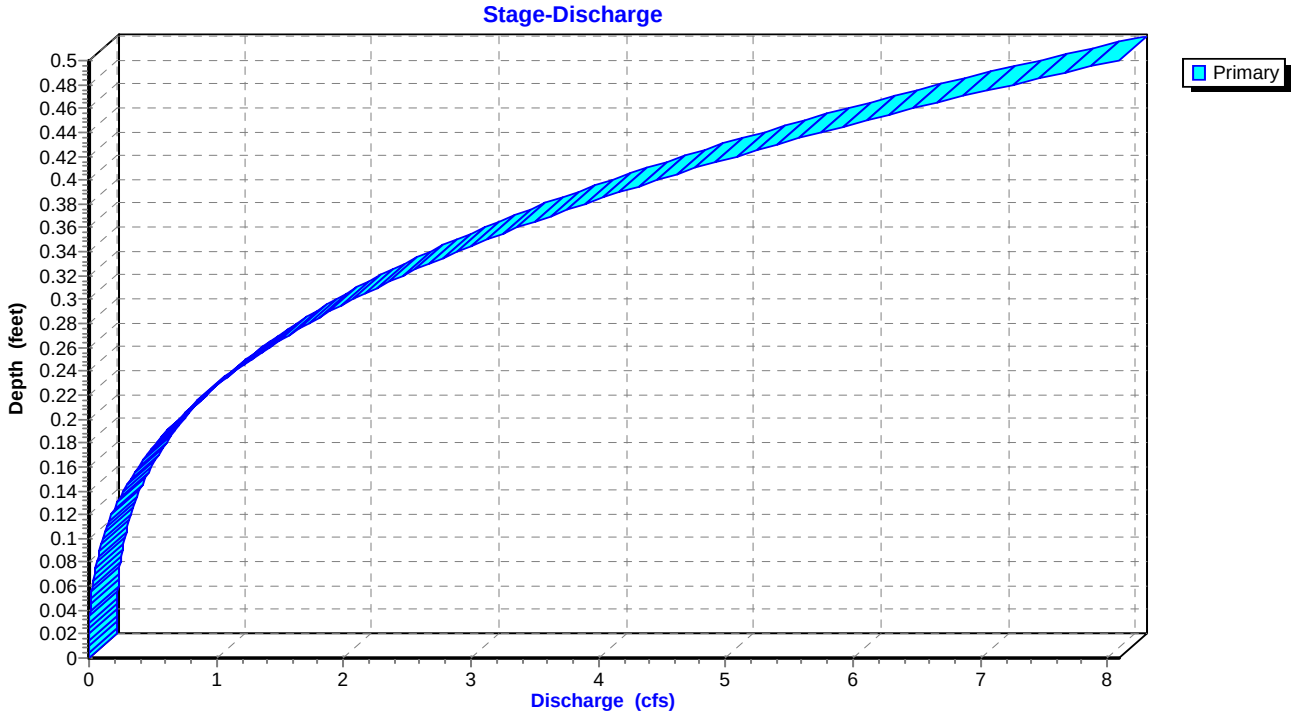


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Reach 2R: Type 1 Drainage Swale



Reach 2R: Type 1 Drainage Swale



Summary for Reach 3R: South Drainage Swale to Unkamet Brook

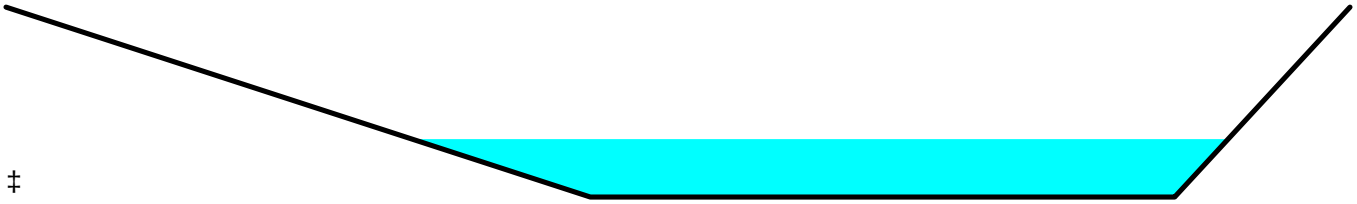
Inflow Area = 2.629 ac, 77.92% Impervious, Inflow Depth = 3.57" for 10-year event
Inflow = 9.51 cfs @ 12.13 hrs, Volume= 0.782 af
Outflow = 9.33 cfs @ 12.17 hrs, Volume= 0.782 af, Atten= 2%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 5.6 min

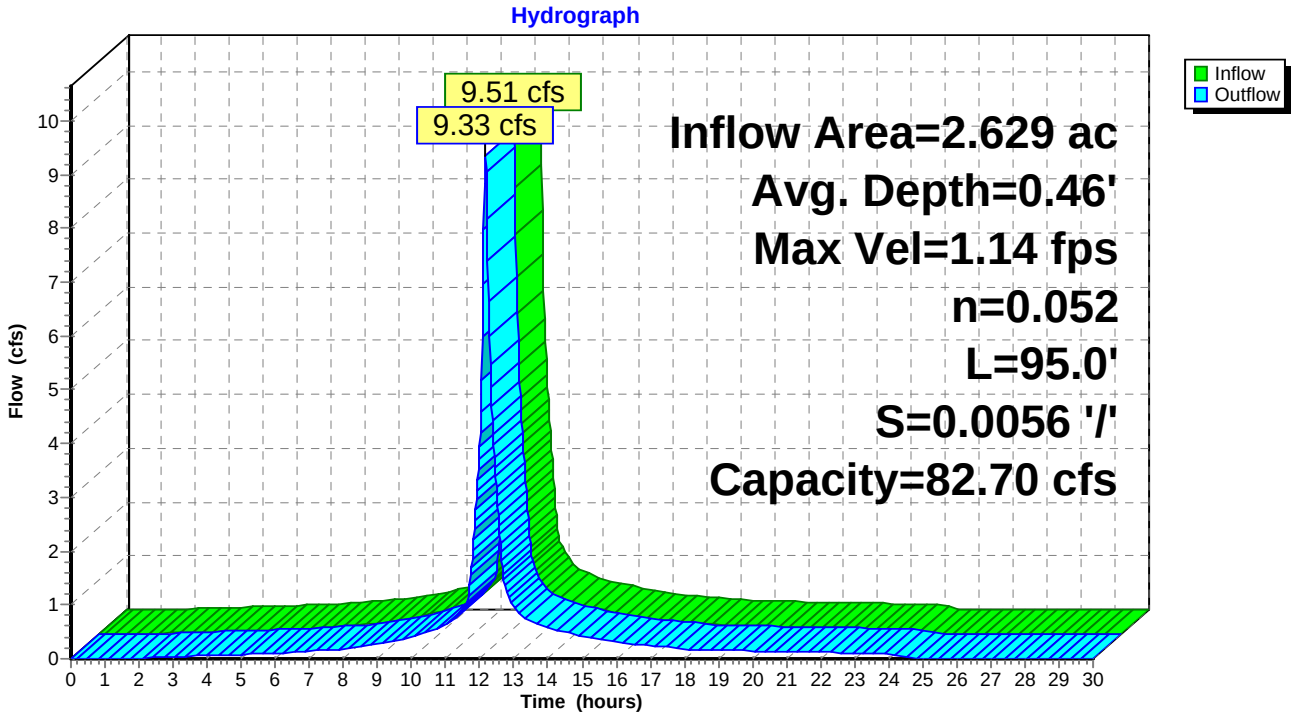
Peak Storage= 780 cf @ 12.15 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 82.70 cfs

15.00' x 1.50' deep channel, n= 0.052
Side Slope Z-value= 10.0 3.0 '/' Top Width= 34.50'
Length= 95.0' Slope= 0.0056 '/'
Inlet Invert= 988.67', Outlet Invert= 988.14'

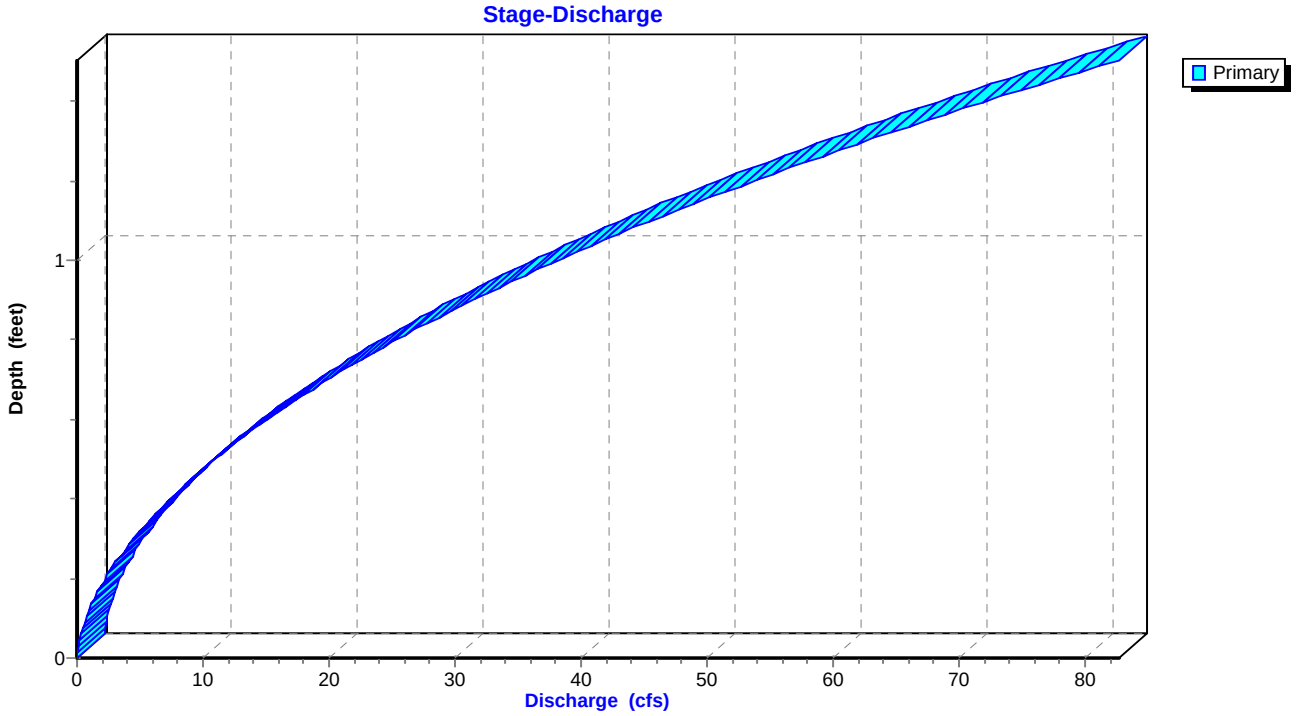
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Reach 3R: South Drainage Swale to Unkamet Brook



Reach 3R: South Drainage Swale to Unkamet Brook



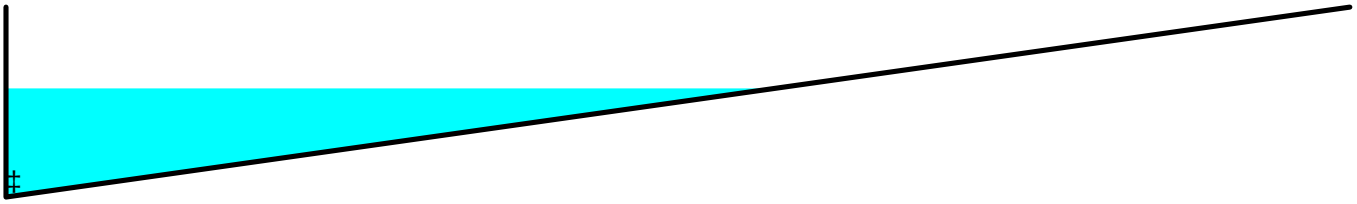
Summary for Reach N2: North Curb

Inflow Area = 2.470 ac,100.00% Impervious, Inflow Depth = 3.96" for 10-year event
Inflow = 10.45 cfs @ 12.07 hrs, Volume= 0.816 af
Outflow = 10.13 cfs @ 12.11 hrs, Volume= 0.816 af, Atten= 3%, Lag= 2.5 min

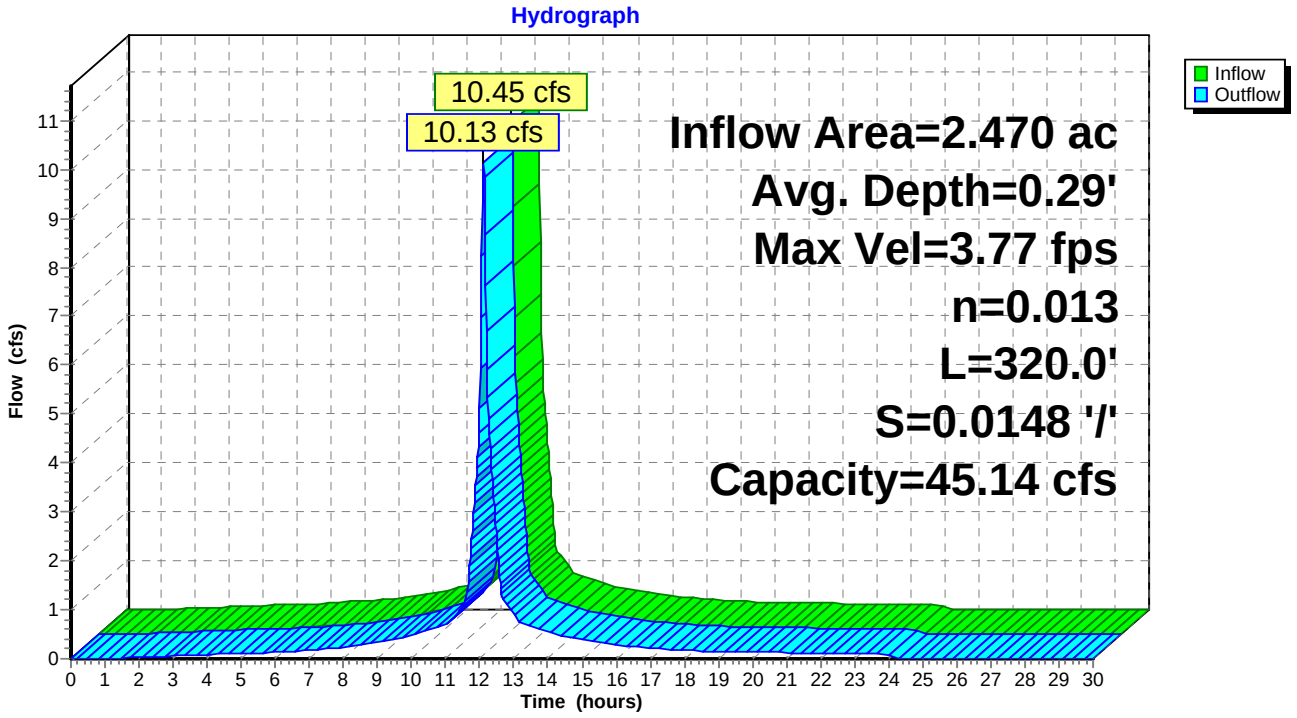
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.77 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 3.8 min

Peak Storage= 865 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 45.14 cfs

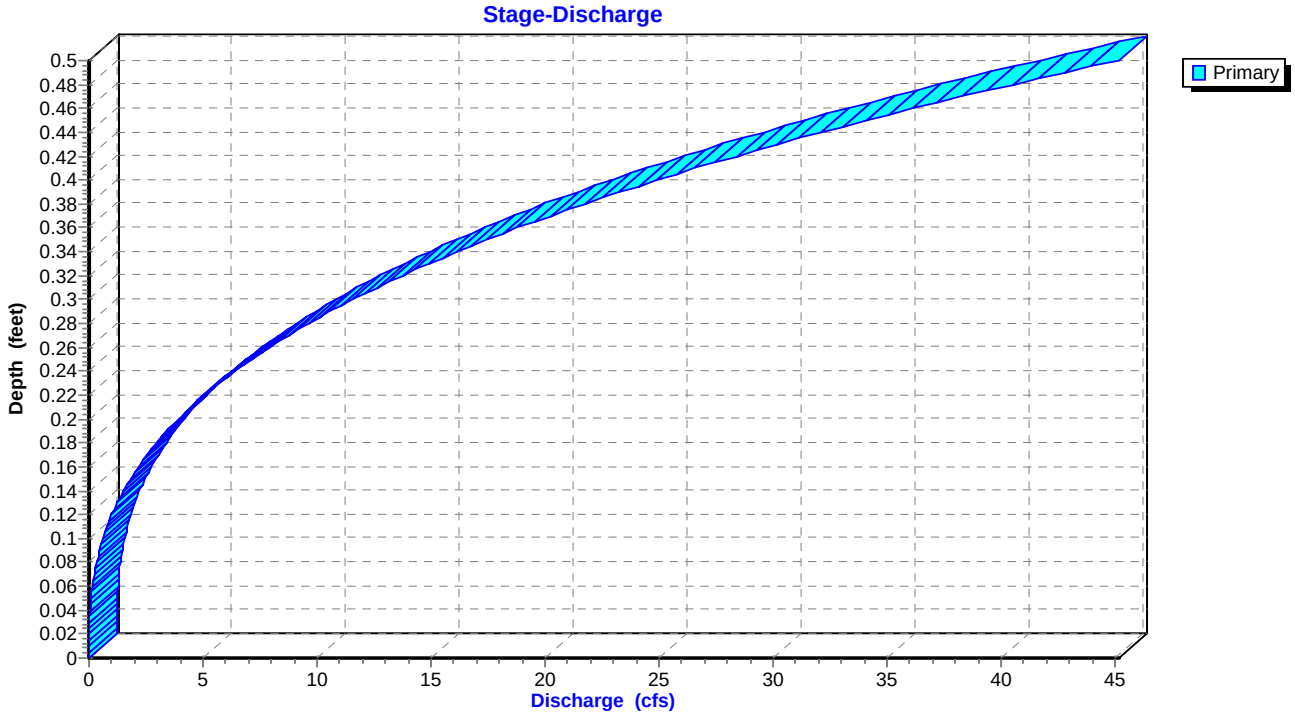
0.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 0.0 66.0 '/' Top Width= 33.00'
Length= 320.0' Slope= 0.0148 '/'
Inlet Invert= 995.80', Outlet Invert= 991.05'



Reach N2: North Curb



Reach N2: North Curb



Summary for Reach N3: Channel Outlet - North

Inflow Area = 2.470 ac,100.00% Impervious, Inflow Depth = 3.96" for 10-year event
Inflow = 10.13 cfs @ 12.11 hrs, Volume= 0.816 af
Outflow = 10.03 cfs @ 12.13 hrs, Volume= 0.816 af, Atten= 1%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.37 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 2.2 min

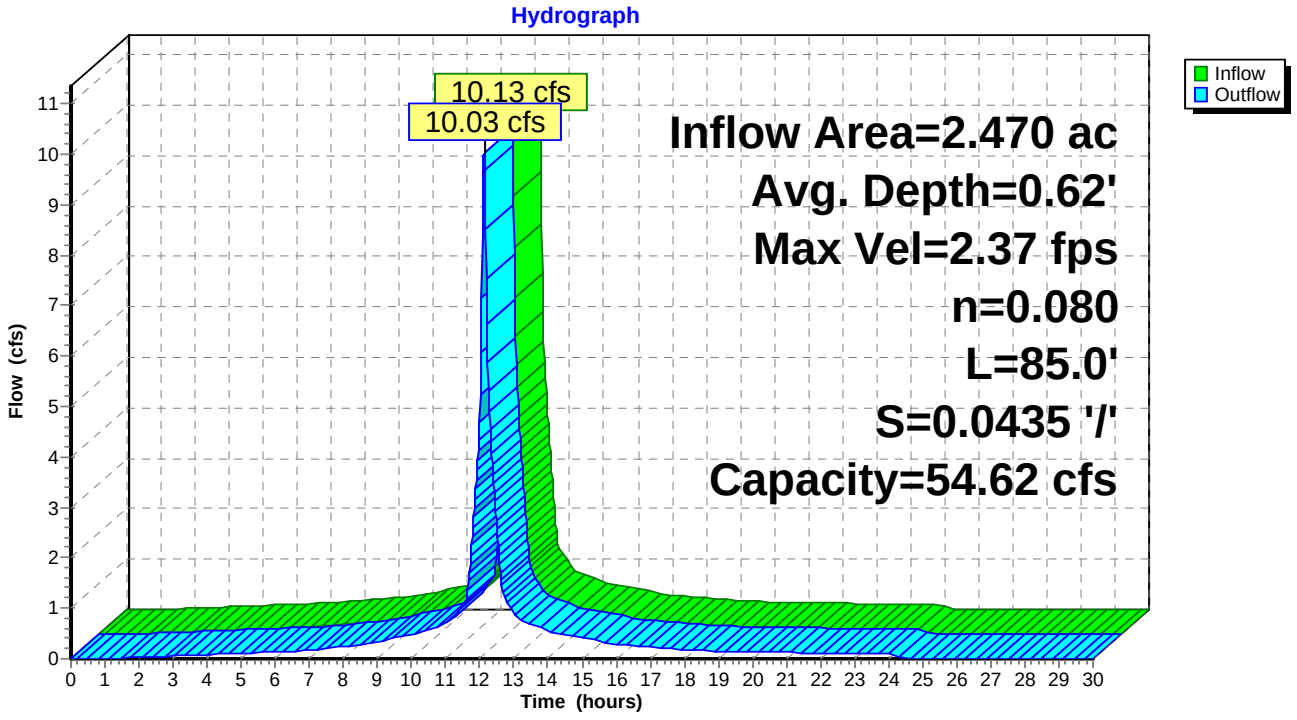
Peak Storage= 363 cf @ 12.12 hrs, Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 54.62 cfs

5.00' x 1.50' deep channel, n= 0.080
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 85.0' Slope= 0.0435 '/'
Inlet Invert= 992.50', Outlet Invert= 988.80'

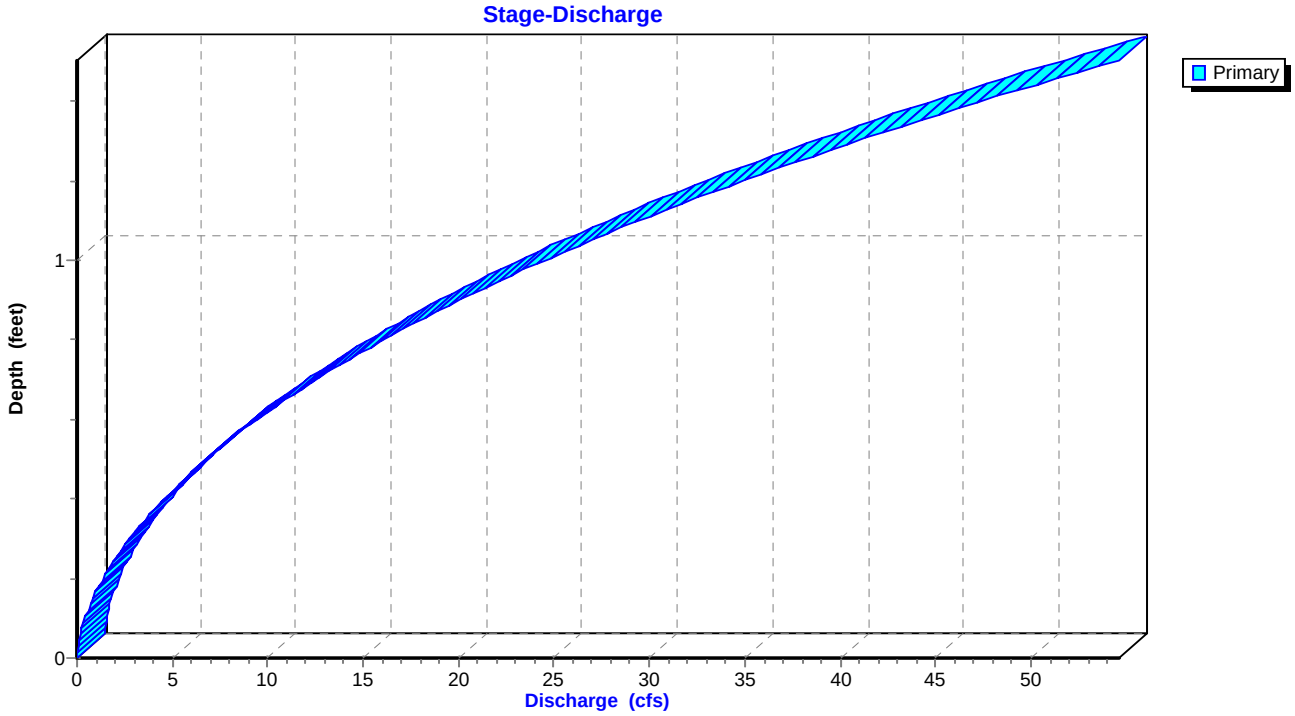


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Reach N3: Channel Outlet - North



Reach N3: Channel Outlet - North



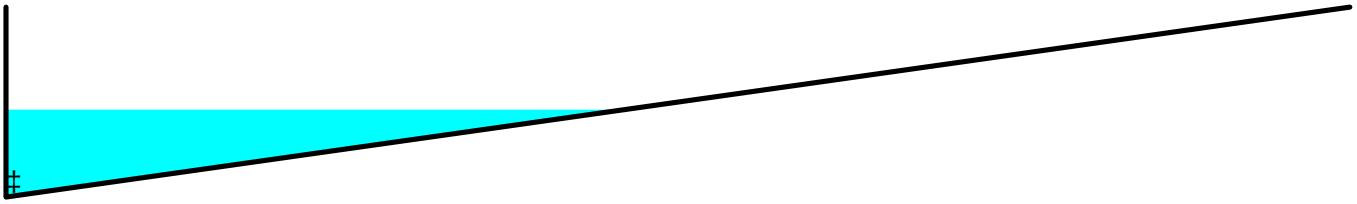
Summary for Reach S2: South Curb

Inflow Area = 1.450 ac,100.00% Impervious, Inflow Depth = 3.96" for 10-year event
Inflow = 6.14 cfs @ 12.07 hrs, Volume= 0.479 af
Outflow = 6.00 cfs @ 12.11 hrs, Volume= 0.479 af, Atten= 2%, Lag= 2.3 min

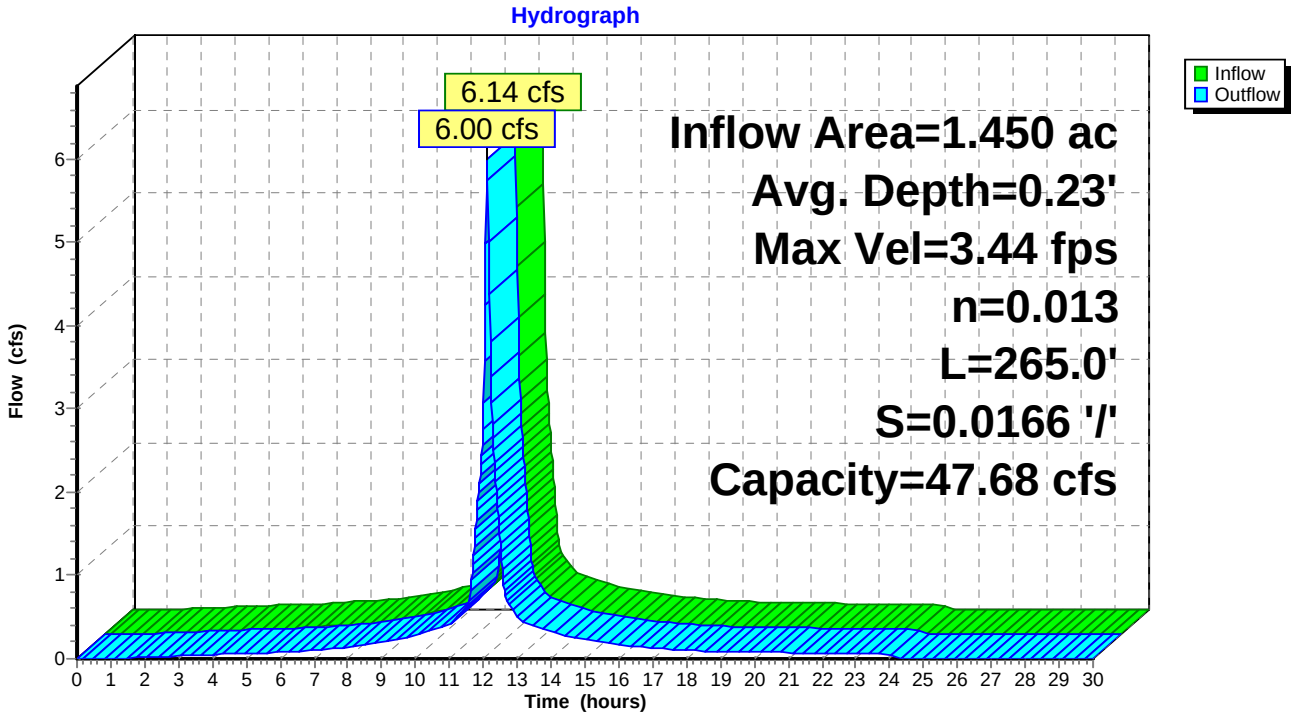
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.44 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 3.4 min

Peak Storage= 462 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 47.68 cfs

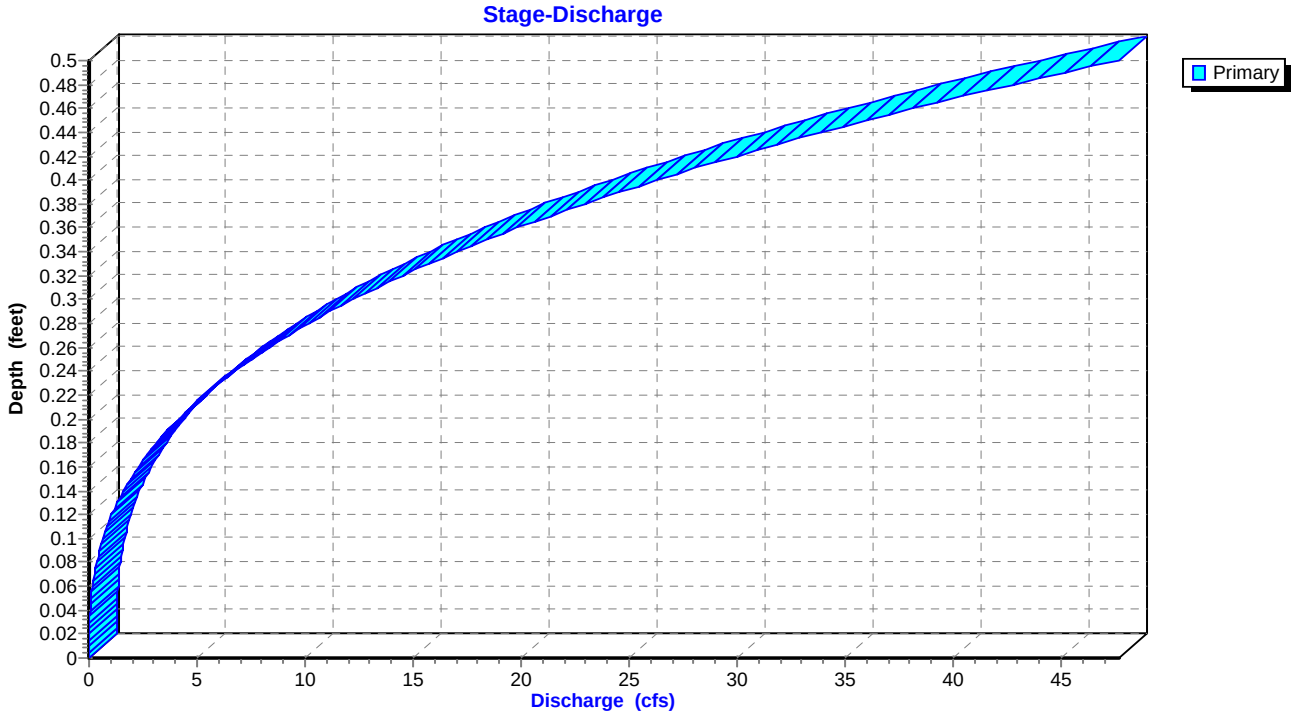
0.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 0.0 66.0 '/' Top Width= 33.00'
Length= 265.0' Slope= 0.0166 '/'
Inlet Invert= 995.80', Outlet Invert= 991.41'



Reach S2: South Curb



Reach S2: South Curb



Summary for Reach S3: Channel Outlet - South

Inflow Area = 1.450 ac,100.00% Impervious, Inflow Depth = 3.96" for 10-year event
Inflow = 6.00 cfs @ 12.11 hrs, Volume= 0.479 af
Outflow = 5.99 cfs @ 12.11 hrs, Volume= 0.479 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Max. Velocity= 6.01 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 0.2 min

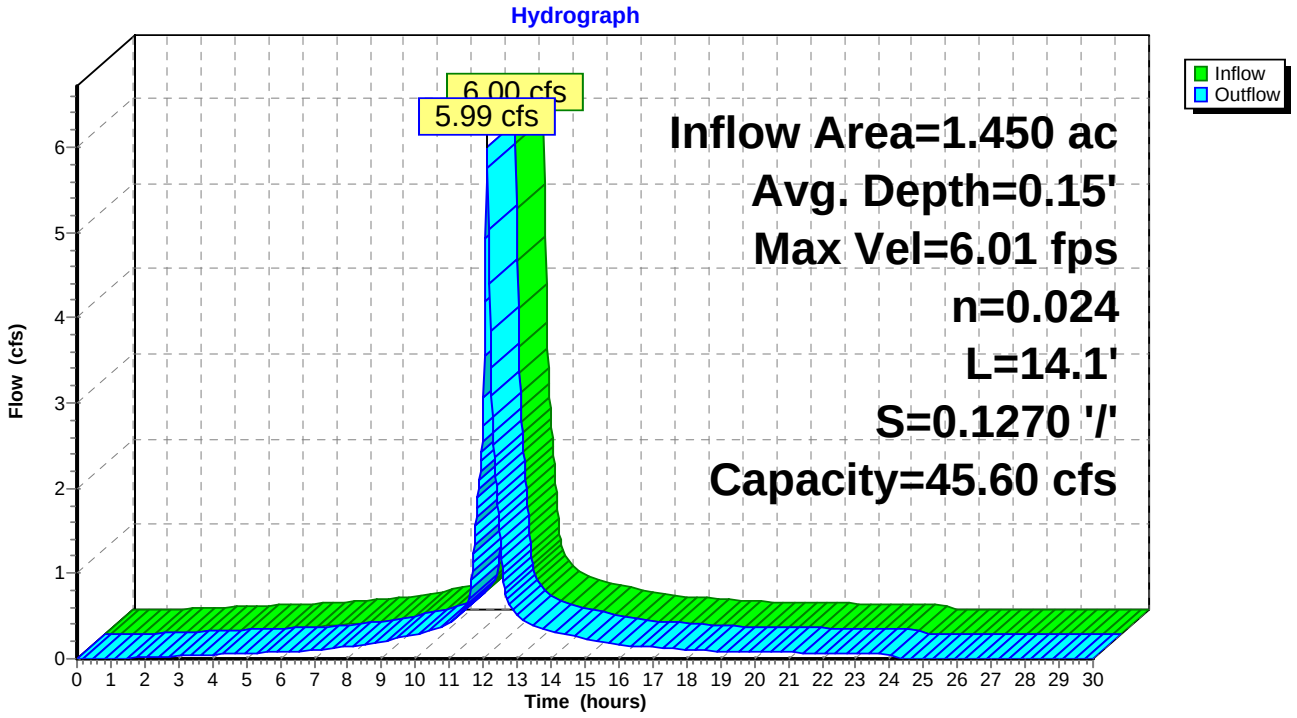
Peak Storage= 14 cf @ 12.11 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 45.60 cfs

6.00' x 0.50' deep channel, n= 0.024
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 14.1' Slope= 0.1270 '/'
Inlet Invert= 991.31', Outlet Invert= 989.52'

