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*Transmitted Via Overnight Courier*

March 3, 2005

Mr. William P. Lovely, Jr.
United States Environmental Protection Agency
EPA - New England (MC HBO)
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

**Re: GE-Pittsfield/Housatonic River Site**
**Newell Street Area II (GECD450)**
**Final Removal Design/Removal Action Work Plan**

Dear Mr. Lovely:

Enclosed for your review is GE's *Final Removal Design/Removal Action Work Plan for Newell Street Area II.*

Please call Dick Gates if you have any questions about this report.

Sincerely,

Andrew T. Silfer/ACC

Andrew T. Silfer, P.E.
GE Project Coordinator

Enclosure
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REPORT

# *Final Removal Design/Removal Action Work Plan for Newell Street Area II*

**General Electric Company**
**Pittsfield, Massachusetts**

**March 2005**

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

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# 1. Introduction

## 1.1 General

On October 27, 2000, a Consent Decree (CD) executed in 1999 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 Newell Street Area II RAA, considered one of the Former Oxbow Areas under the CD and SOW, GE has previously submitted the following documents to satisfy those requirements of the CD and SOW:

- *Pre-Design Investigation Work Plan for the Newell Street Area II Removal Action* (PDI Work Plan) (October 2001);

- *Newell Street Area II Pre-Design Investigation Work Plan Addendum* (PDI Work Plan Addendum) (May 2002);

- *Pre-Design Investigation Report for the Newell Street Area II Removal Action* (PDI Report) (February 2003);

- *Supplemental Pre-Design Investigation Report* (Supplemental PDI Report) (August 2003);

- A letter from GE to EPA titled *Supplemental Sampling Proposal to Support Future Removal Design/Removal Action Activities* (Supplemental Sampling Proposal) (March 2004); and

- *Conceptual Removal Design/Removal Action Work Plan for Newell Street Area II* (Conceptual Work Plan) (July 2004).

The Conceptual Work Plan presented: (1) evaluations of both the PCB and the non-PCB constituents listed in Appendix IX of 40 CFR 264 (excluding pesticides and herbicides), plus benzidine, 2-chloroethyl vinyl ether, and 1,2-diphenylhydrazine (Appendix IX+3) data under existing conditions to assess the need for soil-related removal actions; (2) a conceptual proposal for soil-related removal actions, where necessary; and (3) revised evaluations of PCBs and other Appendix IX+3 constituents in soil under post-remediation conditions (where relevant) to demonstrate that the proposed removal actions will achieve the applicable Performance Standards under the CD and SOW. On November 4, 2004, EPA issued a letter to GE providing approval of the Conceptual Work Plan and requiring submittal of the Final Work Plan by March 4, 2005.

This *Final RD/RA Work Plan for Newell Street Area II* (Final Work Plan) presents a summary of the pre-design investigation activities performed at the Newell Street Area II RAA, a summary of the PCB and Appendix IX+3 evaluation procedures and results, design information, an implementation plan, a discussion regarding Contractor selection, details regarding post-construction activities, and a section concerning the schedule of construction activities. Additional details regarding the specific components of this Final Work Plan are provided in Section 1.3.

## 1.2 Description of Newell Street Area II

The Newell Street Area II RAA occupies an approximate 8-acre area and is generally bounded by the Housatonic River to the north, Newell Street and residential properties to the south, the Newell Street Area I RAA to the east, and Sackett Street to the west (Figure 1-1). This area originally consisted of land containing certain oxbows or low-lying areas of the Housatonic River. Rechannelization and straightening of the Housatonic River in the early 1940s by the City of Pittsfield and United States Army Corps of Engineers (USACE) separated these oxbows and low-lying areas from the active course of the river. The oxbows and low-lying areas were subsequently filled with various materials from a variety of sources, resulting in its current surface elevation and topography.

Newell Street Area II is composed of the following 10 properties:

- Parcel I9-7-1;
- Parcel J9-23-1;
- Parcel J9-23-2;
- Parcel J9-23-3;
- Parcel J9-23-4;
- Parcel J9-23-5;
- Parcel J9-23-6;
- Parcel J9-23-8;
- Parcel J9-23-12; and
- City of Pittsfield property (located southwest of Parcel J9-23-8). This narrow parcel containing a City sewer line has no known tax parcel number and was initially thought to be an easement rather than a separately owned property. GE learned in the course of performing the pre-design investigations that this property is, in fact, a separate parcel owned by the City of Pittsfield.

Each of these properties is identified on Figure 1-2. The largest of the properties (Parcel J9-23-12) is owned by GE; a portion of which was historically used as an employee parking lot (referred to herein as the GE Newell Street parking lot area), while the remainder includes a wooded area. Of the remaining properties, some are owned by GE (Parcels I9-7-1, J9-23-1, J9-23-3, and J9-23-5), two are owned by the City of Pittsfield (Parcel J9-23-2 and the narrow City property containing a sewer line), two are owned by Western Massachusetts Electric Company (WMECo) (Parcels J9-23-6 and J9-23-8), and one is of indeterminate ownership (J9-23-4, as further discussed in Section 3.2.2 below). With the exception of the parking lot area, all of these properties are undeveloped and, pursuant to the CD and SOW, are considered to be "recreational" properties for the purpose of developing appropriate removal actions. Finally, for properties adjacent to the Housatonic River (Parcels I9-7-1, J9-23-1, J9-23-8, J9-23-12, and the City of Pittsfield property), only the non-riverbank portions of these properties are included in the Newell Street Area II RAA. The riverbank portions of these properties have been addressed by a separate Removal Action under the CD (i.e., the Upper ½ Mile Reach Removal Action); those riverbank portions are identified on Figure 1-2.

Under the CD and SOW, as further described below, the GE Newell Street parking lot area located on Parcel J9-23-12 will be subject to installation of an engineered barrier, and hence is not subject to averaging evaluations

for PCBs and other Appendix IX+3 constituents. RD/RA evaluations were performed for the wooded area at Parcel J9-23-12 and for each of the remaining nine properties as separate recreational averaging areas.

## 1.3 Contents of Final Work Plan

Section 3.4 of the SOW contains specific requirements regarding the information required in Final Work Plans, including:

- Results of pre-design studies/investigations;
- An evaluation of the areas and depths subject to removal actions to meet the PCB-related Performance Standards set forth in the SOW;
- An evaluation of the need for additional removal actions to address non-PCB constituents and (if needed) the type of such removal actions;
- A further description of the activities necessary to meet the Performance Standards for natural resource restoration/enhancement activities;
- An evaluation of other issues that may affect the type and extent of removal actions (e.g., groundwater, non-aqueous phase liquid [NAPL]);
- Design assumptions and parameters;
- Identification of Applicable or Relevant and Appropriate Requirements (ARARs) in accordance with Attachment B of the SOW;
- Detailed design of the removal actions;
- Description of other implementation details concerning performance of the removal actions;
- Summary of anticipated Post-Removal Site Control activities following completion of the Removal Action;

- Identification of the Removal Action team, including key personnel, roles and responsibilities, and lines of authority;

- Process for selection of Removal Action Contractor (if not already selected);

- Schedule for implementation of Removal Action;

- Construction Quality Assurance Plan (CQAP); and

- Project closeout requirements.

## 1.4 Scope and Format of Work Plan

To satisfy the requirements identified in Section 1.3 above, the remainder of this Final Work Plan is presented in eight sections. The title and a brief overview of each section are presented below:

**Section 2 – Summary of Pre-Design Investigation Activities,** describes the pre-design soil investigation activities conducted by GE at Newell Street Area II, the results of which were used to determine the need for and extent of removal actions to address PCBs and Appendix IX+3 constituents in soil at the 10 properties located within this RAA.

**Section 3 – Summary of PCB and Appendix IX+3 Evaluation Procedures,** provides an overview of the applicable PCB and Appendix IX+3 Performance Standards for recreational properties, and describes the procedures used to evaluate these constituents in soil at these properties under existing and, where necessary, post-remediation conditions.

**Section 4 – Summary of PCB and Appendix IX+3 Evaluation Results,** presents an overall summary of the PCB and Appendix IX+3 evaluations for the properties located within Newell Street Area II, as presented in the Conceptual Work Plan, as well as the removal actions proposed to achieve the Performance Standards (i.e., soil removal/replacement and/or the installation of engineered barriers, as necessary) for each property.

**Section 5 – Design Information,** describes additional design-related information associated with the removal actions identified in Section 4. Such information includes technical plans and specifications, technical drawings, information regarding performance of soil removal activities and installation of engineered barriers, an evaluation of the effects of the proposed engineered barriers on flood storage capacity of the 100-year floodplain in this area and the need for compensatory flood storage, a description of natural resource restoration/enhancement activities, identification of site-specific ARARs, and a description of the procedures to be implemented to ensure attainment of those ARARs.

**Section 6 – Contractor Selection,** discusses the process for selecting the Remediation Contractor.

**Section 7 – Implementation Plan,** discusses certain site-specific implementation components, including identification of the project participants, Contractor submittal requirements, project-specific site preparation and construction-related components, and the perimeter air monitoring approach. As also discussed in this section, there remains certain implementation-related logistics that are currently unknown and will be provided to EPA in a supplemental information package once a Remediation Contractor has been selected.

**Section 8 – Post-Construction Activities,** identifies the various activities to be performed following implementation of removal actions, including project closeout activities (i.e., pre-certification inspection and preparation of a Final Completion Report) and Post-Removal Site Control activities.

**Section 9 – Schedule,** identifies the schedule for submittal of a supplemental information package to support this Final Work Plan, as well as the anticipated schedule for construction and reporting activities.

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

Finally, it should be noted that this Final Work Plan evaluates the need for and scope of removal actions to achieve the soil-related Performance Standards set forth in the CD and SOW. Groundwater at Newell Street Area II, as well as NAPL in groundwater, are being addressed as part of GE's groundwater-related activities for the Plant Site 1 Groundwater Management Area (GMA 1) pursuant to the CD and SOW. At the present time, these activities consist of the performance of an interim groundwater monitoring program at GMA 1, along with continuation of groundwater/NAPL recovery operations at GMA 1. This Final Work Plan does, however,

include a discussion of the ways in which the NAPL recovery program will be coordinated with the proposed removal actions described herein.

# 2. Summary of Pre-Design Investigation Activities

## 2.1 General

The removal actions presented in this Final Work Plan are based on the results of extensive pre-design investigation activities performed by GE and EPA at Newell Street Area II. Since Section 2 of the 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 herein.

## 2.2 Summary of Pre-Design Soil Investigations

The pre-design investigation activities for the Newell Street Area II RAA consisted of the following:

- Historical soil investigations prior to September 2002 and not associated with the pre-design investigation activities proposed in GE's PDI Work Plan (October 2001) or PDI Work Plan Addendum (May 2002).

- Pre-design activities conducted by GE between September 26 and October 25, 2002, generally including the collection and analysis of soil samples for analysis of PCBs, and for certain of those samples, other Appendix IX+3 constituents.

- Investigation activities conducted by EPA at Newell Street Area II 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 also been considered in the removal action evaluations for this RAA (excluding the sample results rejected in EPA's data validation process).

- Performance of supplemental sampling to satisfy the utility corridor PCB sampling criteria specified in the SOW and to provide additional Appendix IX+3 data. The results of that sampling were provided in the Supplemental PDI Report.

- 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 Conceptual Work Plan.

- Additional PCB sampling found to be necessary because, following completion of site survey activities within Newell Street Area II, GE learned that the locations of certain utilities were slightly different than had been shown on previous mapping, meaning that certain locations previously thought to be within a 50-foot-wide utility band were now understood to lie outside that band. GE also performed additional non-PCB sampling for dioxins/furans and lead within several areas where GE determined that the scope of anticipated removal actions needed to be expanded beyond the removal actions necessary to address PCBs. The results of the additional supplemental investigations were presented to EPA in the Conceptual Work Plan.

The results of the pre-design activities listed above were the basis for the PCB and Appendix IX+3 evaluations presented in the Conceptual Work Plan. The corresponding data summary tables providing the results of soil sampling activities were provided in Appendix B of the Conceptual Work Plan.

# 3. Summary of PCB and Appendix IX+3 Evaluation Procedures

## 3.1 General

This section of the Final Work Plan summarizes the procedures used by GE to determine the need for removal actions to achieve the PCB and Appendix IX+3 Performance Standards specified in the SOW for the averaging areas located within Newell Street Area II. This section provides an overview of the PCB evaluation procedures (Section 3.2), followed by an overview of the evaluation procedures for other Appendix IX+3 constituents (Section 3.3). In addition, it includes a summary of the Performance Standards under the CD and SOW related to natural resource restoration/enhancement activities within Newell Street Area II (Section 3.4).

## 3.2 Summary of PCB Evaluation Procedures

This section provides an overview of the PCB evaluation procedures for Newell Street Area II, including: (1) a description of the applicable PCB-related Performance Standards for this RAA; (2) the current status regarding the obtaining of Grants of Environmental Restrictions and Easements (EREs) for the properties located in Newell Street Area II; (3) an overview of PCB evaluation procedures for each averaging area; and (4) an overview of the utility corridor PCB evaluation procedures.

### 3.2.1 PCB-Related Performance Standards

For the Former Oxbow Areas at the CD Site, which include Newell Street Area II, the Performance Standards related to the presence of PCBs in soil are set forth in Paragraph 26 of the CD and Section 2.3.2 of the SOW. In addition, subsequent to entry of the CD, GE and EPA reached an agreement, embodied in a letter from GE to EPA dated July 16, 2001, concerning the scope of removal actions that will be conducted for the GE-owned Newell Street parking lot area, consistent with the Performance Standards contained in the CD and SOW for that area. In light of that agreement, the pertinent Performance Standards related to the presence of PCBs in soil at Newell Street Area II may be summarized as follows:

- GE must execute and record EREs for the GE-owned properties at Newell Street Area II (I9-7-1, J9-23-1, J9-23-3, J9-23-5, and J9-23-12). The City of Pittsfield has agreed to execute and record EREs for City-owned properties (J9-23-2 and the unnumbered City of Pittsfield property). In addition, GE must make "best efforts" (as defined in the CD) to obtain EREs at properties within the RAA not owned by GE or the City. If an ERE cannot be obtained at a property not owned by either GE or the City, GE must implement a Conditional Solution. The scope of soil-related removal actions at each of the properties in Newell Street Area II is dependent on whether an ERE is obtained or a Conditional Solution will be implemented, as discussed below.

- For the GE-owned Newell Street Area II parking lot area (certain portions of Parcel J9-23-12), GE shall install a 1-foot vegetative engineered barrier over the existing pavement/soil, except that such a barrier is not needed in discrete portions of this area where the average PCB concentrations are below the Performance Standards for recreational areas (10 parts per million [ppm] in the top foot, 15 ppm in the 1- to 3-foot depth increment, and 100 ppm in the top 15 feet), so long as the effectiveness of the barrier is not impaired by discontinuities in the barrier and any pavement in those areas is replaced with a native grassland community, as necessary to meet the applicable natural resource restoration/enhancement Performance Standards (described in Section 5.7). In addition, GE must obtain adequate flood storage compensation (as defined in the CD) for the barrier installed over the parking lot area (described in Section 5.8). The wooded portion of Parcel J9-23-12 was considered a separate averaging area during RD/RA activities.

- As indicated in the SOW, each averaging area subject to RD/RA evaluations within Newell Street Area II is classified as a recreational property. For each such recreational averaging area (other than the GE Newell Street parking lot area), the following Performance Standards must be achieved:

  – For areas where an ERE is obtained, GE must remove/replace soils as necessary to achieve spatial average PCB concentrations of 10 ppm in the top foot and 15 ppm in the 1- to 3-foot depth increment, and must install an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

  – For areas where an ERE cannot be obtained, GE must implement a Conditional Solution, which includes soil removal/replacement to achieve a spatial average PCB concentration of 10 ppm in both the top foot and top 3 feet of soil, and installation of an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

- Further, at each area that exceeds 0.5 acre in size, if GE elects to consider the entire area as an averaging area, GE must ensure the removal of all soil in the top foot in unpaved portions of those areas that contain PCB concentrations greater than 50 ppm -- the "not-to-exceed" (NTE) level. Alternatively, GE may establish averaging areas that do not exceed 0.5 acre in size or may propose other specific averaging areas to EPA for approval, in which case the above NTE level will not apply.

- In addition, at all areas where subgrade utilities potentially subject to emergency repair requirements are present, if the spatial average PCB concentration in the utility corridor exceeds 200 ppm, GE must evaluate whether any additional removal actions are necessary. Further, if subgrade utilities are installed, repaired, or replaced, GE must ensure that the spatial average PCB concentration in the backfill material is less than 10 ppm in the top 3 feet and 25 ppm at greater depths.

### 3.2.2 Status of EREs

As discussed above, Newell Street Area II comprises 10 properties (including the City of Pittsfield property). Parcels I9-7-1, J9-23-1, J9-23-3, J9-23-5, and J9-23-12 are owned by GE, which has agreed in the CD to execute EREs on its properties within the Site. Parcel J9-23-2 and the City of Pittsfield property are owned by the City of Pittsfield, which has likewise agreed in the CD to execute EREs on its properties within the Site. Under the provisions set forth in the CD, the EREs on GE and City properties at this RAA will be executed and recorded after completion of the removal actions.

The remaining parcels are not owned by GE or the City of Pittsfield. Parcels J9-23-6 and J9-23-8 are owned by WMECo, which has advised GE that it does not wish to impose EREs on its properties and instead has elected the Conditional Solution approach. With respect to Parcel J9-23-4, GE advised EPA and MDEP by letter dated September 11, 2003, that: (a) this parcel was previously owned by an individual who passed away and the City was in the process of assuming ownership due to non-payment of property taxes; (b) GE was unable to identify or reach any individual or entity with an ownership interest in this parcel to inquire whether the owner would agree to an ERE; and (c) therefore, GE will implement a Conditional Solution at this parcel.

### 3.2.3 Area-Specific PCB Evaluation Procedures

Section 3.2.3 of the Conceptual Work Plan detailed the general procedures used to evaluate PCB concentrations in soil on an area-specific basis for the properties located within Newell Street Area II. These procedures were established in Attachment E to the SOW (Protocols for PCB Spatial Averaging), and basically 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 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) repeating the evaluations for those areas in their proposed post-remediation condition to ensure that the proposed remediation would achieve the Performance Standards. The evaluation results were presented in Section 4 of the Conceptual Work Plan on an area-by-area basis, with supporting documentation (i.e., Theissen polygon maps and averaging tables) provided in Appendix D of that document.