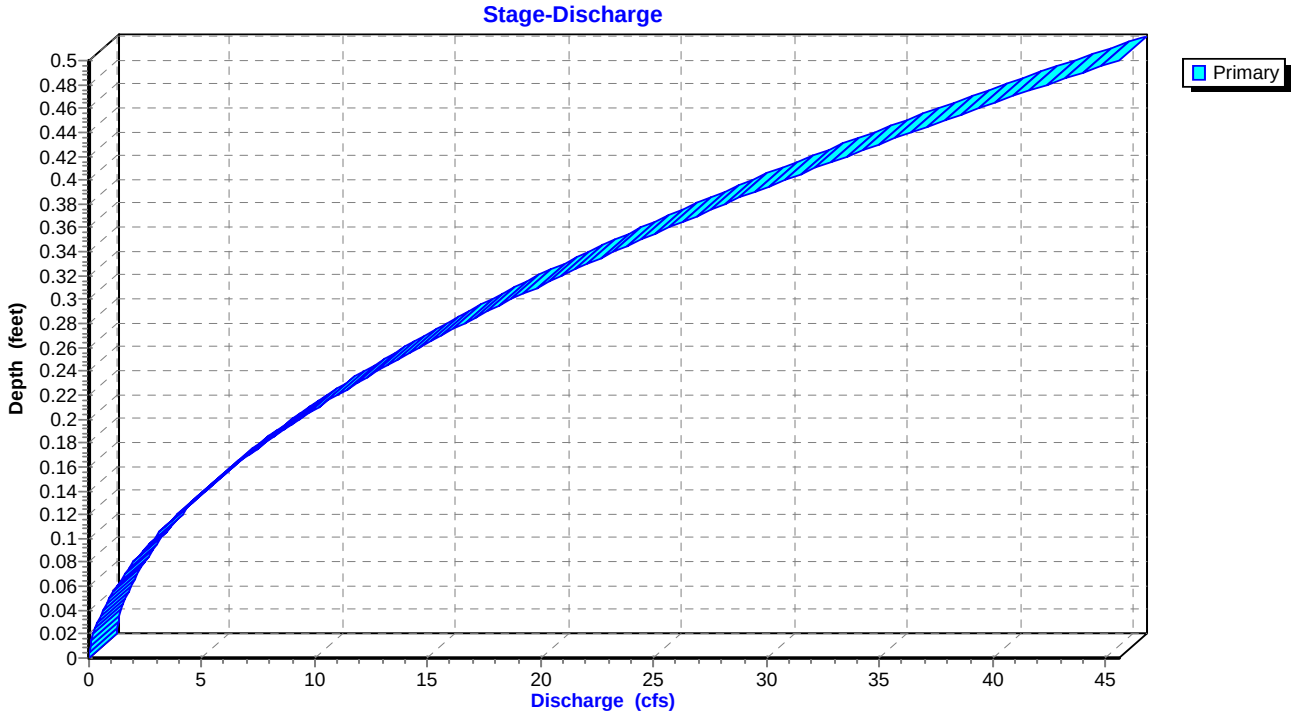
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Reach S3: Channel Outlet - South



Reach S3: Channel Outlet - South



ARCADIS

Attachment 2

Channel Lining Stability Analysis Output

Hydraulic Analysis Report

Project Data

Project Title: Remainder Parking North Outlet

Designer:

Project Date: Friday, April 11, 2014

Project Units: U.S. Customary Units

Notes:

Channel Lining Analysis: Channel Lining Design Analysis

Notes: North Parking Area Drainage Swale Outlet

Lining Input Parameters

Channel Lining Type: Riprap, Cobble, or Gravel

D50: 0.67 (ft)

Riprap Specific Weight: 165 (lb/ft^3)

Water Specific Weight: 62.4 (lb/ft^3)

Riprap Shape is Crushed

Safety Factor: 2

Lining Results

Angle of Repose: 42.3 (degrees)

Relative Flow Depth: 0.733033 (ft)

Manning's n method: Bathurst

Manning's n: 0.0822674

Channel Bottom Shear Results

V*: 0.927689

Reynold's Number: 51072.4

Shield's Parameter: 0.0541279

shear stress on channel bottom: 1.66776 (lb/ft^2)

Permissible shear stress for channel bottom: 3.72086 (lb/ft^2)

channel bottom is stable

Stable D50: 0.600613 (ft)

Channel Side Shear Results

K1: 0.868

K2: 0.882736

Kb: 0

shear stress on side of channel: 1.66776 (lb/ft^2)

Permissible shear stress for side of channel: 3.28454 (lb/ft^2)

Stable Side D50: 0.590587 (lb/ft^2)

side of channel is stable

Channel Lining Stability Results

the channel is stable

Channel Summary

Name of Selected Channel: Channel Analysis

Hydraulic Analysis Report

Project Data

Project Title: Remainder Parking South Drainage Swale

Designer:

Project Date: Monday, March 17, 2014

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes: South Drainage Swale to Unkamet Brook

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 3.0000 (ft/ft)

Side Slope 2 (Z2): 10.0000 (ft/ft)

Channel Width: 15.0000 (ft)

Longitudinal Slope: 0.0059 (ft/ft)

Manning's n: 0.0524

Lining Type: Rock Riprap - 150 mm (6-inch)

Flow: 9.5100 (cfs)

Result Parameters

Depth: 0.4553 (ft)

Area of Flow: 8.1775 (ft^2)

Wetted Perimeter: 21.0158 (ft)

Hydraulic Radius: 0.3891 (ft)

Average Velocity: 1.1629 (ft/s)

Top Width: 20.9192 (ft)

Froude Number: 0.3278

Critical Depth: 0.2244 (ft)

Critical Velocity: 2.5743 (ft/s)

Critical Slope: 0.0678 (ft/ft)

Critical Top Width: 17.9178 (ft)

Calculated Max Shear Stress: 0.1676 (lb/ft^2)

Calculated Avg Shear Stress: 0.1433 (lb/ft^2)

Channel Lining Analysis: Channel Lining Design Analysis

Notes:

Lining Input Parameters

Channel Lining Type: Riprap, Cobble, or Gravel

D50: 0.16 (ft)

Riprap Specific Weight: 165 (lb/ft^3)

Water Specific Weight: 62.4 (lb/ft^3)

Riprap Shape is Crushed

Safety Factor: 2

Calculated Safety Factor: 1.00016

Lining Results

Angle of Repose: 41.6 (degrees)

Relative Flow Depth: 2.44317 (ft)

Manning's n method: Blodgett

Manning's n: 0.0523566

Channel Bottom Shear Results

V*: 0.294114

Reynold's Number: 3866.74

Shield's Parameter: 0.047

shear stress on channel bottom: 0.167633 (lb/ft^2)

Permissible shear stress for channel bottom: 0.771552 (lb/ft^2)

channel bottom is stable

Stable D50: 0.0695256 (ft)

Channel Side Shear Results

K1: 1

K2: 0.988705

Kb: 1.73528

shear stress on side of channel: 0.167633 (lb/ft^2)

Permissible shear stress for side of channel: 0.762838 (lb/ft^2)

Stable Side D50: 0.0703198 (lb/ft^2)

side of channel is stable

Channel Bend Shear Results

Curvature Radius: 75 (ft)

No further correction will occur once R/T > 10

shear stress on bottom of channel in bend: 0.29089 (lb/ft^2)

bottom of bend of the channel is stable

Length of Protection beyond PT: 3.81006 (ft)

Additional Freeboard required because of Superelevation: 0.0117247 (ft)

Channel Bend Side Shear Results

shear stress on side of channel in bend: 0.29089 (lb/ft^2)

The side of the bend of the channel is stable

Channel Lining Stability Results

the channel is stable

Channel Summary

Name of Selected Channel: Channel Analysis

ARCADIS
Infrastructure, environment, buildings

Calculation Sheet

Client: General Electric Company

Project Location: Pittsfield, Mass

Project: Unkamet Brook Revised Final RD/RA Work Plan **Project:** B00401090.0002

Subject: Interior Landfill Cap Drainage Analysis

Prepared by: JEM **Date:** April 10. 2014

Reviewed By: JEM **Date:** April 10, 2014

Checked By: PHB **Date:** April 10, 2014

OBJECTIVE:

Calculate peak stormwater runoff flow rates for the asphalt- covered parking area landfill cap and vegetated landfill cap at the Former Interior Landfill (Remainder Area) for the restoration condition. Analyze the proposed parking area curb and channel outlet drainage features to determine if they will provide sufficient conveyance capacity under the 10-year, 24 hour precipitation event. Check the proposed channel lining material for stability under peak runoff flow conditions.

REFERENCES:

1. Terramodel® (Trimble Navigation Limited) V10.52 terrain modeling software, 2007.
2. HydroCAD (HydroCAD Software Solutions LLC.) V8.50, 2007.
3. U.S. Department of Commerce. Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.
4. Massachusetts Department of Environmental Protection (MassDEP). Massachusetts Stormwater Handbook, February 2008.
5. "Hydrologic Soil Group – Berkshire County, Massachusetts" provided from the National Cooperative Soil Survey (Web Soil Survey), National Resources Conservation Service (included as Attachment 3).
6. Unkamet Brook Area Remainder - Final Removal Design/Removal Action Work Plan, Design Drawings, ARCADIS, April, 2014.
7. Hydraulic Toolbox (Federal Highway Administration [FHWA]) V4.0 hydraulic channel stability software, December 2012.

ASSUMPTIONS:

1. The rainfall amount for the 10-year, 24 hour precipitation events was obtained from Technical Paper No. 40 (Reference 3) and was estimated to be 4.20 inches.
2. Drainage subareas and cover types were determined from site topographic survey and Final Grading Plan drawings for the Former Interior Landfill (Reference 6).

Calculation Sheet

3. The ground slopes and distances used to calculate the watershed time of concentration were determined using distances and elevations measured from the drawings in Reference 6 using Terramodel (Reference 1).

4. Due to the lack of structures susceptible to flooding and presence of stabilized conditions immediately downstream and adjacent to the North Parking Area Channel Outlet, South Parking Area Outlet Channel and South Drainage Swale, a minimum freeboard depth was not assumed in the calculations to determine the limiting conveyance capacity.

OVERVIEW:

Site remediation activities at the Former Interior Landfill site will maintain the existing drainage patterns and drainage outlet locations across the site. A one foot thick asphalt covered engineered barrier will be placed over the existing asphalt surface and a two foot thick vegetated engineered barrier will be installed in the vegetated areas.

CALCULATIONS:

Calculations for stormwater runoff volumes and peak runoff rates were performed using HydroCAD (Reference 2). HydroCAD is an integrated program for hydrologic analysis and the design of drainage systems using standard hydrograph techniques. Runoff hydrographs were developed by HydroCAD based on the TR-20 SCS Unit Hydrograph procedure. The results of the calculations are summarized below.

Estimated Peak Runoff Rates from Drainage Areas

The Former Interior Landfill drainage areas were evaluated for the peak runoff rates associated with the 10-year, 24 hour design storm event. The results are summarized in Table 1 below for the proposed drainage areas and associated drainage channels. HydroCAD calculations are included in Attachment 1.

Table 1 –Peak Stormwater Runoff Rates

Drainage Area ID	Area (Acres)	Curve Number (CN)	Time of Concentration, T_c (min)	Peak Flow, Q_{10}(cfs)
North Parking Area	2.47	98	5.0	10.45
South Parking Area	1.45	98	5.0	6.14

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Infrastructure, environment, buildings

Calculation Sheet

Drainage Area ID	Area (Acres)	Curve Number (CN)	Time of Concentration, T_c (min)	Peak Flow, Q_{10}(cfs)
West Area (to South Drainage Swale)	0.68	96	5.0	2.81
Vegetated Barrier	0.50	80	10.9	1.10

1. Channel and Curb Flow

Table 2 summarizes the hydraulic conditions along the Former Interior Landfill curbs and within the drainage channels. HydroCAD calculations are included in Attachment 1.

Table 2 – Flow Characteristics

Channel ID	Peak Flow, Q_{10}(cfs)	Manning "n"	Channel Depth [ft]	Flow Depth [ft]	Maximum Flow Velocity [ft/s]
North Curb	10.45	0.013	0.5	0.29	3.77
South Curb	6.14	0.013	0.5	0.23	3.44
North Parking Area Channel Outlet	10.45	0.080	1.5	0.73	2.37
South Parking Area Channel Outlet	6.14	0.013	0.5	0.15	6.01
South Drainage Swale	9.51	0.052	0.5	0.45	1.10

2. Channel Lining Analysis

The channel lining stability analysis was performed for the North Parking Area outlet channel and the South Drainage Swale using FHWA Hydraulic Toolbox software (Reference 7). This software analyzes four major types of flexible lining: 1) vegetative linings; 2) manufactured linings (RECPs); 3) riprap,

Calculation Sheet

cobble, and 4) gravel linings based on the procedures found in HEC-15 “Design of Roadside Channels with Flexible Linings”.

The results of the calculations are summarized in Table 3 below. FHWA Hydraulic Toolbox output is included in Attachment 2.

Table 3 - Shear Stresses on Bed and Side Slopes at North Channel Outlet

Channel	Riprap Type	Channel Component	Peak Flow Rate [cfs]	Average Flow Depth at Peak Storage [ft]	Resulting Shear Stress [lb/ft^2]	Allowable Shear Stress [lb/ft^2]	Factor of Safety
North Parking Area Channel Outlet	Type 3	Bed	10.45	0.73	1.67	3.72	2.22
		Side Slope	10.45	0.73	1.67	3.28	1.96
South Drainage Swale	Type 1	Bed	9.51	0.45	0.17(Straight) 0.29 (Bend)	0.77	2.65
		Side Slope	9.51	0.45	0.17(Straight) 0.29 (Bend)	0.77	2.65

SUMMARY:

Based on the above assumptions and calculations, the proposed restoration curb and drainage channels provide sufficient capacity to convey the estimated peak discharge from the 10-year, 24-hour design storm. The selected channel lining material used for the drainage outlet channels and side slopes is shown to be stable during conveyance of the peak flow rate from the 10-year, 24-hour design storm.

ARCADIS

Railroad Spur Culvert Design Calculations

ARCADIS
Infrastructure, environment, buildings

Calculation Sheet

Client: General Electric Company

Project Location: Pittsfield, Mass

Project: Unkamet Brook Revised Final RD/RA Work Plan **Project:** B00401090.0002

Subject: Unkamet Brook Railroad Spur Culvert Analysis

Prepared by: JEM **Date:** April 08, 2014

Reviewed By: JEM **Date:** April 08 2014

Checked By: PHB **Date:** April 10, 2014

OBJECTIVE:

The existing east pipe (48" diameter corrugated steel pipe) of the Unkamet Brook Railroad Spur culvert (Culvert No. 1) will be slip-lined with a 42" diameter corrugated steel pipe as part of Unkamet Brook restoration work. The hydraulic performance of the restored culvert (with slip-lined pipe) will be compared to the existing culvert to determine if the slip-lining of the eastern pipe will result in a change in flow characteristics of the culvert.

REFERENCES:

1. Terramodel® (Trimble Navigation Limited) V10.52 terrain modeling software, 2007.
2. HY-8 Culvert Analysis Program V7.2 (Federal Highway Administration [FHWA]) hydraulic modeling software, January 2012.
3. Unkamet Brook Area Remainder – Revised Final Removal Design/Removal Action Work Plan, Technical Drawings, ARCADIS, April 2014.
4. Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions – Revised Final Removal Design/Removal Action Work Plan, Appendix F, Anchor QEA, LLC, April 2014.

ASSUMPTIONS:

1. The invert elevations, lengths and diameters of existing Unkamet Brook Railroad Spur culvert pipes were determined from supplemental site topographic survey information by Hill Engineers, Architects and Planners dated October 6, 2010 and Existing Site Plan drawings for North of Merrill Road (Reference 3).
2. The proposed slip-lined pipe invert elevation, length and diameter were determined from the Culvert No. 1 Restoration Plan drawing (Reference 3).
3. A Manning's "n" value of 0.024 was assumed for the existing corrugated steel culverts and a Manning's "n" value of 0.012 was assumed for the proposed 42" diameter CSP slip-line pipe based on the manufacturer's data for Contech Ultra-Flo storm sewer pipe specified for the slip-line pipe.

Calculation Sheet

4. A tailwater rating curve was developed for the portion of Unkamet Brook downstream from the Culvert No. 1 outlet using the water surface data provided separately in the "Unkamet Brook Hydrologic and Hydraulic Modeling of Post-Remediation Conditions" (Reference 4) included in Appendix F of the Revised Final Work Plan. The rating curve was input into the HY-8 Culvert Analysis Program to evaluate backwater effects on culvert performance over the range of discharge rates.

CALCULATIONS:

1. Culvert Performance Analysis

Calculations for the conveyance flow performance of the existing and proposed (i.e., restored) culvert were performed using FHWA HY-8 Culvert Analysis program (Reference 2). This program analyzes a variety of culverts types based on the procedures found in HDS-5 "Hydraulic Design of Highway Culverts". The culvert analysis was performed to determine the potential changes in headwater elevation as a result of the proposed slip-lined pipe restoration. The conveyance flow capacity calculation results of this analysis are summarized in Table 1 below. Output from HY-8 is included in Attachment 1.

Table 1 –Summary of Culvert Flows

Total Discharge (cfs)	Existing Headwater Elevation (ft)	Restored Headwater Elevation (ft)
0.00	983.84	983.84
10.00	986.16	986.16
20.00	986.91	986.91
30.00	987.67	987.69
40.00	988.81	988.82
50.00	989.37	989.41
60.00 (estimated 2-year flow event)	989.62	989.66
146.39	-	991.60 (overtopping)
159.11	991.60 (overtopping)	-

ARCADIS
Infrastructure, environment, buildings

Calculation Sheet

SUMMARY:

Based on the above assumptions and calculations, the proposed culvert pipe restoration (i.e., slip-lining the east pipe with a 42" diameter CSP pipe) will result in an increased headwater elevation of approximately 0.04 feet at the culvert bridge crossing for the anticipated range of flows noted above for Unkamet Brook.

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Attachment 1

HY-8 Culvert Analysis Output

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 50 cfs

Maximum Flow: 100 cfs

Table 1 - Summary of Culvert Flows at Crossing: RR Spur Culvert (Existing)

Headwater Elevation (ft)	Total Discharge (cfs)	Existing East Culvert Discharge (cfs)	Existing West Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
983.84	0.00	0.00	0.00	0.00	0
986.16	10.00	5.40	6.01	0.00	4
986.91	20.00	9.94	10.07	0.00	7
987.67	30.00	14.89	15.23	0.00	5
988.81	40.00	19.84	19.95	0.00	2
989.37	50.00	24.90	25.13	0.00	5
989.62	60.00	29.72	29.78	0.00	9
989.86	70.00	34.96	35.12	0.00	7
990.02	80.00	39.82	39.84	0.00	8
990.17	90.00	44.94	45.06	0.00	3
990.30	100.00	51.07	47.14	0.00	7
991.60	159.11	79.56	79.56	0.00	Overtopping

Rating Curve Plot for Crossing: RR Spur Culvert (Existing)

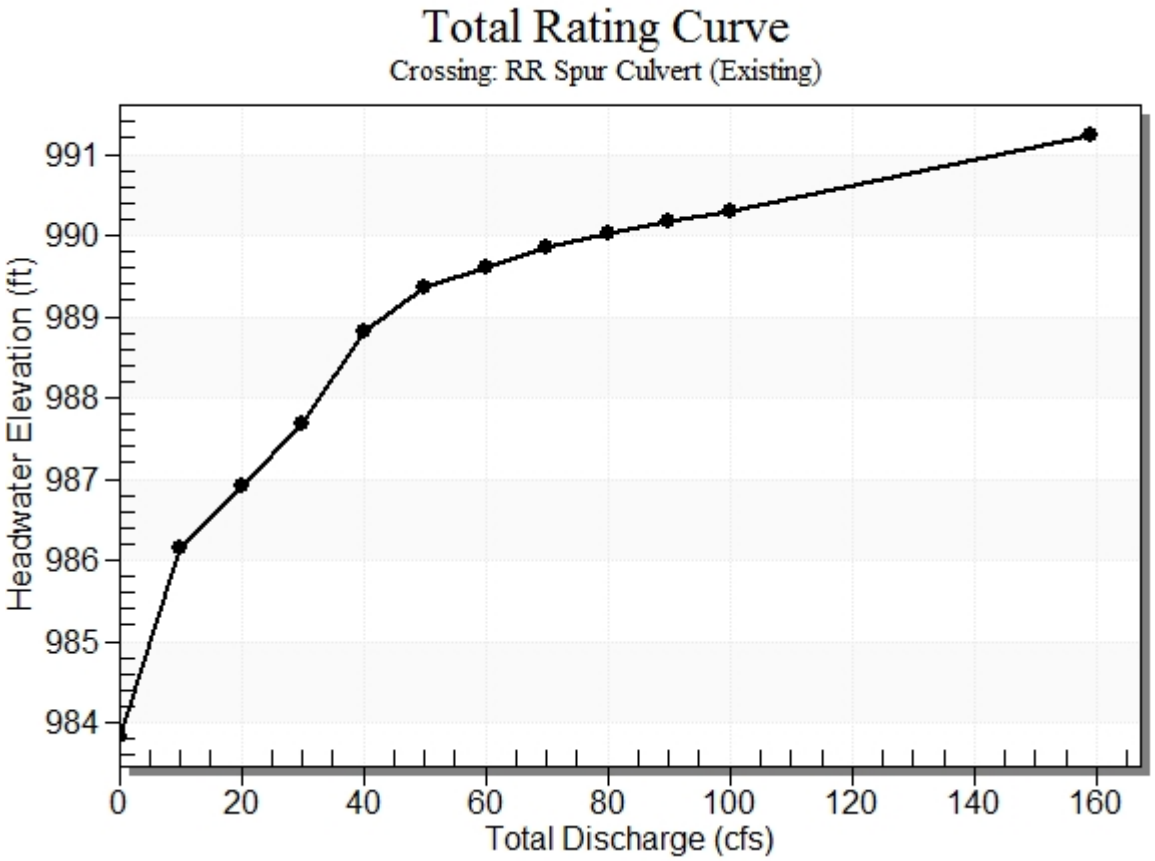


Table 2 - Culvert Summary Table: Existing East Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	983.84	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	5.40	986.16	0.896	1.686	6-FFt	0.567	0.669	2.550	2.201	0.639	0.312
20.00	9.94	986.91	1.230	2.431	6-FFt	0.791	0.913	3.280	2.565	0.901	0.401
30.00	14.89	987.67	1.530	3.208	4-FFf	0.967	1.127	4.000	2.942	1.185	0.437
40.00	19.84	988.81	1.776	4.335	4-FFf	1.131	1.306	4.000	3.286	1.579	0.470
50.00	24.90	989.37	2.011	4.914	4-FFf	1.267	1.472	4.000	3.675	1.981	0.496
60.00	29.72	989.62	2.229	5.140	4-FFf	1.396	1.614	4.000	4.023	2.365	0.519
70.00	34.96	989.86	2.454	5.393	4-FFf	1.524	1.758	4.000	4.598	2.782	0.546
80.00	39.82	990.02	2.654	5.542	4-FFf	1.635	1.884	4.000	5.113	3.169	0.569
90.00	44.94	990.17	2.858	5.705	4-FFf	1.752	2.006	4.000	5.398	3.576	0.580
100.00	51.07	990.30	3.096	5.759	4-FFf	1.885	2.141	4.000	5.509	4.064	0.584

****

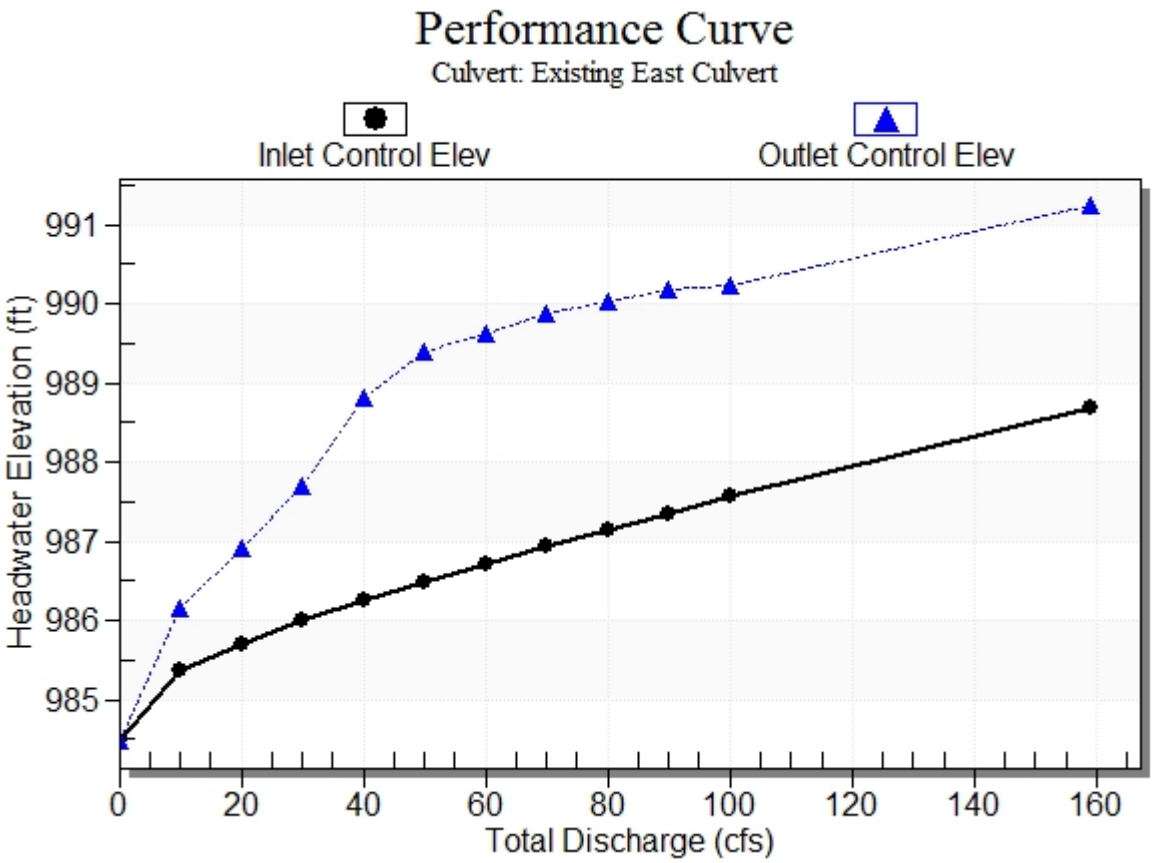
Straight Culvert

Inlet Elevation (invert): 984.48 ft, Outlet Elevation (invert): 983.61 ft

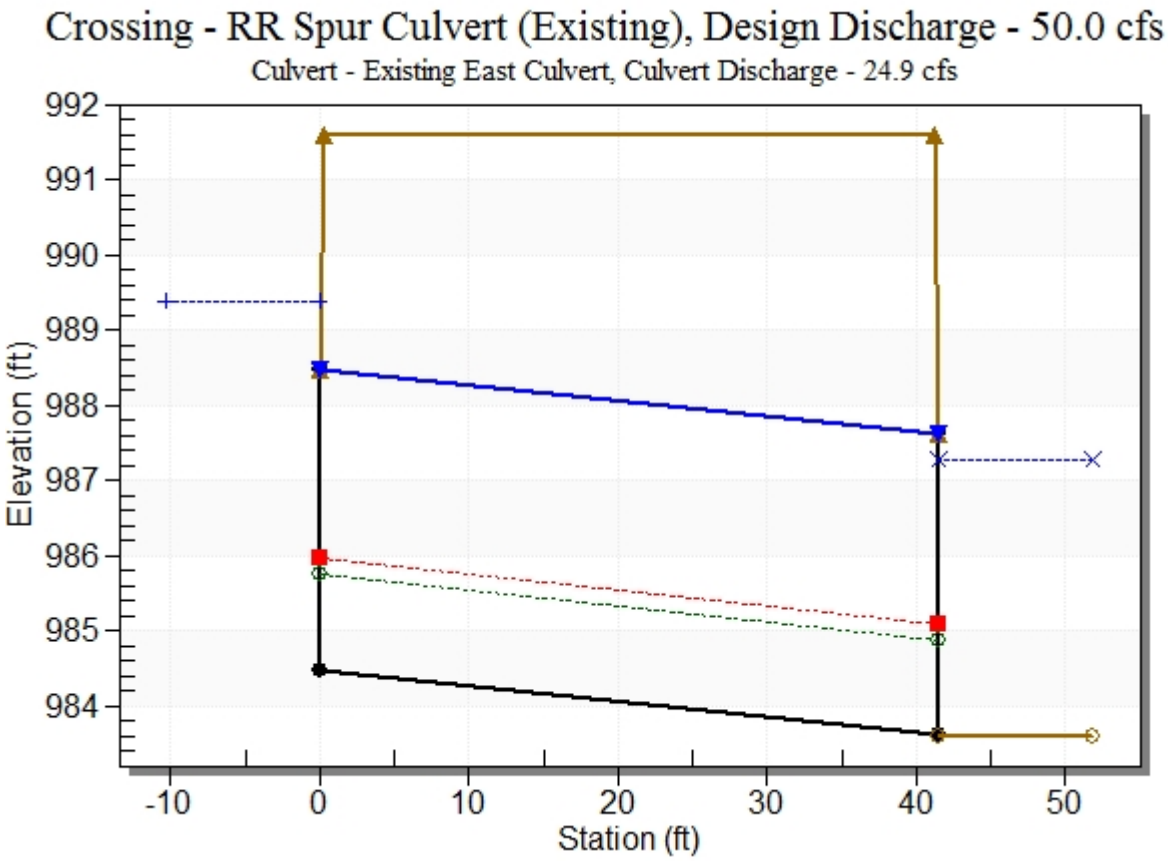
Culvert Length: 41.51 ft, Culvert Slope: 0.0210

****

Culvert Performance Curve Plot: Existing East Culvert



Water Surface Profile Plot for Culvert: Existing East Culvert



Site Data - Existing East Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 984.48 ft

Outlet Station: 41.50 ft

Outlet Elevation: 983.61 ft

Number of Barrels: 1

Culvert Data Summary - Existing East Culvert

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Culvert Summary Table: Existing West Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	983.84	0.000	0.000	0-NF	0.000	0.000	0.300	0.000	0.000	0.000
10.00	6.01	986.16	0.957	1.914	6-FFt	0.697	0.707	2.446	2.560	0.746	0.400
20.00	10.07	986.91	1.248	2.336	6-FFt	0.893	0.920	2.854	3.290	1.050	0.470
30.00	15.23	987.67	1.562	2.727	6-FFt	1.117	1.141	3.217	4.040	1.407	0.520
40.00	19.95	988.81	1.794	3.124	6-FFt	1.278	1.310	3.579	5.130	1.682	0.570
50.00	25.13	989.37	2.038	3.554	6-FFt	1.455	1.476	3.957	3.657	2.004	0.494
60.00	29.78	989.62	2.247	3.970	4-FFf	1.589	1.615	4.000	5.830	2.370	0.610
70.00	35.12	989.86	2.476	4.607	4-FFf	1.744	1.762	4.000	6.010	2.795	0.630
80.00	39.84	990.02	2.670	5.213	4-FFf	1.875	1.884	4.000	6.080	3.170	0.664
90.00	45.06	990.17	2.878	5.589	4-FFf	2.014	2.008	4.000	6.150	3.586	0.698
100.00	47.14	990.30	2.960	5.917	4-FFf	2.069	2.056	4.000	6.220	3.751	0.731

****

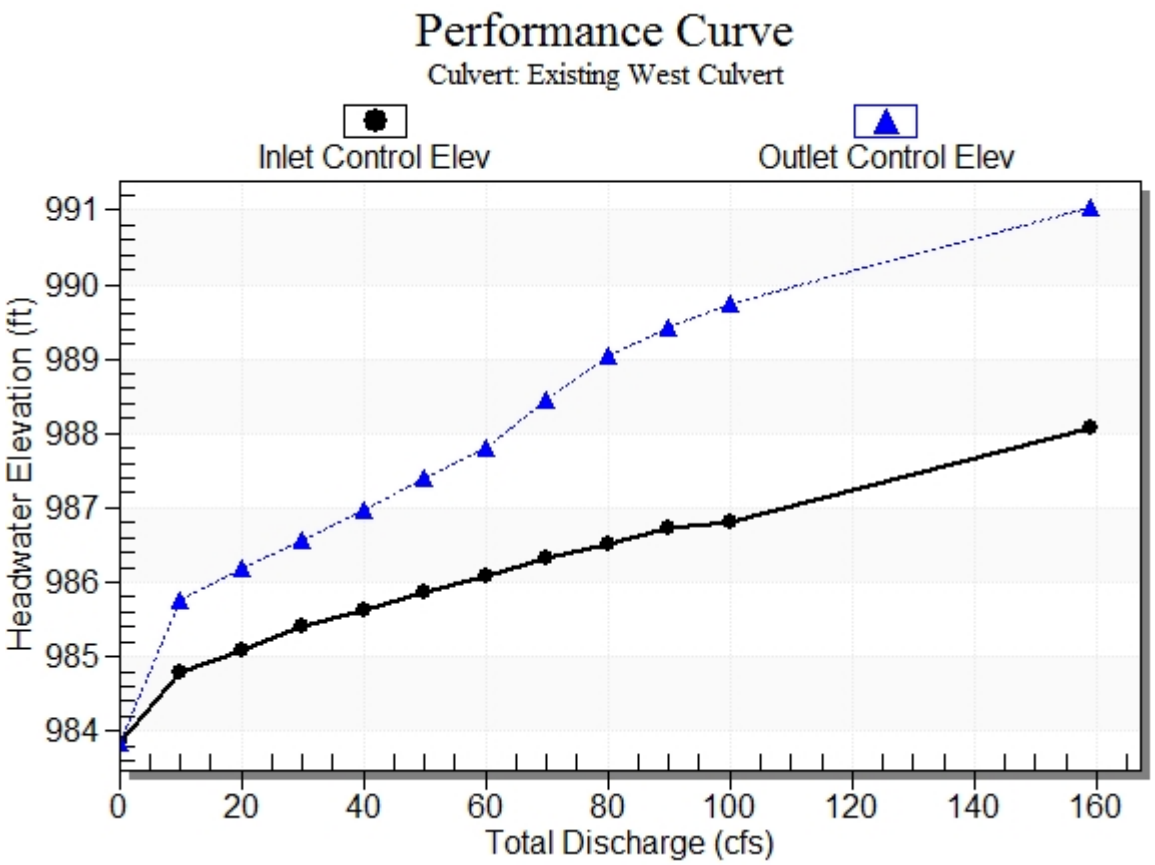
Straight Culvert

Inlet Elevation (invert): 983.84 ft, Outlet Elevation (invert): 983.30 ft

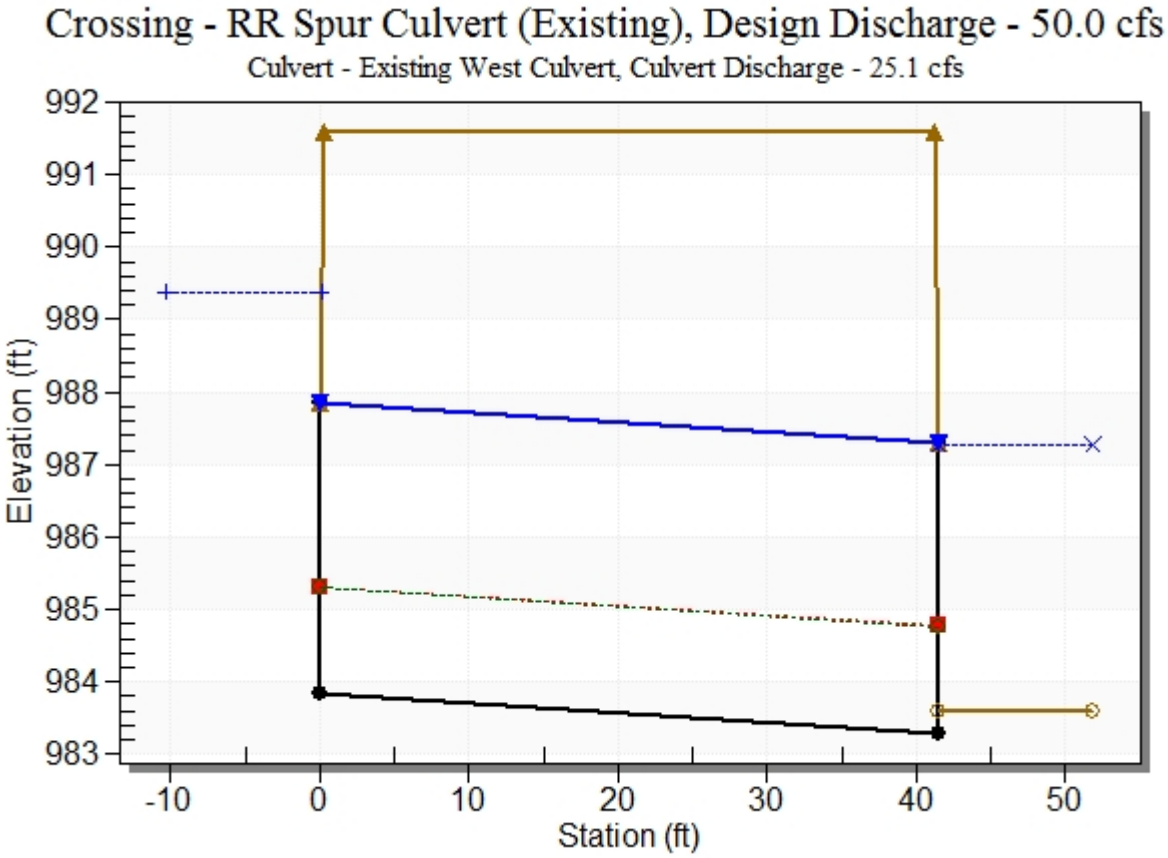
Culvert Length: 41.50 ft, Culvert Slope: 0.0130

****

Culvert Performance Curve Plot: Existing West Culvert



Water Surface Profile Plot for Culvert: Existing West Culvert



Site Data - Existing West Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 983.84 ft

Outlet Station: 41.50 ft

Outlet Elevation: 983.30 ft

Number of Barrels: 1

Culvert Data Summary - Existing West Culvert

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 4 - Downstream Channel Rating Curve (Crossing: RR Spur Culvert (Existing))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
0.00	983.60	0.00	0.00
2.00	985.37	1.77	0.17
5.00	985.71	2.11	0.29
10.00	986.16	2.56	0.40
20.00	986.89	3.29	0.47
30.00	987.64	4.04	0.52
40.00	988.73	5.13	0.57
50.00	989.26	5.66	0.59
60.00	989.43	5.83	0.61
70.00	989.61	6.01	0.63
150.00	990.17	6.57	0.90
275.00	991.06	7.46	1.35

Tailwater Channel Data - RR Spur Culvert (Existing)

Tailwater Channel Option: Enter Rating Curve

Channel Invert Elevation: 983.60 ft

Roadway Data for Crossing: RR Spur Culvert (Existing)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 991.60 ft

Roadway Surface: Gravel

Roadway Top Width: 41.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 50 cfs

Maximum Flow: 100 cfs

Table 1 - Summary of Culvert Flows at Crossing: RR Spur Culvert (Restored)

Headwater Elevation (ft)	Total Discharge (cfs)	East Slipline Culvert Discharge (cfs)	Existing West Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
983.84	0.00	0.00	0.00	0.00	0
986.16	10.00	4.35	6.18	0.00	4
986.91	20.00	8.60	11.56	0.00	7
987.69	30.00	13.52	16.68	0.00	6
988.82	40.00	16.59	23.68	0.00	3
989.41	50.00	22.76	27.44	0.00	8
989.66	60.00	25.86	34.23	0.00	7
989.93	70.00	31.95	38.70	0.00	7
990.10	80.00	34.96	45.09	0.00	3
990.29	90.00	39.08	50.03	0.00	8
990.29	100.00	40.52	59.48	0.00	9
991.60	146.39	64.21	82.19	0.00	Overtopping

Rating Curve Plot for Crossing: RR Spur Culvert (Restored)

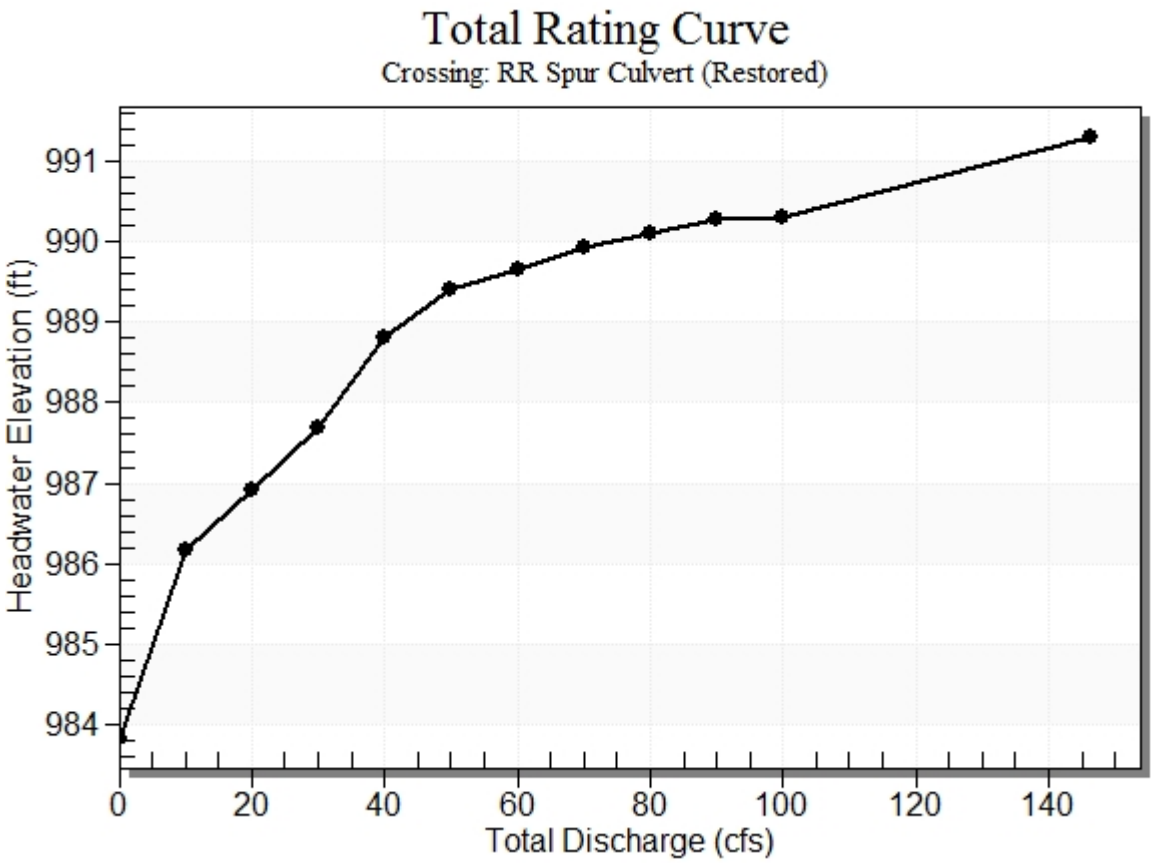


Table 2 - Culvert Summary Table: East Slipline Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	983.84	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	4.35	986.16	0.901	1.437	6-FFt	0.379	0.623	2.300	2.216	0.650	0.316
20.00	8.60	986.91	1.282	2.186	6-FFt	0.534	0.882	3.030	2.674	0.971	0.411
30.00	13.52	987.69	1.632	2.974	4-FFf	0.683	1.113	3.500	3.048	1.405	0.447
40.00	16.59	988.82	1.826	4.097	4-FFf	0.752	1.240	3.500	3.566	1.724	0.488
50.00	22.76	989.41	2.194	4.713	4-FFf	0.889	1.461	3.500	3.848	2.365	0.507
60.00	25.86	989.66	2.369	4.936	4-FFf	0.957	1.565	3.500	4.501	2.688	0.541
70.00	31.95	989.93	2.705	5.241	4-FFf	1.059	1.749	3.500	4.988	3.321	0.564
80.00	34.96	990.10	2.868	5.382	4-FFf	1.110	1.831	3.500	5.400	3.634	0.585
90.00	39.08	990.29	3.093	5.560	4-FFf	1.179	1.941	3.500	5.661	4.062	0.600
100.00	40.52	990.29	3.172	5.540	4-FFf	1.203	1.977	3.500	6.080	4.212	0.664

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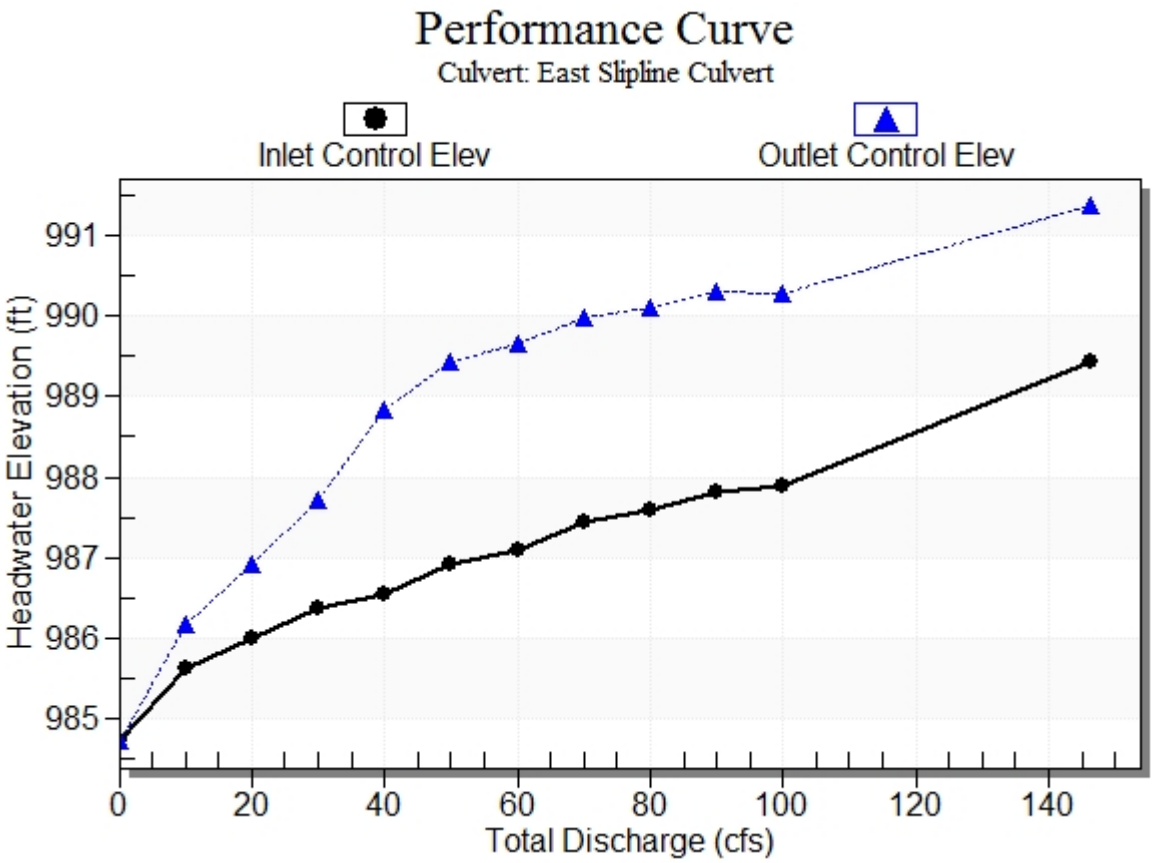
Straight Culvert

Inlet Elevation (invert): 984.73 ft, Outlet Elevation (invert): 983.86 ft

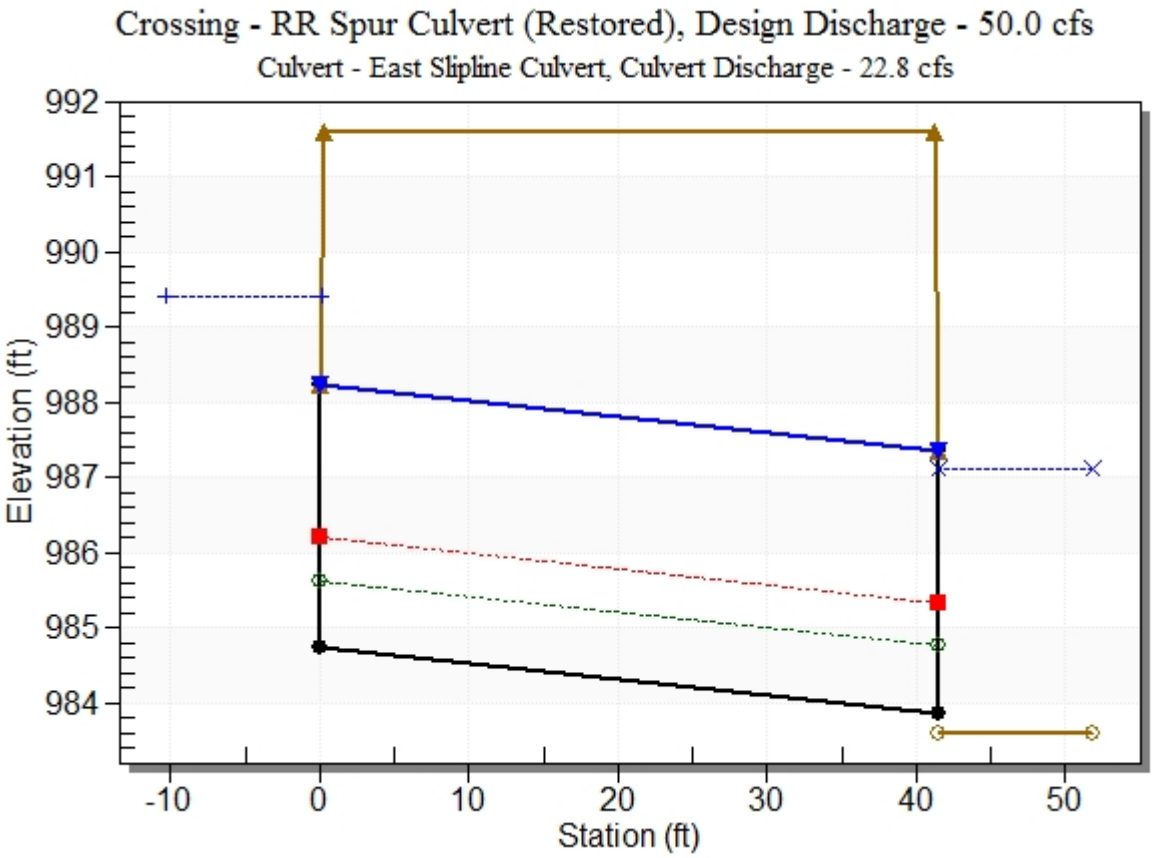
Culvert Length: 41.51 ft, Culvert Slope: 0.0210

****

Culvert Performance Curve Plot: East Slipline Culvert



Water Surface Profile Plot for Culvert: East Slipline Culvert



Site Data - East Slipline Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 984.73 ft

Outlet Station: 41.50 ft

Outlet Elevation: 983.86 ft

Number of Barrels: 1

Culvert Data Summary - East Slipline Culvert

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: NONE

Table 3 - Culvert Summary Table: Existing West Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	983.84	0.000	0.000	0-NF	0.000	0.000	0.300	0.000	0.000	0.000
10.00	6.18	986.16	0.972	1.805	6-FFt	0.709	0.717	2.337	2.560	0.810	0.400
20.00	11.56	986.91	1.343	2.223	6-FFt	0.960	0.988	2.734	3.290	1.263	0.470
30.00	16.68	987.69	1.631	2.637	6-FFt	1.166	1.196	3.117	4.040	1.588	0.520
40.00	23.68	988.82	1.970	2.922	6-FFt	1.405	1.434	3.341	5.130	2.112	0.570
50.00	27.44	989.41	2.143	3.419	6-FFt	1.522	1.547	3.797	3.497	2.227	0.484
60.00	34.23	989.66	2.439	3.742	4-FFf	1.718	1.738	4.000	5.830	2.724	0.610
70.00	38.70	989.93	2.624	4.336	4-FFf	1.845	1.856	4.000	6.010	3.080	0.630
80.00	45.09	990.10	2.880	4.779	4-FFf	2.014	2.009	4.000	6.080	3.588	0.664
90.00	50.03	990.29	3.072	5.330	4-FFf	2.146	2.119	4.000	6.150	3.981	0.698
100.00	80.00	990.29	4.250	6.298	4-FFf	2.972	2.707	4.000	6.220	6.366	0.731

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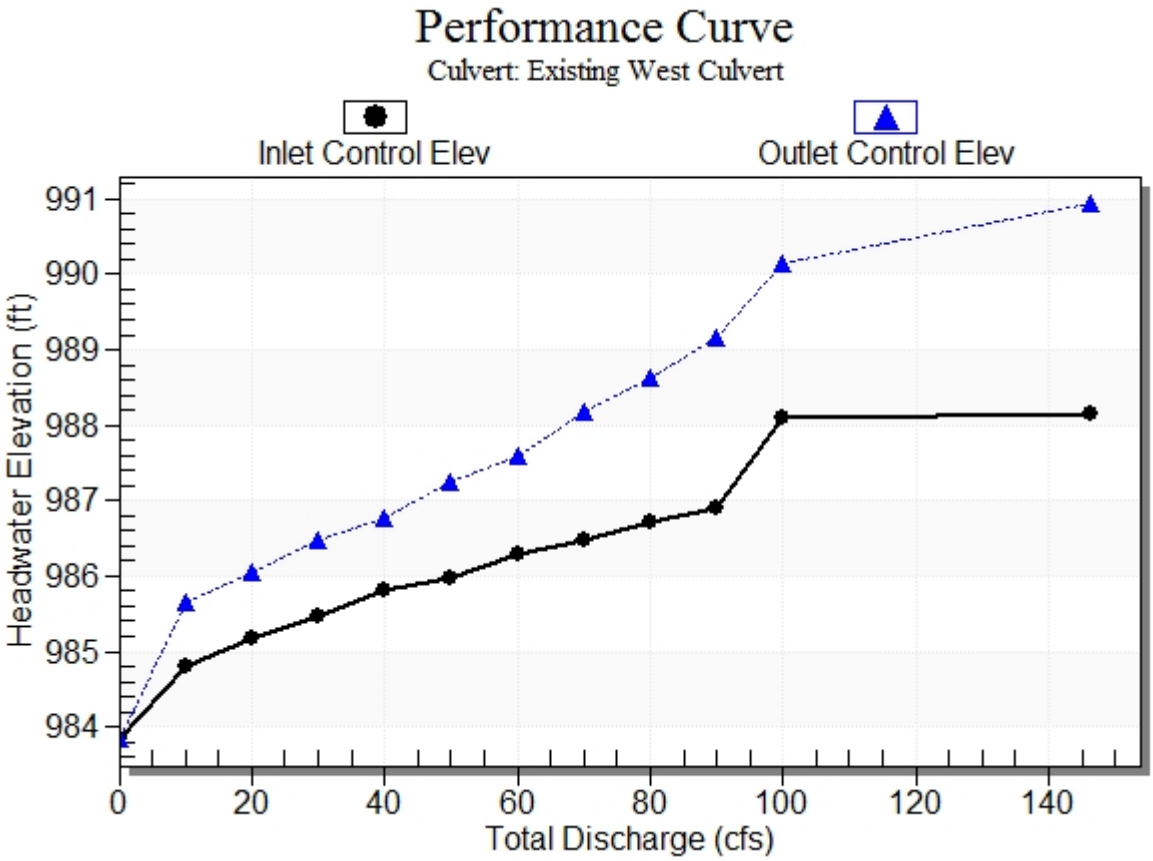
Straight Culvert

Inlet Elevation (invert): 983.84 ft, Outlet Elevation (invert): 983.30 ft

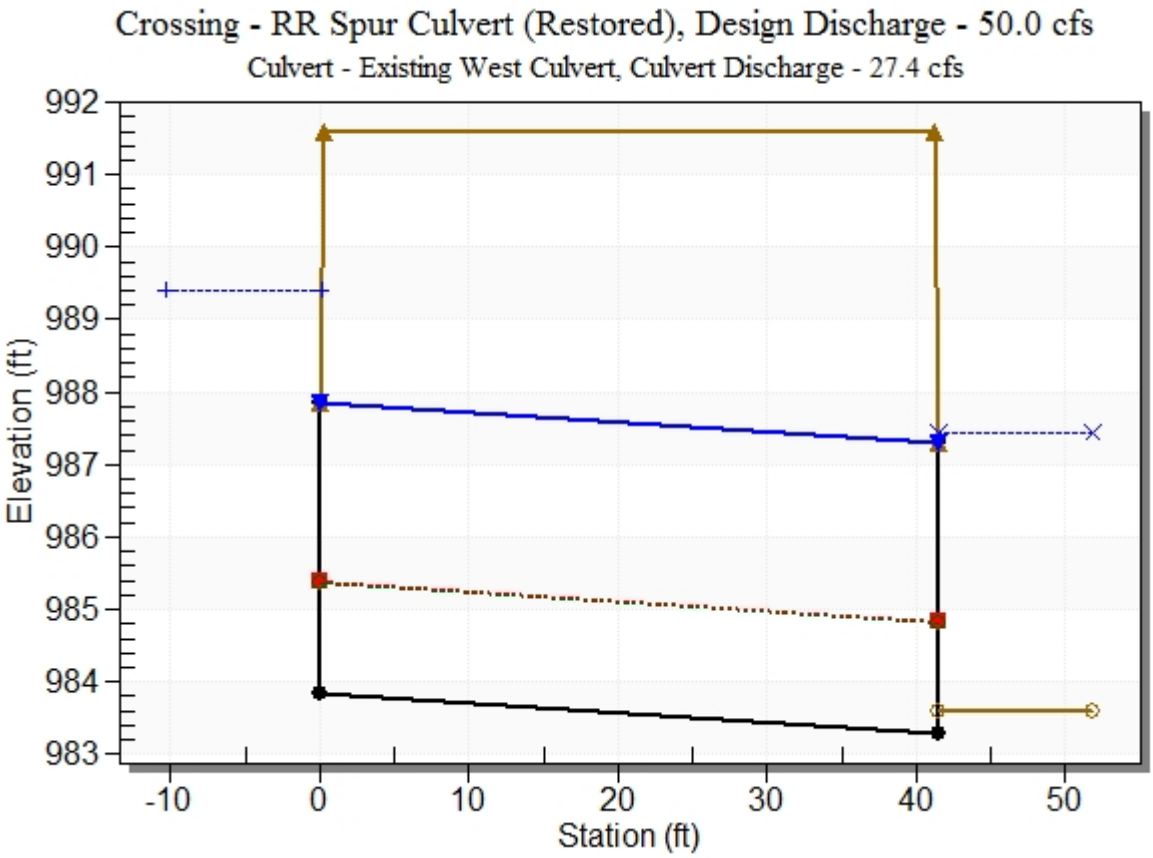
Culvert Length: 41.50 ft, Culvert Slope: 0.0130

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Culvert Performance Curve Plot: Existing West Culvert



Water Surface Profile Plot for Culvert: Existing West Culvert



Site Data - Existing West Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 983.84 ft

Outlet Station: 41.50 ft

Outlet Elevation: 983.30 ft

Number of Barrels: 1

Culvert Data Summary - Existing West Culvert

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 4 - Downstream Channel Rating Curve (Crossing: RR Spur Culvert (Restored))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
0.00	983.60	0.00	0.00
2.00	985.37	1.77	0.17
5.00	985.71	2.11	0.29
10.00	986.16	2.56	0.40
20.00	986.89	3.29	0.47
30.00	987.64	4.04	0.52
40.00	988.73	5.13	0.57
50.00	989.26	5.66	0.60
60.00	989.43	5.83	0.61
70.00	989.61	6.01	0.63
150.00	990.17	6.57	0.90
275.00	991.06	7.46	1.35

Tailwater Channel Data - RR Spur Culvert (Restored)

Tailwater Channel Option: Enter Rating Curve

Channel Invert Elevation: 983.60 ft

Roadway Data for Crossing: RR Spur Culvert (Restored)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 991.60 ft

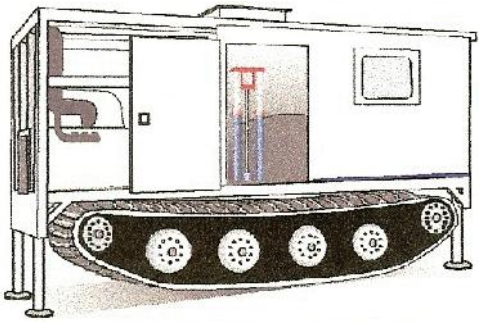
Roadway Surface: Gravel

Roadway Top Width: 41.00 ft

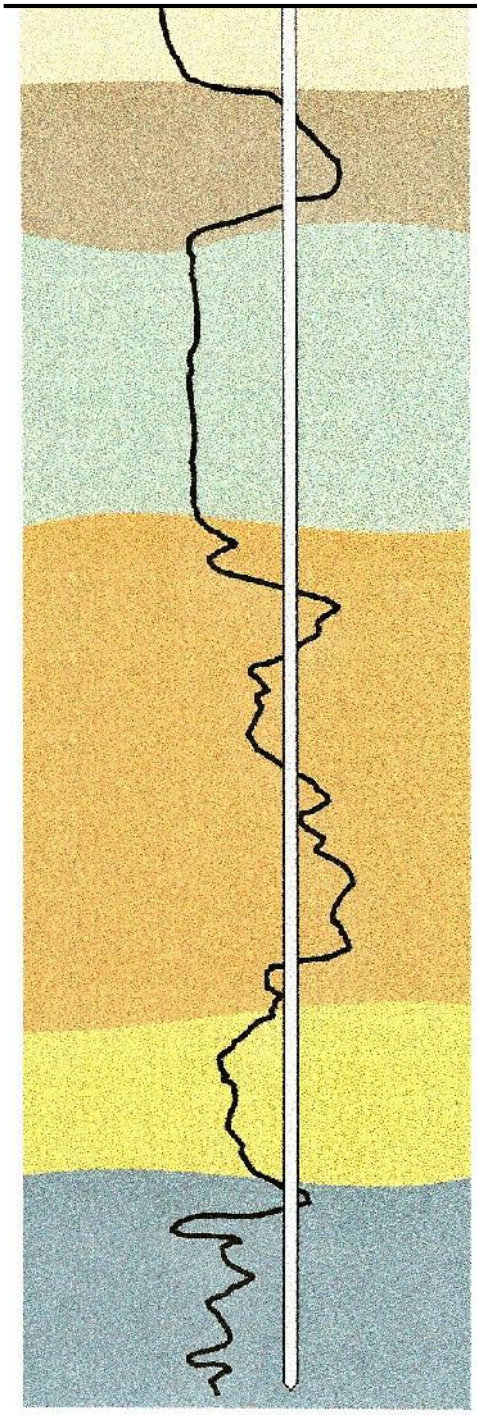
ARCADIS

Appendix H

Summary of Supplemental Geotechnical Investigations



Geotechnical and Environmental In Situ Testing Contractors



ConeTec Field Report

Presentation of In Situ Test Results for:

Unkamet Brook Sewer Realignment Project
Pittsfield, Massachusetts

Presented to: ARCADIS U.S., Inc.

Date: August 19, 2013

Presented by: ConeTec Inc.
436 Commerce Lane, Unit C
West Berlin, NJ 08091
(856) 767-8600

PRESENTATION OF IN SITU TESTING PROGRAM RESULTS

Unkamet Brook Sanitary Sewer Realignment Project
Former GE Pittsfield Facility
1 Plastics Avenue
Pittsfield, Massachusetts

August 14th and 15th, 2013

Prepared for:

ARCADIS U.S., Inc.
Syracuse, New York

Prepared by:
ConeTec Inc.
West Berlin, NJ

August 19th, 2013

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APPENDIX D Electronic Data Files

1.0 INTRODUCTION

This report presents the results of a piezocone penetrometer testing (CPTU) program carried out in the Unkamet Brook area located near the rear parking lot of the former General Electric Pittsfield facility located at 1 Plastics Avenue in Pittsfield, Massachusetts. The work was performed under subcontract to ARCADIS U.S., Inc. (ARCADIS), of Syracuse, New York. The CPTU program took place on August 14th and 15th, 2013.

A total of 12 soundings were completed at seven different sounding locations. The CPT testing was performed to evaluate in situ geotechnical criteria of the soils.

CPT sounding locations were selected and numbered under the direction and supervision of ARCADIS personnel (Ms. Mandy Giampaolo).

2.0 FIELD EQUIPMENT AND PROCEDURES

2.1 CONE PENETRATION TESTING

The cone penetrometer tests were carried out using an integrated electronic piezocone manufactured by ConeTec in Vancouver, Canada. The piezocone used was a compression model cone penetrometer with a 15 cm^2 tip and a 225 cm^2 friction sleeve. The cone is designed with an equal end area friction sleeve and an end area ratio of 0.80. The piezocone dimensions and the operating procedure were in accordance with ASTM Standard D-5778-12. A diagram of the cone penetrometer used for this project is shown as Figure 1.

Pore pressure filter elements, made of porous plastic, were saturated under a vacuum using silicone as the saturating fluid. The pore pressure element was six millimeters thick and was located immediately behind the tip (the u_2 location) for all soundings.

The cone was advanced using one of ConeTec's 4x4 direct push drill trucks. The following data were recorded onto magnetic media every five centimeters (approximately every two inches) as the cone was advanced into the ground:

- Tip Resistance (q_c)
- Sleeve Friction (f_s)
- Dynamic Pore Pressure (u)

Before each sounding a complete set of analog baseline readings are taken with a multi-meter and compared with the digitized value on the computer screen. This provides a check on the analog to digital conversion board.

The evaluation of the analog baselines is key to consistent readings. The baseline data should be stable and should not wander excessively during the course of a sounding. Baseline data can be used to apply corrections to the cone data where necessary. For this project, the baseline shift from sounding to sounding was small, typically less than 0.1% of full scale, and no data corrections were applied.

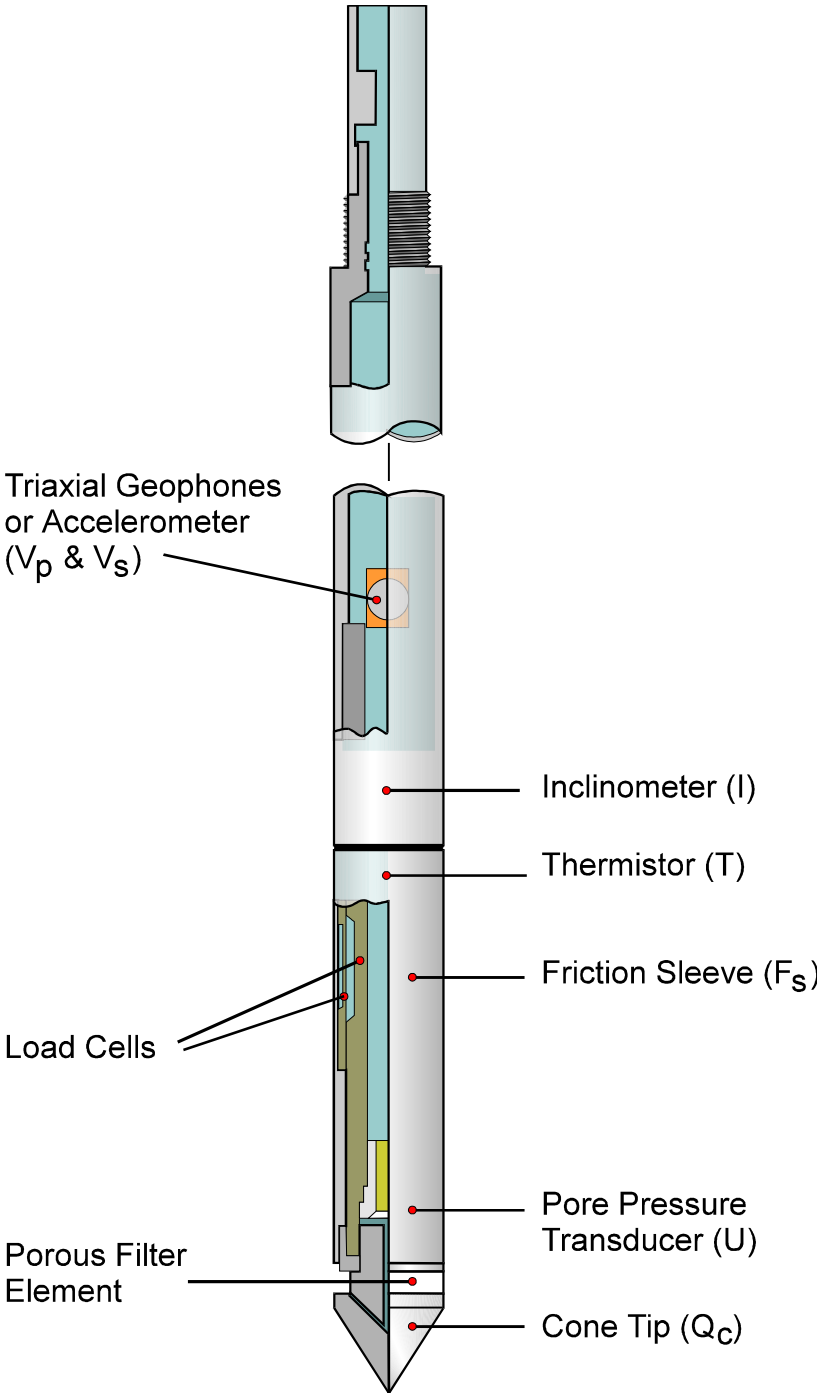


FIGURE 1 - TYPICAL CONE PENETROMETER

2.2 PORE PRESSURE DISSIPATION TESTS

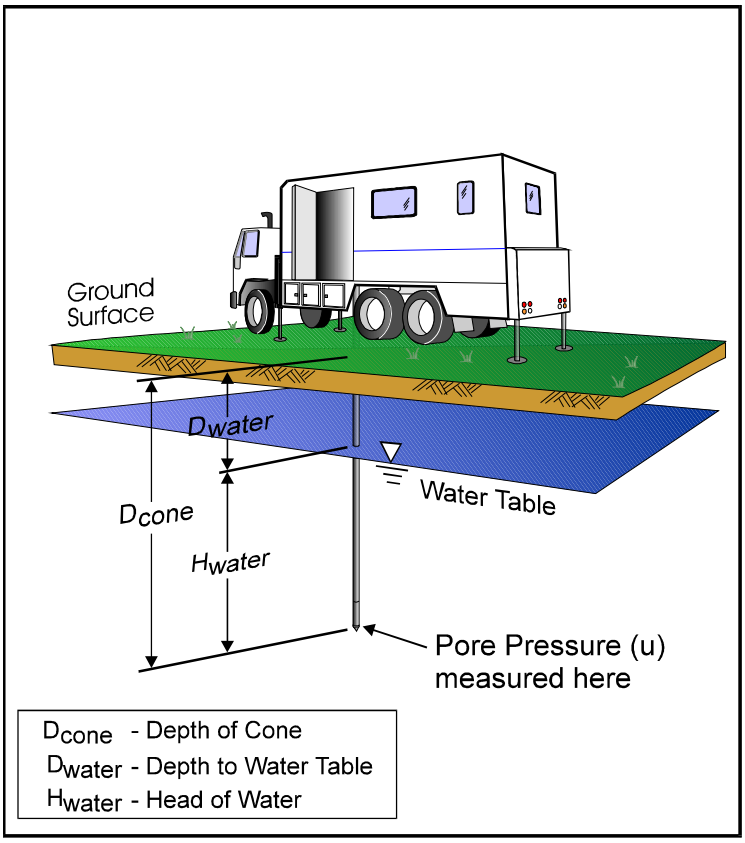
When cone penetration is stopped, the piezocone essentially becomes a piezometer. While stopped, pore water pressures are automatically recorded at five-second intervals and the readings are stored in a dissipation file (.ppd). Dissipation data can then be plotted onto a dissipation curve consisting of pore water pressure (u) verses time (t). The shapes of dissipation curves are very useful in evaluating soil type, drainage and in situ static water level.

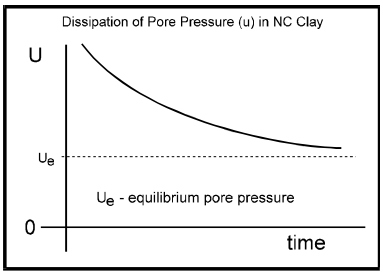
A flat curve that stabilizes quickly (i.e. less than 30 seconds) is typical of a free draining sand. In this case, the final measured pore water pressure is the static in situ water pressure.

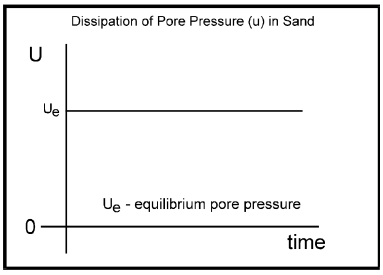
Soils that generate excess dynamic pore water pressure during penetration will dissipate this excess pressure when penetration stops. The shape of the dissipation curve and the time of dissipation can be used to estimate C_h, the coefficient of consolidation that can in turn be used to calculate K_h, the horizontal permeability.