### 3.2.4 Utility Corridor Evaluations

As discussed in Section 3.2.4 of the Conceptual Work Plan, subsurface utilities potentially subject to emergency repairs were also subject to additional evaluation activities. Specifically, the corridor associated with each such utility was evaluated by calculating the spatial average PCB concentration for each such corridor using the procedures described in Section 3.2.4 of the Conceptual Work Plan, and then comparing that average concentration to the PCB Performance Standard of 200 ppm for utility corridors. The results of these evaluations were presented in Section 4.12 of the Conceptual Work Plan.

## 3.3 Summary of Appendix IX+3 Constituent Evaluation Procedures

This section provides 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. As with PCBs, the other Appendix IX+3 constituents were evaluated first for each evaluation area in its existing condition. For each evaluation area where the applicable Performance Standards are not met, removal actions were proposed and post-remediation conditions were evaluated to ensure achievement of the Performance Standards.

### 3.3.1 Applicable Performance Standards

The applicable Performance Standards for non-PCB Appendix IX+3 constituents in soil at Newell Street Area II are included in Section 2.3.2 of the SOW. These standards include the following:

- For dioxins/furans, total Toxicity Equivalency Quotient (TEQ) concentrations must be calculated using the Toxicity Equivalency Factors (TEFs) developed by the World Health Organization (WHO) (van den Berg J. et al., Environ. Health Perspectives, Vol. 106, No. 12, Dec. 1998). Either the maximum TEQ concentration or the 95% Upper Confidence Limit on the mean (95% UCL) of the TEQ data must be below certain Preliminary Remedial Goals (PRGs) developed or approved by EPA for dioxin/furan TEQs. These PRGs are 1 part per billion (ppb) in the top foot and 1.5 ppb in the 1- to 3-foot depth interval. In addition, EPA previously requested, in a May 24, 2002 comment letter on the Conceptual Work Plan for Newell Street Area I, that GE also compare the maximum or 95% UCL TEQ concentrations to the following TEQ criteria, although these are not Performance Standards specified in the CD or SOW: 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 all recreational areas.

- For other non-PCB Appendix IX+3 constituents, any combination of the following must be achieved: (1) maximum concentrations of individual constituents that do not exceed the Screening PRGs established or approved by EPA (as discussed below); or (2) for the remaining constituents, average concentrations that either: (a) do not exceed the MCP Method 1 soil standards (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 $1 \times 10^{-5}$ and a non-cancer Hazard Index (HI) of 1.

### 3.3.2 Overview of Evaluation Process

The initial task performed in the evaluation of non-PCB Appendix IX+3 constituents in soil at Newell Street Area II 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 (as set forth in Exhibit F-1 to Attachment F of the SOW) or certain surrogate PRGs approved by EPA. Additional details regarding this screening step were provided in Section 3.3.3 of the Conceptual Work Plan.

- Second, for dioxin/furan TEQs, the maximum concentration or the 95% UCL at each area and relevant depth increment was compared to the applicable dioxin/furan PRG described above (as well as those additional criteria requested by EPA, where appropriate). Additional details regarding this evaluation step were provided in Section 3.3.4 of the 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 same depth increments used for the PCB evaluations, as specified in Section 3.2.1. These average concentrations were then compared to the MCP Method 1 soil standards for such constituents. Additional details regarding this evaluation step were provided in Section 3.3.5 of the 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 in the SOW for such evaluations. Additional details regarding this evaluation step were provided in Section 3.3.6 and Appendix G of the Conceptual Work Plan.

At averaging areas where the evaluations indicated the need for additional remediation to address non-PCB Appendix IX+3 constituents in soil, a remediation proposal was developed. Such areas generally consisted of those areas with exceedances of dioxin/furan TEQ PRGs or with significant exceedances of Method 1 soil standards such that an area-specific risk evaluation under existing conditions was not deemed warranted. The additional removal actions at these areas consisted of soil removal/replacement. For such areas, an evaluation was then conducted of post-remediation conditions. This evaluation consisted of repeating Steps 2 through 4 of the above-described process, as necessary, to demonstrate that the proposed removal actions will achieve the applicable Performance Standards for non-PCB Appendix IX+3 constituents. The specific procedures used to take account of the proposed soil removal/replacement in these post-remediation evaluations were discussed in Section 3.3.7 of the Conceptual Work Plan. The evaluation results were summarized on an area-by-area basis in

Section 4 of the Conceptual Work Plan, with supporting documentation provided in Appendices F (evaluation tables) and G (risk assessment) of that document.

## 3.4 Performance Standards for Natural Resource Restoration/Enhancement Activities

Attachment I to the SOW sets forth the Performance Standards and other requirements for the natural resource restoration/enhancement activities at Newell Street Area II. These Performance Standards and requirements apply to the GE Newell Street parking lot area (at Parcel J9-23-12). In connection with the removal actions for this area, GE is required to enhance the habitat in the parking lot area through the planting of herbaceous vegetation and placement of other items in this area. Specifically, the Performance Standards for this area are as follows:

- GE shall plant an herbaceous native grassland community on the surface of the vegetative engineered barrier, using a mixture of native grass and wildflower species.

- In addition to the vegetative enhancements, GE shall place uncontaminated stumps and rock piles randomly throughout this vegetated area to provide habitat for fossorial and ground-dwelling wildlife. Further, GE shall place bluebird boxes along the edge of the former parking lot area adjacent to the Housatonic River with a minimum of 300 yards between boxes.

To achieve these Performance Standards, Attachment I to the SOW sets forth more specific requirements relating to these activities. Plans for implementing these natural resource restoration/enhancement activities following installation of the vegetative engineered barrier are described in Section 5.7.

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

## 4.1 General

Section 4 of the Conceptual Work Plan presented the results of the area-specific PCB and Appendix IX+3 evaluations which were performed in accordance with the evaluation procedures summarized in Section 3 of that document. The Conceptual Work Plan presented the following information for each averaging area located within Newell Street Area II:

- Description of area and identification of applicable Performance Standards;
- Evaluation of existing conditions with respect to PCBs and discussion of the need for removal actions to address PCBs;
- Evaluation of existing conditions with respect to other Appendix IX+3 constituents and discussion of the need for removal actions to address these constituents;
- Description of proposed removal actions (as shown on Figure 4-1 of the Conceptual Work Plan);
- Evaluation of post-remediation conditions with respect to PCBs; and
- Evaluation of post-remediation conditions with respect to other Appendix IX+3 constituents, if required.

Following discussion of the above-referenced averaging area-specific evaluations, the Conceptual Work Plan presented the required utility corridor evaluation for PCBs. Finally, the Conceptual Work Plan presented an overall summary of the removal actions for Newell Street Area II, including the soil removal volumes and engineered barrier installation areas.

In support of the PCB and Appendix IX+3 evaluations, the Conceptual Work Plan included backup documentation for the evaluations. Specifically, the spatial averaging tables and Theissen polygon maps developed in support of the area-specific PCB evaluations were presented in Appendix D of the Conceptual Work Plan, while the spatial averaging tables and Theissen polygon maps developed in support of the utility corridor PCB evaluations were presented in Appendix E of that document. Appendix F of the Conceptual Work Plan contained the evaluation tables developed in support of the Appendix IX+3 evaluations and Appendix G of that report presented the area-specific risk evaluations.

## 4.2 Overall Summary

Based on the evaluations presented in Section 4 of the Conceptual Work Plan, that document proposed removal actions consisting of soil removal/replacement and/or installation of engineered barriers at each of the 10 averaging areas at Newell Street Area II. In addition to the soil removal actions proposed in the Conceptual Work Plan, GE has now, as directed by EPA in its November 4, 2004 conditional approval letter, considered extending the proposed removal actions (either soil removal or installation of engineered barrier) in several specific areas suggested in that letter. In each of these cases, the extent of removal or engineered barrier installation specified in the Conceptual Work Plan satisfies the Performance Standards. Nonetheless, based on considerations of design and constructability, GE has elected to perform the following additional removal actions:

- Soil removal activities specified in the Conceptual Work Plan for Parcel I9-7-1 will be expanded as requested in Condition No. 1(a) of EPA's conditional approval letter, to include the top foot of soil bounded between the pink polygon shown on Figure 4-1 of the Conceptual Work Plan and the riverbank soil along the East Branch of the Housatonic River;

- Soil removal activities specified in the Conceptual Work Plan for Parcel J9-23-1 will be expanded as requested in Condition No. 1(b) of EPA's conditional approval letter, to include the top foot of soil bounded between the pink polygon shown on Figure 4-1 of the Conceptual Work Plan and the riverbank soil along the East Branch of the Housatonic River;

- Surface cover installation activities specified in the Conceptual Work Plan for Parcel J9-23-8 will be expanded as requested in Condition No. 1(e) of EPA's conditional approval letter, to include (1) placement of the barrier over soil in the vicinity of N2SC-08 which is bounded by polygon 399 at the 3- to 4-foot depth interval; and (2) expansion of the barrier over soil in the vicinity of sample location RAA13F-94 and NS-21 and bounded by the northwest corner of Parcel J9-23-9; and

- Soil removal activities specified in the Conceptual Work Plan for the City of Pittsfield property will be expanded as requested in Condition No. 1(f) of EPA's conditional approval letter, to include the top foot of soil bounded between the pink polygon in the vicinity of RAA13-Z85 as shown on Figure 4-1 of the Conceptual Work Plan and the riverbank soil along the East Branch of the Housatonic River.

With regard to the other expansions that EPA asked GE to consider, GE has evaluated these other expansions and has determined that (1) they are not necessary to achieve the Performance Standards, and (2) considerations associated with constructability or design do not require these expansions.

GE has also expanded the areas subject to removal based on utility corridor-related conditions set forth in EPA's November 4, 2004 conditional approval letter. The additional removal actions to be performed by GE are as follows:

- Soil removal activities specified in the Conceptual Work Plan for the Utility Area 2 (the City of Pittsfield property) will be expanded as requested in Condition No. 2(a) of EPA's conditional approval letter, to include removal of soils from the PCB polygons associated with sample RAA13-F91 to a depth of 5 feet; and

- Soil removal activities for the Utility Area 4 (the Eastern Portion of the 48-Inch Line) will be conducted as requested in Condition No. 2(b) of EPA's conditional approval letter, to include removal of soils from the PCB polygons associated with samples NS-1 and NS-1A to a depth of 8 feet.

### 4.2.1 PCB Evaluation Summary

Table 4-1 below lists the post-remediation average PCB concentration for each depth increment subject to evaluation at each averaging area, as presented in the Conceptual Work Plan, as well as the applicable PCB Performance Standard for that depth increment. It should be noted that the post-remediation average PCB concentrations presented in Table 4-1 for the Newell Street Area II averaging areas are those previously reported in the Conceptual Work Plan and have not been revised to incorporate the above-listed additional removal actions performed voluntarily by GE and the additional utility corridor-related removals required by EPA, as discussed in the preceding section. The evaluations were not subject to revision since the post-remediation conditions for each averaging area specified in the Conceptual Work Plan already satisfied the applicable PCB Performance Standards and revising these evaluations to incorporate the performance of additional removal actions voluntarily performed by GE would only further lower the applicable post-remediation average PCB concentrations.

Table 4-1 also lists the currently estimated volume of soil removal and estimated area requiring installation of engineered barriers at each averaging area. The soil removal volumes and the areas to be covered by engineered

barriers presented in this table are greater than those specified in the Conceptual Work Plan. The soil removal volumes and engineered barrier area specified in the Conceptual Work Plan were developed to satisfy the PCB and non-PCB Performance Standards. The revised soil removal volumes and engineered barrier areas specified in Table 4-1 below include the volumes and areas specified in the Conceptual Work Plan as well as the additional volumes removed and areas to be covered as part of the performance of the additional removal actions being performed voluntarily by GE, the additional utility corridor-related removal required pursuant to EPA's November 4, 2004 conditional approval letter, and miscellaneous additional removal actions associated with the design and constructability of the soil removal actions.

**Table 4-1**

**Final Average PCB Concentrations and Estimated Soil Removal Volumes/Engineered Barrier Areas**

| Parcel | Final Average PCB Concentration (ppm) | PCB Performance Standard (ppm) | Estimated Soil Removal Volume (cubic yards) | Estimated Engineered Barrier Area (sq. ft.) |
|---|---|---|---|---|
| ***I9-7-1*** | | | 50 | 0 |
| 0 – 1' | 5.8 | 10 | | |
| 1 – 3' | 4.6 | 15 | | |
| 0 – 15' | 1.4 | 100 | | |
| ***J9-23-1*** | | | 470 | 0 |
| 0 – 1' | 6.0 | 10 | | |
| 1 – 3' | 4.7 | 15 | | |
| 0 – 15' | 1.1 | 100 | | |
| ***J9-23-2*** | | | 110 | 0 |
| 0 – 1' | 8.4 | 10 | | |
| 1 – 3' | 9.7 | 15 | | |
| 0 – 15' | 3.5 | 100 | | |
| ***J9-23-3*** | | | 250 | 0 |
| 0 – 1' | 5.2 | 10 | | |
| 1 – 3' | 0.1 | 15 | | |
| 0 – 15' | 14.9 | 100 | | |
| ***J9-23-4*** | | | 690 | 0 |
| 0 – 1' | 2.3 | 10 | | |
| 0 – 3' | 0.8 | 10 | | |
| 0 – 15' | 87.1 | 100 | | |
| ***J9-23-5*** | | | 590 | 0 |
| 0 – 1' | 1.1 | 10 | | |
| 1 – 3' | 0.4 | 15 | | |
| 0 – 15' | 35.4 | 100 | | |

| Parcel | Final Average PCB Concentration (ppm) | PCB Performance Standard (ppm) | Estimated Soil Removal Volume (cubic yards) | Estimated Engineered Barrier Area (sq. ft.) |
|---|---|---|---|---|
| ***J9-23-6*** | | | 370 | 1,050 |
| 0 – 1’ | 3.0 | 10 | | |
| 0 – 3’ | 1.9 | 10 | | |
| 0 – 15’ | 62.9 | 100 | | |
| ***J9-23-8*** | | | 9,140 | 51,050 |
| 0 – 1’ | 6.2 | 10 | | |
| 0 – 3’ | 6.3 | 10 | | |
| 0 – 15’ | 64.2 | 100 | | |
| ***J9-23-12 (parking lot)*** | | | 390[1] | 99,900 |
| 0 – 1’ | NA[2] | NA[2] | | |
| 1 – 3’ | | | | |
| 0 – 15’ | | | | |
| ***J9-23-12 (wooded area)*** | | | 1,530 | 0 |
| 0 – 1’ | 2.1 | 10 | | |
| 1 – 3’ | 9.8 | 15 | | |
| 0 – 15’ | 4.8 | 100 | | |
| ***City of Pittsfield Property*** | | | 920 | 3,750 |
| 0 – 1’ | 5.0 | 10 | | |
| 1 – 3’ | 5.3 | 15 | | |
| 0 – 15’ | 55.4 | 100 | | |
| **Total:** | | | **14,510** | **155,750** |

Notes:

1. Soil removal is not necessary to satisfy Performance Standards. Removal is being performed as required by EPA in its November 4, 2004 conditional approval letter (Condition No. 2(b)).
2. Not applicable. PCB evaluations were not required for the specified area because the GE Newell Street parking lot area will be subject to installation of an engineered barrier in accordance with the CD and SOW.

As indicated in the above table, the removal actions for Newell Street Area II will involve excavation of approximately 14,510 cubic yards of soil and the installation of approximately 3.6 acres of engineered barrier.

### 4.2.2 Utility-Related PCB Information

Table 4-2 below lists the post-remediation average PCB concentration for each of the four utility areas specified in the Conceptual Work Plan. For Utility Areas 1 and 3, the post-remediation average PCB concentrations presented below are those previously reported in Section 4.12 of the Conceptual Work Plan. For Utility Areas 2

and 4, the post-remediation average PCB concentrations have been modified to reflect additional removal actions to be conducted by GE pursuant to Condition No. 2 of EPA's November 4, 2004 conditional approval letter. In addition, revised post-remediation average PCB evaluations for Utility Areas 2 and 4 have been included in Attachment A.

**Table 4-2**

**Final Average PCB Concentrations for Utility Corridors**

| Utility Corridor | Average PCB Concentration (ppm) | Performance Standard (ppm) |
|---|---|---|
| Utility Area 1: Sackett Street | 0.5 | 200 |
| Utility Area 2: City of Pittsfield Property | 184.6 | 200 |
| Utility Area 3: Western Portion of 48-Inch Line | 164.3 | 200 |
| Utility Area 4: Eastern Portion of 48-Inch Line | 206.7 | 200 |

Estimated soil removal volumes associated with removal actions to be conducted within each utility area have been incorporated into the removal volumes identified above in Table 4-1.

With regard to Utility Area 4, as indicated above, GE has incorporated into its evaluations the additional removal required by Condition No. 2(b) of EPA's November 4, 2004 conditional approval letter. As noted in the Conceptual Work Plan, Utility Area 4 is located entirely on GE-owned property, which will be subject to an ERE and covered by an engineered barrier. Under the terms of the ERE that will be applicable to this property, no non-emergency excavation will be allowed in areas with engineered barriers unless the owner obtains a Conditional Exception from MDEP, and emergency excavations will be subject to separate requirements. Therefore, the restrictions built into the EREs will allow the Agencies (as well as GE) an opportunity to evaluate any planned excavation in these areas to ensure that appropriate measures are taken, including both health and safety precautions and soil disposition activities.

Moreover, as also noted in the Conceptual Work Plan, in the event that repairs to this utility are necessary in the future, GE is required by the Performance Standards in the SOW to ensure that the spatial average PCB concentration of the backfill materials is at or below 10 ppm in the top 3 feet and 25 ppm at greater depths.

Such activity would further reduce the average PCB concentration for the entire utility corridor for subsequent excavations.

### 4.2.3 Appendix IX+3 Evaluation Summary

As previously indicated, information regarding the post-remediation concentrations of non-PCB Appendix IX+3 constituents and corresponding area-specific risk evaluations (where necessary) is provided in Appendix F and Appendix G, respectively, of the Conceptual Work Plan.