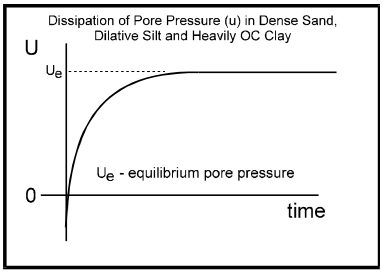
Figure 2 shows some idealized shapes of various pore water pressure dissipation curves. The reader is referred Robertson et. al., 1992 to reference dissipation test data analytical techniques.

Estimation of Ground Water Table from CPT Dissipation Tests









Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

FIGURE 2 - TYPICAL DISSIPATION TESTS

3.0 CONE PENETRATION TEST DATA AND INTERPRETATION

3.1 ANALYSIS OF PIEZOCONE DATA - GENERAL

A total of 12 CPT soundings, involving approximately 256 feet of testing, were completed at seven different sounding locations (there were five refusals).

The interpretation of cone data is based on the relationship between cone bearing, q_c, sleeve friction, f_s, and penetration pore water pressure, u. The friction ratio, Rf, (sleeve friction divided by cone bearing) is a calculated parameter which is used to infer soil behavior type. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

The interpretation of soils encountered on this project was carried out using correlations developed by Robertson, 1990. It should be noted that it is not always possible to clearly identify a soil type based on q_c, f_s and u. Occasionally soils will fall within different soil categories on the classification charts. In these situations, experience and judgment and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type. Computer tabulations of the interpreted soil types along with certain other geotechnical parameters for each cone sounding are presented in Appendix B.

Each of the parameters measured in the sounding is discussed briefly below. A detailed explanation of CPTU testing and interpretation of the results can be found in Robertson, 1989.

TIP RESISTANCE (q_c): The resistance to penetration, measured at the cone tip, provides an accurate profile of subsurface strata. The recorded tip resistance is a composite of the penetration resistance of the soils located five to ten cone diameters (7 to 14 inches) in front of and behind the tip. The actual resistance "sensed" by the tip depends on the soil properties and on the relative stiffness of the layers encountered. Tip resistance is often corrected for pore pressure effects when testing in soft saturated cohesive soils.

For this project the correction was made and the tip resistance shown, q_t is the corrected tip resistance.

The correction used is: $q_t = q_c + (1\text{-}a)u$

Where:
- q_t = corrected tip resistance
- q_c = measured tip resistance
- a = net area ratio for cone (0.80 for ConeTec cone penetrometers)
- u = dynamic pore water pressure measured behind tip

SLEEVE FRICTION (f_s) The resistance recorded on the friction sleeve, is a measure of the remolded strength of the soil. Values of sleeve friction in very soft soils (such as peat) may fluctuate due to the measured force being small relative to the capacity of the measuring

load cell.

FRICTION RATIO (R_f) The ratio of sleeve friction to tip resistance expressed as a percentage, is an indicator of soil type. Cohesive soils generally have friction ratios that are greater than two, while sands and non-plastic silts have friction ratios that are lower than two.

PORE PRESSURE (u*)* Dynamic pore water pressure is measured during penetration. (dynamic pore water pressure data can be found in the .cor, and .xls files. Static pore water pressure is measured when cone penetration is stopped (static pore water pressure data can be found in the .ppd files). The measured dynamic pore water pressure changes with the location of the porous filter and negative readings are possible when the filter is located behind the tip.

It is important to note that the CPT classifies soil by physical behavior, not by grain size; therefore, the CPT classification should be verified against samples obtained from a conventional drilling program. While the CPT soil classification may not always be accurate in terms of the actual label it applies to a particular soil, it is very accurate in grouping soils with similar mechanical properties.

Table 1 presents a summary of CPT soundings including sounding depths, estimated phreatic surface and approximate sounding location coordinates (UTM Zone 18).

3.2 CONE PLOTS

The data from each sounding was plotted using the computer program SCREENzW. The plots are included in Appendix A. SCREENzW was developed by ConeTec Inc. and it incorporates soil behavior type (SBT) classification as part of the plot. The soil classification is based on the classification chart reproduced chart in Appendix B.

3.3 PORE PRESSURE DISSIPATION TEST RESULTS

Pore water pressure dissipation data are collected and automatically recorded during pauses in penetration. The pore water pressure data is recorded at five second intervals. Six pore water pressure dissipation tests, involving approximately 20 minutes of time, were performed on this project, the plots for which can be found in Appendix C. Table 2 presents a summary of dissipation traces including trace durations, calculated phreatic surface depths and some estimated consolidation data.

3.4 CPT DATA PROCESSING

The electronic data files were processed using the program SCREENzW. SCREENzW is a program developed by ConeTec to calculate common engineering parameters from CPT data. The processed data file summery sheet is attached in Appendix B. The files (NLI.xls) are included in the electronic data package. The calculations used are summarized in the table at the front of the Appendix. Each calculation is derived according to the referenced article.

For this project, the piezometric surface used was determined from the pore water pressure dissipation tests and the dynamic pore pressure responses recorded during the CPT. The exact depth used can be found in the headers of the nli.xls files.

3.5 ELECTRONIC DATA FILES

Along with the report, all of the project data can be downloaded from ConeTec's "ConeTec Data Services" (CDS) website (www.conetecdataservices.com) using a secure, project-specific user name and password. These electronic files contain all important project information including tabular data (.xls and ASCII formats), GPS coordinates of approximate sounding locations, dynamic and static pore water pressure and some basic interpretation files in Microsoft™ Excel format (.xls). Information regarding the digital file formats of the electronic files is included in Appendix D.

5.0 REFERENCES

Robertson, P.K., 1990, “Soil Classification using the Cone Penetration Test”, Canadian Geotechnical Journal, vol. 27, pages 151-158.

Robertson, P.K., Sully, J., Woeller, D.G., Lunne, T., Powell, J.M., and Gillespie, D.J., 1992, “Estimating Coefficient of Consolidation from Piezocone Tests”, Canadian Geotechnical Journal, vol. 29, pages 539-550.

APPENDIX A

Job No: 13-53053
Client: ARCADIS
Project: Unkamet Brook Area, Pittsfield, MA
Date: 08/14/13 to 08/15/13

TABLE 1 - CPT SOUNDING SUMMARY

CPT Sounding	File Name	Date	Cone	Assumed Phreatic Surface (ft)	Final Depth (ft)	Northing UTM Zone 18 (m)	Easting UTM Zone 18 (m)
UK-CPT-1	13-53053_CP01	08/15/13	243:T1500F15U500	3.0	48.06	4702849	647099
UK-CPT-2	13-53053_CP02	08/15/13	243:T1500F15U500	3.0	52.00	4702824	647125
UK-CPT-3	13-53053_CP03	08/15/13	243:T1500F15U500	3.0	5.41	4702803	647146
UK-CPT-3A	13-53053_CP03A	08/15/13	243:T1500F15U500	3.0	6.73	4702803	647147
UK-CPT-4	13-53053_CP04	08/15/13	243:T1500F15U500	3.0	7.87	4702785	647161
UK-CPT-4A	13-53053_CP04A	08/15/13	243:T1500F15U500	3.0	37.40	4702785	647162
UK-CPT-5	13-53053_CP05	08/15/13	243:T1500F15U500	3.0	4.27	4702766	647174
UK-CPT-5A	13-53053_CP05A	08/15/13	243:T1500F15U500	3.0	5.25	4702766	647175
UK-CPT-6	13-53053_CP06	08/14/13	243:T1500F15U500	3.0	4.43	4702732	647209
UK-CPT-6A	13-53053_CP06A	08/14/13	243:T1500F15U500	3.0	44.46	4702732	647210
UK-CPT-7	13-53053_CP07	08/14/13	243:T1500F15U500	3.0	3.94	4702718	647219
UK-CPT-7A	13-53053_CP07A	08/14/13	243:T1500F15U500	3.0	36.42	4702718	647220
Totals:	**12**				**256.23**		

Note: Hydrostatic water table assumed for interpretation tables was based on pore pressure data.

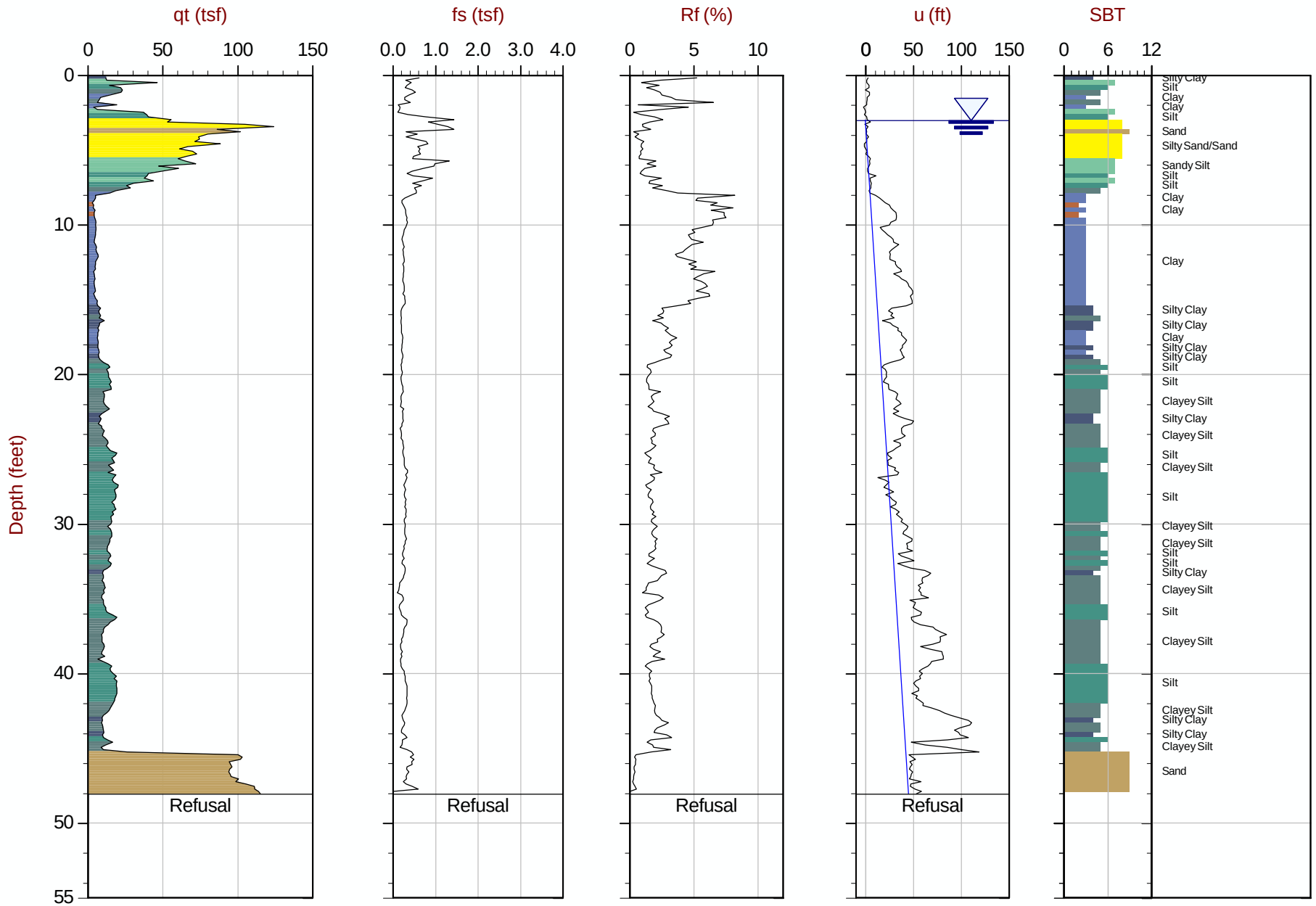
Non-Normalized CPT Plots

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 14:16
Site: Unkamet Brook Area

Sounding: UK-CPT-1
Cone: 243:T1500F15U500



Max Depth: 14.650 m / 48.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP01.COR

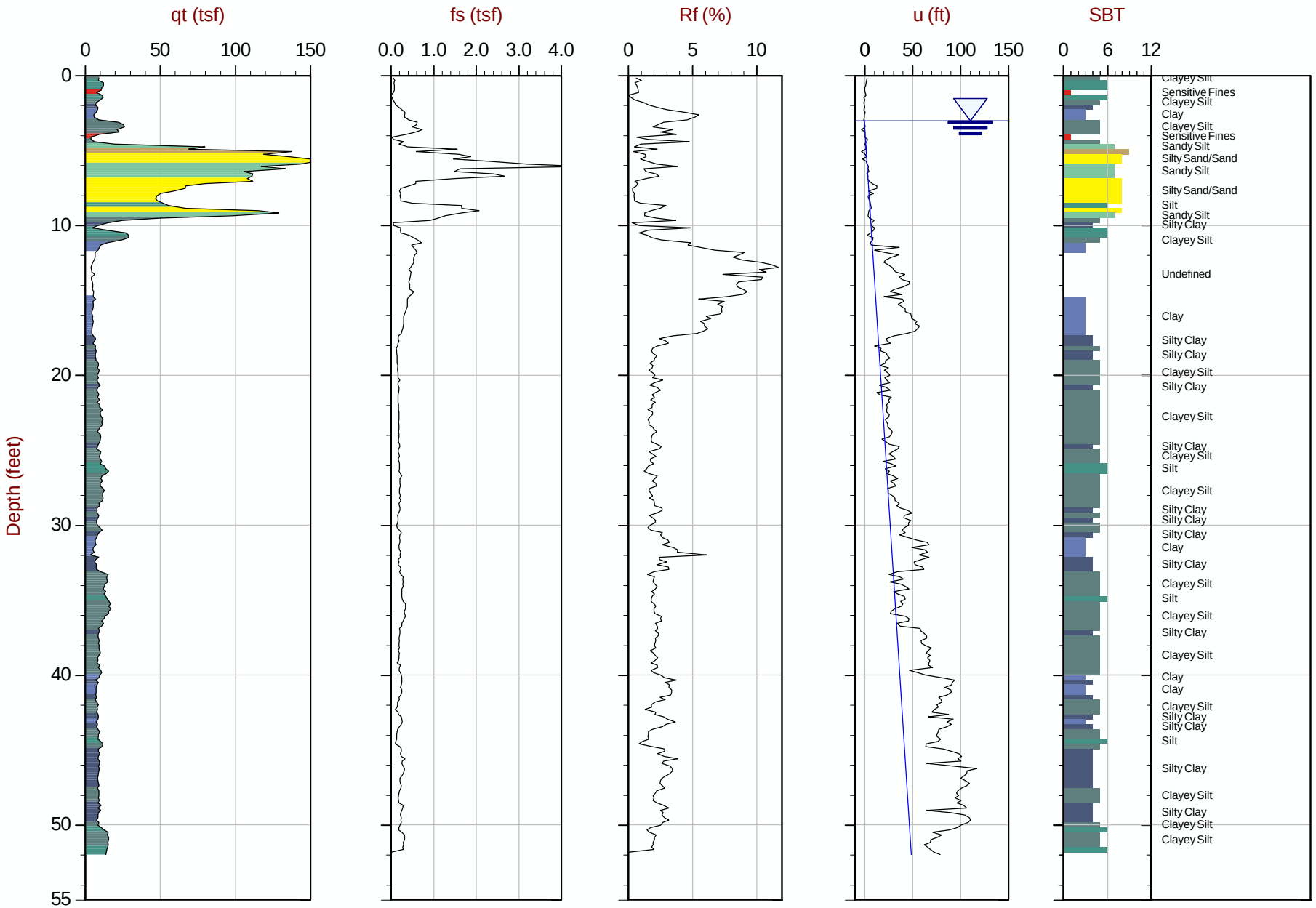
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702849 E: 647099

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 12:26
Site: Unkamet Brook Area

Sounding: UK-CPT-2
Cone: 243:T1500F15U500



Max Depth: 15.850 m / 52.00 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP02.COR

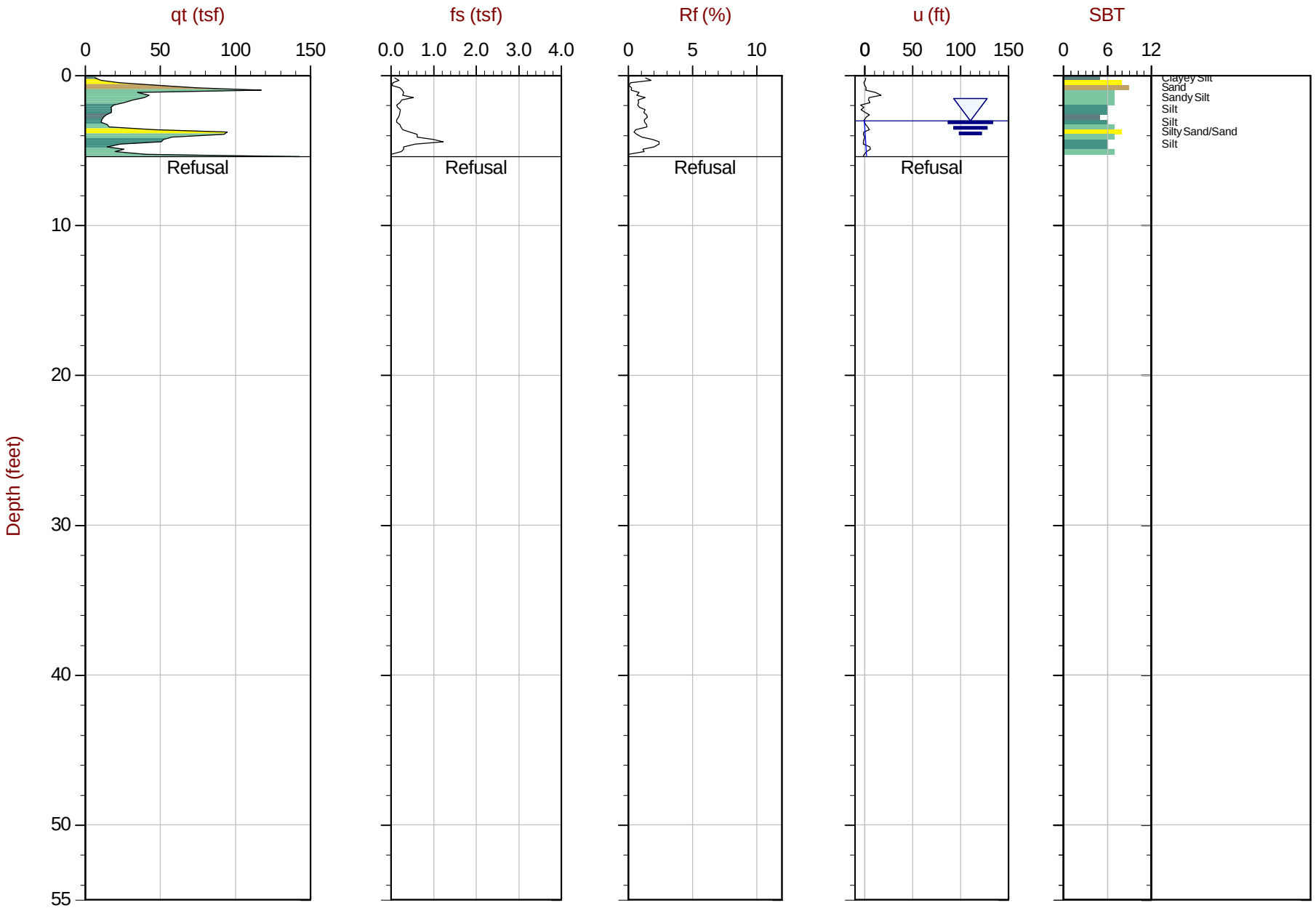
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702824 E: 647125

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 11:32
Site: Unkamet Brook Area

Sounding: UK-CPT-3
Cone: 243:T1500F15U500



Max Depth: 1.650 m / 5.41 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP03.COR

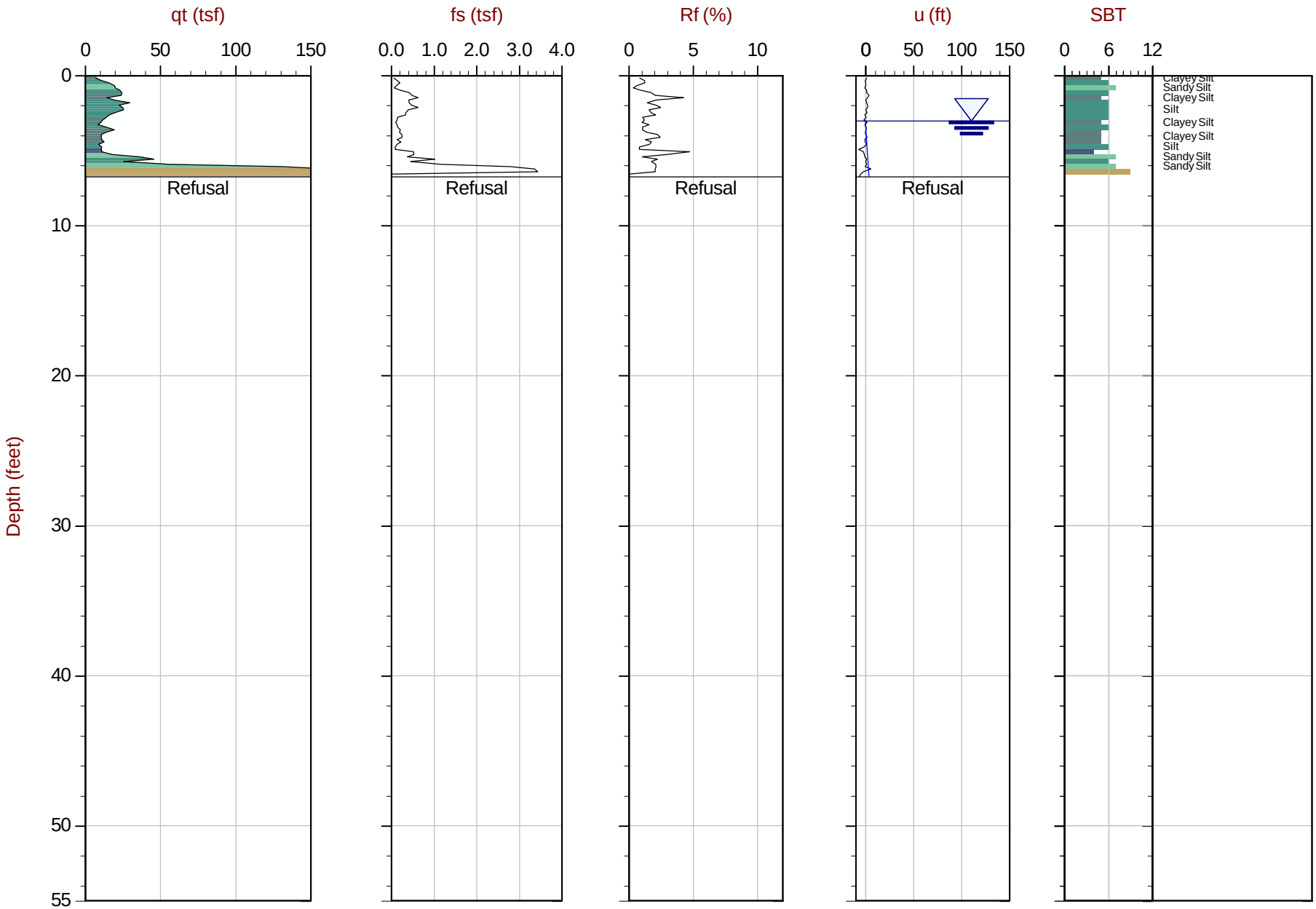
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702803 E: 647146
Page No: 1 of 1

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 11:48
Site: Unkamet Brook Area

Sounding: UK-CPT-3A
Cone: 243:T1500F15U500



Max Depth: 2.050 m / 6.73 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP03A.COR

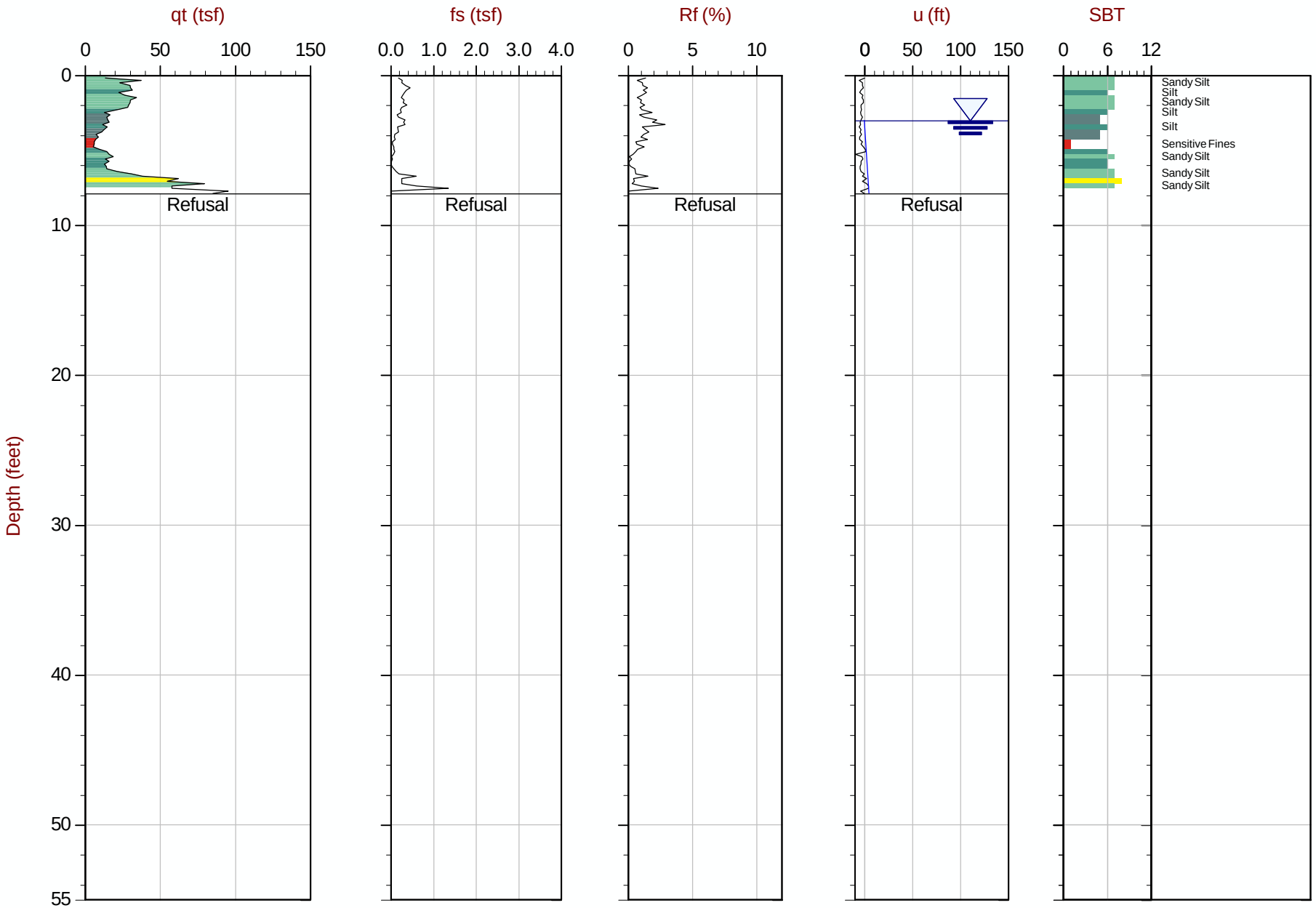
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702803 E: 647146

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 09:34
Site: Unkamet Brook Area

Sounding: UK-CPT-4
Cone: 243:T1500F15U500



Max Depth: 2.400 m / 7.87 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP04.COR

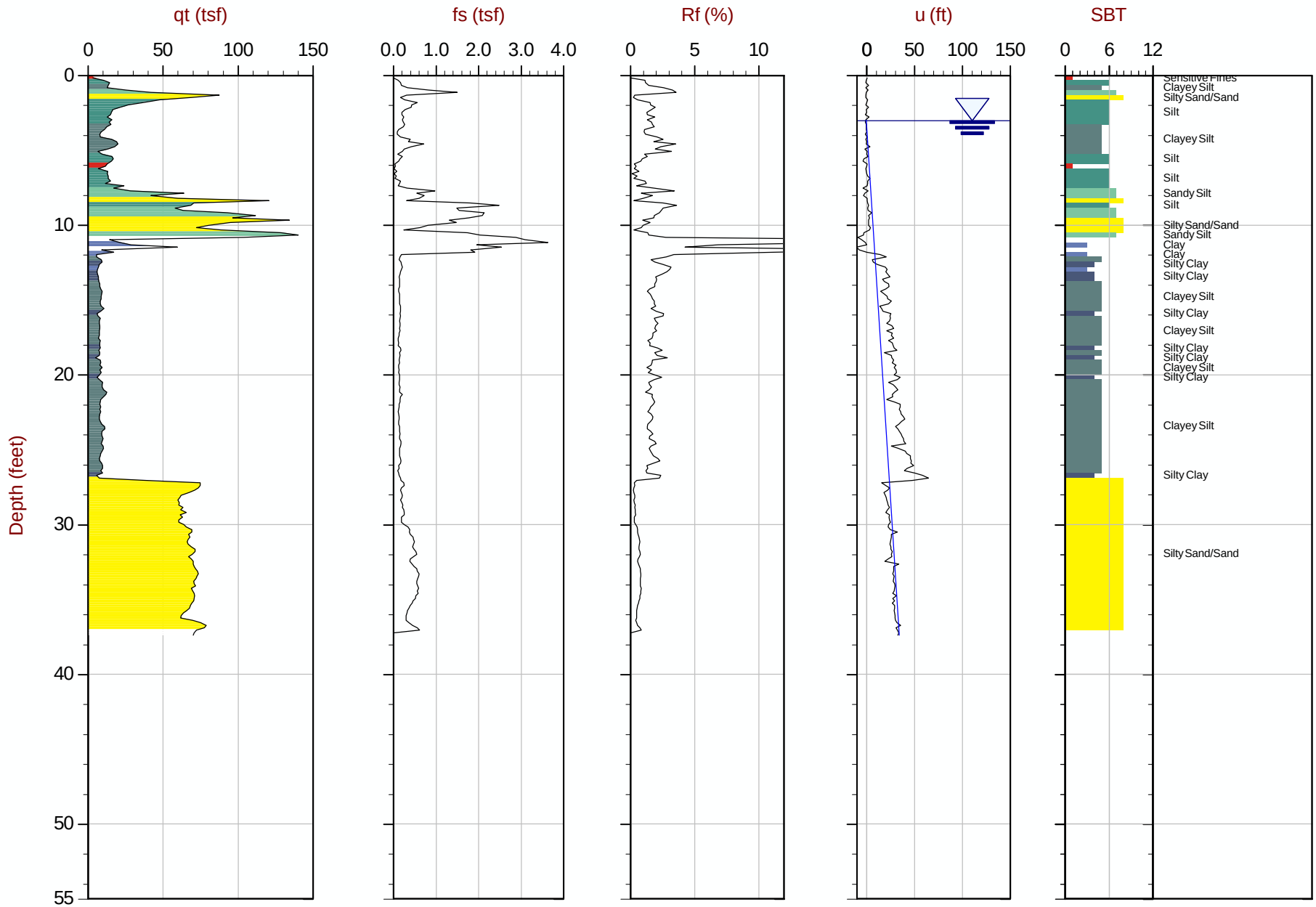
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702785 E: 647161

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 10:02
Site: Unkamet Brook Area

Sounding: UK-CPT-4A
Cone: 243:T1500F15U500



Max Depth: 11.400 m / 37.40 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP04A.COR

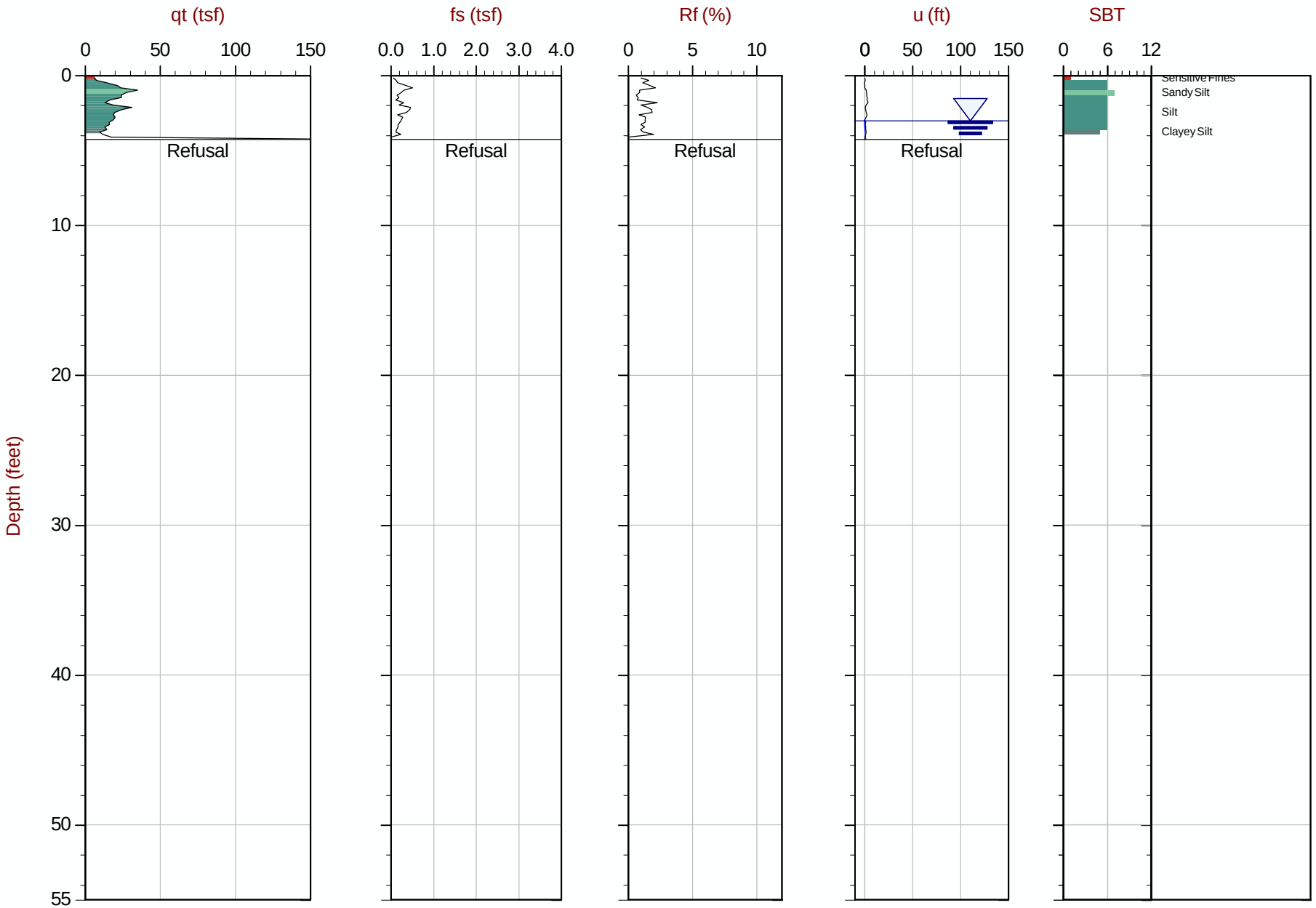
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Coords: UTM Zone 18 N: 4702785 E: 647162

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 08:25
Site: Unkamet Brook Area

Sounding: UK-CPT-5
Cone: 243:T1500F15U500



Max Depth: 1.300 m / 4.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP05.COR