## 4.3 Flood Storage Information

Since each of the averaging areas located included within Newell Street Area II is located entirely within the 100-year floodplain for the Housatonic River (which is situated at approximate elevation 990.5 feet in the vicinity of Newell Street Area II), compensatory flood storage will be required to offset the loss of flood storage capacity associated with the installation of engineered barriers or other ancillary items in locations where soil removal is not proposed. Information regarding the volume of lost flood storage capacity associated with the proposed removal actions is further discussed in Section 5.8.

# 5. Design Information

## 5.1 General

The primary objectives for the Newell Street Area II Removal Action involve the reduction of PCB and Appendix IX+3 constituent concentrations to levels that are protective of human health and the environment. This section discusses the removal action activities necessary to achieve those objectives. These activities generally consist of the excavation of impacted material, disposal of this material at On-Plant Consolidation Areas (OPCAs) located at the GE Pittsfield facility, backfilling of excavations with clean material, placement of a 1-foot-thick (minimum) engineered barrier over the surface of specific areas (in accordance with Technical Drawings 4 through 9), 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 is currently in the process of selecting a Remediation Contractor to perform the removal actions proposed herein. Section 6 provides further details regarding that selection process, while Section 7 provides additional site-specific implementation details associated with construction of the various design components.

## 5.2 Technical Specifications

Preliminary technical design information regarding soil removal and the installation of engineered barriers within Newell Street Area II was provided in the Conceptual Work Plan. In addition, certain of the plans comprising GE's Project Operations Plan (POP) provide additional design, construction, and implementation-related information relevant to the construction activities. With the exception of the FSP/QAPP and the Health and Safety Plan (HASP) (which was provided to EPA for informational purposes only), the latest revisions to the POP plans were conditionally approved by EPA in a letter dated April 24, 2003, and were submitted to EPA on July 14, 2003.

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, ranging from initial pre-design activities to the performance and completion of remediation activities. 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 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 Newell Street Area II construction activities and are incorporated herein by reference.

Since the time the Conceptual Work Plan was submitted to EPA in July 2004, GE has further developed the technical design of the removal actions for Newell Street Area II. The various design details are summarized in this Final Work Plan, but are more specifically described in the Technical Drawings and Specifications developed by GE for use in selecting a Remediation Contractor. Copies of the Technical Drawings and Specifications are provided in Attachments B and C, respectively, and include those related to soil removal and engineered barrier installation, as well as other construction elements. The Technical Drawings and Specifications in Attachments B and C, respectively, include project-specific construction quality assurance requirements for engineered barriers.

## 5.3 Soil Removal Activities

As described in Section 4.2, GE will remove approximately 14,510 cubic yards of soil from the properties comprising Newell Street Area II. Based on a review of the analytical data located within the limits of removal actions, soils subject to removal will be transported to and properly disposed of at the Building 71 OPCA, as further described in Section 7.5.3. Prior to initiating removal activities for the areas subject to soil removal, the horizontal limits of removal will be surveyed and staked in the field. During removal activities, field measurements will be made to verify that the target removal depths/elevations have been achieved for each excavation area. Following removal, common backfill will be obtained from an off-site source (Sections 5.5 and 7.5.5) and will be placed and compacted to re-establish the original grade and/or subgrade elevation for an engineered barrier. The provisions specified in the Technical Drawings (Attachment B), Technical Specifications (Attachment C), and the POP (including the Soil Cover/Backfill Characterization Plan and the CQAP) will be utilized during the removal and backfill activities.

## 5.4 Excavation Stabilization

For removal areas where excavations will exceed 4 feet in depth and where Contractor personnel will enter the excavations to perform work, the Remediation Contractor will be required to provide some form of excavation sidewall stability in accordance with Occupational Health and Safety Administration (OSHA) requirements. These methods may include, but not be limited to, 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 Contractor, a Professional Engineer licensed in the Commonwealth of Massachusetts will design and stamp the system.

## 5.5 Backfilling Excavations

Soil fill, topsoil, and engineered barrier components will be used to backfill the excavations at Newell Street Area II. 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 Specifications provided in Attachments B and C, respectively.

The specific fill sources to be used for this project will be identified by the selected Remediation Contractor. The backfill materials to be used at these properties will originate either from existing sources or from new, currently unidentified sources of backfill material. Existing sources of backfill 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), semivolatile organic compounds (SVOCs), and metals. If such existing, approved sources have been used by GE within the past 18 months, these prior analytical data will not be resubmitted to EPA. For any backfill 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 in the POP. The name of the proposed backfill source location and the results of the analyses for PCBs and Appendix IX+3 VOCs, SVOCs, and metals (if necessary) will be submitted to EPA in a supplemental information package prior to the use of such material.

## 5.6 Engineered Barrier

As established in Technical Attachment G to the SOW, the minimum thickness of the engineered barrier to be placed in certain areas of Newell Street Area II is 1 foot. This minimum thickness will be installed/achieved within all areas in which engineered barriers are to be constructed; however, in several areas, the thickness of the engineered barrier will be greater than 1 foot in order to accommodate the variability in the current topography of the area and to provide a final surface that is fairly level but promotes drainage of rainfall runoff (i.e., a downward slope of approximately 1.5% to 2%), as shown by the targeted final grade contours on Technical Drawings 5B and 6B.

The total extent of the engineered barrier to be placed within Newell Street Area II encompasses approximately 155,750 square feet (sq. ft.) across the entire RAA, of which, approximately 99,900 sq. ft. will be subject to the performance of natural resource restoration/enhancement activities within the GE parking lot area of Parcel J9-23-12 in accordance with the CD and SOW. The scope of natural resource restoration/enhancement activities is further discussed in Section 5.7.

Engineered barriers will consist of a layer of non-woven geotextile, geomembrane liner, geocomposite drainage net, fill material, and a suitable cover. The type of cover will depend on the specific area. The cover for vegetated portions of the engineered barriers will consist of a topsoil layer, which will be subject to vegetative planting as specified in the Technical Specifications provided in Attachment C. Specific vegetative requirements associated with the natural resource restoration/enhancement activities are further described in Section 5.7 below.

GE noted in the Conceptual Work Plan that it anticipated that a non-paved access road would be needed across a portion of the vegetative engineered barrier to allow for access to groundwater/NAPL monitoring and recovery wells during the performance of monitoring and maintenance activities. GE has now determined that a paved access road would be preferable because it will provide greater protection of the engineered barrier components and require less monitoring and maintenance. Therefore, the Technical Drawings provided in Attachment B provide for the construction of a paved access road in the areas indicated in Technical Drawings 4, 5A, and 5B of Attachment B. Cross-sections depicting the various cover configurations are provided on Technical Drawings 7 and 8.

## 5.7 Natural Resource Restoration/Enhancement Activities

As discussed in the Conceptual Work Plan, the CD and SOW require GE to implement a number of natural resource restoration/enhancement activities at the GE Newell Street parking lot area (at Parcel J9-23-12) in accordance with the Performance Standards and other requirements set forth in the CD and SOW. Following installation of the engineered barrier within the parking lot portion of Parcel J9-23-12, GE will implement the following natural resource restoration/enhancement measures within the area covered by the vegetative engineered barrier in accordance with the applicable Performance Standards and requirements set out in Attachment I to the SOW:

- GE will plant a variety of herbaceous species 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. The grassland species to be used in the plantings will include a mixture of native warm-season grass and wildflower species, such as big bluestem (*Andropogon gerardi*), little bluestem (*Andropogon scoparius*), indian grass (*Scorghastrum nutans*), wild blue lupine (*Lupinus perennis*), Canada wild-rye (*Elymus canadensis*), Canada goldenrod (*Solidago Canadensis*), common milkweed (*Asclepias syriaca*), beard tongue (*Pestamon digitalis*), grass-leaved goldenrod (*Euthamia graminifolia*), blue verain showy tick-trefoil (*Desmodium canadense*), roundhead blush clover (*Lespidesa capitata*), and wild bergamont (*Monarada fistulosa*). To ensure soil stability and prevent erosion, a nurse crop of annual rye-grass (*Lolium temulentum*) will be added to the seed mixture. The seed mixture will be seeded at a rate of 25 pounds per acre.

- To provide habitat primarily for fossorial and ground-dwelling wildlife, GE will place uncontaminated stumps and rock piles randomly throughout the GE Newell Street parking lot area at a minimum spacing of 100 feet. The stumps and piles will be approximately 6 feet in diameter and no more than 3 feet in height. The stumps and rocks will be obtained by GE from an off-site source.

- GE will also place bluebird boxes along the edges of the GE Newell Street parking lot area adjacent to the river, with a minimum of 300 yards between boxes.

Additional details related to the scope of natural resource restoration/enhancement activities will be provided to EPA in the supplemental information package. This information is anticipated to include a site plan showing the proposed locations of the stump and rock piles, installation techniques, and seeding procedures. In addition,

Section 7.0 of Attachment I to the SOW provides general specifications that will be followed for all plantings to be conducted as part of habitat restoration/enhancement activities at the parking lot area. Finally, Section 8.0 of Attachment I to the SOW requires that GE monitor, inspect, and maintain the plantings and structures in accordance with the Performance Standards and other requirements specified therein.

## 5.8 Flood Storage Capacity

As discussed in the Conceptual Work Plan, for the soil removal/replacement activities, it is expected that the excavation and backfill/restoration activities will be conducted in such a manner as to re-establish the same general ground surface and topography of the affected areas (to the extent feasible), so that there is minimal net change in flood storage capacity for these actions. Further, the engineered barriers at properties other than the GE parking lot area on Parcel J9-23-12 will be located within areas requiring soil removal. Therefore, it is anticipated that these barriers will be installed to match the existing grade (to the extent feasible), thus avoiding any appreciable impact on flood storage capacity.

As shown on Technical Drawings 5B and 6B, the installation of the engineered barrier at GE's Newell Street parking lot area (at Parcel J9-23-12) will result in the loss of flood storage capacity within this RAA. GE has performed calculations to determine the need for additional flood storage capacity at this RAA. The results of these calculations are presented in Attachment D and summarized below.

Comparison of the final grading configuration within areas subject to installation of an engineered barrier (depicted on Technical Drawings 5B and 6B) to the existing surface grades (depicted on Technical Drawings 1 and 3) shows that installation of the proposed engineered barriers would result in a loss of flood storage capacity totaling approximately 6,270 cubic yards. To offset this loss in flood storage capacity, GE will obtain the necessary flood storage compensation through gains in flood storage capacity resulting from other projects within the 100-year floodplain.

## 5.9 Applicable or Relevant and Appropriate Requirements

The removal actions to be conducted at Newell Street Area II will be subject to several ARARs. Attachment B to the SOW identifies the chemical-specific, action-specific, and location-specific ARARs for Removal Actions Outside the River. As noted above, the Removal Action for Newell Street Area II includes soil

removal/replacement and installation of engineered barriers. All of these activities will be performed within the 100-year floodplain of the Housatonic River. In these circumstances, the Newell Street Area II Removal Action is subject to the following ARARs identified in Attachment B to the SOW: the action-specific ARARs identified in Table 2, subsection B ("Soil Removal"), subsection C ("Surface Cover Activities"), subsections I and J (regarding consolidation of excavated soils at the OPCAs), and potentially subsection K ("Other"); and the location-specific ARARs identified in Table 3, subsection B ("Floodplains, Wetlands, and Banks"). If excavation activities involve removal and on-site storage (at the GE Plant Area) of free product, intact drums, and/or other materials that cannot be consolidated at the OPCAs and thus will be subsequently disposed of off-site, 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 Attachment B to the SOW will apply to such storage. In addition, the disposition of excavated materials at GE's OPCAs will be subject to the ARARs for consolidation at the OPCAs (set forth in Table 1 of the Detailed Work Plan for OPCAs).

A summary of the key ARARs that were considered with respect to the removal actions proposed 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 |
|---|---|---|
| Toxic Substances Control Act (TSCA) Regulations (PCB Remediation Waste) (40 CFR 761.61) | • Soil removal<br>• Surface cover activities | • 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) | • Soil removal (equipment cleaning) | • Will be attained by cleaning equipment as necessary in accordance with TSCA regulations (see Section 7.5.10). |
| Resource Conservation and Recovery Act (RCRA) Hazardous Waste Regulations (40 CFR 261.24) | • Soil removal | • Appendix IX+3 evaluations (Section 4 of Conceptual Work Plan). |

| ARAR | Associated Project Components | Means by Which ARAR Will Be Addressed |
|---|---|---|
| Clean Water Act NPDES Regulations (Stormwater Discharges)<br>[40 CFR 122.44(k);<br>40 CFR 122.26(c)(ii)(C);<br>40 CFR 125.100-.104] | • Soil removal<br>• Surface cover activities | • Implementation of erosion and sedimentation controls (Section 7.4.5). |
| Massachusetts Air Pollution Control Requirements<br>(310 CMR 7.09) | • Soil removal<br>• Surface cover activities | • Implementation of dust control measures (as necessary) and air monitoring (Sections 7.5.3 and 7.6). |
| TSCA Regulations (Storage for Disposal)<br>(40 CFR 761.61;<br>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.<br>• 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)<br>(40 CFR 761.40) | • Temporary storage of removed materials | • Will be attained by marking PCB items in accordance with these requirements. |
| RCRA Hazardous Waste Regulations (Storage of Hazardous Waste)<br>(40 CFR 264, Subparts I and J<br>40 CFR 262.34) | • 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.<br>• Temporary storage of drums and other equipment in containers at GE's existing on-plant hazardous waste storage facility.<br>• 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.<br>• 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. |

| ARAR | Associated Project Components | Means by Which ARAR Will Be Addressed |
|---|---|---|
| RCRA Hazardous Waste Management/Disposal Facilities Regulations (Preparedness and Prevention) (40 CFR 264, Subparts C) | • Temporary storage of removed materials | • 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 | • Operation of GE's existing on-plant hazardous waste storage facility meets these requirements. |
| RCRA Hazardous Waste Management/Disposal Facilities Regulations (Closure) (40 CFR 264.111 - .115) | • Temporary storage of removed materials | • 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. |
| Massachusetts Hazardous Waste Regulations (Storage of Hazardous Waste) (310 CMR 30.680, 30.690 310 CMR 30.340) | • Temporary storage of removed materials | • 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 | • See discussion of Federal RCRA Hazardous Waste Regulations (Closure) above. |
| ARARs Relating to Disposition of Excavated Materials in OPCAs | • Permanent consolidation of removed materials at OPCAs | • Refer to August 25, 1999 letter from GE to EPA re: *Supplemental Addendum to June 1999 Detailed Work Plan*, for relevant ARARs relating to disposition of excavated material at the OPCAs and means of addressing such ARARs. |
| TSCA Spill Cleanup Policy (40 CFR 761, subpart G) | • 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. |
| Executive Order for Floodplain Management [Exec. Order 11988 (1977); 40 CFR Part 6, App. A; 40 CFR 6.302(b)] | • Soil removal and surface cover activities in floodplain | • No practical alternative with less adverse impact on floodplain.<br>• Implementation of erosion and sedimentation controls (Section 7.4.5).<br>• Provision of compensatory flood storage capacity to offset loss in flood storage capacity (Section 5.8).<br>• Restoration of habitat (Section 7.5.11). |

| ARAR | Associated Project Components | Means by Which ARAR Will Be Addressed |
|---|---|---|
| Massachusetts Wetlands Protection Act and Regulations [MGL c. 131 §40; 310 CMR 10.53(3)(q); 310 CMR 10.54-.58] | • Soil removal<br>• Placement of fill materials within 100-year floodplain<br>• Natural Resource Restoration/Enhancement Activities | • No practical alternative with less adverse impact on resource areas.<br>• All practical measures will be taken to minimize adverse impact on river.<br>• Implementation of erosion and sedimentation controls (Section 7.4.5).<br>• Natural Resource Restoration/ Enhancement Activities (Section 5.7).<br>• Provision of compensatory flood storage capacity to offset loss in flood storage capacity (Section 5.8).<br>• Restoration of disturbed vegetation (Section 7.5.11). |

# 6. Contractor Selection

Prior to conducting the planned Removal Action as described above, GE will select a Remediation Contractor that is qualified to complete the on-site soil remediation/construction activities. To accomplish this, GE will develop a Request for Proposal (RFP) that describes the project, provides the Technical Drawings contained herein, provides Technical Specifications for completing the work, and solicits bids from prospective Contractors. GE anticipates submitting an RFP to prospective Remediation Contractors by April 1, 2005, with a request that they prepare their bids and return them to GE by April 21, 2005.

Based on these requests, GE anticipates that the potential Contractors will return their bids to GE for review by approximately April 21, 2005. GE and its Supervising Contractor (Blasland, Bouck & Lee, Inc.) will then review the potential Contractor bids for completeness, relevant experience, the proposed work schedule, and the Contractors' financial status. After the review is complete, GE will select the Remediation Contractor and initiate a contractual agreement. GE anticipates that this will occur on or about May 2, 2005.

Upon selection of a successful bidder, the Remediation Contractor will be responsible for providing several submittals to GE, including those identified in Section 7.3 of this Final Work Plan. GE will subsequently provide the Contractor information and submittals to EPA in a supplemental information package, as described in Section 9 of this 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, those plans will be followed during implementation of the Newell Street Area II Removal Action.

As a supplement to the implementation-related procedures specified in the POP plans, this section provides additional details regarding certain 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 perimeter air monitoring approach.