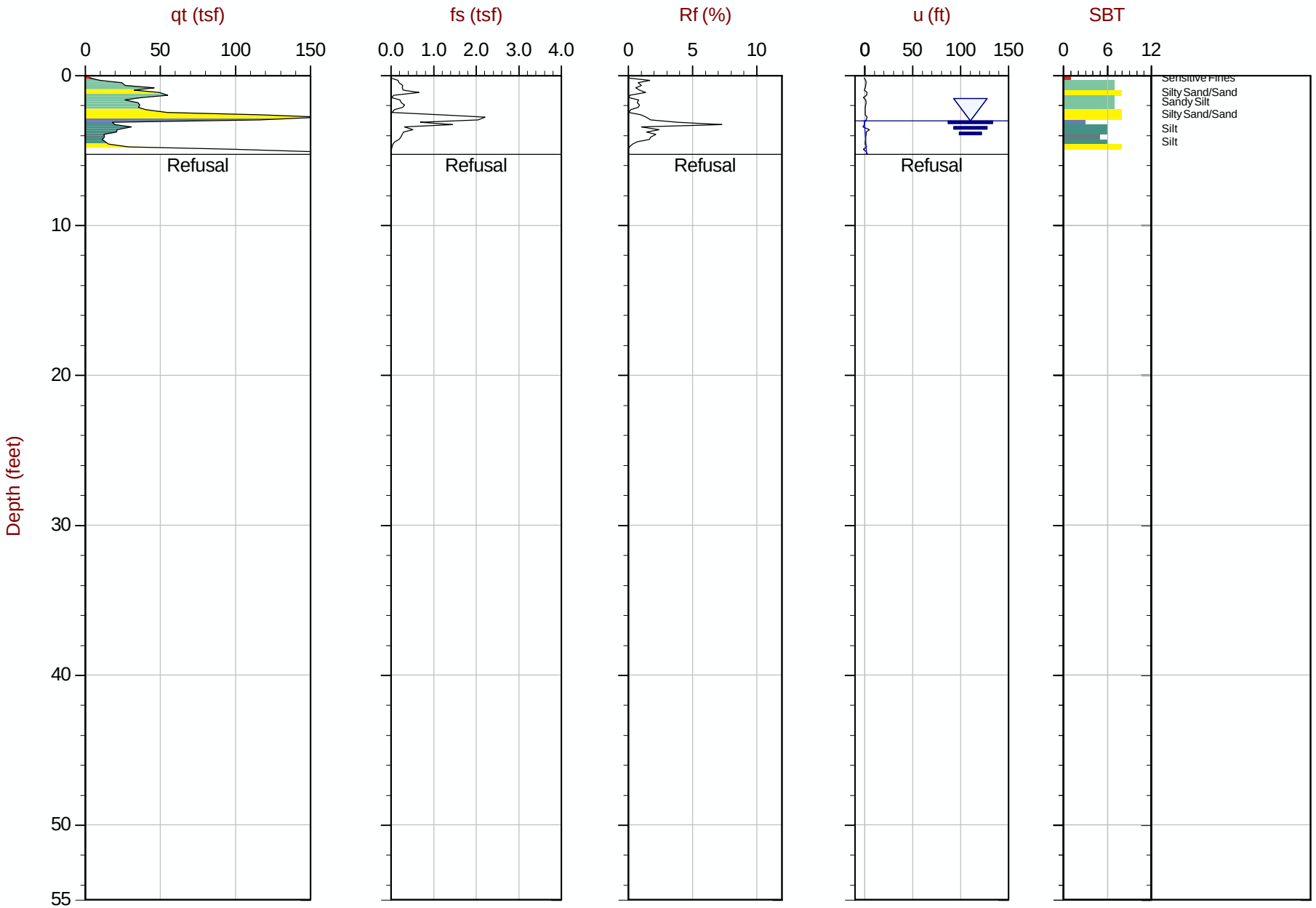
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702766 E: 647174

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:15:13 08:46
Site: Unkamet Brook Area

Sounding: UK-CPT-5A
Cone: 243:T1500F15U500



Max Depth: 1.600 m / 5.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP05A.COR

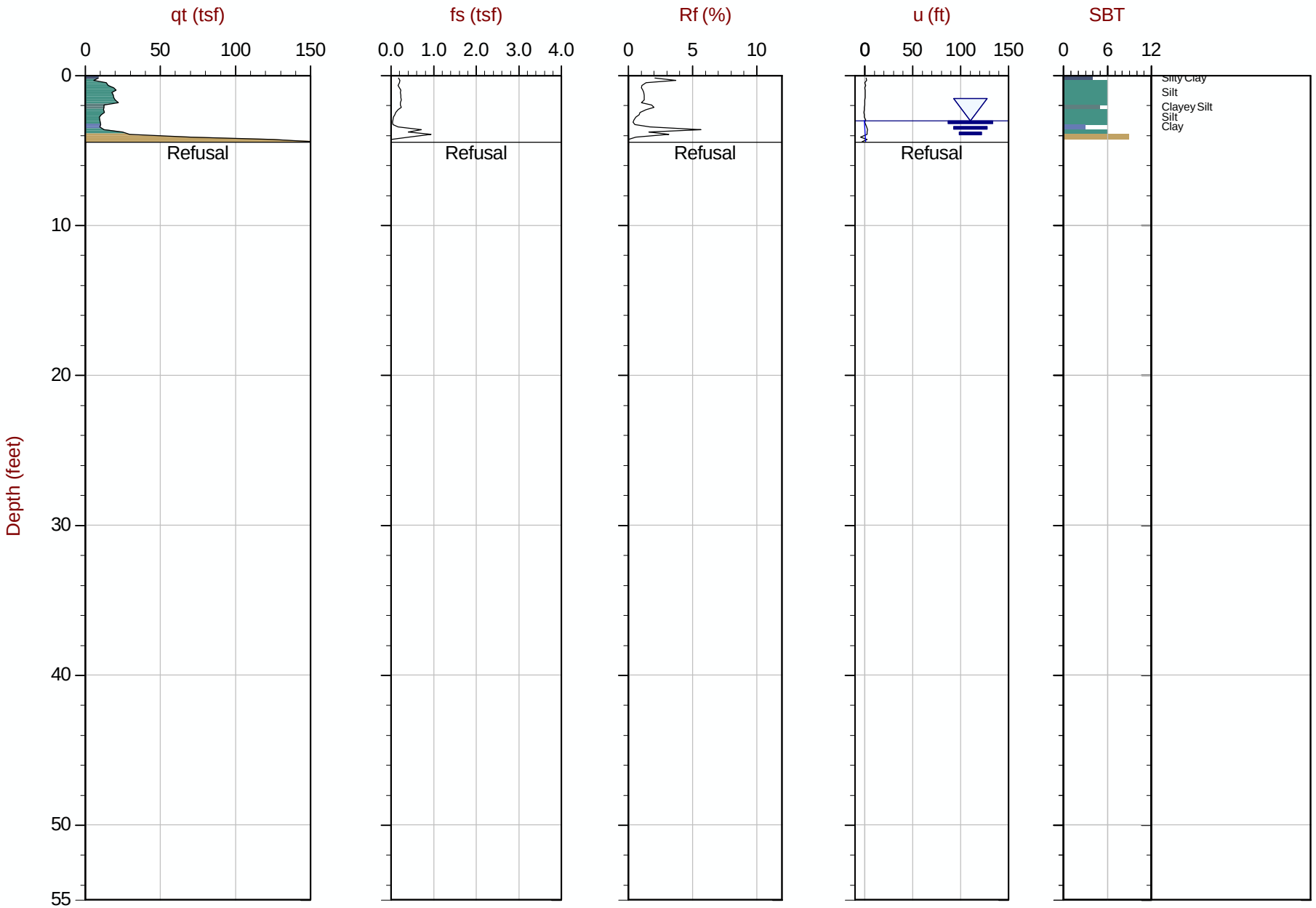
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702766 E: 647174

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:14:13 16:01
Site: Unkamet Brook Area

Sounding: UK-CPT-6
Cone: 243:T1500F15U500



Max Depth: 1.350 m / 4.43 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP06.COR

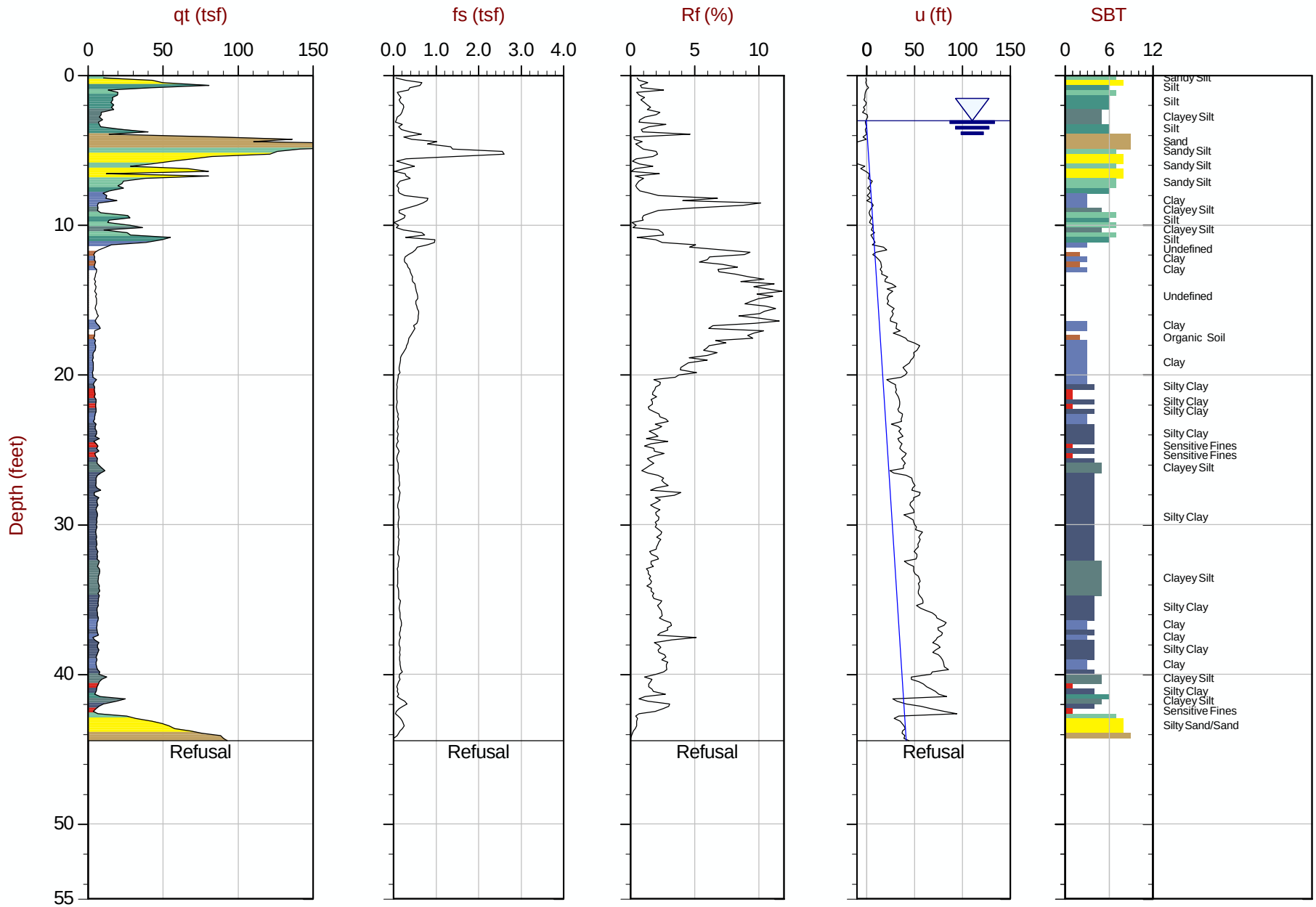
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702732 E: 647209

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:14:13 16:15
Site: Unkamet Brook Area

Sounding: UK-CPT-6A
Cone: 243:T1500F15U500



Max Depth: 13.550 m / 44.45 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP06A.COR

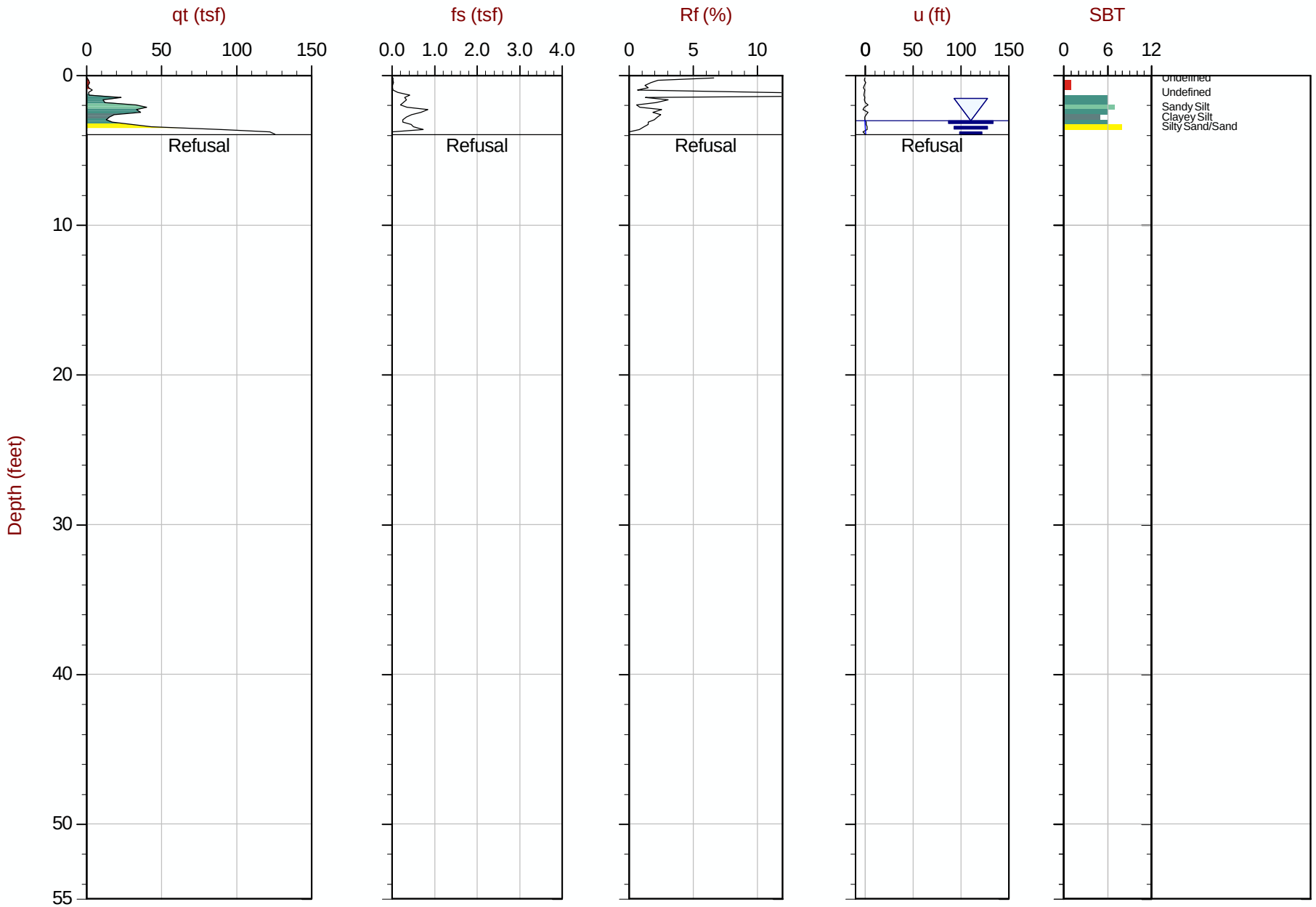
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702732 E: 647210

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:14:13 10:05
Site: Unkamet Brook Area

Sounding: UK-CPT-7
Cone: 243:T1500F15U500



Max Depth: 1.200 m / 3.94 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP07.COR

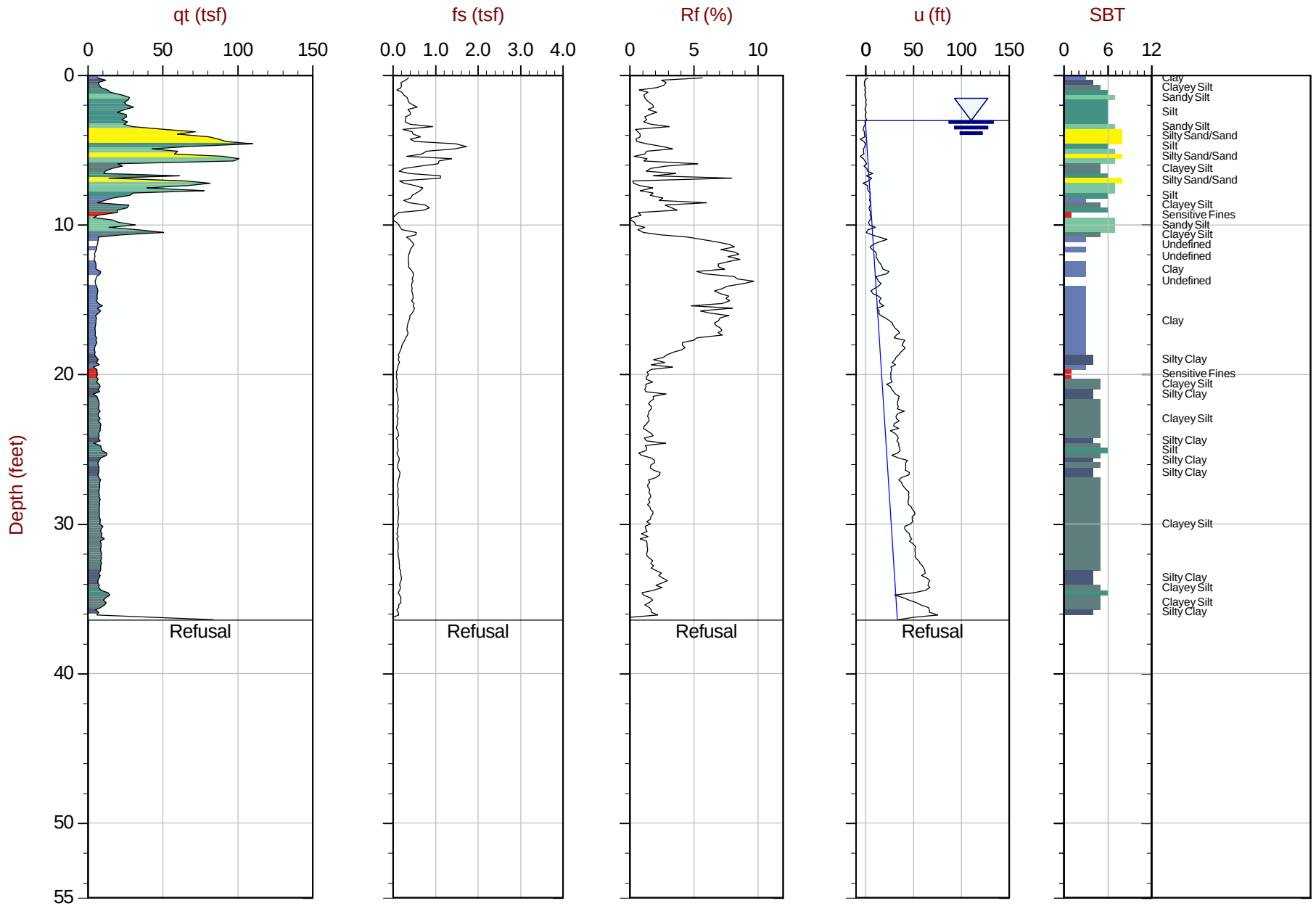
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702718 E: 647219

CONETEC

ARCADIS

Job No: 13-53053
Date: 08:14:13 14:23
Site: Unkamet Brook Area

Sounding: UK-CPT-7A
Cone: 243:T1500F15U500



Max Depth: 11.100 m / 36.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.100 m

File: 13-53053_CP07A.COR

SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4702718 E: 647220

APPENDIX B

CONETEC INTERPRETATION METHODS

A Detailed Description of the Methods Used in ConeTec's CPT Interpretation and Plotting Software



Revision SZW-Rev 05A
April 8, 2011

Prepared by Jim Greig

CONETEC

ConeTec Interpretations as of April 8, 2011

ConeTec's interpretation routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended. ConeTec does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and does not assume liability for any use of the results in any design or review. Representative hand calculations should be made for any parameter that is critical for design purposes. The end user of the interpreted output should also be fully aware of the techniques and the limitations of any method used in this program. The purpose of this document is to inform the user as to which methods were used and what the appropriate papers and/or publications are for further reference.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (e.g. 0.20m). Note that q_t is the tip resistance corrected for pore pressure effects and q_c is the recorded tip resistance. Since all ConeTec cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, f_s, are not required.

The tip correction is: $q_t = q_c + (1-a) \cdot u_2$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.80 for ConeTec cones)

The total stress calculations are based on soil unit weights that have been assigned to the Soil Behavior Type zones, from a user defined unit weight profile or by using a single value throughout the profile.

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). For over water projects the effects of the column of water have been taken into account as has the appropriate unit weight of water. How this is done depends on where the instruments were zeroed (i.e. on deck or at mud line).

Details regarding the interpretation methods for all of the interpreted parameters are provided in Table 1. The appropriate references cited in Table 1 are listed in Table 2. Where methods are based on charts or techniques that are too complex to describe in this summary the user should refer to the cited material.

The Soil Behavior Type classification charts (normalized and non-normalized) shown in Figures 1 and 2 are based on the charts developed by Dr. Robertson and Dr. Campanella at the University of British Columbia. These charts appear in many publications, most notably: Robertson, Campanella, Gillespie and Greig (1986); Robertson (1990) and Lunne, Robertson and Powell (1997). The Bq classification charts shown in Figures 3a and 3b are based on those described in Robertson (1990) and Lunne, Robertson and Powell (1997). The Jefferies and Davies SBT chart shown in Figure 3c is based on that discussed in Jefferies and Davies, 1993.

Where the results of a calculation/interpretation are declared *'invalid'* the value will be represented by the text strings "-9999" or "-9999.0". In some cases the value 0 will be used. Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g. drilled out section or data gap).

2. Where the interpretation method is inappropriate, for example, drained parameters in an undrained material (and vice versa).

3. Where interpretation input values are beyond the range of the referenced charts or specified limitations of the interpretation method.

4. Where pre-requisite or intermediate interpretation calculations are invalid.

The parameters selected for output from the program are often specific to a particular project. As such, not all of the interpreted parameters listed in Table 1 may be included in the output files delivered with this report.

The output files are provided in Microsoft Excel XLS format. The ConeTec software has several options for output depending on the number or types of interpreted parameters desired. Each output file will be named using the original COR file basename followed by a three or four letter indicator of the interpretation set selected (e.g. BSC, TBL, NLI or IFI) and possibly followed by an operator selected suffix identifying the characteristics of the particular interpretation run.

Table 1
CPT Interpretation Methods

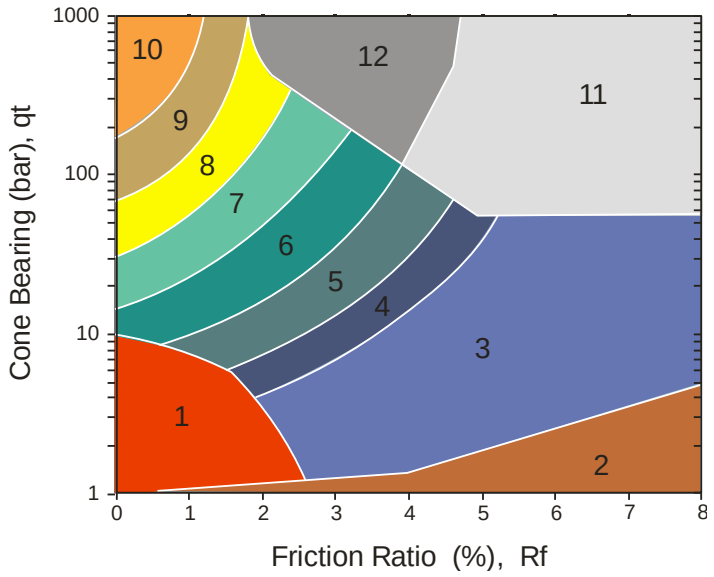
Interpreted Parameter	Description	Equation	Ref
Depth	Mid Layer Depth *(where interpretations are done at each point then Mid Layer Depth = Recorded Depth)*	*Depth (Layer Top) + Depth (Layer Bottom) / 2.0*	
Elevation	Elevation of Mid Layer based on sounding collar elevation supplied by client	Elevation = Collar Elevation - Depth	
Avgqc	Averaged recorded tip value (q_c)	$Avgqc = \frac{1}{n}\sum_{i=1}^{n} q_c$ *n=1 when interpretations are done at each point*	
Avgqt	Averaged corrected tip (q_t) where: $q_t = q_c + (1-a) \bullet u$	$Avgqt = \frac{1}{n}\sum_{i=1}^{n} q_t$ *n=1 when interpretations are done at each point*	
Avgfs	Averaged sleeve friction (f_s)	$Avgfs = \frac{1}{n}\sum_{i=1}^{n} fs$ *n=1 when interpretations are done at each point*	
AvgRf	Averaged friction ratio (Rf) where friction ratio is defined as: $Rf = 100\% \bullet \frac{fs}{qt}$	$AvgRf = 100\% \cdot \frac{Avgfs}{Avgqt}$ *n=1 when interpretations are done at each point*	
Avgu	Averaged dynamic pore pressure *(u)*	$Avgu = \frac{1}{n}\sum_{i=1}^{n} u_i$ *n=1 when interpretations are done at each point*	
AvgRes	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} RESISTIVITY_i$ *n=1 when interpretations are done at each point*	
AvgUVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} UVIF_i$ *n=1 when interpretations are done at each point*	
AvgTemp	Averaged Temperature (this data is not always available since it is a specialized test)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} TEMPERATURE_i$ *n=1 when interpretations are done at each point*	

Interpreted Parameter	Description	Equation	Ref
AvgGamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} GAMMA_i$ *n=1 when interpretations are done at each point*	
SBT	Soil Behavior Type as defined by Robertson and Campanella	See Figure 1	2, 5
U.Wt.	Unit Weight of soil determined from one of the following user selectable options: 1) uniform value 2) value assigned to each SBT zone 3) user supplied unit weight profile	See references	5
T. Stress σ_v	Total vertical overburden stress at Mid Layer Depth. *A layer is defined as the averaging interval specified by the user. For data interpreted at each point the Mid Layer Depth is the same as the recorded depth.*	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ *where* γ_i is layer unit weight h_i is layer thickness	
E. Stress σ_v'	Effective vertical overburden stress at Mid Layer Depth	*Estress = Tstress - u_{eq}*	
Ueq	Equilibrium pore pressure determined from one of the following user selectable options: 1) hydrostatic from water table depth 2) user supplied profile	For hydrostatic option: $u_{eq} = \gamma_w \cdot (D - D_{wt})$ where u_{eq} is equilibrium pore pressure γ_w is unit weight of water D is the current depth D_{wt} is the depth to the water table	
Cn	SPT N_{60} overburden correction factor	*$Cn=(\sigma_v')^{-0.5}$* where *σ_v' is in tsf* *$0.5 < C_n < 2.0$*	
N_{60}	SPT N value at 60% energy calculated from qt/N ratios assigned to each SBT zone. This method has abrupt N value changes at zone boundaries.	*See Figure 1*	4, 5
$(N_1)_{60}$	SPT N_{60} value corrected for overburden pressure	*$(N_1)_{60} = Cn \cdot N_{60}$*	4
$N_{60}I_c$	SPT N_{60} values based on the Ic parameter	(qt/pa)/ N_{60} = 8.5 (1 – Ic/4.6)	5
$(N_1)_{60}$Ic	SPT N_{60} value corrected for overburden pressure (using N_{60} $I_{c)}$. User has 2 options.	*1) $(N_1)_{60}Ic = Cn \cdot (N_{60}\, Ic)$* 2) q_{c1n}/ *$(N_1)_{60}Ic$* = 8.5 (1 – Ic/4.6)	4 5
$(N_1)_{60cs}$Ic	Clean sand equivalent SPT $(N_1)_{60}$Ic. User has 3 options.	1) $(N_1)_{60cs}Ic = \alpha + \beta((N_1)_{60}Ic)$ 2) $(N_1)_{60cs}Ic = K_{SPT} * ((N_1)_{60}Ic)$ 3) q_{c1ncs})/ $(N_1)_{60cs}$Ic = 8.5 (1 – Ic/4.6) FC ≤ 5%: α = 0, β=1.0 FC ≥ 35% α = 5.0, β=1.2 5% < FC < 35% $\alpha = \exp[1.76 - (190/FC^2)]$ $\beta = [0.99 + (FC^{1.5}/1000)]$	10 10 5
Su	Undrained shear strength based on q_t Su factor N_{kt} is user selectable	$Su = \frac{qt - \sigma_v}{N_{kt}}$	1, 5
Su	Undrained shear strength based on pore pressure Su factor $N_{\Delta u}$ is user selectable	$Su = \frac{u_2 - u_{eq}}{N_{\Delta u}}$	1, 5
k	Coefficient of permeability (assigned to each SBT zone)		5

Interpreted Parameter	Description	Equation	Ref
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{qt - \sigma_v}$ *where:* $\Delta u = u - u_{eq}$ *and* u = dynamic pore pressure u_{eq} = equilibrium pore pressure	1, 5
Q_t	Normalized q_t for Soil Behavior Type classification as defined by Robertson, 1990	$Qt = \frac{qt - \sigma_v}{\sigma'_v}$	2, 5
F_r	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson, 1990	$Fr = 100\% \cdot \frac{fs}{qt - \sigma_v}$	2, 5
Net qt	Net tip resistance	$qt - \sigma_v$	
qe	Effective tip resistance	$qt - u_2$	
qeNorm	Normalized effective tip resistance	$\frac{qt - u_2}{\sigma'_v}$	
SBTn	Normalized Soil Behavior Type as defined by Robertson and Campanella	See Figure 2	2, 5
SBT-BQ	Non-normalized Soil Behavior type based on the Bq parameter	See Figure 3	2, 5
SBT-BQn	Normalized Soil Behavior based on the Bq parameter	See Figure 3	2, 5
SBT-JandD	Soil Behaviour Type as defined by Jeffries and Davies	See Figure 3	7
SBT-BQn	Normalized Soil Behavior base on the Bq parameter	See Figure 3	2, 5
I_c	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log_{10}Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$ *Where:* $Q = \left(\frac{qt - \sigma_v}{P_{a2}}\right)\left(\frac{P_a}{\sigma'_v}\right)^n$ *And* Fr *is in percent* P_a = atmospheric pressure P_{a2} = atmospheric pressure n varies from 0.5 to 1.0 and is selected in an iterative manner based on the resulting I_c	3, 8
FC	Apparent fines content (%)	$FC = 1.75(Ic^{3.25}) - 3.7$ $FC = 100$ for $Ic > 3.5$ $FC = 0$ for $Ic < 1.26$ $FC = 5\%$ if $1.64 < Ic < 2.6$ AND $F_r < 0.5$	3
Ic Zone	This parameter is the Soil Behavior Type zone based on the Ic parameter (valid for zones 2 through 7 on SBTn chart)	Ic < 1.31 Zone = 7 1.31 < Ic < 2.05 Zone = 6 2.05 < Ic < 2.60 Zone = 5 2.60 < Ic < 2.95 Zone = 4 2.95 < Ic < 3.60 Zone = 3 Ic > 3.60 Zone = 2	3
PHI ϕ	Friction Angle determined from one of the following user selectable options: a) Campanella and Robertson b) Durgunoglu and Mitchel c) Janbu d) Kulhawy and Mayne	See reference	5 5 5 11

Interpreted Parameter	Description	Equation	Ref
Dr	Relative Density determined from one of the following user selectable options: a) Ticino Sand b) Hokksund Sand c) Schmertmann 1976 d) Jamiolkowski - All Sands	See reference	5
OCR	Over Consolidation Ratio	a) Based on Schmertmann's method involving a plot of $S_u/\sigma_v' /(S_u/\sigma_v')_{NC}$ and OCR where the Su/p' ratio for NC clay is user selectable	9
State Parameter	The state parameter is used to describe whether a soil is contractive (SP is positive) or dilative (SP is negative) at large strains based on the work by Been and Jefferies	See reference	8, 6, 5
Es/qt	Intermediate parameter for calculating Young's Modulus, E, in sands. It is the Y axis of the reference chart.	Based on Figure 5.59 in the reference	5
Young's Modulus E	Young's Modulus based on the work done in Italy. There are three types of sands considered in this technique. The user selects the appropriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in the Es/qt chart.	Mean normal stress is evaluated from: $\sigma_m' = \frac{1}{3}(\sigma_v' + \sigma_h' + \sigma_h')$ where σ_v'= vertical effective stress σ_h'= horizontal effective stress and $\sigma_h = K_o \cdot \sigma_v'$ with Ko assumed to be 0.5	5
q_{c1}	q_t normalized for overburden stress used for seismic analysis	$q_{c1} = q_t \cdot (Pa/\sigma_v')^{0.5}$ where: Pa = atm. Pressure q_t is in MPa	3
q_{c1n}	q_{c1} in dimensionless form used for seismic analysis	$q_{c1n} = (q_{c1} / Pa)(Pa/\sigma_v')^n$ where: Pa = atm. Pressure and n ranges from 0.5 to 0.75 based on Ic.	3
K_{SPT}	Equivalent clean sand factor for $(N_1)60$	$K_{SPT} = 1 + ((0.75/30) \cdot (FC - 5))$	10
K_{CPT}	Equivalent clean sand correction for q_{c1N}	$K_{cpt} = 1.0$ for $I_c \leq 1.64$ $K_{cpt} = f(I_c)$ for $I_c > 1.64$ (see reference)	10
q_{c1ncs}	Clean sand equivalent q_{c1n}	$q_{c1ncs} = q_{c1n} \cdot K_{cpt}$	3
CRR	Cyclic Resistance Ratio (for Magnitude 7.5)	$q_{c1ncs} < 50$: $CRR_{7.5} = 0.833 [(q_{c1ncs}/1000] + 0.05$ $50 \leq q_{c1ncs} < 160$: $CRR_{7.5} = 93 [(q_{c1ncs}/1000]^3 + 0.08$	10

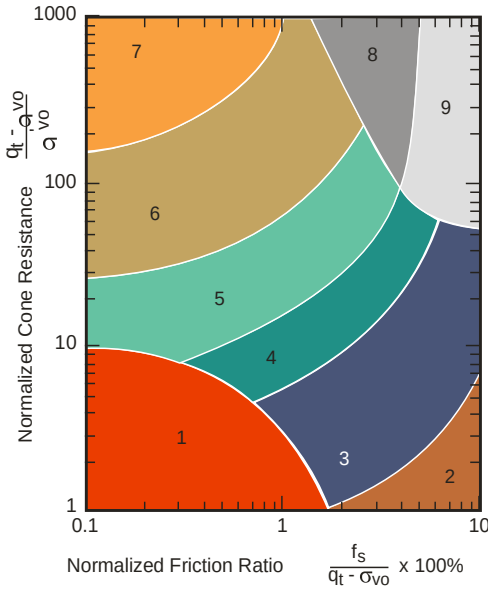
Interpreted Parameter	Description	Equation	Ref
CSR	Cyclic Stress Ratio	$CSR = (\tau_{av}/\sigma_v') = 0.65\ (a_{max} / g)\ (\sigma_v/ \sigma_v')\ r_d$ $r_d = 1.0 - 0.00765\ z$ $z \leq 9.15m$ $r_d = 1.174 - 0.0267\ z$ $9.15 < z \leq 23m$ $r_d = 0.744 - 0.008\ z$ $23 < z \leq 30m$ $r_d = 0.50$ $z > 30m$	10
MSF	Magnitude Scaling Factor	See Reference	10
FofS	Factor of Safety against Liquefaction	$FS = (CRR_{7.5} / CSR)\ MSF$	10
Liquefaction Status	Statement indicating possible liquefaction	Takes into account FofS and limitations based on I_c and q_{c1ncs}.	10
Cont/Dilat Tip	Contractive / Dilative qc1 Boundary based on $(N_1)_{60}$	$(\sigma_v')_{boundary} = 9.58 \times 10^{-4}\ [(N_1)_{60}]^{4.79}$ qc1 is calculated from specified qt(MPa)/N ratio	13
Cq	Normalizing Factor	$Cq = 1.8 / (0.8 + ((\sigma_v'/Pa))$	12
qc1 (Cq)	Normalized tip resistance based on Cq	$q_{c1} = C_q * q_t$ (some papers use q_c)	12
Su(Liq)/s'v	Liquefied Shear Strength Ratio	$\frac{Su(Liq)}{\sigma_v'} = 0.03 + 0.0143(q_{c1})$	13



Zone	qt / N	Soil Behavior Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

Figure 1 Non-Normalized Behavior Type Classification Chart



Zone	Normalized Soil Behavior Type
1	sensitive fine grained
2	organic material
3	clay to silty clay
4	clayey silt to silty clay
5	silty sand to sandy silt
6	clean sands to silty sands
7	gravelly sand to sand
8	very stiff sand to clayey sand
9	very stiff fine grained

Figure 2 Normalized Behavior Type Classification Chart

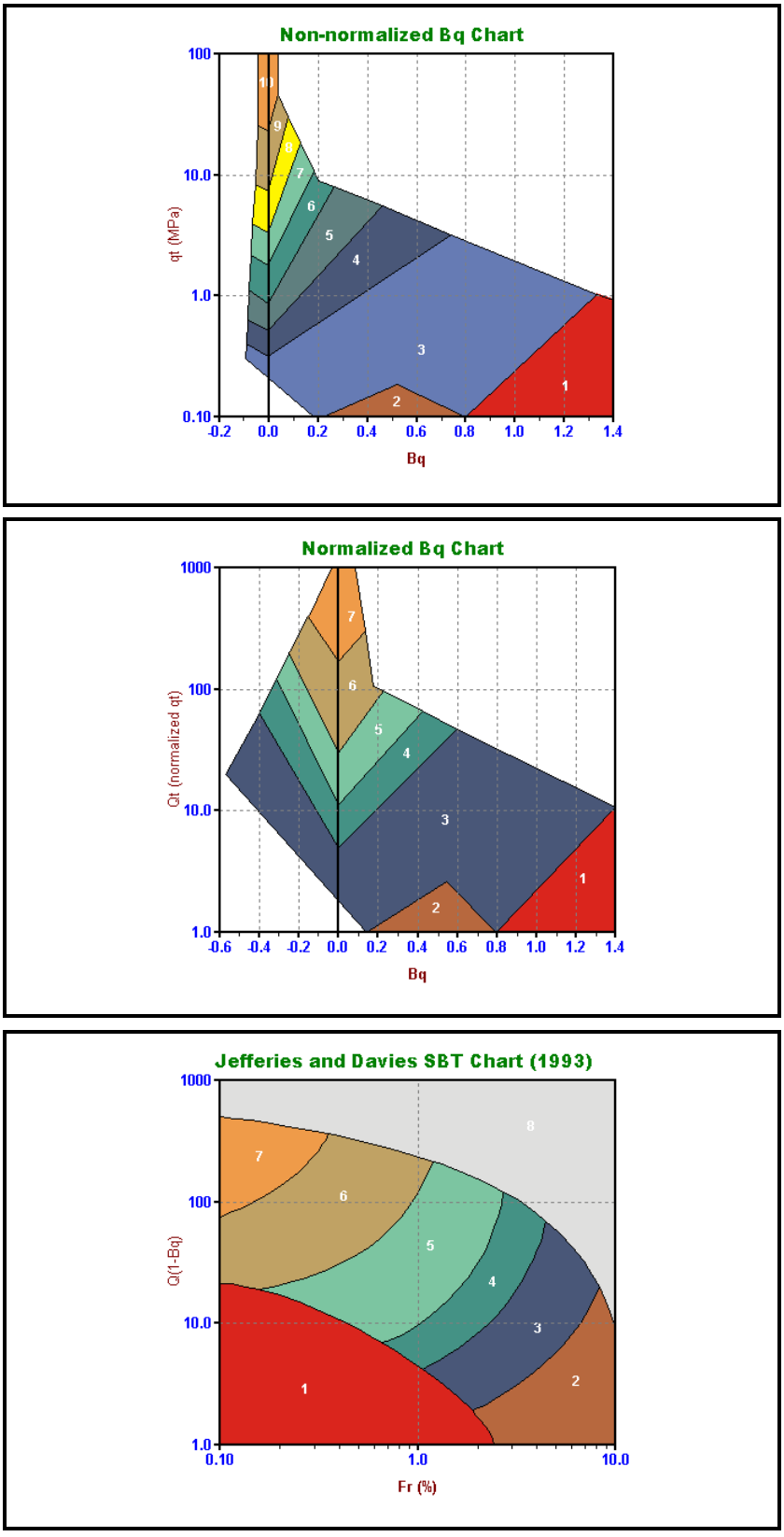


Figure 3 – Alternate Soil Behaviour Type Charts

Table 2 References

No.	References
1	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, “Use of Piezometer Cone Data”, Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
2	Robertson, P.K., 1990, “Soil Classification Using the Cone Penetration Test”, Canadian Geotechnical Journal, Volume 27.
3	Robertson, P.K. and Fear, C.E., 1998, “Evaluating cyclic liquefaction potential using the cone penetration test”, Canadian Geotechnical Journal, 35: 442-459.
4	Robertson, P.K. and Wride, C.E., 1998, “Cyclic Liquefaction and its Evaluation Based on SPT and CPT”, NCEER Workshop Paper, January 22, 1997
5	Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, “ Cone Penetration Testing in Geotechnical Practice,” Blackie Academic and Professional.
6	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, “CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility”, 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.
7	Jefferies, M.G. and Davies, M.P., 1993. “Use of CPTu to Estimate equivalent N_{60}”, Geotechnical Testing Journal, 16(4): 458-467.
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10	Proceedings of theNCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Salt LakeCity, 1996. Chaired by Leslie Youd. 11
11	Kulhawy, F.H. and Mayne, P.W. ,1990, “Manual on Estimating Soil Properties for Foundation Design, *Report No. EL-6800”*, Electric Power Research Institute, Palo Alto, CA, August 1990, 306 p.
12	Olson, S.M. and Stark, T.D., 2002, “Liquefied strength ratio from liquefied flow filaure case histories”, Canadian Geotechnical Journal, 39: 951-966.
13	Oslon, Scott M. and Stark, Timothy D., 2003, “Yield Strength Ratio and Liquefaction Analysis of Slopes and Embankments”, Journal of Geotechnical and Geoenvironmental Engineering, ASCE, August 2003.