## 7.2 Project Participants

To the extent possible, the following table identifies the key project participants involved in the design and implementation of the Newell Street Area II remediation/construction activities, along with their project roles and contact information:

| Organization/Contact | Role | Address and Phone Number |
|---|---|---|
| United States Environmental Protection Agency<br><br>William P. Lovely, Jr. | - Lead regulatory agency.<br>- Review and approval of Final Work Plan.<br>- Oversight of removal actions. | USEPA Region 1<br>One Congress Street, Suite 1100<br>Boston, MA 02114-2023<br>(617) 918-1240 |

| Organization/Contact | Role | Address and Phone Number |
|---|---|---|
| General Electric Company<br><br>Richard W. Gates | - Supervise pre-design, construction, and documentation activities related to the Newell Street Area II Removal Action.<br>- Supervise implementation of the Removal Action and related activities to ensure that they are conducted in accordance with the CD.<br>- Direct/coordinate activities of the Remediation Contractor and other GE-contracted organizations.<br>- Responsible for preparation of a Final Completion Report. | General Electric Company<br>159 Plastics Avenue<br>Building 59<br>Pittsfield, MA 01201<br>(413) 448-5909 |
| Blasland, Bouck & Lee, Inc.<br><br>James M. Nuss, P.E., LSP | - Supervising Contractor for GE.<br>- Review Remediation Contractor submittals.<br>- Project coordination and documentation.<br>- Provide technical assistance related to the implementation of the Removal Action.<br>- Assist in verifying that the Removal Action is complete and performed in accordance with the Work Plan.<br>- Prepare Final Completion Report. | Blasland, Bouck & Lee, Inc.<br>6723 Towpath Road<br>Syracuse, NY 13214<br>(315) 446-9120 |
| Berkshire Environmental Consultants<br><br>Maura Hawkins | - Design and implement perimeter air monitoring in conjunction with construction activities. | Berkshire Environmental Consultants, Inc.<br>152 North Street, Suite 250<br>Pittsfield, MA 01201<br>(413) 443-0130 |
| Remediation Contractor (To be determined) | - Implement all construction-related activities. | (To be determined) |

## 7.3 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. Those submittals include an Operations Plan, HASP, and Contingency Plan. Each of these submittals is further described below.

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. This plan will be prepared in consultation with GE and its Supervising Contractor and will include the following:

- List of equipment to be used on-site;
- Recreational property protection procedures;
- Work Schedule;
- The Contractor's proposed plan for controlling vehicular and pedestrian traffic during the performance of construction activities;
- Proposed sheetpiling design (if applicable) or alternate excavation stabilization measures;
- The Contractor's qualifications package (if requested by GE);
- Stormwater (including run-on and run-off), erosion, noise, and dust control measures;
- The Contractor's proposed excavation approach;
- 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 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 drainageway, a flood control contingency plan to identify measures to protect the work site(s) and the waterway from impacts in the event of high water and/or flood conditions;
- 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.

In addition to the required pre-mobilization document submittals specified above, the Remediation Contractor will be required to prepare a submittal(s) specifying the sources and, if necessary, the corresponding analytical data for proposed backfill sources to be used during the performance of this project.

Once developed by the selected Remediation Contractor and approved by GE, each of the above-listed Contractor submittals will be submitted to EPA in a supplemental information package. In addition to these submittals, the Contractor is 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 provided to the prospective Contractors as part of the RFP for this project is provided in Attachment E. (Please note that submittals required by GE but not subject to submittal to EPA as part of the supplemental information package have been shaded.)

## 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;
- Site survey and layout;
- Installing erosion and sedimentation control measures; and
- Surface preparation.

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 through 6B, certain above ground and subsurface utilities are known to be present within and adjacent to Newell Street Area II. Subsurface utilities include sanitary sewer lines located within each of the utility areas specified in the Conceptual Work Plan. Above ground utilities include the overhead power lines

located on Parcels J9-23-6 and J9-23-8. In addition to these utilities, there is aboveground and underground piping and/or electrical wiring associated with GE's ongoing NAPL recovery operations at Newell Street Area II. Additional details regarding the temporary shut-down/start-up of this NAPL recovery system are provided in Section 7.5.7. The selected Contractor will be responsible for coordinating with DIGSAFE to determine the locations of all utilities at the start of the work and coordinating with the owners of the utilities regarding relocation/termination of any utilities, as required.

GE will work with the selected Contractor in coordinating with WMECo (and any other related utility companies) to identify the presence of underground wiring associated with the high tension electrical towers located on Parcels J9-23-6 and J9-23-8. Earlier, following submittal of the Conceptual Work Plan, GE met with WMECo to discuss the anticipated removal actions to be performed at Parcels J9-23-6 and J9-23-8. During that meeting, GE inquired about the presence of any potential underground wiring associated with the towers and information related to the footer foundation beneath each of the towers. GE was provided various contact information to obtain this information during, and following, this meeting. GE has attempted to contact these individuals and recently received a return phone call. GE and the selected Remediation Contractor (once determined) will continue to communicate with WMECo (and any other related utility companies) in an effort to obtain this information. In the event this information is obtained prior to submitting the supplemental information package, it will be included.

### 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.

**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, are typically held with the 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 (i.e., flashing beacons mounted on sawhorses).

### 7.4.3 "Clean" Access Area

Since a number of activities will require periodic access/egress between the work site and adjacent areas, a "clean" transition area will be established. Such an area 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 transport area will be constructed of gravel or a layer of geotextile fabric and will be properly delineated from the remainder of the property. The specific location and construction of the access area 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.

### 7.4.4 Survey Control

In accordance with the CQAP, survey controls will be established at the start of the work and maintained throughout the construction activities. GE will provide survey benchmarks so that the Remediation Contractor can establish appropriate horizontal and vertical control consistent with the existing survey data.

As stated in the CQAP, the Remediation Contractor will establish a minimum 50-foot control grid within Newell Street Area II. Prior to placing any engineered barrier materials, the Contractor will be required to survey the current elevation at each grid point, plus up to 10 additional locations to be identified at the discretion of GE. The 10 additional locations to be identified by GE 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. This survey will be performed to verify that a minimum 1-foot-thick engineered barrier has been placed in all areas within Newell Street Area II (relative to the initial survey), and to verify that the final surface grade has been achieved. Placement of the final surface cover materials (i.e., topsoil or asphalt, as appropriate) will not be permitted until GE has reviewed the Contractor's survey documentation to verify that the specified surface cover thickness has been provided.

### 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 stockpile areas and/or entering work areas and open excavations.

Specific to this RAA, erosion control measures to be implemented will include placement of hay bales and/or staked silt fencing around the perimeter of the downhill side 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 Drawing 2. This fencing will be placed at the start of the site work activities and will be maintained until a good stand of vegetation is established.

In addition to the hay bale/silt fence, other erosion and sedimentation control measures will be implemented as needed. At a minimum, this will include placement of erosion control measures around any temporary soil stockpiles.

### 7.4.6 Surface Preparation

Various surface preparation activities will be performed prior to or in conjunction with the initial site preparation activities. These surface preparation activities are specified on Technical Drawings 2 and 3.

## 7.5 Construction Activities

### 7.5.1 Monitoring Well Decommissioning

Forty groundwater monitoring wells and six dense nonaqueous phase liquid (DNAPL) recovery wells are located within Newell Street Area II. Specifically, the wells are located on the following properties:

Groundwater Monitoring:

- Parcel J9-23-1 - well GMA1-8;
- Parcel J9-23-8 - wells GMA1-9, MW-1S, MW-1D, N2SC-01S, N2SC-02, N2SC-03S, N2SC-04, N2SC-05, N2SC-08, N2SC-09I, N2SC-09S, N2SC-12, N2SC-13I, N2SC-13S, N2SC-15, N2SC-16, N2SC-17, NS-17, NS-18, NS-19, NS-20, and NS-35; and
- Parcel J9-23-12 - wells N2SC-06, N2SC-07, N2SC-07S, N2SC-11, NS-1, NS-9, NS-10, NS-11, NS-16, NS-21, NS-23, NS-24, NS-31, NS-33, NS-34, NS-36, and NS-37.

DNAPL Recovery:

- Parcel J9-23-8 - wells N2SC-01I, N2SC-03I, N2SC-14, and NS-30; and
- Parcel J9-23-12 - wells NS-15 and NS-32.

Twenty of the monitoring wells (GMA1-8, GMA1-9, MW-1S, MW-1D, N2SC-02, N2SC-07, N2SC-07S, N2SC-08, N2SC-09I, N2SC-13I, N2SC-15, N2SC-16, N2SC-17, NS-9, NS-10, NS-16, NS-17, NS-20, NS-36, and NS-37) and all six of the DNAPL recovery wells are currently part of the GMA 1 quality monitoring/DNAPL recovery well network (although not all of the monitoring wells are currently being sampled under the interim groundwater monitoring program currently in progress at GMA 1). Most of these monitoring wells will be proposed to be protected during the performance of the remediation activities described herein. However, several monitoring wells (most of which are not currently used in the GMA 1 program) located in areas not considered vital to the monitoring program will be proposed to be decommissioned prior to the

commencement of soil removal activities and not be replaced following decommissioning and performance of the proposed remediation activities.

In late March 2005, GE will submit a separate proposal to EPA that identifies the wells proposed to be decommissioned and the rationale for removing certain wells from the GMA 1 monitoring programs. In addition, as discussed in Section 7.5.7, that proposal will outline any proposed changes to the existing DNAPL recovery systems prior to and/or in conjunction with performance of the proposed remediation activities. Following EPA approval of that proposal, GE will decommission each of these monitoring wells in accordance with the general procedures described in Appendix GG of GE's FSP/QAPP for the GE-Pittsfield/Housatonic River Site. Monitoring and recovery well locations are provided on Technical Drawings 1, 3, and 4.

### 7.5.2 Excavation in the Vicinity of the WMECo High-Tension Line Towers

The selected Contractor must take precautions to avoid damage to the high tension towers and associated footers/foundations or interruption of service during the performance of the removal actions summarized herein. GE will work the selected Contractor to obtain information (if available) related to the footer/foundation beneath these towers and the excavation protocols to be followed by the selected Contractor. As indicated in Section 7.4.1, GE and the selected Contractor (once determined) will continue to communicate with WMECo (and any other related utility companies) in an effort to obtain this information. In the event this information is obtained prior to submitting the supplemental information package, it will be included therein.

### 7.5.3 Soil Removal, Material Handling, and Transportation and Disposal

The proposed removal actions will require excavation and handling of certain existing soils within Newell Street Area II. Specifically, existing soils within the excavation limits and depths, as depicted on Technical Drawing 3, will be removed using conventional construction equipment (e.g., excavator, backhoe, loader). The maximum depth of excavation will be approximately 8 feet below ground surface (bgs). Based on data from the ongoing groundwater monitoring program at Newell Street Area II (indicating that depth to groundwater ranges between 6.5 feet and 11.5 feet bgs), excavation of saturated materials is not anticipated for the majority of the soil removal activities. However, if saturated materials are encountered, they will be mixed with drier soil such that the resulting material will pass the Paint Filter Test. If this procedure does not yield a material that will pass

the Paint Filter Test, drying agents may need to be added. Such drying agents could include, but not be limited to, quick-lime, cement, and/or flyash.

As soils are excavated, and prior to their transport to the Building 71 OPCA, a number of intermediate on-site handling activities may be necessary. To ensure that such activities are performed in a manner that minimizes the potential for inadvertent releases to the environment, unsafe conditions for on-site and off-site personnel, and delays or complications in project completion, several on-site material handling procedures will be implemented. The specific method(s) of handling the removed soils will be based on, but not limited to, the following considerations:

- The characteristics of the excavated soils and corresponding disposition requirements;
- The locations from which the materials are removed and their proximity to the loading area(s); and
- The overall sequence and schedule of the removal actions.

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 conduct direct loading to trucks to the extent practical. Additional information regarding material handling is discussed below.

- To reduce the potential for migration of PCBs or other Appendix IX+3 constituents due to wind- and rainfall-related factors, temporary stockpiles, staging areas, and 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 the area is not under active excavation/use. In addition, if concerns regarding airborne dust are identified or suspected, water will be sprayed to keep the open excavation (or excavated soils) moist. Finally, to the extent possible, all temporary stockpiles and staging areas will be located in areas subject to future excavation activities to prevent possible contamination of clean soils. If such stockpiles or staging areas are required in areas not subject to future excavation, polyethylene sheeting will be placed under such stockpiles or staging areas and these areas will be bermed to prevent excavated soils or precipitation runoff from such stockpiles from contacting underlying soils.

- To the extent feasible and practicable, material handling and loading areas will not be established in locations that may interfere with construction operations or necessary traffic flow. In addition, material

handling areas will be located so as to take into account site topography and avoid (to the extent possible) low-lying drainage areas where surface runoff is likely to accumulate.

- Additional erosion and sedimentation control measures (e.g., hay bales and geotextile fencing) will be utilized as necessary.

Based on the specified soil removal limits identified on Technical Drawing 3, the total volume of existing materials to be removed from the work area is approximately 14,510 in-situ cubic yards. Based on a review of the analytical results collected from within these removal limits during previous investigations, GE has determined that soils removed as part of the activities described herein will be subject to placement in the Building 71 OPCA. Additional information regarding the transport and disposition of excavated materials is provided below in Section 7.5.5.

### 7.5.4 Groundwater Management

As noted above, the depth to groundwater at Newell Street Area II typically ranges between 6.5 feet and 11.5 feet bgs. The deepest excavation, as depicted on Technical Drawing 3, is approximately 8 feet bgs. As such, groundwater should not be encountered in the majority of the excavations. However, as a contingency, if groundwater enters into the deeper excavations, it is anticipated that sumps equipped with pumps should be able to keep the excavation dry. If such an arrangement is necessary to keep the excavation dry, a tanker truck, and possibly temporary water storage tanks, will be brought on site to collect the pumped groundwater prior to transporting it to GE's Building 64G water treatment plant for treatment and discharge.

### 7.5.5 Transport and Disposition of Excavated Materials and Remediation-Derived Waste

As indicated above, all excavated materials will be consolidated in GE's Building 71 OPCA, excluding items (if any) that are prohibited for disposition at the OPCAs under the CD and SOW. Previous sampling and analysis conducted for soils at Newell Street Area II indicate that soils at most sampling locations that represent the areas where soil will be excavated during the Removal Action either have PCB concentrations over 50 ppm, and thus are regulated for disposal under TSCA, or appear to have concentrations of other constituents that would cause them to constitute characteristic hazardous waste under RCRA. As such, all excavated soils will be transported

to and consolidated at the Building 71 OPCA, which is authorized to receive TSCA- and RCRA-regulated material.

The transportation of excavated materials from Newell Street Area II for disposition at the Building 71 OPCA will occur "on-site" as regulated under the terms of the CD, and thus will be subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on-site permitting exemption referenced in Paragraph 9.a of the CD. In these circumstances, site-specific transportation procedures have been developed for this removal action, as listed below, subject to EPA review and approval.

The Remediation Contractor will be required to implement the following procedures for the transport of excavated materials from Newell Street Area II to the Building 71 OPCA:

- 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 Building 71 OPCA on a daily basis; and

- Utilize the EPA Paint Filter Test as necessary to confirm that the materials are suitable for transport (i.e., no free liquids).

The transport of excavated materials from Newell Street Area II to the Building 71 OPCA will be conducted in accordance with the following guidelines:

- After a safety check of the truck, the truck bed will be lined with polyethylene. Excavated soil will be placed in the truck and the load will be covered.

- A Hazardous Materials Bill of Lading (BOL) will be prepared and signed by the truck driver. The DOT shipping description to be used on the BOL will be:

  "RQ, Polychlorinated biphenyls, mixture, 9, UN 2315, PG 111, RQ"

- After another safety check of the vehicle and placarding, the truck will leave the site and proceed to the Building 71 OPCA utilizing the primary route shown on Figure 7-1. If, for some reason, the primary route is not used, the secondary route shown on Figure 7-1 (or an alternate route to be proposed by GE to EPA) will be used.

- Upon arrival of the truck at the Building 71 OPCA, the OPCA Contractor will document receipt of the load and the material will be off-loaded and placed by the OPCA Contractor.

### 7.5.6 Backfilling of Excavations

Backfilling operations will be initiated as soon as practicable after completion and proper documentation of excavation activities (i.e., survey control). It is anticipated that the excavations will be backfilled and compacted using conventional construction equipment. As indicated in Section 7.5.2, the selected Contractor must take precautions to avoid damage to the high tension towers and associated footers/foundations or interruption of service during the performance of the removal actions summarized herein. Clean backfill materials will be placed in 12-inch thick lifts in a loose state and compacted in accordance with the Technical Specifications (Attachment C) prior to additional fill being placed within the excavation. The excavation will be brought up to the predetermined subgrade elevation prior to installing the final surface layer (e.g., topsoil and seed, access road materials, engineered barrier).

Backfill material will be clean, natural material, no greater than gravel in size to ensure proper settlement, permeability, and compactability. The specific fill sources to be used for this project will be identified by the Remediation Contractor. A description of the process for identifying such sources and, if necessary, submitting the analytical data for them was presented in Section 5.5.

### 7.5.7 DNAPL Collection System Evaluation

GE is considering several potential modifications to the existing DNAPL collection system to be implemented prior to or in conjunction with performance of the proposed remediation activities, in order to complete any intrusive activities prior to placement of the engineered barrier. In late March 2005, GE will submit a separate proposal to EPA outlining any proposed changes concerning the DNAPL recovery systems in this area. That document will also contain GE's proposal to decommission certain Newell Street Area II monitoring wells, as discussed in Section 7.5.1. Implementation of any proposals approved by EPA will be conducted under GE's GMA 1 NAPL monitoring program, although the field activities will be performed in coordination with the proposed remediation activities for Newell Street Area II.

If no modifications are made to the existing DNAPL collection system, concrete pads will be installed beneath the trailer and storage shed associated with the two separate collection systems, as shown on Technical Drawing 4. The surrounding surface cover components to be installed as part of surface cover installation activities will be anchored to the concrete pads as shown on Technical Drawing 8. In order to allow for these pads to be installed, the DNAPL system will be temporarily taken off line to allow for the following activities to occur:

- Disconnection of the electrical wiring and piping which enter the trailer and storage shed;
- Preparation of the trailer and storage shed for relocation; and
- Temporary relocation of the trailer and storage shed from their existing locations.

Once the above activities have been completed the trailer and storage shed will be placed onto the newly installed concrete pads, electrical wiring and associated piping will be reconnected, and the DNAPL collection system will be restarted. GE will perform supplemental DNAPL monitoring on a weekly basis at each recovery well and, if necessary, manual collection activities while the automated system is offline.

### 7.5.8 Placement of Engineered Barriers

As part of the removal actions, engineered barriers will be installed at various locations within Newell Street Area II. The locations where barriers will be installed, along with the final surface grading configurations, are provided on Technical Drawings 4, 5B, and 6B, with construction details (e.g., cross-sections, anchor trenches, etc.) provided on Technical Drawings 7 through 9.

It is anticipated that conventional construction equipment will be used to spread and compact the various cover materials that are incorporated within the particular type of cover. It is anticipated that the geotextile cushion, geomembrane liner, and geocomposite will be laid out by hand and anchored with sand bags until the remaining cover materials are placed. During the placement of any type of engineered barrier, the Contractor will exercise appropriate care when covering the geotextile, geomembrane, and geocomposite layers with the cover materials such that construction equipment does not damage the liner components. The specific materials to be used and procedures to be followed when installing the sublayers of the engineered barriers are provided in detail in the Technical Specifications (Attachment C). As discussed in Section 5.6, the surface covers for vegetated engineered barriers will consist of topsoil and grass seed, with the exception of the vegetated engineered barrier within the GE Newell Street parking lot area at Parcel J9-23-12. Information regarding the vegetative planting associated with natural resource restoration/enhancement activities within this area is specified in Section 5.7. Surface covers for access roads will consist of subbase material and access road surface fill. The specific materials to be used and procedures to be followed in installing the surface covers for the engineered barriers are also provided in detail in the Technical Specifications in Attachment C.

### 7.5.9 Installation of Excavation Controls

For excavations extending to depths greater than 4 feet and which Contractor personnel will enter to perform work, excavation sidewall stabilization will be required, as discussed in Section 5.4. In addition, excavations adjacent to the footers of the towers supporting overhead power lines may require stabilization. GE and the selected Contractor (once determined) will continue to communicate with WMECo (and any other related utility companies) in an effort to obtain appropriate excavation procedures/controls to be utilized when removing soils in the vicinity of these towers. If additional procedures/controls beyond those included herein are identified prior to submission of the forthcoming supplemental information package, such procedures/controls will be included in that package. If the Remediation Contractor plans to install excavation controls to provide excavation stability and/or maintain the structural stability of any adjacent structures, such controls will be designed and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts.

### 7.5.10 Equipment Cleaning

Equipment and materials that have come into contact with existing soils at Newell Street Area II 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 its departure from Newell Street Area II. Equipment cleaning will be conducted as specified in Section 3.5 of the Site Management Plan within the POP.

### 7.5.11 Restoration of Disturbed Vegetation

This section pertains to the restoration of vegetated areas outside the limits of any engineered barriers. As indicated on Technical Drawings 4, 5B and 6B, excavation areas that originally contained vegetated surfaces (lawns, vegetated areas, etc.) will first be restored to within 3 inches of the original grade utilizing compacted soil fill materials. In areas requiring the placement of grass seed, 3 inches of topsoil will then be used to restore pre-excavation grades, followed by placement of grass seed and mulch. As part of the site restoration activities, the Contractor will restore removed trees and shrubs as appropriate in consultation with the property owners. All restored trees and shrubs will be installed at least 10 feet outside the limits of any engineered barriers on each applicable property to ensure that the barrier components are not impacted at some future time by the root structures of such restored vegetation.

In conjunction with the restoration activities described above, GE anticipates performing a tree inventory within and adjacent to soil removal areas not subject to the placement of an engineered barrier. Once complete, the results of this inventory will be used to create a tree restoration plan to be included in the supplemental information package. The tree restoration plan will show the anticipated tree planting locations and list the types and sizes of trees to be used during restoration. The tree inventory and tree restoration plan will be provided in the supplemental information package.

In addition, GE will conduct a wetland survey within and adjacent to the Intermittent Standing Water Area located on Parcels J9-23-4 and J9-23-5. GE will then develop the scope of restoration activities for this area using the results of the wetland survey. The results of this survey and the scope of the restoration activities will be provided in the supplemental information package.

## 7.6 Perimeter Air Monitoring

Ambient air monitoring for PCBs and particulate matter will be performed during the removal actions. The scope of the ambient air monitoring program is presented in Attachment F to this Final Work Plan. 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 at least once every 4 weeks during the course of construction. Ambient air monitoring for particulates will be performed on a continuous basis during all active construction activities using real-time particulate air monitors.

For both PCB and particulate monitoring, baseline monitor locations will be established at four locations within Newell Street Area II. Although subject to change based on the location of construction activities and weather conditions, the ambient air monitoring scope of work (Attachment F) identifies preliminary locations for air monitoring. Finally, a background monitoring location will be established during removal actions inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street.

# 8. Post-Construction Activities

## 8.1 General

This section addresses the activities to be performed by GE following the completion of removal actions at Newell Street Area II. These activities include project closeout activities (including preparation and submittal of a Final Completion Report), Post-Removal Site Control activities, and additional activities relating to properties at which a Conditional Solution is implemented. Each of these topics is further discussed below.

## 8.2 Project Closeout – Pre-Certification Inspection and Completion Report

Once GE has determined that the removal actions for Newell Street Area II are complete (excluding Post-Removal Site Control activities) and the applicable Performance Standards have been attained, GE will schedule and conduct a pre-certification inspection with EPA and MDEP. This inspection will be conducted within 90 days after GE concludes that the removal actions are complete.

After the pre-certification inspection, GE will proceed with remaining closeout activities, which will consist of development and submittal of a Final Completion Report to summarize and document the scope of the completed Removal Action activities. At a minimum, the Final Completion Report will include the following:

- A description of the removal actions performed;
- Identification of any deviations from the design submittals approved by EPA;
- A listing of removal action quantities, including soil volumes removed and areas subject to installation of engineered barriers;
- Results of quality assurance/quality control (QA/QC) testing performed during the removal actions;
- Survey data to document the current grade and final surface contours;
- Copies of Record Drawings to document the as-built conditions;

- Representative project photographs;

- Documentation regarding the disposition of materials excavated in conjunction with the construction activities; and

- A summary of Post-Removal Site Control activities and a schedule for such activities.

As indicated in Section 9, the Final Completion Report will be submitted to EPA within 30 days after the pre-certification inspection (or at such other time as may be proposed by GE and approved by EPA at the time of that inspection).

## 8.3 Post-Removal Site Control Plan and Other Post-Construction Inspection, Maintenance, and Repair Activities

Post-construction inspection, maintenance, and repair activities (I/M activities) will be performed at Newell Street Area II as required by Technical Attachment J to the SOW. Such activities will be performed to ensure that the completed removal actions are performing as designed. The scope of those I/M activities are described below and were based on the minimum I/M requirements established by Attachment J to the SOW, as well as anticipated I/M requirements specific to the final design of the Newell Street Area II Removal Action.

### 8.3.1 Periodic Inspections

GE will initiate post-construction inspections of the restored surfaces at Newell Street Area II following completion of the construction activities. Such inspections will be performed for both the engineered barriers and the other restored areas.

For the engineered barrier areas, the first inspection will be performed approximately one month after completion of the construction activities to visually identify potential problems associated with such areas, such as settlement or the presence of stressed vegetation. Thereafter, the engineered barrier areas will be inspected approximately every 6 months (until EPA approves a different frequency for such inspections). These inspections will be performed by GE (or a designated GE representative) to assess the integrity of the engineered barriers (i.e., to identify deficiencies that would affect the integrity of the barriers).

Vegetative engineered barriers will be visually inspected for the following conditions as they would affect the integrity of the barriers: (a) evidence of topsoil erosion; (b) establishment and coverage of vegetation (e.g., bare or sparsely vegetated areas); (c) deficiencies in the soil layer overlying the synthetic cover components (e.g., excessive erosion, surface water ponding, depressions, exposed synthetic cover components, vehicle ruts, or other abnormalities); (d) damage to synthetic cover components; (e) uneven settlement relative to surrounding areas; (f) the proper functioning of any associated surface water diversions; and (g) overall integrity (including animal burrows, unauthorized excavation, or other conditions that could jeopardize the integrity of the barriers).

Portions of the engineered barriers restored with asphalt surfaces (i.e., access roads) will be visually inspected for the following conditions as they would affect the integrity of the barriers: (a) excessive cracking, fissures, spalling, or potholes caused by heaving, uneven settlement, or vehicular use; and (b) evidence of depressions and/or surface water ponding, excessive rutting, or exposed subbase materials.

For other backfilled/restored areas, the first inspection will likewise be performed approximately one month after completion of construction activities. Thereafter, these areas will be inspected every 6 months for the first year after restoration and annually thereafter (subject to subsequent EPA approval of a different frequency). At a minimum, these inspections will include visual observations of the following: (a) erosion controls to verify their continued effectiveness until such time vegetation is sufficiently established; (b) any areas where excessive settlement has occurred relative to the surrounding areas; (c) any drainage or growth problems due to possible over-compaction of the backfill materials; and (d) other conditions that could jeopardize the performance of the removal actions as designed.

In addition, GE will inspect all restored areas of Newell Street Area II semi-annually during the 2-year period following planting and installation of such vegetative material. These inspections are anticipated to occur in May and October of each year to ensure that the vegetation is growing as anticipated and is providing the desired degree of erosion control. If needed, additional planting, seeding, or sod placement will be performed to replace dead or dying vegetation (discussed below).

### 8.3.2 Maintenance/Repair

GE will be responsible for maintenance and repair of site conditions and features as necessary to meet the requirements of the CD and SOW. Such activities will include addressing any conditions noted during the

periodic inspections. Examples of maintenance/repair activities that may be identified and conducted as a result of the periodic inspections include, but are not limited to, placement of additional topsoil/asphalt in areas of erosion or settlement and repair or replacement of any components of the engineered barriers exhibiting deficiencies or potential problems.

Any such conditions noted as a result of periodic inspections (or as otherwise observed by GE) will be addressed as soon as practicable. The nature of the associated maintenance/repair will be documented in the subsequent inspection report.

### 8.3.3 Inspection Schedule and Reporting

As noted above, the areas subject to engineered barrier construction and excavation/backfilling at Newell Street Area II will be inspected approximately one month after completion of the final restoration activities. Thereafter, the engineered barrier areas will be inspected approximately every 6 months until such time as EPA approves a different frequency for such inspections, and the other backfilled/restored areas will be inspected approximately every 6 months for the first year after implementation and annually thereafter (subject to subsequent EPA approval of a different frequency). Additionally, during the 2-year period following planting and installation of vegetative material, the areas at which such vegetation was planted will be inspected in May and October to ensure that the vegetation is growing as anticipated and is providing the necessary erosion control.

Inspection reports will be prepared every 6 months, subject to EPA approval of an alternate frequency. These reports will be submitted to EPA and will document I/M activities performed since submittal of the previous inspection report. As required by Attachment J to the SOW, these reports will include the following information (as relevant):

- Description of the type and frequency of inspection and/or monitoring activities conducted;

- Description of any significant modifications to the inspection and/or monitoring program made since submittal of the preceding monitoring report;

- Description of any conditions or problems noted during the inspection and/or monitoring period which are or may be affecting the performance of the removal action;

- Description of any measures taken to correct conditions which are affecting the performance of the removal action;

- Results of sampling analyses and screening conducted as part of the inspection and/or monitoring program (if any); and

- Description of any measures that may need to be performed to correct any conditions affecting the performance of the removal action.

## 8.4 Additional Activities Relating to Conditional Solutions

In addition to the Post-Removal Site Control activities described above, GE will comply with the requirements of Paragraphs 34 through 38 of the CD with respect to each of the properties at which a Conditional Solution is implemented. These requirements include, among others: (1) provision of a notification to the property owner and the holders of any easements on the property, within 30 days after completion of the on-site removal actions, of the CD provisions relating to Conditional Solutions and the residual contamination on the property (Paragraph 36); (2) annual determination of whether there has been a change in ownership of the property and, if so, provision of notification to the new owner regarding the same items noted above (Paragraph 36); and (3) performance of an annual inspection of the property to determine whether there has been any change in activities and uses of the property since implementation of the removal actions that would involve exposure to soil greater than 3 feet in depth or would be inconsistent with the land use for which the Conditional Solution was implemented, and submittal of a report to EPA and MDEP on that inspection within 30 days thereafter (Paragraph 38).

# 9. Schedule

As discussed in Sections 7.5.1 and 7.5.7, GE will submit to EPA a proposal in late March 2005 that identifies the groundwater monitoring and/or recovery wells proposed to be decommissioned and the rationale for removing certain wells from the GMA 1 monitoring programs, and a proposal outlining any other proposed changes to the DNAPL recovery systems in this area.

As described in Section 6, GE will develop and submit an RFP to potential Remediation Contractors on or about April 4, 2005. GE anticipates selection of a Remediation Contractor on or about May 2, 2005. GE proposes that within 30 days of selection of a Remediation Contractor, GE will submit a supplemental information package to EPA as a follow-up to this Work Plan. This supplemental information package 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., Operations Plan, HASP, and Contingency Plan);
- Additional excavation stabilization controls/procedures associated with excavation adjacent to support towers for overhead power lines (if identified by WMECo);
- Identification of backfill sources and locations;
- Analytical data for samples collected from the backfill sources (unless the backfill sources have already been approved based on previously submitted analytical data);
- A tree inventory and tree planting plan for soil removal areas not subject to the placement of an engineered barrier;
- A scope of proposed restoration activities within and adjacent to the Intermittent Standing Water Area on Parcels J9-23-4 and J9-23-5; and
- Additional information regarding natural resource restoration/enhancement activities to be conducted by GE in the Newell Street parking lot area.

Following EPA approval of this Final Work Plan and the supplemental information package, site preparation activities will be initiated. The specific schedule for the implementation and completion of the removal actions at this RAA will depend on several factors, including the timing of EPA approval of this Final Work Plan and the supplemental information package, receipt of the necessary access permission from non-GE property owners

to conduct the proposed removal actions at their properties, and timing of the onset of winter weather conditions. GE currently anticipates that it will be able to commence removal actions at this RAA during the summer of 2005, and that such activities will be completed during the 2005 construction season. Additional details regarding overall project duration, including an estimate of the duration of the entire project in working weeks will be provided in the Remediation Contractor's Work Schedule – which is a required component of the Contingency Plan submittal (Section 7.3) – that will be provided to EPA as part of the forthcoming supplemental information package. With respect to access, if GE is unable to obtain access permission from particular property owners after using "best efforts" (as defined in the CD) to do so, it will so advise EPA and MDEP and seek their assistance in obtaining such access pursuant to Paragraph 60.f(i) of the CD. In addition, if issues relating to access may cause a delay in the completion of this Removal Action, GE will so advise EPA.

Within 90 days of completing the field construction activities, GE will schedule and conduct a pre-certification inspection with EPA and MDEP, as described in Section 8.2. Within 30 days thereafter, or at such other time as proposed by GE and approved by EPA at the time of the inspection, GE will submit a Final Completion Report on this Removal Action. That report will represent the completion of the CD-required construction activities. Periodic inspection reports will be provided thereafter to EPA in accordance with the schedules outlined in Sections 8.3.3 and 8.4.

# *Figures*


REMOVAL ACTION AREA:

NEWELL STREET AREA II

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETRICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS. ADDITIONALLY, CONSTRUCTION PLANS PROVIDED BY GENERAL ELECTRIC COMPANY WERE USED.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

0 500' 1000'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
FINAL RD/RA WORK PLAN FOR
NEWELL STREET AREA II RAA

# REMOVAL ACTION AREA

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

FIGURE
1-1

X: 30193X04.DWG
L: ON=*, OFF=REF*
P: PAGESET/SYR-DL
3/2/05 SYR-85-DMW LAF GHS
N/30193004/RAA/30193G12.DWG

East Branch Housatonic River

CITY OF PITTSFIELD PROPERTY

J9-23-1
J9-23-2
J9-23-3
J9-23-4
J9-23-5
J9-23-6
J9-23-8
J9-23-12
I9-7-1

HATHAWAY STREET
SACKET ST
LYMAN STREET
NEWELL STREET
ONTARIO STREET EXT.

**LEGEND:**

- EDGE OF WATER
- DRAINAGE CHANNEL WITH INTERMITTENT FLOW
- PAVED ROADWAY
- UNPAVED ROADWAY
- VEGETATION
- APPROXIMATE PARCEL BOUNDARY
- J9-23-11 PARCEL ID
- APPROXIMATE REMOVAL ACTION AREA BOUNDARY
- GE PARKING LOT AREA – AREA SUBJECT TO INSTALLATION OF VEGETATIVE ENGINEERED BARRIER IN ACCORDANCE WITH THE CONSENT DECREE AND STATEMENT OF WORK (SEE NOTE 4)
- RECREATIONAL PROPERTY (GE OWNED)
- RECREATIONAL PROPERTY (NON-GE OWNED)
- GE-OWNED WOODED AREA
- PAVED AREA
- AREA ADDRESSED AS PART OF THE UPPER 1/2-MILE REACH

**NOTES:**

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETRICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS.
2. TAX ASSESSORS' PARCEL IDENTIFICATION NUMBERS AND BOUNDARY INFORMATION OBTAINED FROM CITY OF PITTSFIELD'S TAX ASSESSOR'S OFFICE AND IS CURRENT THROUGH SEPTEMBER 5, 1997.
3. PROPERTY USE DESIGNATIONS REFLECT CURRENT AND FORESEEABLE FUTURE USE.

0 50' 100'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II RAA**

**SITE PLAN**

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

FIGURE **1-2**

X: 30193X00, X01.DWG
L: ON=*, OFF=*REF, |PROPERTY, |E_HATHAWAY*, |FLOOD, |S_ONTARIO_ST, |SIBLEY_ST
P: PAGESET/SYR-DL
3/2/05 SYR-54-RLP KLS GHS
N/30193004/REMOVAL/30193G02.DWG

ON-PLANT CONSOILDATION AREAS

NEWELL STREET AREA II

G.E. CO. PARKING LOT

GE PARKING LOT

KELLOGG ST.

TYLER STREET

EA

**LEGEND:**

PRIMARY TRAVEL ROUTE TO ON-PLANT CONSOLIDATION AREAS

SECONDARY TRAVEL ROUTE TO ON-PLANT CONSOLIDATION AREAS

**NOTES:**

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETRICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS. ADDITIONALLY, CONSTRUCTION PLANS PROVIDED BY GENERAL ELECTRIC COMPANY WERE USED.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES/LIMITS ARE APPROXIMATE.