APPENDIX C

Job Number: 13-53053
Client: ARCADIS
Project: Unkamet Brook Area
Date: Aug 14, 2013 to Aug 15, 2013

Table 2 - DISSIPATION TRACE SUMMARY

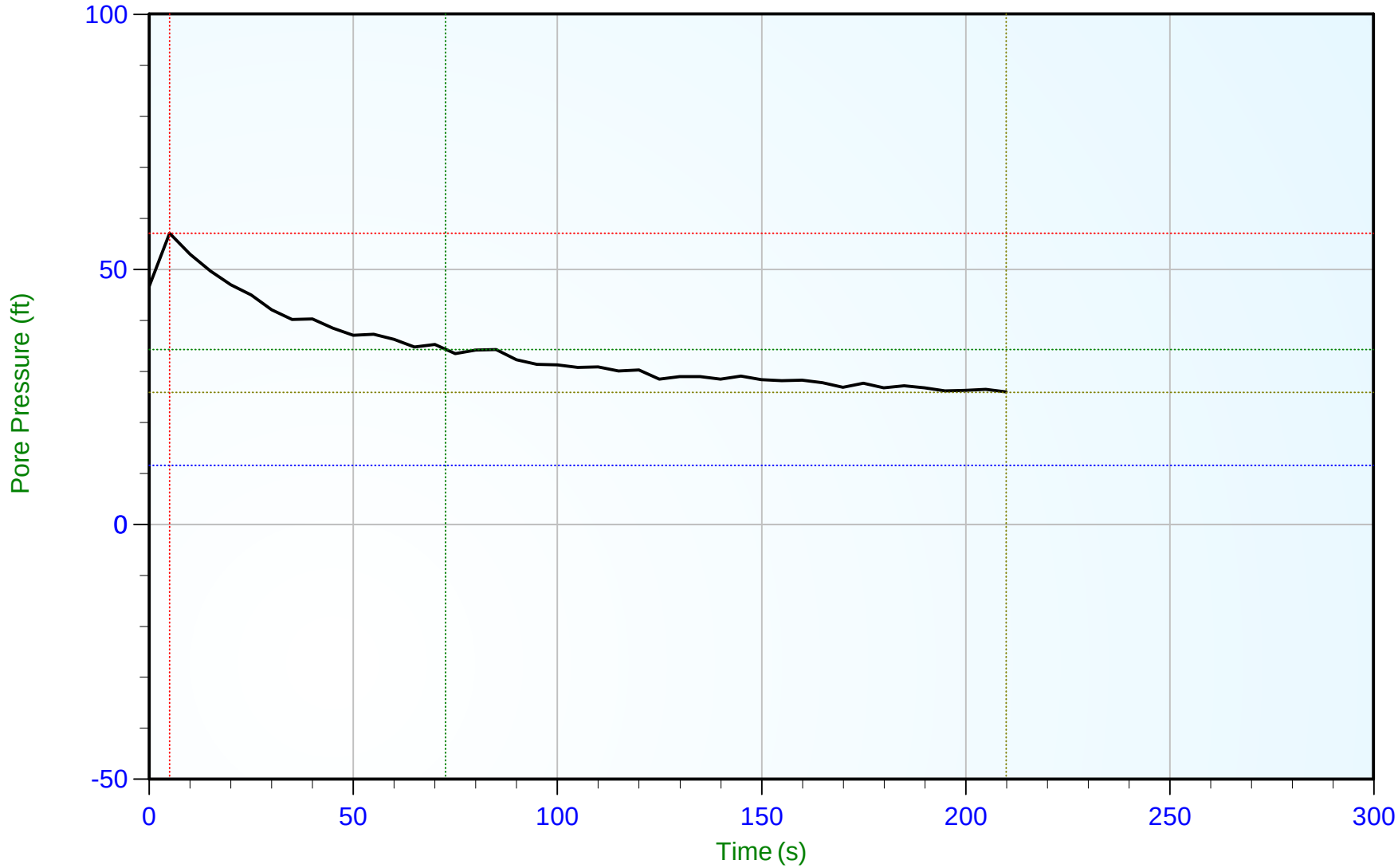
Sounding ID	Duration	Depth	Ueq	Calc. Phrea. Surface	Est. Phrea. Surface Used	T50	Ch
	sec.	ft	ft	ft	ft	sec.	cm^2/min.
UK-CPT-2	210	14.60	11.60		3.0	67.6	10.4
UK-CPT-4A	135	21.49	18.49		3.0	17.6	39.9
UK-CPT-4A	120	24.61	21.61			9.2	76.7
UK-CPT-6A	145	41.50	38.50		3.0	27.6	25.4
UK-CPT-7	540	3.94	1.10	2.8	3.0		
UK-CPT-7A	100	36.42	33.91	2.5	3.0		
	1,250	sec.					

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/15/2013 12:26
Site: Unkamet Brook

Sounding: UK-CPT-2
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP02.PPD
Depth: 4.450 m / 14.600 ft
Duration: 210.0 s

U Min: 25.9 ft
U Max: 57.1 ft

WT: 0.914 m / 3.000 ft
Ueq: 11.6 ft
U(50): 34.33 ft

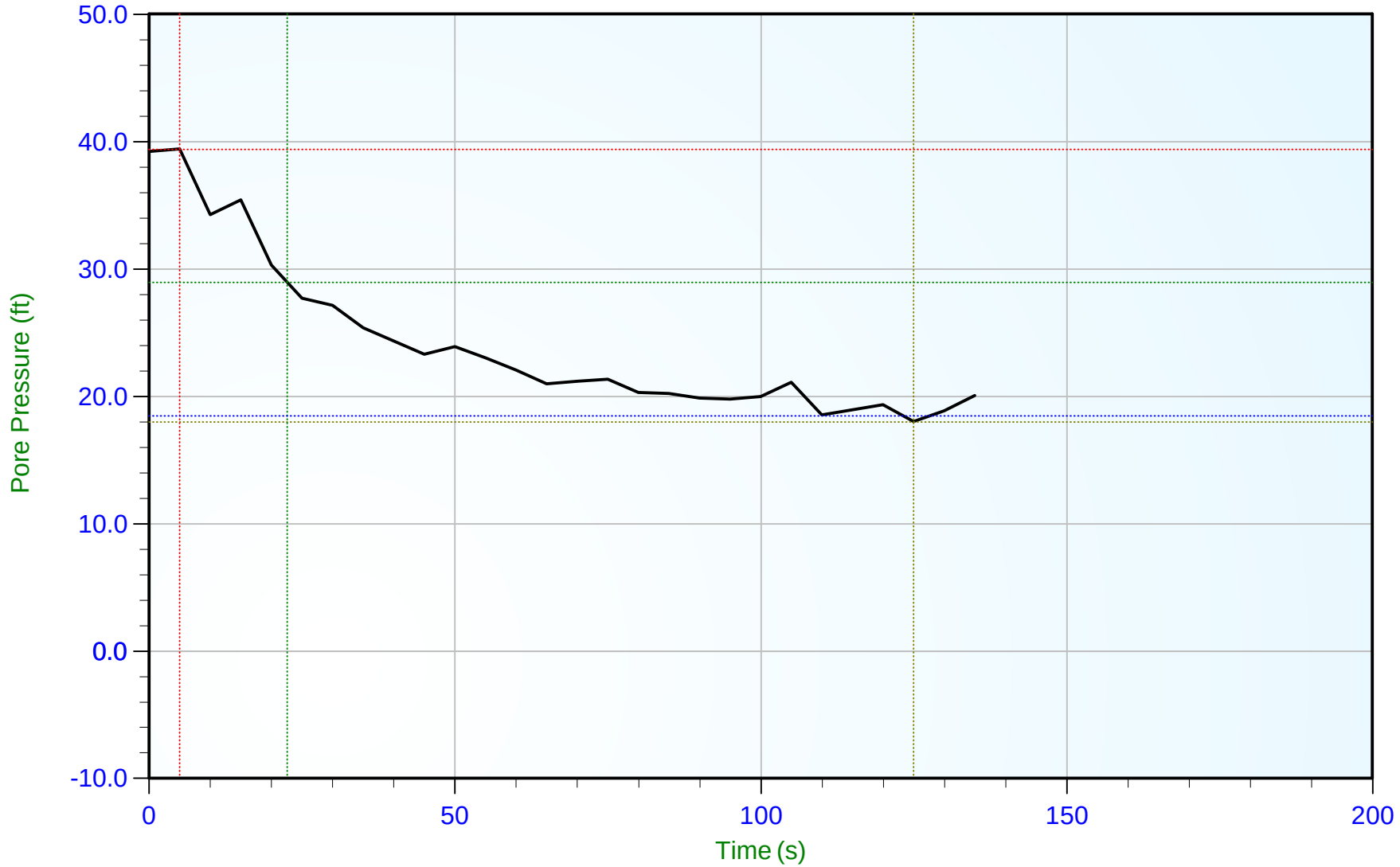
T(50): 67.6 s
Ir: 100
Ch: 10.4 sq cm/min

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/15/2013 10:02
Site: Unkamet Brook

Sounding: UK-CPT-4A
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP04A.PPD
Depth: 6.550 m / 21.489 ft
Duration: 135.0 s

U Min: 18.0 ft
U Max: 39.4 ft

WT: 0.914 m / 3.000 ft
Ueq: 18.5 ft
U(50): 28.95 ft

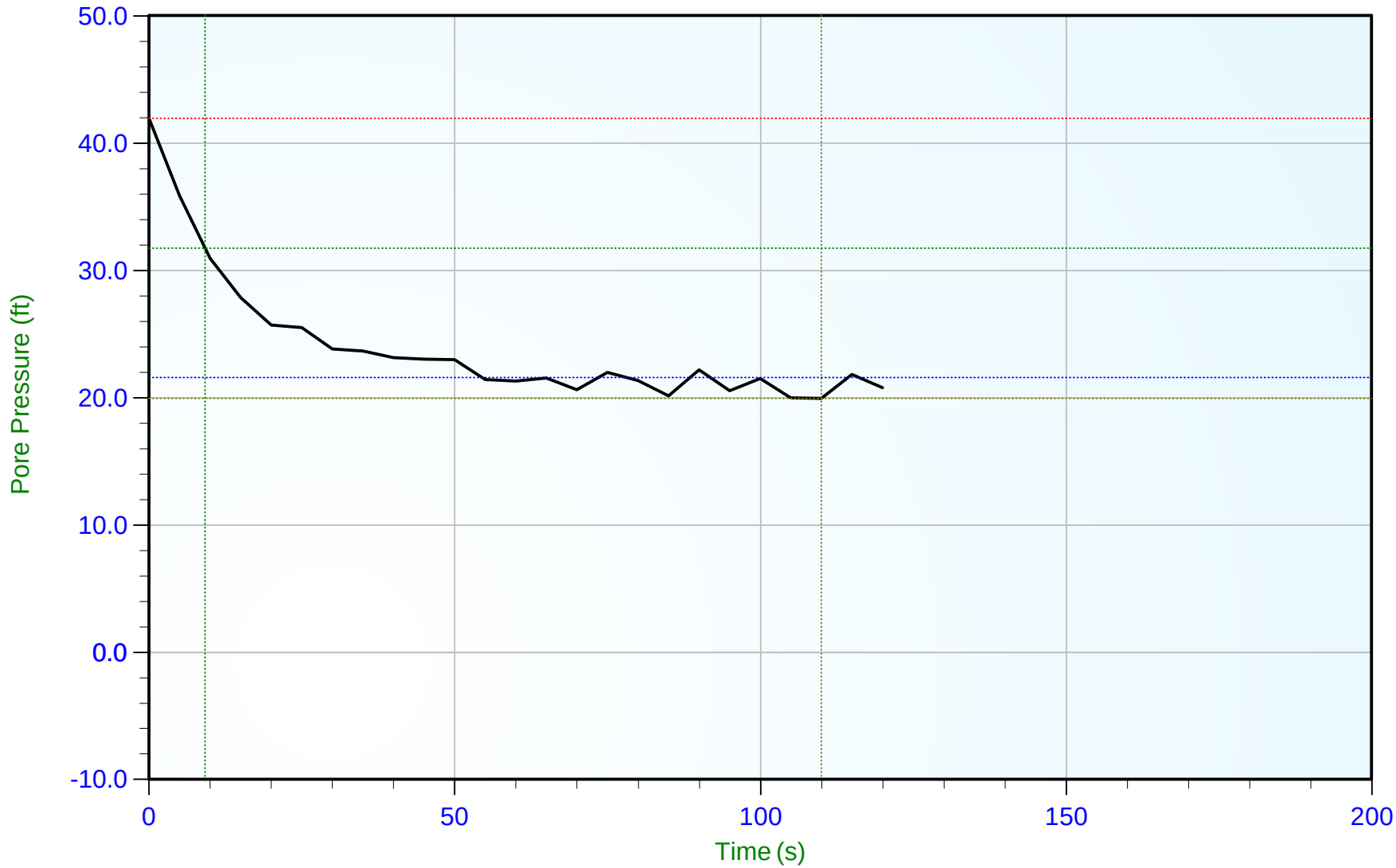
T(50): 17.6 s
Ir: 100
Ch: 39.9 sq cm/min

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/15/2013 10:02
Site: Unkamet Brook

Sounding: UK-CPT-4A
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP04A.PPD
Depth: 7.500 m / 24.606 ft
Duration: 120.0 s

U Min: 20.0 ft
U Max: 41.9 ft

WT: 0.914 m / 3.000 ft
Ueq: 21.6 ft
U(50): 31.77 ft

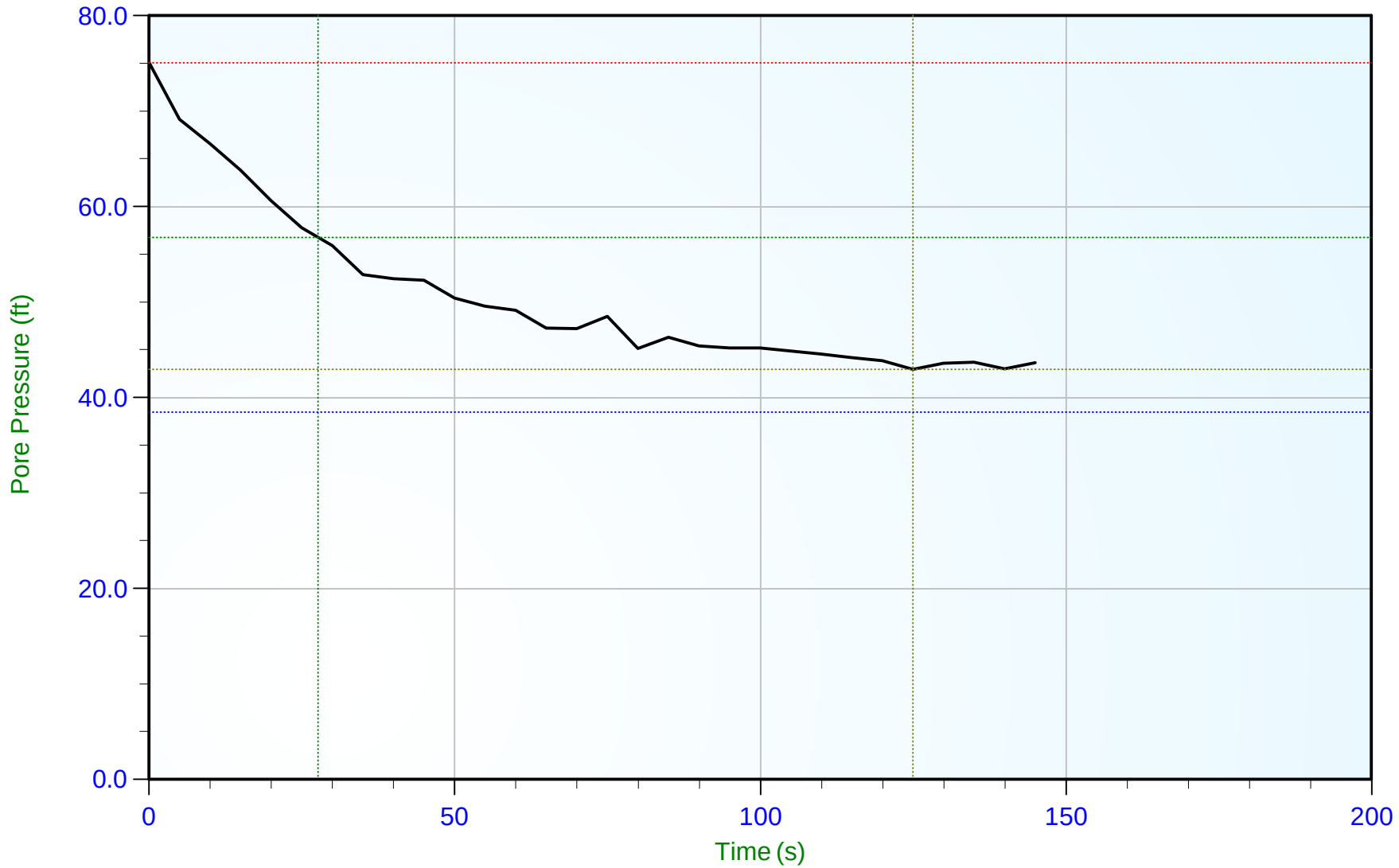
T(50): 9.2 s
Ir: 100
Ch: 76.7 sq cm/min

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/14/2013 16:15
Site: Unkamet Brook

Sounding: UK-CPT-6A
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP06A.PPD
Depth: 12.650 m / 41.502 ft
Duration: 145.0 s

U Min: 43.0 ft
U Max: 75.1 ft

WT: 0.914 m / 3.000 ft
Ueq: 38.5 ft
U(50): 56.81 ft

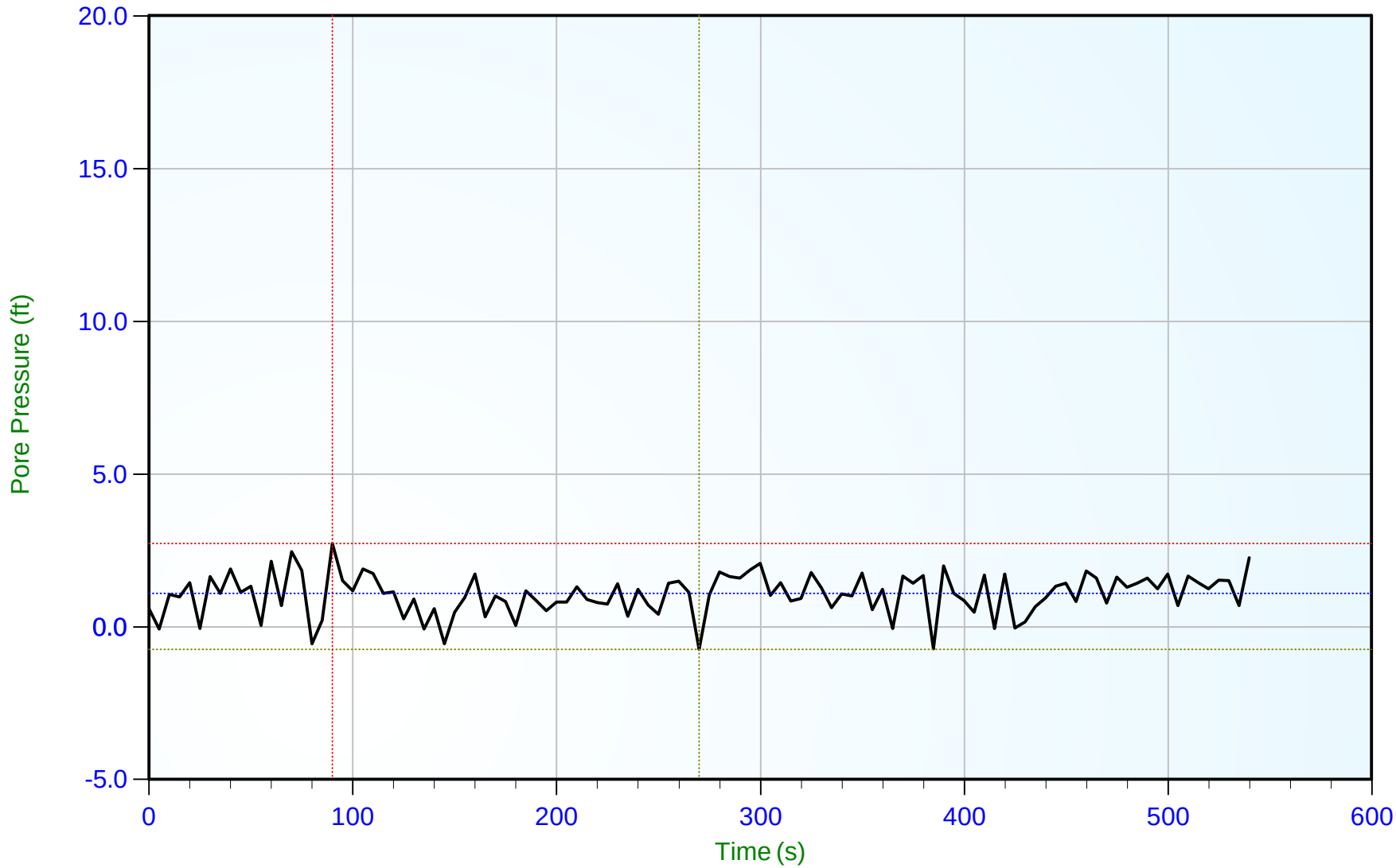
T(50): 27.6 s
Ir: 100
Ch: 25.4 sq cm/min

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/14/2013 10:05
Site: Unkamet Brook

Sounding: UK-CPT-7
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP07.PPD
Depth: 1.200 m / 3.937 ft
Duration: 540.0 s

U Min: -0.7 ft
U Max: 2.7 ft

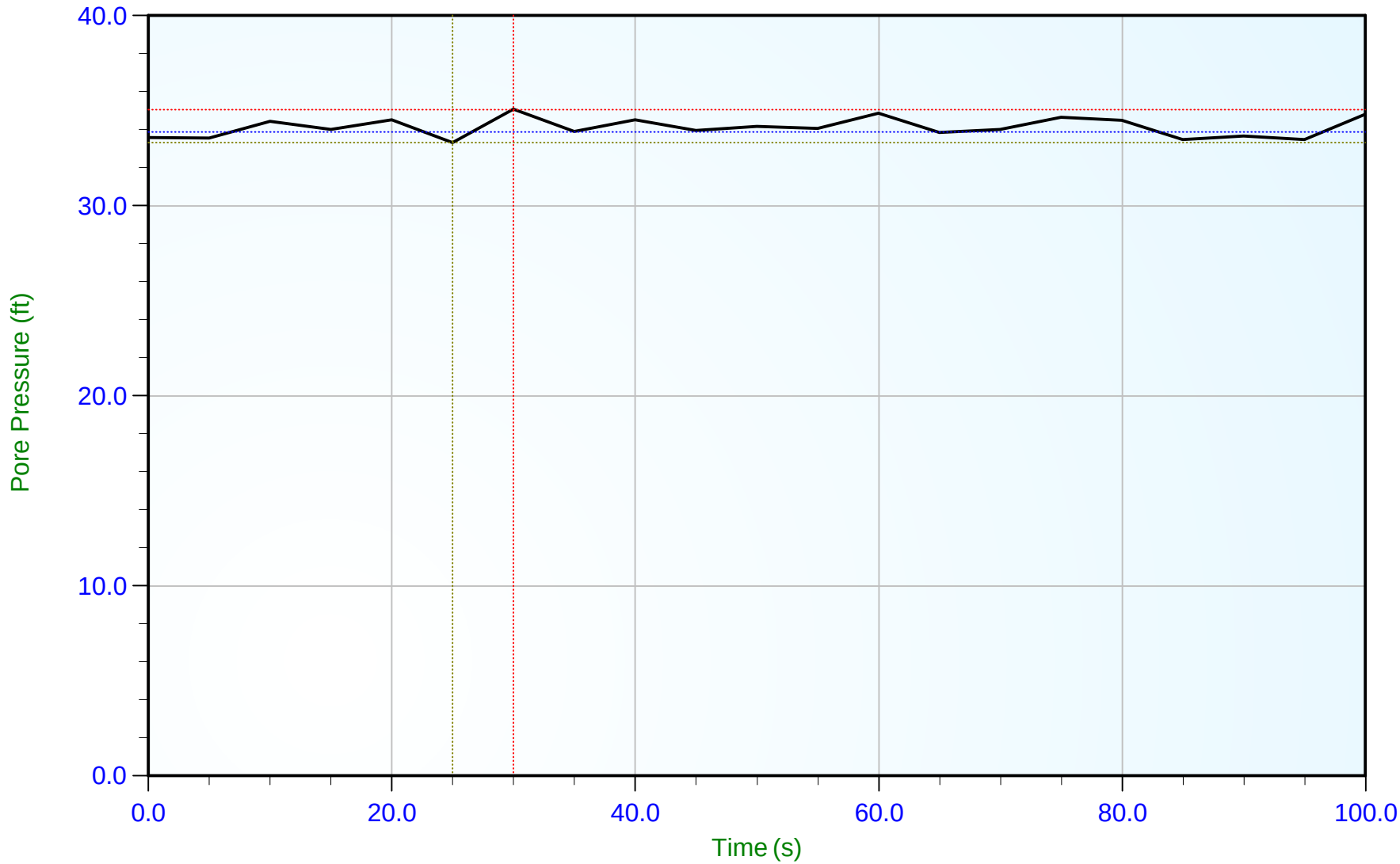
WT: 0.866 m / 2.841 ft
Ueq: 1.1 ft

CONETEC

ARCADIS

Job No: 13-53053
Date: 08/14/2013 14:23
Site: Unkamet Brook

Sounding: UK-CPT-7A
Cone: 243:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-53053_CP07A.PPD
Depth: 11.100 m / 36.417 ft
Duration: 100.0 s

U Min: 33.3 ft
U Max: 35.1 ft

WT: 0.766 m / 2.511 ft
Ueq: 33.9 ft

APPENDIX D

Electronic Data Files

The released data contains the following folders:

1: CPT Data - .cor files in ASCII and .xls format.
2: Pore Pressure Dissipation Data - .ppd files in Excel format
3: CPT Plots - .pdf files
4: Data Interpretation - .xls files contain common engineering values.

ConeTec Digital File Formats

CPT Data Files (COR Extension)

ConeTec cone penetration test (CPT) data files are stored in ASCII text files that are readable by almost any text editor. ConeTec CPT data files are named such that the first three characters contain the job number, the next two characters are CP followed by two characters indicating the sounding number. The last eighth character position is reserved for the letters a, b, c, d etc to uniquely identify multiple soundings at the same location. The CPT sounding file has the extension COR, and pore pressure dissipation files have the extension PPD or PPF. As an example, for job number 11-701 the first sounding will have file names 701CP01.COR and 701CP01.PPD.

The sounding (COR) file consists of the following components:

1. Two lines of header information
2. Data records
3. End of data marker
4. Units information

Header Lines

Line 1:
Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time
Columns 22-36 contain the sounding Operator

Line 2:
Columns 1-16 contain the Job Location
Columns 17-31 contain the Cone ID
Columns 32-47 contain the sounding number

Data Records

The data records contain four or more columns of data in floating point format. A comma (and spaces) separates each data item:

Column 1: Sounding Depth (meters)
Column 2: Tip (q_c) data uncorrected for pore pressure effects. Recorded in units selected by the operator
Column 3: Sleeve (f_s) data. Recorded in units selected by the operator
Column 4: Dynamic pore pressure readings. Recorded in units selected by the operator
Column 5: Empty, Resistivity, UVIF or Gamma data

End of Data Marker

After the last line of data there will be a line containing ASCII 26 (CTL-Z) and a newline (carriage return/ line feed) character. This is used to mark the end of data.

Units Information

The last section of the file contains information about the units that were selected for the sounding. A separator bar makes up the first line. The second line contains the type of units used for depth, q_c, f_s and u. The third line contains the conversion values required for ConeTec's software to convert the recorded data to an internal set of base units (bar for q_c, bar for f_s and meters for u).

CPT Dissipation Files (PPx Extension)

CPT Dissipation files have the same naming convention as the CPT sounding files and have the extension PPD, PPF or PPM. PPF (PPM and PPD) files consist of the following components:

1. Two lines of header information
2. Data records

Header Lines (same as COR file):

Line 1: Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time
Columns 22-36 contain the sounding Operator

Line 2: Columns 1-16 contain the Job Location
Columns 17-31 contain the Cone ID
Columns 32-47 contain the sounding number

Data Records

The data records immediately follow the header lines. Each data record can occupy several lines in the file and is a complete record of a dissipation test at a particular depth. Each data record starts with a line containing two values separated by spaces; the first value being an index number (not currently used by the Software) and the second being the dissipation test depth in meters. Following this line are the dissipation pore pressure values stored at five second intervals with a maximum of 12 entries per line. The last line of the dissipation record may not contain a full 12 entries. The data record is terminated with an ASCII 30 character (appears as a triangle in some editors).

This sequence is repeated for every dissipation test in the sounding. No marker is used to indicate end of file. Units information is not stored in this file. Users need to check the CPT file for the units that were used.

CPT Basic Interpretations (TBL Extension)

Prior to 2007, ConeTec's basic CPT interpretation output files were generally delivered in text files with a TBL extension. The root file names of these files was the same as the COR files. A number of calculated geotechnical parameters are presented in these files. The files are stored as ASCII text files that can be viewed using any text editor such as Notepad or Wordpad. The files do not contain any page formatting. These files were not distributed if the enhanced interpretation files are provided.

CPT Enhanced Interpretations (IFI, IFP, XLS Extension)

Prior to 2007, ConeTec's enhanced CPT interpretation output files were delivered in several formats, each file type containing the exact same information but formatted slightly differently. The files typically have any of the following file extensions:

1. IFI this is an importable TAB delimited ASCII text file containing approximately 47 data columns of geotechnical interpretations. The file is designed for easy import to Excel. A companion document describes the techniques used for the interpretations (usually reproduced at the beginning of the Interpretation Appendix). Text editors can be used to view the file contents, however, they may remove the tabs or replace the tabs with spaces upon saving the file destroying the feature that makes them easy to import into

Excel.

Because Excel imports the data as text and the sheet is protected two steps may be necessary to modify the data or use the values in certain Excel functions:

a) Under Tools (Excel 2000) Select the Protection Option and then Unprotect the sheet
b) Select the entire sheet, copy and then use Paste Special to paste as values to a second sheet.

Future versions of our interpretation routine eliminated these inconveniences.

2. IFP this is a printable ASCII text file containing the same 47 columns of geotechnical interpretations as the IFI file. This file type has been formatted as a multi-page document with up to 132 characters per line and up to 68 lines per page. Each page has been separated into multiple sections to accommodate all the data fields. Each physical page has a header section and a page/section number. The file is designed for direct printing to laser printers set into compressed font mode. This output is typically provided in the Interpretation Appendix.

   An abbreviated set of interpretations (containing 36 columns of output) may be generated instead. These files usually have the extensions NLI and NLP. XLS files can be generated from these as well.

   IFI and IFP files are seldom distributed anymore. Prior to 2007, the IFI file was often converted to an XLS file.

3. XLS Excel format files were often generated from the IFI files and consequently, they are very similar to the corresponding IFI file. The XLS files may have also been generated from abbreviated NLI interpretation files.

In each case, the root file name is the same as the COR files.