0 300' 600'
GRAPHIC SCALE

X: 300193X04.DWG
L: ON=*, OFF=REF
P: PAGESET/SYR-DL
3/2/05 SYR-85-GMS LAF GHS
N/30193004/RAA/30193G05.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
FINAL RD/RA WORK PLAN FOR
NEWELL STREET AREA II RAA

# PROPOSED PRIMARY AND SECONDARY TRAVEL ROUTES FOR EXCAVATED MATERIALS TO OPCAs

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

FIGURE
7-1

# *Attachments*

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

# *Attachment A*

# Revised PCB Utility Evaluations for Utility Areas 2 and 4

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

# Revised PCB Utility Evaluations for Utility Area 2

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

**TABLE A-1**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 2 (CITY OF PITTFIELD PROPERTY) : 0- TO 14-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**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 |
|---|---|---|---|---|---|---|---|
| NS-29A | 176A | 478 | 0 - 0.5 | 34 | 8.85 | 34.00 | 300.81 |
| NS-29A | 176,176B | 1,607 | 0 - 0.5 | ***0.021*** | 29.76 | 0.02 | 0.62 |
| RAA13-A86 | 159 | 99 | 0 - 0.5 | ***0.021*** | 1.83 | 0.02 | 0.04 |
| RAA13-A87 | 158 | 419 | 0 - 0.5 | ***0.021*** | 7.75 | 0.02 | 0.16 |
| RAA13-B87 | 175 | 1,175 | 0 - 0.5 | ***0.021*** | 21.76 | 0.02 | 0.46 |
| RAA13-C88 | 151 | 1,467 | 0 - 0.5 | ***0.021*** | 27.17 | 0.02 | 0.57 |
| RAA13-F91 | 136 | 1,911 | 0 - 0.5 | ***0.021*** | 35.39 | 0.02 | 0.74 |
| RAA13-G91 | 177 | 402 | 0 - 0.5 | ***0.021*** | 7.44 | 0.02 | 0.16 |
| RAA13-G92 | 135 | 1,788 | 0 - 0.5 | ***0.021*** | 33.11 | 0.02 | 0.70 |
| RAA13-H92 | 179A | 301 | 0 - 0.5 | 1.5 | 5.58 | 1.50 | 8.37 |
| RAA13-H92 | 179 | 228 | 0 - 0.5 | ***0.021*** | 4.21 | 0.02 | 0.09 |
| RAA13-H93 | 178A | 943 | 0 - 0.5 | 7.2 | 17.46 | 7.20 | 125.69 |
| RAA13-H93 | 178 | 8 | 0 - 0.5 | ***0.021*** | 0.15 | 0.02 | 0.00 |
| RAA13-I93 | 134 | 866 | 0 - 0.5 | 2.195 | 16.04 | 2.20 | 35.20 |
| **Totals:** | -- | 11,691 | -- | -- | 216.50 | -- | 473.61 |
| | | | | | **Volume-Weighted Average:** | | **2.19** |

**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 |
|---|---|---|---|---|---|---|---|
| NS-29A | 170A | 478 | 0.5 - 1 | 34 | 8.85 | 34.00 | 300.79 |
| NS-29A | 170,170B | 1,607 | 0.5 - 1 | ***0.021*** | 29.76 | 0.02 | 0.62 |
| RAA13-A86 | 151 | 99 | 0.5 - 1 | ***0.021*** | 1.83 | 0.02 | 0.04 |
| RAA13-A87 | 150 | 419 | 0.5 - 1 | ***0.021*** | 7.75 | 0.02 | 0.16 |
| RAA13-B87 | 169 | 1,175 | 0.5 - 1 | ***0.021*** | 21.76 | 0.02 | 0.46 |
| RAA13-C88 | 147 | 1,467 | 0.5 - 1 | ***0.021*** | 27.17 | 0.02 | 0.57 |
| RAA13-F91 | 132 | 1,911 | 0.5 - 1 | ***0.021*** | 35.39 | 0.02 | 0.74 |
| RAA13-G91 | 171 | 402 | 0.5 - 1 | ***0.021*** | 7.44 | 0.02 | 0.16 |
| RAA13-G92 | 131 | 1,788 | 0.5 - 1 | ***0.021*** | 33.11 | 0.02 | 0.70 |
| RAA13-H92 | 173A | 301 | 0.5 - 1 | 1.5 | 5.58 | 1.50 | 8.37 |
| RAA13-H92 | 173 | 228 | 0.5 - 1 | ***0.021*** | 4.21 | 0.02 | 0.09 |
| RAA13-H93 | 172A | 943 | 0.5 - 1 | 7.2 | 17.46 | 7.20 | 125.69 |
| RAA13-H93 | 172 | 8 | 0.5 - 1 | ***0.021*** | 0.15 | 0.02 | 0.00 |
| RAA13-I93 | 130 | 866 | 0.5 - 1 | 2.195 | 16.04 | 2.20 | 35.20 |
| **Totals:** | -- | 11,691 | -- | -- | 216.50 | -- | 473.59 |
| | | | | | **Volume-Weighted Average:** | | **2.19** |

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 75 | 243 | 1 - 2 | ***0.021*** | 8.99 | 0.02 | 0.19 |
| NS-29A | 91 | 1,519 | 1 - 2 | 0.55 | 56.25 | 0.55 | 30.94 |
| NS-29A | 91A,91B | 566 | 1 - 2 | ***0.021*** | 20.97 | 0.02 | 0.44 |
| RAA13-1 | 76 | 8 | 1 - 2 | ***0.021*** | 0.29 | 0.02 | 0.01 |
| RAA13-B87 | 90 | 1,442 | 1 - 2 | ***0.021*** | 53.42 | 0.02 | 1.12 |
| RAA13-C88 | 72 | 429 | 1 - 2 | 1.35 | 15.88 | 1.35 | 21.43 |
| RAA13-C88 | 72A | 1,039 | 1 - 2 | ***0.021*** | 38.47 | 0.02 | 0.81 |
| RAA13-F91 | 68 | 2,885 | 1 - 2 | ***0.021*** | 106.84 | 0.02 | 2.24 |
| RAA13-H93 | 92 | 2,110 | 1 - 2 | 1.5 | 78.15 | 1.50 | 117.22 |
| RAA13-H93 | 92A | 1,452 | 1 - 2 | ***0.021*** | 53.77 | 0.02 | 1.13 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 175.53 |
| | | | | | **Volume-Weighted Average:** | | **0.41** |

**TABLE A-1**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 2 (CITY OF PITTFIELD PROPERTY) : 0- TO 14-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 75 | 243 | 2 - 3 | ***0.021*** | 8.99 | 0.02 | 0.19 |
| NS-29A | 91A,91B | 1,524 | 2 - 3 | 0.55 | 56.46 | 0.55 | 31.05 |
| NS-29A | 91 | 560 | 2 - 3 | ***0.021*** | 20.76 | 0.02 | 0.44 |
| RAA13-1 | 76 | 8 | 2 - 3 | ***0.021*** | 0.29 | 0.02 | 0.01 |
| RAA13-B87 | 90 | 1,442 | 2 - 3 | ***0.021*** | 53.42 | 0.02 | 1.12 |
| RAA13-C88 | 72A | 429 | 2 - 3 | 1.35 | 15.88 | 1.35 | 21.43 |
| RAA13-C88 | 72 | 1,039 | 2 - 3 | ***0.021*** | 38.47 | 0.02 | 0.81 |
| RAA13-F91 | 68 | 2,885 | 2 - 3 | ***0.021*** | 106.84 | 0.02 | 2.24 |
| RAA13-H93 | 92 | 2,110 | 2 - 3 | 1.5 | 78.15 | 1.50 | 117.22 |
| RAA13-H93 | 92A | 1,452 | 2 - 3 | ***0.021*** | 53.77 | 0.02 | 1.13 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 175.64 |
| | | | | | **Volume-Weighted Average:** | | **0.41** |

**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 (ppm) | Average PCB Conc. TIMES Total Volume |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 73 | 243 | 3 - 4 | 6.6 | 8.99 | 6.60 | 59.30 |
| NS-29A | 88 | 2,085 | 3 - 4 | 0.069 | 77.22 | 0.07 | 5.33 |
| RAA13-1 | 74 | 8 | 3 - 4 | 180 | 0.29 | 180.00 | 51.80 |
| RAA13-B87 | 87 | 1,442 | 3 - 4 | 1,200 | 53.42 | 1,200.00 | 64,100.44 |
| RAA13-C88 | 70 | 1,467 | 3 - 4 | 0.355 | 54.35 | 0.36 | 19.29 |
| RAA13-F91 | 66 | 2,885 | 3 - 4 | ***0.021*** | 106.84 | 0.02 | 2.24 |
| RAA13-H93 | 89 | 3,562 | 3 - 4 | 0.34 | 131.92 | 0.34 | 44.85 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 64,283.26 |
| | | | | | **Volume-Weighted Average:** | | **148.46** |

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 77 | 243 | 4 - 5 | 0.054 | 8.99 | 0.05 | 0.49 |
| NS-29A | 92 | 2,085 | 4 - 5 | 0.069 | 77.22 | 0.07 | 5.33 |
| RAA13-1 | 78 | 8 | 4 - 5 | 180 | 0.29 | 180.00 | 51.80 |
| RAA13-B87 | 91 | 1,442 | 4 - 5 | 1,200 | 53.42 | 1,200.00 | 64,100.44 |
| RAA13-C88 | 76 | 1,467 | 4 - 5 | 0.355 | 54.35 | 0.36 | 19.29 |
| RAA13-F91 | 70 | 2,885 | 4 - 5 | ***0.021*** | 106.84 | 0.02 | 2.24 |
| RAA13-H93 | 93 | 3,562 | 4 - 5 | 0.34 | 131.92 | 0.34 | 44.85 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 64,224.45 |
| | | | | | **Volume-Weighted Average:** | | **148.32** |

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 77 | 243 | 5 - 6 | 0.054 | 8.99 | 0.05 | 0.49 |
| NS-29A | 92 | 2,085 | 5 - 6 | 0.069 | 77.22 | 0.07 | 5.33 |
| RAA13-1 | 78 | 8 | 5 - 6 | 180 | 0.29 | 180.00 | 51.80 |
| RAA13-B87 | 91 | 1,442 | 5 - 6 | 1,200 | 53.42 | 1,200.00 | 64,100.44 |
| RAA13-C88 | 76 | 1,467 | 5 - 6 | 0.355 | 54.35 | 0.36 | 19.29 |
| RAA13-F91 | 70 | 2,885 | 5 - 6 | 4,400 | 106.84 | 4,400.00 | 470,102.52 |
| RAA13-H93 | 93 | 3,562 | 5 - 6 | 0.34 | 131.92 | 0.34 | 44.85 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 534,324.72 |
| | | | | | **Volume-Weighted Average:** | | **1,233.98** |

**TABLE A-1**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 2 (CITY OF PITTFIELD PROPERTY) : 0- TO 14-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 68 | 243 | 6 - 8 | 6.5 | 17.97 | 6.50 | 116.81 |
| NS-29A | 82 | 2,085 | 6 - 8 | 0.071 | 154.43 | 0.07 | 10.96 |
| RAA13-1 | 69 | 8 | 6 - 8 | 0.11 | 0.58 | 0.11 | 0.06 |
| RAA13-B87 | 81 | 1,442 | 6 - 8 | 160 | 106.83 | 160.00 | 17,093.45 |
| RAA13-C88 | 65 | 1,467 | 6 - 8 | 0.284 | 108.69 | 0.28 | 30.87 |
| RAA13-F91 | 60 | 2,885 | 6 - 8 | 790 | 213.68 | 790.00 | 168,809.54 |
| RAA13-H93 | 83 | 3,562 | 6 - 8 | 0.14 | 263.83 | 0.14 | 36.94 |
| **Totals:** | -- | 11,691 | -- | -- | 866.02 | -- | 186,099 |
| | | | | | **Volume-Weighted Average:** | | **214.89** |

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 98 | 243 | 8 - 9 | **0.0105** | 8.99 | 0.01 | 0.09 |
| NS-29A | 111 | 2,085 | 8 - 9 | 0.071 | 77.22 | 0.07 | 5.48 |
| RAA13-1 | 99 | 8 | 8 - 9 | 0.11 | 0.29 | 0.11 | 0.03 |
| RAA13-B87 | 110 | 1,442 | 8 - 9 | 160 | 53.42 | 160.00 | 8,546.73 |
| RAA13-C88 | 95 | 1,467 | 8 - 9 | 0.284 | 54.35 | 0.28 | 15.43 |
| RAA13-F91 | 91 | 2,885 | 8 - 9 | 790 | 106.84 | 790.00 | 84,404.77 |
| RAA13-H93 | 112 | 3,562 | 8 - 9 | 0.14 | 131.92 | 0.14 | 18.47 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 92,991 |
| | | | | | **Volume-Weighted Average:** | | **214.75** |

**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 |
|---|---|---|---|---|---|---|---|
| J9-23-8-SB-1 | 60 | 243 | 9 - 10 | **0.0105** | 8.99 | 0.01 | 0.09 |
| NS-29A | 73 | 2,799 | 9 - 10 | 0.071 | 103.68 | 0.07 | 7.36 |
| RAA13-1 | 61 | 8 | 9 - 10 | 0.11 | 0.29 | 0.11 | 0.03 |
| RAA13-B87 | 72 | 2,195 | 9 - 10 | 160 | 81.30 | 160.00 | 13,008.12 |
| RAA13-F91 | 54 | 2,885 | 9 - 10 | 790 | 106.84 | 790.00 | 84,404.77 |
| RAA13-H93 | 74 | 3,562 | 9 - 10 | 0.14 | 131.92 | 0.14 | 18.47 |
| **Totals:** | -- | 11,691 | -- | -- | 433.01 | -- | 97,439 |
| | | | | | **Volume-Weighted Average:** | | **225.03** |

**10- 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 |
|---|---|---|---|---|---|---|---|
| NS-29A | 70 | 2,799 | 10 - 12 | 0.29 | 207.36 | 0.29 | 60.13 |
| RAA13-1 | 59 | 23 | 10 - 12 | 1.8 | 1.68 | 1.80 | 3.03 |
| RAA13-B87 | 57 | 2,423 | 10 - 12 | 155 | 179.47 | 155.00 | 27,817.22 |
| RAA13-F91 | 52 | 2,885 | 10 - 12 | 52.6 | 213.68 | 52.60 | 11,239.72 |
| RAA13-H93 | 71 | 3,562 | 10 - 12 | 0.055 | 263.83 | 0.06 | 14.51 |
| **Totals:** | -- | 11,691 | -- | -- | 866.02 | -- | 39,135 |
| | | | | | **Volume-Weighted Average:** | | **45.19** |

**TABLE A-1**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 2 (CITY OF PITTFIELD PROPERTY) : 0- TO 14-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**

**12- 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 |
|---|---|---|---|---|---|---|---|
| NS-29A | 64 | 2,799 | 12 - 14 | 0.29 | 207.36 | 0.29 | 60.13 |
| RAA13-1 | 54 | 23 | 12 - 14 | 1.8 | 1.68 | 1.80 | 3.03 |
| RAA13-B87 | 52 | 2,423 | 12 - 14 | 155 | 179.47 | 155.00 | 27,817.22 |
| RAA13-F91 | 48 | 2,885 | 12 - 14 | 52.6 | 213.68 | 52.60 | 11,239.72 |
| RAA13-H93 | 65 | 3,562 | 12 - 14 | 0.055 | 263.83 | 0.06 | 14.51 |
| **Totals:** | -- | 11,691 | -- | -- | 866.02 | -- | 39,135 |
| | | | | | **Volume-Weighted Average:** | | **45.19** |

**SUMMARY: 0- 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 |
|---|---|---|---|---|---|---|---|
| **Totals:** | -- | 11,691 | -- | -- | 6,062 | -- | 1,118,929 |
| | | | | | **Volume-Weighted Average:** | | **184.58** |

Notes:

1. Polygon ID and area based on information presented in Appendix E of the Conceptual RD/RA Work Plan.
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.