CPT Interpretations (Excel Format)

Beginning in 2007, ConeTec's software was modified to output CPT interpretations directly to Excel format files (XLS extension) without creating intermediate ASCII files. In accordance with specific client requests, there are several different configurations of output parameters in ConeTec's interpretation files. Since the Excel format file must have the XLS extension a suffix is used after the basename of the source CPT data file (COR) to identify the format of the file. The configurations still follow the formats described above and use the same extensions but now as suffixes. To allow for various runs (e.g. using a different water table, or user supplied equilibrium profile, or different methods for a particular parameter) of the same data an additional suffix may be specified by the engineer post processing the data to identify each particular run. This suffix will follow the one used to identify the format of the file.

For example:

If the selected format is ConeTec's TBL configuration and each run is identified by a run number. The resultant files generated for 701CP01.COR would be:

701CP01-TBL-RUN01.XLS
701CP01-TBL-RUN02.XLS
701CP01-TBL-RUN03.XLS

CPT Data in Excel Format

Since 2007, ConeTec provides the equivalent of the ASCII COR files in Excel Format. These files will have the same basename as the COR files and an XLS extension.

Pore Pressure Dissipation Data in Excel Format

Since 2007, ConeTec provides the equivalent of the ASCII PPD format files in Excel format. These files will contain each dissipation trace that exceeds a minimum duration (selected by the engineer during post-processing) in a particular Excel spreadsheet column. The first column (Column A) will contain the time in seconds and the second column (Column B) will contain the time in minutes. Subsequent columns will contain dissipation trace data. The time columns will extend to the longest trace of the data set.

Detailed header information is provided at the top of the spreadsheet. The test depth in meters and feet, the number of points in the trace and the particular units are identified at the top of each trace column.

The Excel format file names will have the same basename as the original PPD format file followed by the suffix -PPD and then followed by a second suffix that the engineer doing the post processing can specify. Because the engineer can select various types of units for the dissipation data output (which can be different from the units used in the original recording) the secondary suffix is often used to identify the units in the XLS file, however, the original recorded units and the output units are clearly identified within the XLS spreadsheet file.

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Unkamet Brook Area – SPT
Boring Logs 101 and 102

Since 1951

CDC CARR-DEE CORP.
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November 17, 1989

H&A FILE NO. X-54-524

Haley & Aldrich, Inc.
58 Charles Street
Cambridge, MA 02141

Attn: Mr. Bruce Wilkinson

Attached herewith are the results of subsurface investigation (one copy), made as directed at site for Proposed Treatment Facility, General Electric, Pittsfield, MA.

We shall this date ship via United Parcel Service, all soil samples to your offices.

At your convenience, please furnish this office with a plan or sketch showing boring locations, so that we may complete our file.

In making inquiries, please refer to our Job No. 89361.

Very truly yours,

CARR-DEE CORP.

Henry J. DeSimone
Principal

HJD/mh

RECEIVED
NOV 20 1989
HALEY & ALDRICH, INC.

CARR-DEE CORP.

37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (617) 391-4500

To HALEY & ALDRICH, INC., 58 CHARLES ST., CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD,MA Scale 1" = 3 ft.

BORING 101

Ground Surface

0'3"	ASPHALT			
		27	S#1,	FROM 0'6" TO 2'6"
		21		RECOVERED 6"
		20		
		18		
	FILL			
	SAND, GRAVEL,			
		10	S#2,	FROM 5'0" TO 7'0"
		3		RECOVERED 4"
		4		
	LITTLE SILT	5		
9'0"				
		2	S#3,	FROM 10'0" TO 12'0"
		1		RECOVERED 10"
		1		
	ORGANIC	2		
	SILTY	4	S#4,	FROM 14'0" TO 16'0"
		2		RECOVERED 10"
		1		
		2		
	SAND			
		3	S#5,	FROM 19'0" TO 21'0"
		2		RECOVERED 0"
		1		
21'0"		9		

CONTINUED ON SHEET NUMBER 2

CARR-DEE CORP.
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To HALEY & ALDRICH, INC., 58 CHARLES ST., CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD,MA Scale 1" = 3 ft.

BORING 101

21'0"			
	MEDIUM DENSE FINE SAND, SOME INORGANIC SILT	10 8 9 9	S#6, FROM 21'0" TO 23'0" RECOVERED 12"
24'0"			
		6 5 5 6	S#7, FROM 24'0" TO 26'0" RECOVERED 12"
	MEDIUM DENSE		
		6 6 7 6	S#8, FROM 29'0" TO 31'0" RECOVERED 12"
	FINE SAND, LITTLE		
		5 4 7 8	S#9, FROM 34'0" TO 36'0" RECOVERED 12"
	INORGANIC SILT		
		5 8 9 8	S#10, FROM 39'0" TO 41'0" RECOVERED 13"
41'0"			

CONTINUED ON SHEET NUMBER 3

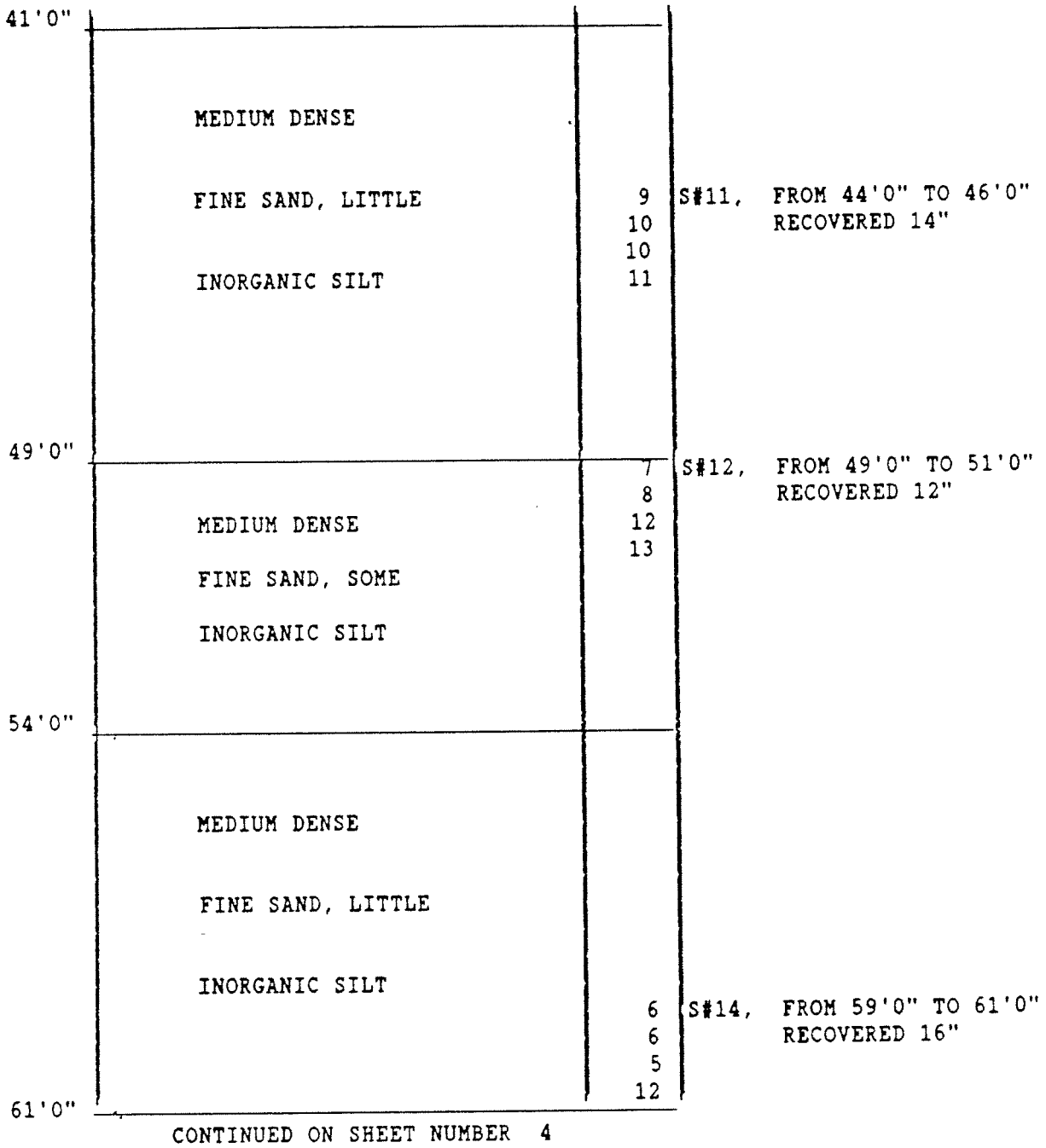
CARR-DEE CORP.

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To HALEY & ALDRICH, INC., 58 CHARLES ST., CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD,MA Scale 1" = 3 ft.

BORING 101



CONTINUED ON SHEET NUMBER 4

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To HALEY & ALDRICH, INC., 58 CHARLES ST., CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD,MA Scale 1" = 3 ft.

BORING 101

61'0"				
	MEDIUM DENSE FINE SAND, LITTLE INORGANIC SILT			
64'0"				
	DENSE FINE SAND, SAND, LITTLE INORGANIC SILT	12 15 19 23	S#15,	FROM 64'0" TO 66'0" RECOVERED 16"
69'0"				
	MEDIUM DENSE FINE SAND, LITTLE INORGANIC SILT	13 12 15 26	S#16,	FROM 69'0" TO 71'0" RECOVERED 16
71'0"				

WATER LEVEL 4'6"
SIZE OF CASING NW, LENGTH 5'0"
DRILLER: R. LONG, INSPECTOR: KARA DOWE
DATE STARTED & COMPLETED: 11-15-89, 11-16-89

:ples have been visually classified by HJD. Unless otherwise specified, water levels noted were observed at completion
ngs, and do not necessarily represent permanent ground water levels. Figures in right hand column indicate number of blows
d to drive Two-Inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(+/-). Figures in column to left
ed) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches(+/-).

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To HALEY & ALDRICH, INC., 58 CHARLES STREET, CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD, MA Scale 1" = 3 ft.

BORING 102

Ground Surface

0'3" — ASPHALT

FILL

SAND, GRAVEL,

LITTLE SILT

29, 10, 4, 7 — S#1, FROM 0'6" TO 2'6" RECOVERED 7"

7, 8, 11, 8 — S#2, FROM 5'0" TO 7'0" RECOVERED 4"

9'0"

ORGAANIC SILTY

FINE SAND, TRACE

OF ROOTS, FIBRES

1, 2, 2, 2 — S#3, FROM 10'0" TO 12'0" RECOVERED 10"

14'0"

ORGANIC

SILT, TRACE

FINE SAND

2, 1, 3, 3 — S#4, FROM 14'0" TO 16'0" RECOVERED 12"

3, 2 — S#5, FROM 19'0" TO 20'0" RECOVERED 8"

20'0"

CONTINUED ON SHEET NUMBER 2

CARR-DEE CORP.

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To HALEY & ALDRICH, INC., 58 CHARLES STREET, CAMBRIDGE, MA Date Nov. 17, 1989 Job No. 89361

Job Site GENERAL ELECTRIC, PROPOSED TREATMENT FACILITY, PITTSFIELD, MA Scale 1" = 3 ft.

BORING 102

20'0"	MEDIUM DENSE FINE SAND, LITTLE GRAVEL, INORGANIC SILT	7 13	S#5A,	FROM 20'0" TO 21'0" RECOVERED 6"
22'0"	MEDIUM DENSE FINE SAND & INORGANIC SILT	14 7 11 13	S#6,	FROM 24'0" TO 26'0" RECOVERED 12"
26'0"				

WATER LEVEL 6'0"
SIZE OF CASING NW, LENGTH 15'0"
DRILLER: R. LONG, INSPECTOR: KARA DOWE
DATE STARTED & COMPLETED: 11-16-89

1 samples have been visually classified by HJD. Unless otherwise specified, water levels noted were observed at completion borings, and do not necessarily represent permanent ground water levels. Figures in right hand column indicate number of blows required to drive Two-Inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(+/-). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches(+/-).

Appendix I

Revised Flood Storage Assessment

TABLE I-1
FLOOD STORAGE ASSESSMENT FOR UNKAMET BROOK AREA AREA REMOVAL ACTION

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA - REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Incremental Elevation (ft NGVD 29)	Estimated Flood Storage Gain or Loss			Net Gain or Loss in Flood Storage Volume (cu. yd.)
	West Barrier Area (cu. yd.)	Unkamet Brook Re-routing (cu. yd.)	Realigned Sanitary Sewer South of Landfill (cu. yd.)	
984-985	0	1659	0	1,659
985-986	0	1192	-15	1,176
986-987	0	649	-148	501
987-988	-15	145	-215	-85
988-989	-41	73	-204	-172
989-990	-197	22	-173	-349
990-991	-27	4	-122	-145
991-992	1	0	0	1
992-993	2	0	0	2
993-994	0	0	0	0
994-995 (See Note 5)	-1	0	0	-1
Total	-278	3,743	-877	2,588

Notes:

1. Flood storage capacity calculated on a foot-by-foot basis using Terramodel site modeling software and a comparison of: (1) exisiting site topography within the remediation areas as shown on Drawing No. GE-1110-CX101-M (REV 10-23-07), GE-1110-009-CX101 (REV 01-08-09) and GE-1110-006-CX101-M (REV 12-02-08) provided by Hill Engineers, Architects and Planners; and (2) the designed removal actions as presented in the Technical Drawings for the Unkamet Brook Area Removal Action..
2. The existing and proposed flood storage volumes presented represent the flood storage volume at and below the datum elevation.
3. A negative (-) value indicates a loss in flood storage volume. A positive value indicates a gain in flood storage volume.
4. Change in flood storage volume rounded to the nearest whole cubic yard (cy).
5. Water surface elevation 995 is associated with the 100-year FEMA (1987) Return Interval Event.

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Appendix J

Contingency Plan for Potential Overtopping of Water Barriers, Observations of NAPL, or Discovery of Intact Vessels

1. Introduction

This Contingency Plan describes the procedures to be followed by the General Electric Company (GE) and the Remediation Contractor for responding to: (a) overtopping of the water flow diversion barriers to be installed in Unkamet Brook to allow removal of brook sediments "in the dry"; (b) observations of non-aqueous-phase liquid (NAPL) or NAPL-stained soils or sheens during the excavation of the Unkamet Brook sediments or bank soils or other construction activities that are part of the Unkamet Brook Area Removal Action; and (c) finding of relatively intact drums, capacitors, or other vessels during excavations that are part of this Removal Action.

2. Contingency Plan Associated with Potential Overtopping

As described in the Revised Final RD/RA Work Plan for Unkamet Brook Area-Remainder (Revised Remainder Final Work Plan), GE will conduct the removal of sediments and bank soils from Unkamet Brook (excluding the portion to be re-routed) "in the dry" to the extent practicable. To facilitate such removal, upstream and downstream flow barriers (e.g., sheetpile dams, earthen berms, and/or sandbags) will be installed in the channel and a bypass conveyance system will be constructed to convey waters around the respective removal areas. This section describes the activities to be undertaken by GE and the Remediation Contractor to minimize the potential for impacts from potential overtopping of the flow diversion barriers during flood events and to respond to any such overtopping.

During the course of the sediment removal activities, if significant precipitation is anticipated or forecasted, the length of the brook segment under active excavation will be limited to that which the Remediation Contractor anticipates can be performed in one day's time, thereby leaving no open unprotected excavation areas overnight. To further reduce potential impacts during flooding events, GE and the Remediation Contractor will closely monitor the weather forecast throughout the performance of removal activities to plan the sequence of the construction activities accordingly. Precautions will be taken in advance of pending inclement weather, and the schedule for specific work activities will be adjusted. The Remediation Contractor will have additional equipment and materials available at the site in the event that overtopping of a water flow barrier is anticipated due to rising water levels or forecasted rainfall. In the event of such anticipated overtopping, the Remediation Contractor will perform the following response activities:

- Evacuate all excavation equipment and personnel from within the removal area; and

- Place a layer of geotextile over any areas where sediment removal or restoration is in progress and/or has not been completed, and adequately anchor the geotextile using sand bags.

Following an overtopping event, after any water retained within the channel has receded below the level of the upstream flow barrier, and the bypass pump has sufficiently conveyed the upstream water around the removal area, any impounded water within the removal area will be allowed to collect at the downstream end of the removal area (i.e., at the backflow water flow barrier) and pumped into the brook downstream of the removal area, using a pump suspended a minimum of six inches above the bottom of the brook. The location of the discharge point for the water pumped from the removal area will be protected so that existing soils and/or sediments are not scoured and suspended by the discharging water. When all such overtopping waters have been pumped from the removal area, the geotextile will be removed and sediment removal activities will be continued.

3. Contingency Plan Associated with Potential Observations of NAPL

This section describes measures to be deployed in the event that NAPL or NAPL-stained soils or sediments or sheens are encountered during excavation of sediments or bank soils in Unkamet Brook and/or or other remedial construction activities.

3.1 Responses to NAPL Observations

During the course of sediment and bank soil removal activities, as well as other construction activities, visual observations will be made for the presence of NAPL in the form of free product, sheens on surface water resulting from NAPL, or NAPL-stained soils or sediments. In the event that free product NAPL is observed in the sediments or soils during construction (including free product NAPL that results in a sheen) or is observed migrating from the banks into the brook, the location will be documented, and the following procedures, at a minimum, will be initiated:[1]

- The Remediation Contractor will temporarily cease removal activities in the subject area, and immediate response actions will be initiated including deployment of appropriate control measures (e.g., booms, sorbent pads) as required. GE will be notified immediately and will immediately notify the U.S. Environmental Protection Agency (EPA) of the observation (unless an EPA representative was already present at the time and place of the observation),[2] and the appropriate measures to be implemented on a location-specific basis will be discussed.

- To mitigate the migration of NAPL, any free product NAPL observed will be removed (to the extent feasible), and up to 10 cubic yards of sediment or soil from around and below the observed NAPL will be removed if the NAPL can be readily addressed through removal and if agreed upon by GE and EPA (or directed by EPA).

- If, following such removal, NAPL remains, GE will make a proposal to EPA to address that remaining NAPL either through: (a) installation of engineered organo-clay mats (e.g., Reactive Core Mats) or potentially a low-permeability barrier, over the NAPL-impacted area; or (b) further investigation to define the extent of NAPL at that location, to be followed by removal or containment of the NAPL.

---

[1] These procedures apply to sheens associated with observed free product NAPL or releases of NAPL into the brook from the banks, and do not apply to the observations of sheens in the brook that are derived from the sediments. Such sheens are addressed in Section 3.2.

[2] In addition, if the observed free-product NAPL results in a sheen on the water surface, notifications will also be made to the National Response Center and the Massachusetts Department of Environmental Protection (MDEP) to the extent required by applicable regulations, except as those agencies have agreed otherwise.

- Following approval by EPA, GE will implement the investigation and/or control activities approved by EPA to address the remaining NAPL.

- In the event that NAPL or NAPL-stained soils are removed during the remediation activities within the Unkamet Brook Area, GE will segregate such material for proper characterization, handling, and disposal, as described in Sections 7.5.4 and 7.5.5 of the Revised Remainder Final Work Plan

- If, after implementation of the above steps, some non-*de minimis* NAPL contamination will remain in soils adjacent to or underlying the brook or elsewhere at the RAA, the location(s) of such remaining NAPL contamination and any containment measures – or, if engineered organo-clay mats or a low-permeability barrier have been installed, the location(s) of such mats/barrier – will be surveyed and documented on the as-built drawings. In addition, any engineered organo-clay mats or other NAPL containment measures will be shown on the ERE plans for the subject property, to the extent feasible and appropriate (or, if there is no ERE, will be described in the Conditional Solution notice to the property owner).

Any actions taken under this contingency plan will ensure compliance with the NAPL Performance Standards in the SOW.

3.2 Response to Sheens Not Associated with Observed Free Product NAPL

It is expected that, during remedial construction activities, sheens may frequently be observed on the surface of the water in Unkamet Brook that derive from the disturbance of the sediments or banks soils and are not associated with observed free product NAPL or releases of NAPL from the banks to the brook. Given that expectation, along with the facts that controls will be in place during such activities to contain materials suspended in the water column within the brook and that the work will be under the close oversight of EPA, it seems unnecessary to provide notification every time such a sheen is observed. Accordingly, consistent with the EPA-approved procedures for work at the Silver Lake Area, GE will not make such notifications for sheens of this type to EPA.

For such sheens on the brook surface that derive from the disturbance of sediments or bank soils and are not associated with NAPL, GE will notify the National Response Center (NRC) of the first such sheen, but will not notify the NRC of any subsequent sheen observed in the brook, provided that: (a) GE is performing the EPA-approved response actions in Unkamet Brook; (b) the subsequent sheen occurs within an area of containment (i.e., within sheetpiles, berms, sandbags, silt curtains, or booms); and (c) the subsequent sheen is consistent in nature and appearance with the previously reported sheen. However, if any such sheen migrates beyond the final turbidity curtain and enters the Housatonic River, GE will notify the NRC accordingly.

Similarly, GE will provide notification to the Massachusetts Department of Environmental Protection (MDEP) Emergency Response section the first time such a sheen is observed. However, consistent with the procedures to which MDEP has agreed for the Silver Lake Area, GE need not provide such notification to MDEP of any subsequent sheen in Unkamet Brook provided that: (a) GE is performing the EPA-approved response actions in Unkamet Brook; (b) the subsequent sheen occurs within an area of containment (i.e., within sheetpiles, berms, sandbags, silt curtains, or booms); and (c) the subsequent sheen is consistent in nature and appearance with the previously reported sheen.

In addition, in the event that such sheens are observed on the surface of the brook, sorbent booms will be deployed, to the extent practicable, around the perimeter of the sheen, and sorbent pads will be used if necessary (within the areas of the booms, if deployed) to reduce the amount of sheen on the water surface.

4. Contingency Plan for Discovery of Relatively Intact Drums, Capacitors, or Other Vessels

In the event that relatively intact drums, capacitors, or other vessels are encountered during excavation activities at the Unkamet Brook Area, the following procedures will be implemented:

- The Remediation Contractor will immediately stop excavation activities in the area where the drum(s), capacitor(s), or other vessel(s) were discovered, and will immediately notify GE.

- GE will provide immediate notification of any such discovery to EPA and the MDEP, if there are no Agency personnel on site.

- Any liquid-containing drums, capacitors, or other vessels, as well as any potentially contaminated non-liquid-containing intact vessels, will be segregated, overpacked, characterized, and ultimately transported off-site for disposal.

- Following performance of the immediate responses, GE will continue discussions with EPA regarding the need for and/or scope of follow-up activities, such as additional air monitoring, investigations, and response actions, if necessary. Based on those discussions, GE will determine the need for and scope of any such follow-up actions, subject to EPA approval; and GE will undertake such follow-up actions (if any) as are determined to be necessary.

- The Remediation Contractor will not resume excavation activities until approved to do so by EPA.

Appendix K

Contractor Submittal Tracking Form

APPENDIX K
CONTRACTOR SUBMITTAL TRACKING FORM

REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
1	Operations Plan - The Operations Plan will include (at a minimum) the following items: • The Contractor's qualifications package (if requested by GE). • List of equipment to be used on-site. • The Contractor's proposed plan for controlling vehicular and pedestrian traffic, noise, and dust during the performance of construction activities. • A map of all proposed access roads to be used during implementation of the remediation activities. • Proposed excavation support design (if applicable) or alternate excavation stabilization measures. • The Contractor's proposed plan for water diversion/bypass pumping and storm water management (including run-on, run-off, and flows from outfalls discharging to Unkamet Brook), erosion control, and control of re-suspension in Unkamet Brook. • The Contractor's proposed approach for implementing the remediation and restoration activities described in the West Revised Final Work Plan and the Remainder Revised Final Work Plan, as approved by EPA. • Work schedule, including the Contractor's proposed plan for the timing/sequencing of the remediation activities (including the proposed culvert cleaning procedures) and backfilling/restoration of the sediment removal and re-routed brook areas (including the adjacent/abutting bank soil removal areas). • Materials handling and staging approach. • Equipment cleaning procedures.	Revised Final RD/RA Work Plan, Section 7.3						
2	Health and Safety Plan - The Health and Safety Plan will address those activities to be undertaken by the Contractor and present required information including, but not limited to, the following (as applicable): • Training. • Identification of key personnel (including the Contractor's Health and Safety Officer). • Medical surveillance. • Site hazards. • Work zones. • Personal safety equipment and protective clothing. • Personal air monitoring. • Personnel/equipment cleaning. • Confined space entry. • Construction safety procedures. • Standard operating procedures and safety programs. • Material Safety Data Sheets (MSDSs).	Revised Final RD/RA Work Plan, Section 7.3						
3	Contingency Plan - The Contingency Plan will set forth procedures for responding to emergency conditions or events that may occur during the performance of the Removal Actions and will include (at a minimum) the following information: • A spill prevention control and countermeasures plan for all materials brought on the work site. • Emergency vehicular access/egress. • Evacuation procedures of personnel from the work site. • For work sites that include or are adjacent to a surface water drainage way, a flood control contingency plan identifying measures to protect those areas and the waterway from impacts in the event of a high water and/or flood conditions. • A contingency plan for addressing potential overtopping of the flow barriers during work in Unkamet Brook, potential observations of NAPL during construction activities, and potential discovery of relatively intact drums, capacitors, or other vessels during excavations – all to be consistent with GE's Contingency Plan in Appendix J. • List of all contact personnel with phone numbers and procedures for notifying each. • Routes to local hospital(s). • Identification of responsible personnel who will be in a position at all times to receive incoming phone calls and to dispatch Contractor personnel and equipment in the event of an emergency situation.	Revised Final RD/RA Work Plan, Section 7.3						
4	Identification of backfill sources and locations and analytical data for samples collected from the backfill sources (unless the backfill sources have already been approved based on previously submitted analytical data).	Revised Final RD/RA Work Plan, Section 7.3/9.0						

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REVISED FINAL RD/RA WORK PLAN FOR UNKAMET BROOK AREA-REMAINDER
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
5	Tree/Shrub Inventory and Planting Plan - The Tree/Shrub Inventory and Planting Plan will identify all trees and shrubs located within and adjacent to both soil removal and support areas that need to be removed (and subsequently replaced) to facilitate performance of the Removal Action. The Tree/Shrub Inventory and Planting Plan will be provided prior to commencement of work and shall include the following information: ♦ A scaled figure depicting the planting areas. ♦ A tabulated listing (by species and quantity) of the trees/shrubs to be installed within each planting area (which will include an identification of appropriate alternate species native to Berkshire County to replace any non-native or invasive species identified during the tree/shrub inventory). ♦ Detailed planting specifications (e.g. stock size, fertilization requirements, etc.) for trees and shrubs.	Revised Final RD/RA Work Plan, Section 7.3						
6	Record Drawings to document any deviations from the work specified in the RFP. Deviations shall be noted on the Record Drawings as soon as possible following their identification by the Contractor, GE, or GE's Representative.	--						
7	Maintenance of Sanitary Sewer Flows - A bypass plan for maintaining sanitary sewer flow when the flow is to be bypassed around work area. The bypass plan shall be subject to review by GE and GE's Representative prior to implementation. The bypass plan shall be submitted for review a minimum of three weeks prior to proposed installation of the bypass system. No bypass operations may commence until the bypass plan has been received and reviewed by GE and GE's Representative. The bypass plan shall be designed, signed, stamped by an engineer licensed in the Commonwealth of Massachusetts. The bypass plan shall, at a minimum, document the following: ♦ General plan detailing the bypass system for conveyance of peak flows to downstream sewer lines. ♦ Sewer plugging plan, including type, locations, and manufacturer's information for sewer plugs ♦ Number, type, and capacities of primary and standby pumps proposed ♦ Schematic drawings documenting the arrangement of the bypass pumping system, including pumps, pump sizes, pump locations, size and type of bypass piping, and configuration of pumps and pipe, including suction and discharge lines, location of plugs, etc. ♦ Scheduling information on intended bypass system setup, construction operation and inspection, and restoration of flow. ♦ Expected flow maintenance capacity of system as installed. Supporting calculations shall be supplied if required by the Engineer. * GE's and GE's Representative's receipt of bypass plan submittals does not relieve the Contractor of means, methods, and sequences of construction, requirement to convey peak flows, and safety of the operation.	Materials and Performance, Section 02190 (Part 1.03A)						
8	Earthwork - Proposed equipment and compaction method(s) provided prior to earthwork activities.	Materials and Performance, Section 02200 (Part 1.04A)						
9	Earthwork - Results of moisture/density tests performed on fill materials (determined by ASTM D1557), in accordance with Part 3.04.C.2 of M&P - Section 02200.	Materials and Performance, Section 02200 (Part 1.04B)						
10	Earthwork - Results of in-place density tests performed on fill materials (determined by ASTM D6938), in accordance with Part 3.04.C.4 of M&P - Section 02200.	Materials and Performance, Section 02200 (Part 1.04C)						
11	Restoration of Surfaces - Schedule of restoration operations.	Materials and Performance, Section 02207 (Part 1.03A)						
12	Restoration of Surfaces - Material cut sheets and installation procedures for chain link fencing.	Materials and Performance, Section 02207 (Part 1.03B)						
13	Restoration of Surfaces - Name of proposed fencing installer.	Materials and Performance, Section 02207 (Part 1.03C)						
14	Topsoil, Seeding, Planting, and Mulching - Identification of proposed off-site topsoil sources (name and address) and quantity of material available from proposed source.	Materials and Performance, Section 02212 (Part 1.04A)						
15	Topsoil, Seeding, Planting, and Mulching - Sample(s) of proposed topsoil to be tested by GE for the chemical contaminants specified in Section 5.5 (Backfilling Excavations) of the Revised Final RD/RA Work Plan. Samples shall be collected and analyzed from the proposed off-site topsoil source at the appropriate frequency provided in Part 2.01A(3) of M&P - Section 02212.	Materials and Performance, Section 02212 (Part 1.04B)						
16	Topsoil, Seeding, Planting, and Mulching - Identification of agricultural laboratory to be used for topsoil analysis.	Materials and Performance, Section 02212 (Part 1.04C)						

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GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
17	Topsoil, Seeding, Planting, and Mulching - Results of testing performed by agricultural laboratory on proposed off-site topsoil material (including results for pH and organic content) and laboratory's fertilizer recommendations (e.g., nutrient concentrations, application rates, etc.) based on those testing results. Samples shall be collected and analyzed from the proposed off-site topsoil source at the frequencies provided in Part 2.01A(1) and 2.01A(2) of M&P - Section 02212.	Materials and Performance, Section 02212 (Part 1.04D)						
18	Topsoil, Seeding, Planting, and Mulching - Quantification of fertilizer additions to topsoil to demonstrate compliance with the recommendations of the agricultural laboratory.	Materials and Performance, Section 02212 (Part 1.04E)						
19	Topsoil, Seeding, Planting, and Mulching - Certificates from seed vendors for each seed mixture to demonstrate compliance with the mixes specified in Parts 2.01C of M&P - Section 02212. The certificates shall include the following: the botanical name and common name, origin, date of production, date of packaging and name and address of supplier and be submitted at least 2 weeks prior to time of planting.	Materials and Performance, Section 02212 (Part 1.04F)						
20	Topsoil, Seeding, Planting, and Mulching - Certificates from plant stock supplier for each group of plant stock required, stating botanical name, common name, date of packaging, and name and address of supplier shall be submitted at least 2 weeks prior to planting	Materials and Performance, Section 02212 (Part 1.04G)						
21	Topsoil, Seeding, Planting, and Mulching - Should hydroseed be used, the Contractor shall submit all data including material and application rates and methods.	Materials and Performance, Section 02212 (Part 1.04H)						
22	Topsoil, Seeding, Planting, and Mulching - Product information for erosion control matting/stakes (if used).	Materials and Performance, Section 02212 (Part 1.04I)						
23	Geocomposite - Manufacturer's data for the geocomposite including physical properties and roll size.	Materials and Performance, Section 02219 (Part 1.04A)						
24	Geocomposite - The origin (supplier's name and production plant) and identification (brand name and number) of the geotextile and geonet used to fabricate the geocomposite.	Materials and Performance, Section 02219 (Part 1.04B)						
25	Geocomposite - Material sample of geocomposite.	Materials and Performance, Section 02219 (Part 1.04C)						
26	Geocomposite - Manufacturer's installation procedures and specifications.	Materials and Performance, Section 02219 (Part 1.04D)						
27	Geocomposite - Manufacturer's Quality Assurance (QA)/Quality Control (QC) program.	Materials and Performance, Section 02219 (Part 1.04E)						
28	Geocomposite - Written certification that the minimum test values provided under Part 2.02 of M&P - Section 02219 are guaranteed by the Manufacturer.	Materials and Performance, Section 02219 (Part 1.04F)						
29	Geocomposite - Contractor's proposed transportation, handling, and storage techniques for the geocomposite.	Materials and Performance, Section 02219 (Part 1.04G)						
30	Geocomposite - Contractor's written certification (provided prior to the installation of the geocomposite) that the field-delivered geocomposite has not been damaged due to improper transportation, handling, or storage.	Materials and Performance, Section 02219 (Part 1.04H)						
31	Geocomposite - Contractor's written certification (provided prior to the installation of the geocomposite) that the surface on which the geocomposite is to be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE's Representative.	Materials and Performance, Section 02219 (Part 1.04I)						
32	Geocomposite - All personnel performing installation shall be qualified by previous experience.	Materials and Performance, Section 02219 (Part 1.04J)						
33	Geocomposite - Shop drawings depicting installation details, a panel layout diagram, and a description of proposed installation techniques for the geocomposite.	Materials and Performance, Section 02219 (Part 1.04K)						
34	Geocomposite - QC certificates (signed by a responsible party employed by the Manufacturer) for the geocomposite, which identify the sections of field-delivered material they represent. The QC certificates shall include lot and roll identification numbers, testing procedures, and results of QC tests. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for: • Unit Weight (geotextile component) (ASTM D5261). • Thickness (ASTM D1777). • Geotextile-Geonet Ply Adhesion (ASTM D7005/F904/GRI GC7). • Transmissivity (ASTM D4716*) (See Note 4). * QC tests for the above-listed properties shall be performed in accordance with the Manufacturer's QA/QC program.	Materials and Performance, Section 02219 (Part 1.04L)						
35	Geocomposite - Contractor's written certification that the field-delivered material meets the Manufacturer's specifications. The Contractor shall also provide the lot and roll identification numbers for the field-delivered material.	Materials and Performance, Section 02219 (Part 1.04M)						

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GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
36	Fill Materials - Identification of proposed off-site fill sources (names and addresses) and quantity of material available from each source.	Materials and Performance, Section 02222 (Part 1.04A)						
37	Fill Materials - Sieve or particle analysis results for proposed off-site soil fill (using ASTM D422) asphalt subbase (using AASHTO T11), riprap, structural fill, silty sand, and filter stone materials. Samples shall be collected and analyzed for geotechnical properties from each proposed fill source at the frequencies provided in Parts 2.01D of M&P - Section 02222 (as appropriate).	Materials and Performance, Section 02222 (Part 1.04B)						
38	Fill Materials - Samples of the proposed soil fill and silty sand material to be tested by GE for the chemical contaminants specified in Section 5.5 (Backfilling Excavations) of the Revised Final RD/RA Work Plan. Samples shall be collected and analyzed from the proposed off-site soil fill source at the frequencies provided in Parts 2.01E of M&P - Section 02222 (as appropriate).	Materials and Performance, Section 02222 (Part 1.04C)						
39	Geotextile Fabric - Manufacturer's data for non-woven geotextile fabric including, at a minimum, physical properties, packaging, and installation techniques.	Materials and Performance, Section 02232 (Part 1.04A)						
40	Geotextile Fabric - The origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin used to manufacture the non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04B)						
41	Geotextile Fabric - Material sample of non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04C)						
42	Geotextile Fabric - Manufacturer's installation procedures and specifications for non-woven geotextile.	Materials and Performance, Section 02232 (Part 1.04D)						
43	Geotextile Fabric - Manufacturer's Quality Assurance (QA)/Quality Control (QC) program for non-woven geotextile.	Materials and Performance, Section 02232 (Part 1.04E)						
44	Geotextile Fabric - Results of QC tests conducted by the Manufacturer during the manufacturing of the field-delivered non-woven geotextile fabric. The results shall identify the sections/panels of the fabric they represent. The Contractor shall also provide the lot and roll identification numbers for the field-delivered non-woven geotextile fabric	Materials and Performance, Section 02232 (Part 1.04F)						
45	Geotextile Fabric - Written certification, by the Manufacturer, that the minimum test values provided under Part 2.02 of M&P - Section 02232 are guaranteed by the Manufacturer for the non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04G)						
46	Geotextile Fabric - Contractor's proposed transportation, handling, storage, and installation techniques for the non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04H)						
47	Geotextile Fabric - Shop drawings (provided at least one week prior to installation) depicting installation details and a description of proposed installation techniques for the non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04I)						
48	Geotextile Fabric - Manufacturer's standard warranty provided for the non-woven geotextile fabric.	Materials and Performance, Section 02232 (Part 1.04J)						
49	Geotextile Fabric - Contractor's written certification that the field-delivered non-woven geotextile fabric meets the Manufacturer's specifications.	Materials and Performance, Section 02232 (Part 1.04K)						
50	Geotextile Fabric - Contractor's written certification (provided prior to the installation of the non-woven geotextile fabric) that the field-delivered non-woven geotextile fabric has not been damaged due to improper transportation, handling, or storage.	Materials and Performance, Section 02232 (Part 1.04L)						
51	Geotextile Fabric - Contractor's written certification (provided prior to the installation of the non-woven geotextile fabric) that the surface on which the non-woven geotextile fabric will be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE's Representative.	Materials and Performance, Section 02232 (Part 1.04M)						
52	Geotextile Fabric - Results of QC tests conducted by the Manufacturer on the non-woven geotextile. The QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for: • Unit Weight (ASTM D5261). • Grab Strength (ASTM D4632). • Trapezoidal Tear Strength (ASTM D4533). • Burst Strength (ASTM D3786). • Puncture (ASTM D6241). • Ultraviolet Resistance (ASTM D4355). • Apparent Opening Size (ASTM D4751). • Permeability (ASTM D4491) (not required for cushioning geotextile).	Materials and Performance, Section 02232 (Part 1.04N)						