# Revised PCB Utility Evaluations for Utility Area 4

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

**TABLE A-2**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 4 (EASTERN PORTION OF 48-INCH LINE) : 0- TO 15-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**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 |
|---|---|---|---|---|---|---|---|
| GE-1 | 167 | 361 | 0 - 0.5 | 8.7 | 6.68 | 8.70 | 58.11 |
| GE-5 | 172 | 288 | 0 - 0.5 | 0.57 | 5.33 | 0.57 | 3.04 |
| GE-11 | 173A | 4 | 0 - 0.5 | 3,800 | 0.08 | 3,800.00 | 315.26 |
| GE-11 | 173 | 205 | 0 - 0.5 | ***0.021*** | 3.79 | 0.02 | 0.08 |
| N2SC-06 | 128 | 945 | 0 - 0.5 | 0.95 | 17.51 | 0.95 | 16.63 |
| N2SC-07 | 163 | 239 | 0 - 0.5 | 0.78 | 4.43 | 0.78 | 3.46 |
| NS-1A | 127A | 1,213 | 0 - 0.5 | ***0.021*** | 22.46 | 0.02 | 0.47 |
| NS-7 | 126 | 1,322 | 0 - 0.5 | 190 | 24.48 | 190.00 | 4,651.55 |
| NS-37 | 169 | 976 | 0 - 0.5 | 24 | 18.07 | 24.00 | 433.76 |
| RAA13-A1 | 147 | 876 | 0 - 0.5 | 3.19 | 16.23 | 3.19 | 51.77 |
| RAA13-A93 | 174 | 589 | 0 - 0.5 | 1.68 | 10.90 | 1.68 | 18.31 |
| RAA13-A94 | 165 | 817 | 0 - 0.5 | 0.80 | 15.13 | 0.80 | 12.10 |
| RAA13-A96 | 130 | 1,397 | 0 - 0.5 | 26 | 25.87 | 26.00 | 672.56 |
| RAA13-A97 | 131A | 860 | 0 - 0.5 | 2,100 | 15.92 | 2,100.00 | 33,436.67 |
| RAA13-A97 | 131 | 255 | 0 - 0.5 | ***0.021*** | 4.72 | 0.02 | 0.10 |
| RAA13-A98 | 132 | 557 | 0 - 0.5 | 5.2 | 10.31 | 5.20 | 53.59 |
| RAA13-A98 | 132A | 591 | 0 - 0.5 | ***0.021*** | 10.95 | 0.02 | 0.23 |
| RAA13-A99 | 137A | 906 | 0 - 0.5 | 2.92 | 16.79 | 2.92 | 49.01 |
| RAA13-A99 | 137 | 293 | 0 - 0.5 | ***0.021*** | 5.43 | 0.02 | 0.11 |
| RAA13-B2 | 168 | 1,150 | 0 - 0.5 | 56 | 21.29 | 56.00 | 1,192.23 |
| RAA13-B3 | 133 | 1,077 | 0 - 0.5 | 141 | 19.94 | 141.00 | 2,811.98 |
| RB-1-3 | 171 | 828 | 0 - 0.5 | 126 | 15.33 | 126.00 | 1,931.14 |
| RB-7 | 164 | 114 | 0 - 0.5 | 1,400 | 2.11 | 1,400.00 | 2,950.89 |
| RB-8-3 | 166 | 86 | 0 - 0.5 | 21.5 | 1.60 | 21.50 | 34.42 |
| SL0099 | 170 | 979 | 0 - 0.5 | 45 | 18.12 | 45.00 | 815.43 |
| SL0124 | 162 | 159 | 0 - 0.5 | 21,400 | 2.94 | 21,400.00 | 62,864.48 |
| **Totals:** | -- | 17,085 | -- | -- | 316.39 | -- | 112,377.39 |
| | | | | | **Volume-Weighted Average:** | | **355.18** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-1 | 162 | 361 | 0.5 - 1 | 8.7 | 6.68 | 8.70 | 58.11 |
| GE-5 | 166 | 288 | 0.5 - 1 | 0.57 | 5.33 | 0.57 | 3.04 |
| GE-11 | 167A | 4 | 0.5 - 1 | 3,800 | 0.08 | 3,800.00 | 315.26 |
| GE-11 | 167 | 205 | 0.5 - 1 | ***0.021*** | 3.79 | 0.02 | 0.08 |
| N2SC-06 | 124 | 945 | 0.5 - 1 | 0.95 | 17.51 | 0.95 | 16.63 |
| N2SC-07 | 158 | 353 | 0.5 - 1 | 0.78 | 6.54 | 0.78 | 5.10 |
| NS-1A | 123A | 1,213 | 0.5 - 1 | ***0.021*** | 22.46 | 0.02 | 0.47 |
| NS-7 | 122 | 1,322 | 0.5 - 1 | 190 | 24.48 | 190.00 | 4,651.55 |
| NS-37 | 164 | 1,273 | 0.5 - 1 | 24 | 23.57 | 24.00 | 565.61 |
| RAA13-A1 | 143 | 876 | 0.5 - 1 | 3.19 | 16.23 | 3.19 | 51.77 |
| RAA13-A93 | 168 | 589 | 0.5 - 1 | 1.68 | 10.90 | 1.68 | 18.31 |
| RAA13-A94 | 160 | 817 | 0.5 - 1 | 0.80 | 15.13 | 0.80 | 12.10 |
| RAA13-A96 | 126 | 1,397 | 0.5 - 1 | 26 | 25.87 | 26.00 | 672.56 |
| RAA13-A97 | 127A | 860 | 0.5 - 1 | 2,100 | 15.92 | 2,100.00 | 33,436.67 |
| RAA13-A97 | 127 | 255 | 0.5 - 1 | ***0.021*** | 4.72 | 0.02 | 0.10 |
| RAA13-A98 | 128 | 557 | 0.5 - 1 | 5.2 | 10.31 | 5.20 | 53.59 |
| RAA13-A98 | 128A | 591 | 0.5 - 1 | ***0.021*** | 10.95 | 0.02 | 0.23 |
| RAA13-A99 | 133A | 906 | 0.5 - 1 | 2.92 | 16.79 | 2.92 | 49.01 |
| RAA13-A99 | 133 | 293 | 0.5 - 1 | ***0.021*** | 5.43 | 0.02 | 0.11 |
| RAA13-B2 | 163 | 1,150 | 0.5 - 1 | 56 | 21.29 | 56.00 | 1,192.23 |
| RAA13-B3 | 129 | 1,077 | 0.5 - 1 | 141 | 19.94 | 141.00 | 2,811.98 |
| RB-1-3 | 165 | 1,509 | 0.5 - 1 | 126 | 27.95 | 126.00 | 3,522.14 |
| RB-7 | 159 | 158 | 0.5 - 1 | 1,400 | 2.93 | 1,400.00 | 4,107.44 |
| RB-8-3 | 161 | 86 | 0.5 - 1 | 21.5 | 1.60 | 21.50 | 34.42 |
| **Totals:** | -- | 17,085 | -- | -- | 316.39 | -- | 51,578.53 |
| | | | | | **Volume-Weighted Average:** | | **163.02** |

**TABLE A-2**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 4 (EASTERN PORTION OF 48-INCH LINE) : 0- TO 15-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**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 |
|---|---|---|---|---|---|---|---|
| GE-1 | 86 | 778 | 1 - 2 | 8.7 | 28.83 | 8.70 | 250.80 |
| GE-5 | 85 | 928 | 1 - 2 | 0.57 | 34.38 | 0.57 | 19.60 |
| GE-11 | 83 | 1,927 | 1 - 2 | 3,800 | 71.38 | 3,800.00 | 271,229.93 |
| GE-11 | 83A | 711 | 1 - 2 | ***0.021*** | 26.34 | 0.02 | 0.55 |
| N2SC-06 | 67 | 1,839 | 1 - 2 | 940 | 68.11 | 940.00 | 64,022.01 |
| N2SC-07 | 81 | 353 | 1 - 2 | 20 | 13.07 | 20.00 | 261.44 |
| NS-1A | 66A | 1,302 | 1 - 2 | ***0.021*** | 48.23 | 0.02 | 1.01 |
| NS-7 | 65 | 2,606 | 1 - 2 | 190 | 96.52 | 190.00 | 18,338.10 |
| NS-37 | 88 | 1,687 | 1 - 2 | 24 | 62.48 | 24.00 | 1,499.43 |
| RAA13-B2 | 87 | 1,519 | 1 - 2 | 28 | 56.25 | 28.00 | 1,575.08 |
| RAA13-Z99 | 84 | 1,470 | 1 - 2 | **0.018** | 54.44 | 0.02 | 0.98 |
| RB-7 | 82 | 159 | 1 - 2 | 1,400 | 5.88 | 1,400.00 | 8,231.48 |
| SL0099 | 89 | 1,806 | 1 - 1.5 | 540 | 66.89 | 540.00 | 36,122.20 |
| **Totals:** | -- | 17,085 | -- | -- | 632.79 | -- | 401,552.61 |
| | | | | | **Volume-Weighted Average:** | | **634.57** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-1 | 86 | 778 | 2 - 3 | 22.2 | 28.83 | 22.20 | 639.98 |
| GE-5 | 85 | 928 | 2 - 3 | 253 | 34.38 | 253.00 | 8,698.23 |
| GE-11 | 83 | 2,638 | 2 - 3 | 1.7 | 97.72 | 1.70 | 166.12 |
| N2SC-06 | 67 | 1,839 | 2 - 3 | 940 | 68.11 | 940.00 | 64,022.01 |
| N2SC-07 | 81 | 353 | 2 - 3 | 20 | 13.07 | 20.00 | 261.44 |
| NS-1A | 66A | 1,302 | 2 - 3 | ***0.021*** | 48.23 | 0.02 | 1.01 |
| NS-7 | 65 | 2,606 | 2 - 3 | 500 | 96.52 | 500.00 | 48,258.15 |
| NS-37 | 88 | 1,687 | 2 - 3 | 16 | 62.48 | 16.00 | 999.62 |
| RAA13-B2 | 87 | 1,519 | 2 - 3 | 28 | 56.25 | 28.00 | 1,575.08 |
| RAA13-Z99 | 84 | 1,470 | 2 - 3 | **0.018** | 54.44 | 0.02 | 0.98 |
| RB-7 | 82 | 159 | 2 - 3 | 77 | 5.88 | 77.00 | 452.73 |
| SL0099 | 89 | 1,806 | 2 - 2.5 | 470 | 66.89 | 470.00 | 31,439.69 |
| **Totals:** | -- | 17,085 | -- | -- | 632.79 | -- | 156,515.04 |
| | | | | | **Volume-Weighted Average:** | | **247.34** |

**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 (ppm) | Average PCB Conc. TIMES Total Volume |
|---|---|---|---|---|---|---|---|
| GE-1 | 84 | 778 | 3 - 4 | 22.2 | 28.83 | 22.20 | 639.98 |
| GE-5 | 83 | 928 | 3 - 4 | 253 | 34.38 | 253.00 | 8,698.23 |
| GE-11 | 81 | 2,638 | 3 - 4 | 1.7 | 97.72 | 1.70 | 166.12 |
| N2SC-06 | 65 | 1,839 | 3 - 4 | 780 | 68.11 | 780.00 | 53,124.64 |
| N2SC-07 | 79 | 353 | 3 - 4 | 102 | 13.07 | 102.00 | 1,333.33 |
| NS-1A | 64A | 1,302 | 3 - 4 | ***0.021*** | 48.23 | 0.02 | 1.01 |
| NS-7 | 63 | 2,606 | 3 - 4 | 500 | 96.52 | 500.00 | 48,258.15 |
| NS-37 | 86 | 3,493 | 3 - 4 | 16 | 129.37 | 16.00 | 2,069.91 |
| RAA13-B2 | 85 | 1,519 | 3 - 4 | 108 | 56.25 | 108.00 | 6,075.32 |
| RAA13-Z99 | 82 | 1,470 | 3 - 4 | **0.0175** | 54.44 | 0.02 | 0.95 |
| RB-7 | 80 | 159 | 3 - 4 | 77 | 5.88 | 77.00 | 452.73 |
| **Totals:** | -- | 17,085 | -- | -- | 632.79 | -- | 120,820.38 |
| | | | | | **Volume-Weighted Average:** | | **190.93** |

**TABLE A-2**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 4 (EASTERN PORTION OF 48-INCH LINE) : 0- TO 15-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**

**4- 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 |
|---|---|---|---|---|---|---|---|
| GE-1 | 88 | 706 | 4 - 6 | 0.050 | 52.32 | 0.05 | 2.62 |
| GE-2 | 75 | 1,442 | 4 - 6 | 169 | 106.85 | 169.00 | 18,057.71 |
| GE-5 | 87 | 928 | 4 - 6 | **0.025** | 68.76 | 0.03 | 1.72 |
| GE-11 | 85 | 2,638 | 4 - 6 | **0.025** | 195.44 | 0.03 | 4.89 |
| N2SC-06 | 69 | 1,839 | 4 - 6 | 780 | 136.22 | 780.00 | 106,249.29 |
| N2SC-07 | 83 | 511 | 4 - 6 | 102 | 37.87 | 102.00 | 3,863.00 |
| NS-1 | 74A | 222 | 4 - 6 | ***0.021*** | 16.48 | 0.02 | 0.35 |
| NS-1A | 68 | 1,080 | 4 - 6 | ***0.021*** | 79.98 | 0.02 | 1.68 |
| NS-7 | 67 | 2,606 | 4 - 6 | 130 | 193.03 | 130.00 | 25,094.24 |
| NS-37 | 89 | 3,380 | 4 - 6 | 9.6 | 250.39 | 9.60 | 2,403.78 |
| RAA13-B2 | 90 | 261 | 4 - 6 | 108 | 19.34 | 108.00 | 2,088.56 |
| RAA13-Z99 | 86 | 1,470 | 4 - 6 | **0.0175** | 108.87 | 0.02 | 1.91 |
| **Totals:** | -- | 17,085 | -- | -- | 1,265.55 | -- | 157,769.73 |
| | | | | | **Volume-Weighted Average:** | | **124.67** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-2 | 64 | 1,614 | 6 - 8 | 169 | 119.57 | 169.00 | 20,207.52 |
| GE-5 | 78 | 1,454 | 6 - 8 | **0.025** | 107.73 | 0.03 | 2.69 |
| GE-11 | 76 | 2,638 | 6 - 8 | 1.8 | 195.44 | 1.80 | 351.79 |
| N2SC-06 | 59 | 1,839 | 6 - 8 | 1,400 | 136.22 | 1,400.00 | 190,703.85 |
| N2SC-07 | 74 | 511 | 6 - 8 | 11 | 37.87 | 11.00 | 416.60 |
| NS-1 | 58A | 222 | 6 - 8 | ***0.021*** | 16.48 | 0.02 | 0.35 |
| NS-1A | 58 | 1,080 | 6 - 8 | ***0.021*** | 79.98 | 0.02 | 1.68 |
| NS-7 | 57 | 2,606 | 6 - 8 | 130 | 193.03 | 130.00 | 25,094.24 |
| NS-37 | 79 | 3,380 | 6 - 8 | 0.24 | 250.39 | 0.24 | 60.09 |
| RAA13-B2 | 80 | 270 | 6 - 8 | 79 | 19.96 | 79.00 | 1,577.07 |
| RAA13-Z99 | 77 | 1,470 | 6 - 8 | **0.018** | 108.87 | 0.02 | 1.96 |
| | -- | 17,085 | -- | -- | 1,266 | -- | 238,418 |
| | | | | | **Volume-Weighted Average:** | | **188.39** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-11 | 109 | 2,638 | 8 - 9 | 5.1 | 97.72 | 5.10 | 498.36 |
| N2SC-06 | 90 | 1,839 | 8 - 9 | 1,400 | 68.11 | 1,400.00 | 95,351.93 |
| N2SC-07 | 104 | 511 | 8 - 9 | 11 | 18.94 | 11.00 | 208.30 |
| NS-1 | 89A | 222 | 8 - 9 | 310 | 8.24 | 310.00 | 2,554.29 |
| NS-1A | 89 | 1,080 | 8 - 9 | 33 | 39.99 | 33.00 | 1,319.66 |
| NS-7 | 88 | 2,606 | 8 - 9 | 280 | 96.52 | 280.00 | 27,024.56 |
| NS-37 | 107 | 3,493 | 8 - 9 | 6.7 | 129.37 | 6.70 | 866.77 |
| RAA13-B2 | 108 | 2,317 | 8 - 9 | 79 | 85.83 | 79.00 | 6,780.22 |
| RAA13-Z99 | 106 | 2,378 | 8 - 9 | **0.018** | 88.07 | 0.02 | 1.59 |
| **Totals:** | -- | 17,085 | -- | -- | 632.77 | -- | 134,605.67 |
| | | | | | **Volume-Weighted Average:** | | **212.72** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-11 | 68 | 2,638 | 9 - 10 | 5.1 | 97.72 | 5.10 | 498.36 |
| N2SC-06 | 53 | 1,839 | 9 - 10 | 1,400 | 68.11 | 1,400.00 | 95,351.93 |
| N2SC-07 | 66 | 511 | 9 - 10 | 11 | 18.94 | 11.00 | 208.30 |
| NS-1 | 52A | 222 | 9 - 10 | 310 | 8.24 | 310.00 | 2,554.29 |
| NS-1A | 52 | 1,080 | 9 - 10 | 33 | 39.99 | 33.00 | 1,319.66 |
| NS-7 | 51 | 2,606 | 9 - 10 | 280 | 96.52 | 280.00 | 27,024.56 |
| NS-37 | 71 | 3,493 | 9 - 10 | 6.7 | 129.37 | 6.70 | 866.77 |
| RAA13-B2 | 70 | 2,317 | 9 - 10 | 79 | 85.83 | 79.00 | 6,780.22 |
| RAA13-Z99 | 69 | 2,378 | 9 - 10 | **0.018** | 88.07 | 0.02 | 1.59 |
| **Totals:** | -- | 17,085 | -- | -- | 632.77 | -- | 134,605.67 |
| | | | | | **Volume-Weighted Average:** | | **212.72** |

**TABLE A-2**
**POST-REMEDIATION CONDITIONS**
**UTILITY AREA 4 (EASTERN PORTION OF 48-INCH LINE) : 0- TO 15-FOOT DEPTH INCREMENT**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**
**GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS**

**10- 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 |
|---|---|---|---|---|---|---|---|
| GE-11 | 66 | 2,638 | 10 - 12 | 3.145 | 195.44 | 3.15 | 614.65 |
| N2SC-06 | 51 | 1,839 | 10 - 12 | 85 | 136.22 | 85.00 | 11,578.45 |
| N2SC-07 | 64 | 511 | 10 - 12 | 7.9 | 37.87 | 7.90 | 299.19 |
| NS-1 | 50A | 222 | 10 - 12 | 310 | 16.48 | 310.00 | 5,108.57 |
| NS-1A | 50 | 1,080 | 10 - 12 | 3,400 | 79.98 | 3,400.00 | 271,929.48 |
| NS-7 | 49 | 2,606 | 10 - 12 | 20 | 193.03 | 20.00 | 3,860.65 |
| NS-37 | 69 | 3,493 | 10 - 12 | 0.25 | 258.74 | 0.25 | 64.68 |
| RAA13-B2 | 68 | 2,317 | 10 - 12 | 1.3 | 171.65 | 1.30 | 223.15 |
| RAA13-Z99 | 67 | 2,378 | 10 - 12 | **0.0185** | 176.14 | 0.02 | 3.26 |
| **Totals:** | -- | 17,085 | -- | -- | 1,265.55 | -- | 293,682.08 |
| | | | | | **Volume-Weighted Average:** | | **232.06** |

**12- 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 |
|---|---|---|---|---|---|---|---|
| GE-11 | 60 | 2,638 | 12 - 14 | 5.8 | 195.44 | 5.80 | 1,133.53 |
| N2SC-06 | 47 | 1,839 | 12 - 14 | 85 | 136.22 | 85.00 | 11,578.45 |
| N2SC-07 | 59 | 512 | 12 - 14 | 7.9 | 37.90 | 7.90 | 299.44 |
| NS-1A | 46A | 1,302 | 12 - 14 | 696 | 96.46 | 696.00 | 67,135.64 |
| NS-7 | 45 | 2,606 | 12 - 14 | 0.53 | 193.03 | 0.53 | 102.31 |
| NS-37 | 63 | 3,493 | 12 - 14 | 0.41 | 258.74 | 0.41 | 106.08 |
| RAA13-B2 | 62 | 2,317 | 12 - 14 | 1.3 | 171.65 | 1.30 | 223.15 |
| RAA13-Z99 | 61 | 2,378 | 12 - 14 | **0.0185** | 176.14 | 0.02 | 3.26 |
| **Totals:** | -- | 17,085 | -- | -- | 1,265.58 | -- | 80,581.86 |
| | | | | | **Volume-Weighted Average:** | | **63.67** |

**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 |
|---|---|---|---|---|---|---|---|
| GE-11 | 45 | 2,638 | 14 - 15 | 5.8 | 97.72 | 5.80 | 566.77 |
| N2SC-06 | 36 | 1,839 | 14 - 15 | 85 | 68.11 | 85.00 | 5,789.22 |
| N2SC-07 | 44 | 512 | 14 - 15 | 7.9 | 18.95 | 7.90 | 149.72 |
| NS-1A | 35A | 1,302 | 14 - 15 | 1,500 | 48.23 | 1,500.00 | 72,344.44 |
| NS-7 | 34 | 2,606 | 14 - 15 | 0.65 | 96.52 | 0.65 | 62.74 |
| NS-37 | 48 | 3,493 | 14 - 15 | 0.42 | 129.37 | 0.42 | 54.34 |
| RAA13-B2 | 47 | 2,317 | 14 - 15 | 1.3 | 85.83 | 1.30 | 111.57 |
| RAA13-Z99 | 46 | 2,378 | 14 - 15 | **0.0185** | 88.07 | 0.02 | 1.63 |
| **Totals:** | -- | 17,085 | -- | -- | 632.79 | -- | 79,080.43 |
| | | | | | **Volume-Weighted Average:** | | **124.97** |

**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:** | -- | 17,085 | -- | -- | 9,491.73 | -- | 1,961,587.24 |
| | | | | | **Volume-Weighted Average:** | | **206.66** |

Notes:

1. Polygon ID and area based on information presented in Appendix E of the Conceptual RD/RA Work Plan.
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.