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GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
53	Flexible Membrane Liner - The Contractor shall submit the following information regarding the FML Manufacturer: • Corporate background and information. • Manufacturing capabilities including: - QC procedures for manufacturing. - List of material properties including certified test results, to which FML samples are attached. • Origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin. • Copies of dated QC certificates issued by the resin supplier. • Written certification that the minimum specification limits provided in Part 2.02 of M&P - Section 02234 are guaranteed by the Manufacturer.	Materials and Performance, Section 02234 (Part 1.04A)						
54	Flexible Membrane Liner - A copy of the Installer's letter of approval or license by the Manufacturer.	Materials and Performance, Section 02234 (Part 1.04B)						
55	Flexible Membrane Liner - Record drawings (prepared by the Installer and provided upon completion of installation) illustrating the following information: • Dimensions of all FML field panels. • Panel locations referenced to the Technical Drawings, which depict the identification number assigned to each FML panel. • All field seams and panels with the appropriate number or code. • Location of all patches, repairs, and destructive testing samples.	Materials and Performance, Section 02234 (Part 1.04C)						
56	Flexible Membrane Liner - Shop drawings (provided at least one week prior to installation) that include the layout plan for all FML field panels.	Materials and Performance, Section 02234 (Part 1.04D)						
57	Flexible Membrane Liner - QC program manuals covering all phases of manufacturing and installation.	Materials and Performance, Section 02234 (Part 1.04E)						
58	Flexible Membrane Liner - Complete and detailed written instructions for the storage, handling, installation, seaming, inspection plan fail criteria for liner inspections, and QA/QC testing procedures of the liner in compliance with M&P - Section 02234 and the condition of its warranty.	Materials and Performance, Section 02234 (Part 1.04F)						
59	Flexible Membrane Liner - Manufacturer's standard warranty provided for the FML.	Materials and Performance, Section 02234 (Part 1.04G)						
60	Flexible Membrane Liner - Results of QC tests conducted by the Manufacturer. The QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for: • Density (ASTM D1505). • Carbon Black Content (ASTM D1603). • Carbon Black Dispersion (ASTM D5596). • Thickness (ASTM D5994). • Tensile Properties (ASTM D638). • Tear Strength (ASTM D1004).	Materials and Performance, Section 02234 (Part 1.04H)						
61	Flexible Membrane Liner - Installer's written certification (provided prior to the installation of the FML) that the final surface on which the FML is to be installed is acceptable to both GE and the Contractor. The certification is subject to the review and approval or rejection by GE or GE's Representative.	Materials and Performance, Section 02234 (Part 1.04I)						
62	Flexible Membrane Liner - Contractor's written certification (provided prior to the installation of the FML) that the field-delivered FML has not been damaged due to improper transportation, handling, or storage.	Materials and Performance, Section 02234 (Part 1.04J)						
63	Helical Piles - Detailed shop drawings, submitted at least 3 weeks prior to the start of helical pile installation. Drawings shall include the following: installation sequence, location and identification number of each proposed pile, type and size of central steel shaft, helix plate configuration (number, diameter, and spacing of the helix plates), minimum effective installation torque, minimum overall length, cut-off elevation, and cap plate detail.	Materials and Performance, Section 02325 (Part 1.06A)						
64	Helical Piles - Product data of the following: • Descriptive literature of the helical pile system, parts, and installation procedures. • Description of installation equipment, including position/location during helical pile installation.	Materials and Performance, Section 02325 (Part 1.06B)						

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GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
65	Helical Piles - Design data of the following: • Design computations or complete structural analysis of helical pile system, signed and sealed by professional engineer. Professional engineer's seal shall be clearly legible, including state of registration, registration number, and name on seal. • Certification by professional engineer that professional engineer has performed design of helical pile system in accordance with performance and design criteria stated in the Contract Documents, and that design conforms to all local, state, and federal Laws and Regulations, and to prevailing standards of practice.	Materials and Performance, Section 02325 (Part 1.06C)						
66	Helical Piles - Certification letters, laboratory test reports, certified mill reports, and other data as required to demonstrate product compliance with M&P - Section 02325.	Materials and Performance, Section 02325 (Part 1.06D)						
67	Helical Piles - Calibration reports for each torque indicator or torque motor. Calibration tests shall have been performed within 180 days of the submittal date. Helical pile installation shall not proceed until the Engineer has received the calibration reports. Reports shall include: • Name of testing agency. • Identification number of device calibrated. • Description of calibrated testing equipment. • Date of calibration. • Calibration data.	Materials and Performance, Section 02325 (Part 1.06E)						
68	Helical Piles - Installation records, provided to GE and/or GE's Representative within 24 hours after each pile installation is completed. Records shall include, but are not limited to: • The name of project and Contractor, and Contractor's supervisor during installation. • Date and time of installation. • Name and model of installation equipment. • Type of torque indicator used. • Location of helical pile. • Actual helical pile type and configuration (including lead section, number and size of helix plates, number and type of extension sections). • Helical pile installation duration and observations. • Total length of helical pile, cut-off elevation, installation torque at 1-ft intervals for the final 10 feet. • Comments pertaining to interruptions, obstructions or other relevant information. • Rated load capacity.	Materials and Performance, Section 02325 (Part 1.06F)						
69	Helical Piles - Qualifications statements for the manufacturer, professional engineer, and installer.	Materials and Performance, Section 02325 (Part 1.06G)						
70	Helical Piles - Record drawings depicting as-built location of each helical pile.	Materials and Performance, Section 02325 (Part 1.06H)						
63	Polyvinyl Chloride (PVC) Pipe - Detailed shop drawings, provided a minimum of 3 weeks prior to mobilization of any materials in connection with the work detailed in M&P - Section 02690. These drawings are subject to the review and approval or rejection by GE and GE's Representative.	Materials and Performance, Section 02690 (Part 1.04A)						
64	Polyvinyl Chloride (PVC) Pipe - Manufacturer's data and drawings of the pipe, joints, fittings, and connection details to new and existing structures, showing compliance with M&P - Section 02690.	Materials and Performance, Section 02690 (Part 1.04B)						
65	Ornamental Steel Fence and Gates - Shop drawings showing the layout of fencing and gates with dimension, elevations, details, and finishes of components, accessories, and post foundations.	Materials and Performance, Section 02719 (Part 1.04A)						
65	Ornamental Steel Fence and Gates - Product data for fencing and gate components and accessories demonstrating compliance with the contents of M&P - Section 02719.	Materials and Performance, Section 02719 (Part 1.04B)						
66	Ornamental Steel Fence and Gates - Manufacturer's standard warranty (minimum 10 years) for new fencing and gate materials. Warranty shall cover any defects in material finish, including cracking, peeling, chipping, blistering or corroding	Materials and Performance, Section 02719 (Part 1.04C)						
66	Cast-in-Place Concrete - List of concrete materials and concrete mix designs proposed for use. Include results of tests performed to qualify the materials and to establish the mix designs.	Materials and Performance, Section 03301 (Part 1.06A)						
67	Cast-in-Place Concrete - Manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents	Materials and Performance, Section 03301 (Part 1.06B)						

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Item No.	Submittal Description	Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
66	Cast-in-Place Concrete - Informational Submittals: • Delivery Tickets: Copies of all delivery tickets for each load of concrete delivered to or mixed at the Site. Each delivery tickets shall contain the information in accordance with ASTM C94/C94M along with project identification name and number. • Site Quality Control: Report of testing results for testing of field concrete cylinders for each required time period. Submit within 24 hours after completion of associated test. Test report shall include results of all testing required at time of sampling.	Materials and Performance, Section 03301 (Part 1.06C)						

Notes:

1. All references are to the *Revised Final Removal Design/Removal Action Work Plan for Unkamet Brook Area-Remainder* (ARCADIS, April 2014).
2. Submittal status nomenclature is as follows:
   R - Reviewed
   N - Reviewed and noted
   S - Resubmit
   J - Rejected
3. The Health and Safety Plan is required for GE record-keeping purposes only and, therefore, GE and ARCADIS will review the plan for completeness only. Determination of the appropriate level of worker safety, equipment, and procedures based on site conditions must be made by the Contractor based on site visits, review of available information, and anticipated site activities.
4. Geocomposite submittals to verify transmissivity shall be submitted as early as possible to prevent potential scheduling conflicts.

Appendix L

Supplemental Information on Beaver Deterrent and Debris Diversion Structures

ARCADIS

Product Specification for
BeaverStop by Canada Culvert

BEAVER STOP®







CANADACULVERT™

INNOVATION FLOWS FROM HERE

PROVEN THROUGH PAST PERFORMANCE

For more than 20 years, Beaver Stop® has protected thousands of miles of roads and railways from damage caused by Beavers damming culverts.

An Environmentally Friendly Choice For Beaver Control

- economical way to ensure proper drainage
- allows fish passage
- causes no harm to Beavers or Fish
- cost effective
- durable
- easy to install
- over 4000 installations across North America



Assembly and Installation

Beaver Stop® can range in size from 400mm to over 2400 mm diameter. The Beaver Stop® fits round Corrugated Steel Pipe, but can also be adapted to fit Arched CSP, pipe with sloped ends, Concrete pipe and even HDPE.

Why It Works

The Beaver Stop® guards against the damming of culverts by nuisance beavers. All areas on the culvert are protected: outlet, inlet and the middle. Since the Beaver Stop® structure is suspended, water will continually flow through the main cylinder, even if the overlay is plugged.

Environmentally Friendly

The Beaver Stop® is one of the few methods to manage beaver activity around culverts without impeding the passage of fish, or harming beavers.

Economic Value

Reduce the high maintenance costs of less effective solutions. Traditional methods of protecting your pipe that require frequent inspections and routine cleaning are eliminated. The Beaver Stop® is virtually maintenance free. It will provide years of service requiring little or no maintenance.



British Columbia Dawson Creek, Genelle, Langley, Prince George | **Alberta** Edmonton, Grande Prairie, Ponoka
Saskatchewan Regina, Saskatoon | **Manitoba** Winnipeg | **Ontario** Orangeville

TF. 1 (800) 565-1152
canadaculvert.com

ARCADIS

Product Specification for Floating Debris Boom by Granite Environmental

GRANITE environmental

Debris Boom Spec Sheet

Below you will find typical sizing and specifications for the Floating Debris Boom. Structure and components found on the boom will vary depending on your water conditions and containment requirements.

Typical Debris Boom Sizing & Specifications
(Additional Sizes, Fabrics, etc. Available on Request)

Debris Boom Type	Section Lengths	Skirt Depths	Fabric	Flotation	Chains & Cables
Calm Water Booms	25', 50' & 100'	6" or 12" standard	22 oz. PVC Impermeable	4"	Bottom Ballast: 1/4"
River Booms (standard)	25', 50' & 100'	6" or 12" standard	22 oz. PVC Impermeable	4" or 6"	Bottom Ballast: 1/4" Tension Cable: 1/4"
River Booms (heavy duty)	25', 50' & 100'	6" or 12" standard	22 oz. PVC Impermeable	6"	Bottom Ballast: 5/16" Tension Cable: 5/16"
Marina Booms	25', 50' & 100'	6" or 12" standard	22 oz. PVC Impermeable	6"	Bottom Ballast: 1/4"
Port Booms (standard)	25', 50' & 100'	6" or 12" standard	22 oz. PVC Impermeable	6"	Bottom Ballast: 5/16" Tension Cable: 5/16"
Port Booms (heavy duty)	25', 50' & 100'	16"	22 oz. PVC Impermeable	8"	Bottom Ballast: 5/16" Tension Cable: 5/16"
Coastline Booms	25', 50' & 100'	20"	22 oz. PVC Impermeable	10"	Bottom Ballast: 5/16" Tension Cable: 5/16"
Offshore Booms	25', 50' & 100'	24"	22 oz. PVC Impermeable	12"	Bottom Ballast: 5/16" Tension Cable: 5/16"

Color Options: Standard boom color is yellow. Darker options including green, black, and blue also available on request.

P.O. Box 780928 Sebastian, FL 32978 Toll Free: (1) 888.703.9889 Fax: (+1) 772.589.3343 Int: (+1) 772.646.0597 info@GraniteEnvironmental.com

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Floating Debris Boom

Section Lengths:	25', 50', and 100', other section sizes available on request
Standard Depths:	6" or 12" standard, other options available for demanding conditions
Flotation Element:	Marine grade floats suitable for extended use in marine environments. Floats are encased in the top of the flotation barrier to create a continuous float line.
Fabric:	22 oz. Impermeable PVC standard. Skirts may be impermeable or feature a bottom netting that allows fish to swim through the barrier.
Section Connectors:	Sections will feature grommet eyes to allow for connection between barriers. For heavy duty barriers, sections will also feature slide connectors to further secure the barrier in moving water conditions.
Ballast & Lower Tension Member:	A bottom ballast chain is included at the bottom of all sections. Chains will be enclosed in a fabric sleeve located at the bottom of the skirt.

**Typical Specifications only. Manufacturing details may vary slightly depending on your location and area conditions.

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GRANITE environmental

Floating Debris Boom





This Floating Debris Boom is a reliable debris containment barrier designed to help limit the spread of **trash, small timbers, aquatic plants and more**. Debris booms are made in several different models, including options for calm water, moving water and rough water conditions.

Perfect for use in:

- Rivers
- Harbors
- Lakes
- Ponds
- Coast Lines
- Ports
- Streams
- Marinas

Typical Debris Boom Specifications	
Fabric	22 oz. Impermeable PVC
Typical Section Lengths	25', 50', or 100'
Typical Skirt Depths	6" or 12"
Floats	4", 6", 8", 10", or 12"
Other Components	Bottom Ballast, Tension Cables, Section Connectors

**Other designs, fabrics, and custom sizes available.

Boom Accessories: Anchor Kits, Buoys, Tow Bridles, Tidal Compensators

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Appendix M

Ambient Air Monitoring Program

Ambient Air Monitoring Plan for PCBs and Particulate Matter During Remedial Actions at Unkamet Brook Area, Pittsfield, Massachusetts

General Electric Company
Pittsfield, Massachusetts

Prepared by

Berkshire Environmental Consultants, Inc.
1450 East Street, Suite 6-H
Pittsfield, MA 01201

Revised - April 2014

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1.0 INTRODUCTION

This plan describes ambient air monitoring for polychlorinated biphenyls (PCBs) and particulate matter which will be conducted during remediation actions in the Unkamet Brook Area in Pittsfield, Massachusetts. The Unkamet Brook Area includes two areas described as Unkamet Brook Area -West and Unkamet Brook Area - Remainder. The program consists of ambient air monitoring for PCBs and particulate matter during the earth-moving (intrusive) activities of the remediation at the Unkamet Brook Area.

2.0 SAMPLING OBJECTIVE

The objectives of this sampling program are two-fold:

1. To obtain valid and representative data on ambient levels of PCBs at and around the Unkamet Brook Area before and during soil and sediment remediation activities to ensure that the activities are not causing an unacceptable increase in ambient air PCB concentrations.

2. To obtain valid and representative data on ambient levels of particulate matter at and around the Unkamet Brook Area during soil and sediment remediation activities to ensure that the activities are not causing an unacceptable increase in ambient air particulate matter concentrations.

3.0 SITE ACTIVITY

As described in Work Plans for these areas, the on-site activities to be performed at the Unkamet Brook Area will include the performance of soil and sediment remediation activities (including soil and sediment removal/replacement and/or the installation of engineered barriers) along approximately ½ mile of Unkamet Brook between Dalton Avenue and the East Branch of the Housatonic River and in other nearby areas, as shown on the attached Figure M-1. Performance of the remediation work is subject to review and approval by the United States Environmental Protection Agency (EPA).

Although two separate areas within the Unkamet Brook Area have been designated for administrative purposes (Unkamet Brook Area -West and Unkamet Brook Area - Remainder), the two areas are adjacent and contiguous, and remediation activities will be conducted at these two areas over the same period. For air monitoring purposes, there will be one Ambient Air Monitoring Plan which will address the scope of monitoring and the proposed monitoring locations for the combined areas. A total of 31 on-site monitoring locations have been identified for the overall Unkamet Brook Area. These locations are identified on the attached Figure M-1.

4.0 PCB MONITORING PROGRAM

4.1 *High-Volume PCB Sampling*

The high-volume PCB sampling program will include the following elements:

High-Volume Baseline Monitoring Locations	15 (total number of potential PCB monitoring locations)
High-Volume Monitoring Locations Monitored During Each Event	3-4 (number of locations monitored for each event)
Background Locations	1
Co-Located Monitors (Field Dup)	1
Sampling Time	24 hours per sampling event
Sampling Period	Duration of soil and sediment remediation activity
Frequency of Sampling	Two baseline events prior to the onset of intrusive activities, once every week during the first month of intrusive activities, and once per month during the remainder of remediation activity[1]
No. of Blanks Per Sampling Event	1
Sampling Method	EPA Compendium Method TO-4A
Analytical Method	GC/ECD or GC/MS as described in EPA Method TO-4A

[1] Sampling frequency may be increased if either PCB or particulate monitoring levels exceed threshold values

Ambient air baseline monitoring for PCBs will be conducted for two 24-hour periods prior to the initiation of on-site remediation. During the first month of intrusive activities, PCB sampling will be conducted once every week. If there are no exceedances of the PCB notification level in the first four weekly sampling events, the sampling frequency will be reduced to once per month. The ambient air monitoring frequency for PCBs may be increased to bi-weekly in the event that ambient particulate concentrations at any one location consistently exceed the particulate notification level of 120 µg/m^3 (micrograms per cubic meter). "Consistently exceeding" will be defined as particulate concentrations greater than 120 µg/m^3 on three consecutive 10-hour days or 5 days in any two-week period. Once PCB concentrations are below PCB notification and action levels (see Section 10 of this Ambient Air Monitoring Plan) for two consecutive bi-weekly events, then PCB sampling frequency will revert to once per month.

PCB baseline monitoring will be conducted prior to any soil or sediment remediation activity at the following 15 PCB air monitoring locations shown on Figure M-1: UB-1, UB-2, UB-4, UB-6, UB-7, UB-8, UB-12, UB-14, UB-16, UB-23, UB-24, UB-25, UB-27, UB-28, and UB-31. These sampling locations were selected based first on the location of potential receptors and the location of site activity, and second on both wind direction and the presence of obstructions and other influences that may adversely affect the representativeness of the data. The remediation areas cover a large geographic

area and the 15 monitoring locations have been identified as representative of the entire area subject to remediation. Baseline monitoring will also be conducted at one industrial background location north of Building 9B near New York Avenue on GE property in Pittsfield.

During intrusive activities, PCB monitoring will be conducted at a minimum of 3 of the 31 identified monitoring locations and at the designated industrial background location. The specific locations that will be monitored during a given PCB sampling event will be selected based on the location of remedial construction work, the location of potential receptors, the predominant wind direction, obstructions, site safety and site accessibility. However, for any PCB air monitoring event conducted during the course of intrusive work activities in areas west of the railroad tracks located on Parcel L11-4-12, monitoring location UB-31 will be used together with at least two other appropriate locations. GE will coordinate all sampling locations with EPA prior to each sampling event. The specific locations selected for monitoring will be noted in the appropriate sampling report. Any significant modifications to the locations of monitors will be reviewed with the GE Project Manager.

The sampling method to be used for PCBs in the high-volume samples is EPA Compendium Method TO-4A, *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)*. This method employs a modified high-volume sampler consisting of a glass fiber filter with a polyurethane foam (PUF) backup adsorbent cartridge to sample ambient air at a rate of 0.225 m^3/min. A General Metal Works Model GPS-1 Sampler or equivalent will be used. The filter and cartridge will be placed in clean, sealed containers and returned to the laboratory for analysis.

Procedures for sample media preparation and calibration of the sampling system are specified in Method TO-4A. TO-4A further specifies procedures for calculation and data reporting, and the assessment of data for accuracy and precision.

The samplers will be monitored at six-hour intervals over each 24-hour sampling period. During these six-hour checks, barometric pressure, temperature, and magnehelic pressure readings will be taken and the air flow adjusted to the target flow rate, as necessary. At the end of the sampling period, the sampling modules containing the fiber filters and PUF adsorbents will be removed from the samplers. Each glass fiber filter will be folded and placed on the PUF adsorbent for that sample and each sample consisting of a fiber filter and PUF adsorbent (inside a glass cartridge) will be wrapped in hexane rinsed aluminum foil. Each fiber filter and PUF adsorbent set will be labeled as one sample. The samples will be wrapped, packaged in ice and sent under chain-of-custody to the laboratory for analysis.

The PCB sampling probe height for all high-volume monitors will be approximately 2.0 meters above the ground. This height is adequate to represent the breathing zone and to be above the influence of ground activity around the monitor. The location of the samplers will be in conformance, to the extent practical, with the siting requirements for ambient monitors in *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)* (U.S. EPA. May, 1987).

4.2 *Analytical Procedures*

In the high-volume samples, the PCBs on the PUF and filter will be recovered by the sample extraction procedures described in TO-4A. The extracts will be reduced in volume using concentration techniques as described in TO-4A and subjected to column chromatographic cleanup. The extracts will be analyzed for PCBs using gas chromatography with either electron capture detection (GC/ECD) or mass spectrometry detection (GC/MS) as described in TO-4A.

The samples will be analyzed for the following PCB Aroclors:

PCB-1016	PCB-1221
PCB-1232	PCB-1242
PCB-1248	PCB-1254
PCB-1260	

The detection limit (DL) for PCB analysis of the high volume samples will be 0.0003 µg/m^3, in consideration of the following:

Avg. Sampling Rate	0.225 m^3/min.
Avg. Sample Volume	324 m^3/PUF
Analytical DL	0.1 µg/PUF
Project DL	0.0003 µg/m^3

5.0 PARTICULATE MONITORING

Real-time particulate monitoring will be conducted during intrusive activities in the course of remediation at the Unkamet Brook Area. Monitoring will be conducted daily during the hours of intrusive activities. It is anticipated that the particulate monitoring will be conducted for approximately 10 hours a day, from 7:00 a.m. to 5:00 p.m. Particulate monitoring will occur throughout the period of intrusive activities.

Particulate monitoring will be conducted using a Met One E-BAM monitor or a MIE dataRAM real-time airborne particulate monitor, Model DR-4000 or Model pDR-1000, or equivalent. The Met One E-BAM uses beta attenuation as a measurement technique. The mass of suspended particulate is measured by the decrease in the number of beta particles passed over a particulate filtering medium due to absorption by the particulate. The EBAM monitors have a

measurement range of -0.005 to 65.530 mg/m^3. The Model DR-4000 dataRAM monitor uses a low-volume pump and a light-scattering photometer to measure particulate concentrations with a mean diameter less than 10 micrometers (PM_{10}) and is equipped with a temperature conditioning heater and in-line impactor head. The Model pDR-1000 dataRAM monitor uses a passive sampling technique and light-scattering photometer to determine particulate concentrations. These MIE monitors have a measurement range of 0.0001 to 400 mg/m^3.

For all monitors, particulate data will be averaged and recorded for each 15-minute interval during the sampling day by the instrument's datalogger. An overall daily average will be calculated and recorded by the instrument's datalogger (if the instrument has the capability) or using a spreadsheet. The particulate monitoring results will be reported as PM_{10} (particulate matter with a mean diameter of 10 micrometers or less).

Calibrations and maintenance will be conducted at the frequency and in accordance with the procedures recommended by the manufacturer. All calibrations will be recorded.

The MIE Models 4000 and pDR-1000 monitors have an inherent sensitivity to moisture and readings taken under very high humidity conditions are unreliable. GE may, at times, use the professional engineering judgment of its environmental consultants to determine the reliability and usability of data collected during very high humidity conditions. Data summaries will exclude the time period when moisture is clearly a factor. The raw data file will be marked and maintained to indicate what data are included in the average.

As discussed in Section 3.0, 31 monitoring locations have been identified as indicated on Figure M-1. For particulate monitoring, at least three of these 31 monitoring locations will be utilized for particulate monitoring during a given day of intrusive activities. As required and at the discretion of Berkshire Environmental Consultants (BEC), GE, and the Remediation Contractor, additional monitors may be operated to adequately assess ambient particulate concentrations. The specific monitoring locations to be used on a given day and for a given site will be established based on the following: location of intrusive activities, receptors, truck and vehicle traffic on-site, obstructions, and accessibility. As remediation proceeds and conditions change at the Unkamet Brook Area, the specific monitoring locations will also change.

In addition to the three on-site monitoring locations, an industrial background particulate monitor will be installed north of Building 9B near New York Avenue on GE property in Pittsfield. Data from this station will be used in evaluating ambient particulate concentrations during the remediation (see Section 10.2 below).

6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Quality assurance and quality control (QA/QC) procedures for the air sampling program will follow those described in GE's approved *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP), prepared by ARCADIS of New York, Inc., dated July 2013, with any

subsequent modifications agreed upon by GE and EPA. Additional specific quality assurance and quality control for the monitors will be based on manufacturer's recommendations.

7.0 PCB SAMPLE DOCUMENTATION, HANDLING AND SHIPMENT

Each filter holder and PUF cartridge holder will be pre-marked with a permanent identification number. As each sample is collected, it will be recorded on a field data form along with the date, time and location of collection.

All samples will be securely wrapped for shipment. PCB samples will be preserved at $4^{o}C$ and shipped on ice. Samples will be shipped under chain-of-custody by commercial overnight carrier or courier to the analytical laboratory. Complete details on the PCB sample shipment procedures are contained in the FSP/QAPP.

8.0 METEOROLOGICAL MONITORING

Hourly meteorological data from the Automated Surface Observation System (ASOS) Monitor operated at the Pittsfield Municipal Airport in Pittsfield, Massachusetts will be evaluated for each sampling period. A summary of the wind directional data for the sampling period will be included with the sampling results. This ASOS Monitor is operated by the National Weather Service, Federal Aviation Administration, and the Department of Defense. The ASOS Monitor measures and records wind speed, wind direction, precipitation, temperature, sky conditions, barometric pressure, and relative humidity.

9.0 DOCUMENTATION AND REPORTING

PCB and particulate data will be summarized and reported to the GE Project Manager and the ARCADIS Project Manager. If there is an exceedance of a reporting threshold, GE will be notified as soon as possible. All field and laboratory data recorded during ambient monitoring will be documented according to the procedures in the FSP/QAPP. A written report summarizing the results will be provided to GE and ARCADIS after the conclusion of sampling and will include the following:

Date and Time of Sampling
Sampling Locations
Calibration and Maintenance Activities
Pollutants Monitored
Number of Samples Collected
Analytical Results
Quality Assurance Assessment
Meteorological Data Summary
Discussion of Problems or Disruptions

10.0 NOTIFICATION AND ACTION LEVELS

10.1 *PCBs*

The notification and action levels for PCB concentrations in ambient air are 0.05 µg/m^3 (24-hour average) and 0.1 µg/m^3 (24-hour average), respectively. These are the same levels established by EPA for other remediation activities at the GE-Pittsfield/Housatonic River Site.

If the 0.05 µg/m^3 notification level is exceeded, GE will notify EPA as soon as practical, but no later than 24 hours after receipt of the data showing such an exceedance, and will implement response actions, in consultation with EPA, to prevent exceedances of the action level. The actions to be considered in such circumstances will include those previously implemented by GE at other areas at the GE-Pittsfield/Housatonic River Site (e.g., increased frequency of monitoring, establishment of additional monitoring locations, increased use of dust suppression measures, modifications to dust-producing activities, and/or other appropriate response actions). In addition, GE will provide written notice of the exceedance to EPA within 72 hours following receipt of the data showing the exceedance.

If the action level of 0.1 µg/m^3 is exceeded, GE will: (a) notify EPA of the exceedance within 24 hours after receipt of the data showing the exceedance; and (b) temporarily cease ongoing intrusive activities. In addition, within 72 hours following receipt of data showing the exceedance, GE will evaluate the cause of the exceedance and the need for additional controls, discuss with EPA, and submit a proposal to EPA for review and approval regarding such exceedance, including response actions and engineering controls to address the exceedance (if needed). EPA approval of such proposal will be required before GE resumes intrusive activities.

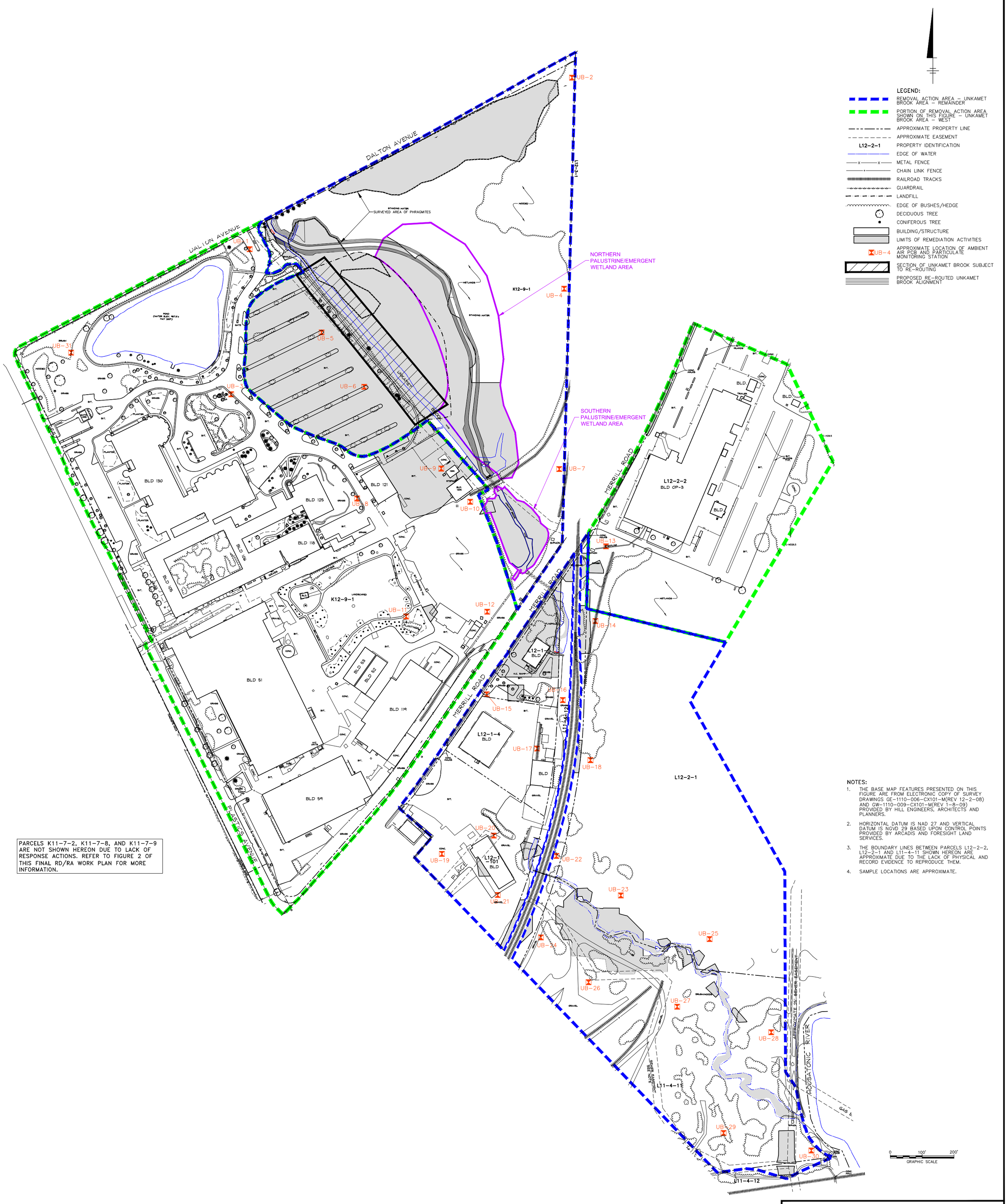
10.2 *Particulate Matter*

For each day of monitoring, the particulate data from the on-site monitors will be compared with the data from the background monitor and with the notification level of 120 µg/m^3 – which represents 80 percent of the current 24-hour National Ambient Air Quality Standard (NAAQS) for PM_{10} (150 µg/m^3). This notification level has been selected to allow notice to GE before concentrations reach the level of the 24-hour NAAQS (the action level). If the average 10-hour PM_{10} concentration at any on-site monitor exceeds the notification level of 120 µg/m^3 (regardless of background levels), the exceedance will be reported to EPA as soon as practicable, but no later than 24 hours following receipt of data showing the exceedance. GE will take appropriate steps to prevent an exceedance of the action level and will discuss with EPA the need for and type of additional response measures. The actions to be considered in these circumstances will include the same types of measures listed above for exceedances of the notification

level for PCBs, or other appropriate measures. In addition, GE will provide written notice of the exceedance to EPA within 72 hours of receipt of the data showing the exceedance.

In the event that any 10-hour average PM_{10} concentration at an on-site monitor exceeds the level of the NAAQS for PM_{10} (150 $\mu g/m^3$ - the action level), GE will: (a) immediately report such exceedance to EPA within 24 hours following receipt of data showing the exceedance; and (b) temporarily cease ongoing intrusive activities. In addition, within 72 hours following receipt of the data showing the exceedance, GE will evaluate the cause of the exceedance and the need for additional engineering controls, discuss with EPA, and submit a proposal to EPA for review and approval regarding such exceedance, including response actions and engineering controls to address the exceedance (if needed). EPA approval of such proposal will be required before GE resumes intrusive activities.

CITY:Syracuse GROUP: Env-141 DB: A.Schilling, K.SARTORI LD: A.Schilling PM: TM: TR: T. LEEMHUIS LYR:ON=*;OFF=REF, (FRZ)
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XREFS: IMAGES: PROJECTNAME: ----
40190X14



PARCELS K11-7-2, K11-7-8, AND K11-7-9 ARE NOT SHOWN HEREON DUE TO LACK OF RESPONSE ACTIONS. REFER TO FIGURE 2 OF THIS FINAL RD/RA WORK PLAN FOR MORE INFORMATION.

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE ARE FROM ELECTRONIC COPY OF SURVEY DRAWINGS GE-1110-006-CX101-M(REV 12-2-08) AND GW-1110-009-CX101-M(REV 1-8-09) PROVIDED BY HILL ENGINEERS, ARCHITECTS AND PLANNERS.
2. HORIZONTAL DATUM IS NAD 27 AND VERTICAL DATUM IS NGVD 29 BASED UPON CONTROL POINTS PROVIDED BY ARCADIS AND FORESIGHT LAND SERVICES.
3. THE BOUNDARY LINES BETWEEN PARCELS L12-2-2, L12-2-1 AND L11-4-11 SHOWN HEREON ARE APPROXIMATE DUE TO THE LACK OF PHYSICAL AND RECORD EVIDENCE TO REPRODUCE THEM.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED FINAL RD/RA WORK PLAN FOR
UNKAMET BROOK AREA - REMAINDER

PROPOSED AMBIENT AIR PCB AND PARTICULATE MONITORING LOCATIONS

ARCADIS

FIGURE
M-1