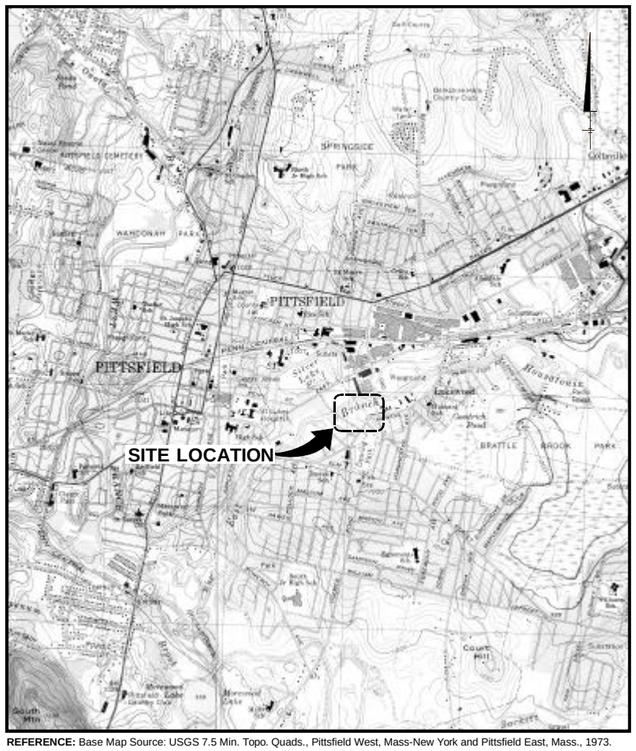
# *Attachment B*

## Technical Drawings

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

TECHNICAL DRAWINGS

# REMOVAL ACTION
# NEWELL STREET AREA II
## REMOVAL ACTION AREA (RAA)




**REFERENCE:** Base Map Source: USGS 7.5 Min. Topo. Quads., Pittsfield West, Mass-New York and Pittsfield East, Mass., 1973.

2000' 0 2000'
APPROX. SCALE: 1 = 2000 FEET

**LOCATION MAP**

**MARCH 2005**

**PREPARED FOR:**

***General Electric Company***
***Pittsfield, Massachusetts***

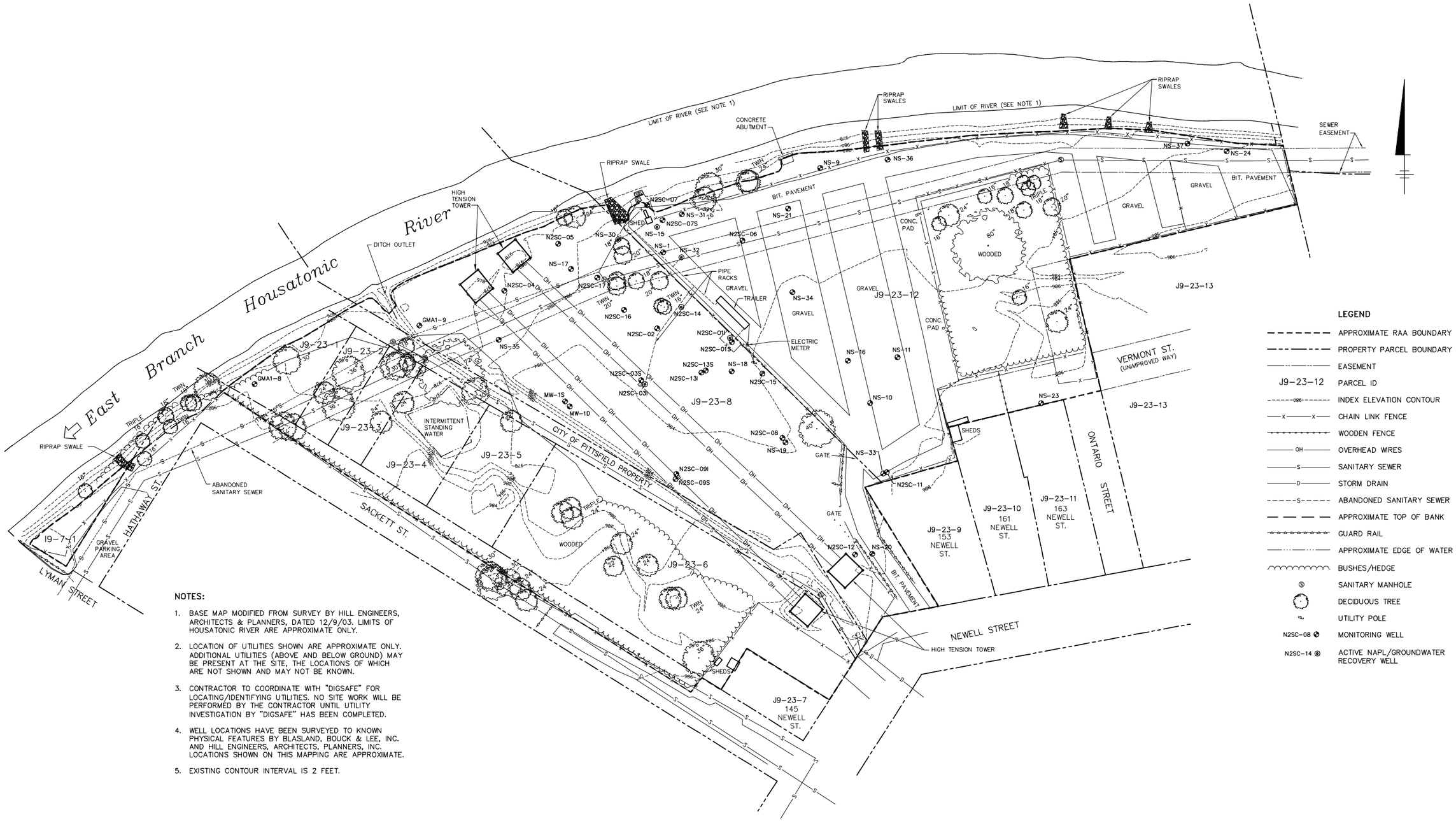
**PREPARED BY:**

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

**INDEX TO DRAWINGS**


COVER SHEET
1. EXISTING SITE PLAN
2. SITE PREPARATION PLAN
3. EXCAVATION LIMITS
4. SITE RESTORATION PLAN
5A. ENGINEERED BARRIER PLAN - SUBGRADE
5B. ENGINEERED BARRIER PLAN - FINAL GRADE
6A. ENGINEERED BARRIER PLAN - SUBGRADE
6B. ENGINEERED BARRIER PLAN - FINAL GRADE
7. DETAILS
8. DETAILS
9. GENERAL NOTES AND DETAILS


03/02/05 SYR-D85-LBR DJH KLS
N:/30193004/cdr/30193C02.cdr




**NOTES:**

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 12/9/03. LIMITS OF HOUSATONIC RIVER ARE APPROXIMATE ONLY.
2. LOCATION OF UTILITIES SHOWN ARE APPROXIMATE ONLY. ADDITIONAL UTILITIES (ABOVE AND BELOW GROUND) MAY BE PRESENT AT THE SITE, THE LOCATIONS OF WHICH ARE NOT SHOWN AND MAY NOT BE KNOWN.
3. CONTRACTOR TO COORDINATE WITH "DIGSAFE" FOR LOCATING/IDENTIFYING UTILITIES. NO SITE WORK WILL BE PERFORMED BY THE CONTRACTOR UNTIL UTILITY INVESTIGATION BY "DIGSAFE" HAS BEEN COMPLETED.
4. WELL LOCATIONS HAVE BEEN SURVEYED TO KNOWN PHYSICAL FEATURES BY BLASLAND, BOUCK & LEE, INC. AND HILL ENGINEERS, ARCHITECTS, PLANNERS, INC. LOCATIONS SHOWN ON THIS MAPPING ARE APPROXIMATE.
5. EXISTING CONTOUR INTERVAL IS 2 FEET.

**LEGEND**

- APPROXIMATE RAA BOUNDARY
- PROPERTY PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PARCEL ID
- INDEX ELEVATION CONTOUR
- CHAIN LINK FENCE
- WOODEN FENCE
- OVERHEAD WIRES
- SANITARY SEWER
- STORM DRAIN
- ABANDONED SANITARY SEWER
- APPROXIMATE TOP OF BANK
- GUARD RAIL
- APPROXIMATE EDGE OF WATER
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- N2SC-08 MONITORING WELL
- N2SC-14 ACTIVE NAPL/GROUNDWATER RECOVERY WELL

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=*REF
P: PAGESET/SYR-CDL
3/2/05 SYR-85-LAF SDL DMW
N/30193D04/RAA/30193G01.DWG

Graphic Scale
50' 0 50' 100'
1"=50'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. **USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.**

| Date | Revisions | Init |
|---|---|---|



Professional Engineer's Name

Professional Engineer's No.

State | Date Signed

| Project Mgr. | Designed by | Drawn by |
|---|---|---|
| ACC | CAA | NES |

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

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA II RAA REMEDIAL ACTION

# EXISTING SITE PLAN

TECHNICAL DRAWINGS

BBL Project No. 301.93

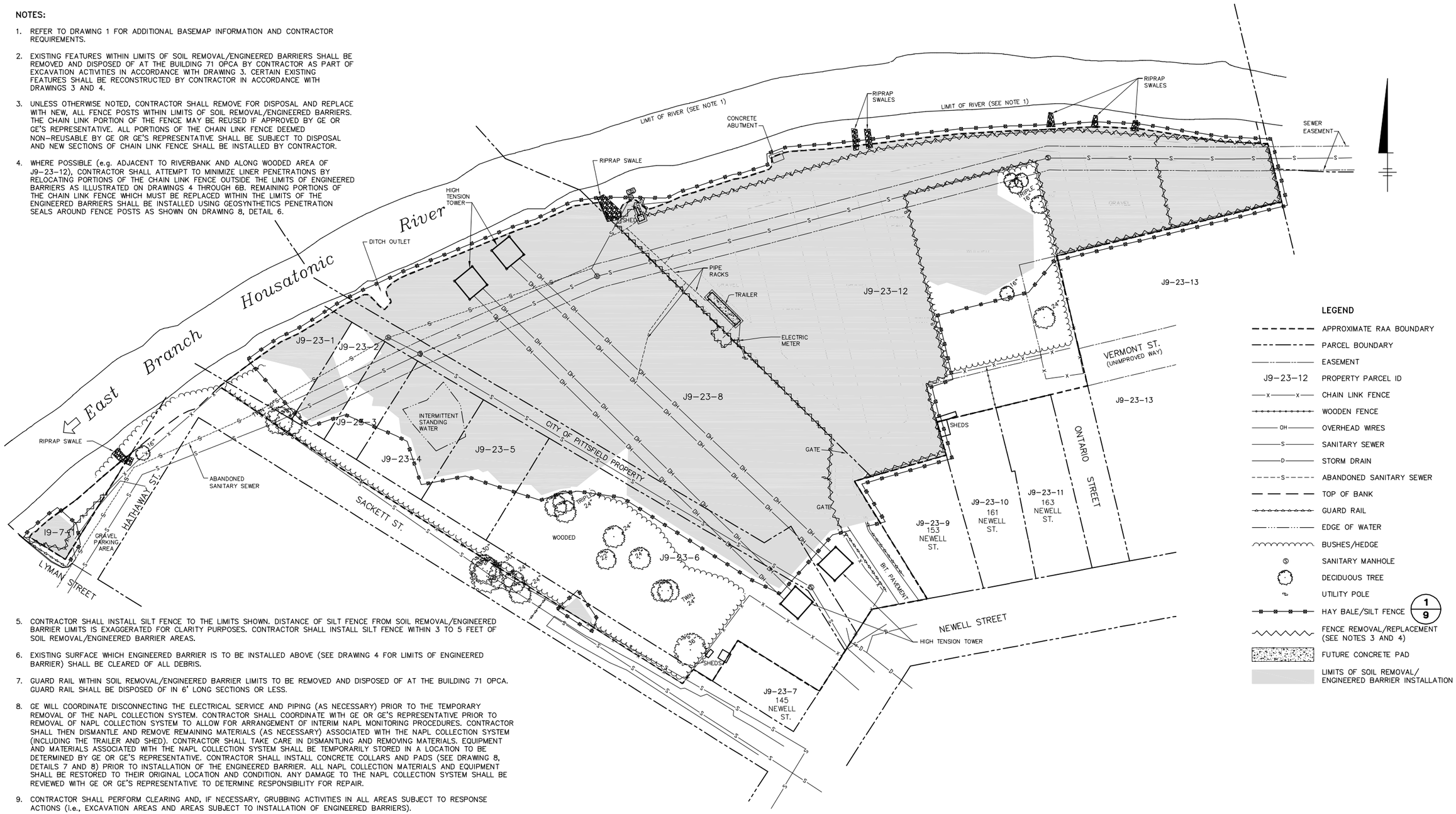
Date MARCH 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

1

NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. EXISTING FEATURES WITHIN LIMITS OF SOIL REMOVAL/ENGINEERED BARRIERS SHALL BE REMOVED AND DISPOSED OF AT THE BUILDING 71 OPCA BY CONTRACTOR AS PART OF EXCAVATION ACTIVITIES IN ACCORDANCE WITH DRAWING 3. CERTAIN EXISTING FEATURES SHALL BE RECONSTRUCTED BY CONTRACTOR IN ACCORDANCE WITH DRAWINGS 3 AND 4.
3. UNLESS OTHERWISE NOTED, CONTRACTOR SHALL REMOVE FOR DISPOSAL AND REPLACE WITH NEW, ALL FENCE POSTS WITHIN LIMITS OF SOIL REMOVAL/ENGINEERED BARRIERS. THE CHAIN LINK PORTION OF THE FENCE MAY BE REUSED IF APPROVED BY GE OR GE'S REPRESENTATIVE. ALL PORTIONS OF THE CHAIN LINK FENCE DEEMED NON-REUSABLE BY GE OR GE'S REPRESENTATIVE SHALL BE SUBJECT TO DISPOSAL AND NEW SECTIONS OF CHAIN LINK FENCE SHALL BE INSTALLED BY CONTRACTOR.
4. WHERE POSSIBLE (e.g. ADJACENT TO RIVERBANK AND ALONG WOODED AREA OF J9-23-12), CONTRACTOR SHALL ATTEMPT TO MINIMIZE LINER PENETRATIONS BY RELOCATING PORTIONS OF THE CHAIN LINK FENCE OUTSIDE THE LIMITS OF ENGINEERED BARRIERS AS ILLUSTRATED ON DRAWINGS 4 THROUGH 6B. REMAINING PORTIONS OF THE CHAIN LINK FENCE WHICH MUST BE REPLACED WITHIN THE LIMITS OF THE ENGINEERED BARRIERS SHALL BE INSTALLED USING GEOSYNTHETICS PENETRATION SEALS AROUND FENCE POSTS AS SHOWN ON DRAWING 8, DETAIL 6.




LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- CHAIN LINK FENCE
- WOODEN FENCE
- OVERHEAD WIRES
- SANITARY SEWER
- STORM DRAIN
- ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- EDGE OF WATER
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- HAY BALE/SILT FENCE (1/9)
- FENCE REMOVAL/REPLACEMENT (SEE NOTES 3 AND 4)
- FUTURE CONCRETE PAD
- LIMITS OF SOIL REMOVAL/ ENGINEERED BARRIER INSTALLATION

5. CONTRACTOR SHALL INSTALL SILT FENCE TO THE LIMITS SHOWN. DISTANCE OF SILT FENCE FROM SOIL REMOVAL/ENGINEERED BARRIER LIMITS IS EXAGGERATED FOR CLARITY PURPOSES. CONTRACTOR SHALL INSTALL SILT FENCE WITHIN 3 TO 5 FEET OF SOIL REMOVAL/ENGINEERED BARRIER AREAS.
6. EXISTING SURFACE WHICH ENGINEERED BARRIER IS TO BE INSTALLED ABOVE (SEE DRAWING 4 FOR LIMITS OF ENGINEERED BARRIER) SHALL BE CLEARED OF ALL DEBRIS.
7. GUARD RAIL WITHIN SOIL REMOVAL/ENGINEERED BARRIER LIMITS TO BE REMOVED AND DISPOSED OF AT THE BUILDING 71 OPCA. GUARD RAIL SHALL BE DISPOSED OF IN 6' LONG SECTIONS OR LESS.
8. GE WILL COORDINATE DISCONNECTING THE ELECTRICAL SERVICE AND PIPING (AS NECESSARY) PRIOR TO THE TEMPORARY REMOVAL OF THE NAPL COLLECTION SYSTEM. CONTRACTOR SHALL COORDINATE WITH GE OR GE'S REPRESENTATIVE PRIOR TO REMOVAL OF NAPL COLLECTION SYSTEM TO ALLOW FOR ARRANGEMENT OF INTERIM NAPL MONITORING PROCEDURES. CONTRACTOR SHALL THEN DISMANTLE AND REMOVE REMAINING MATERIALS (AS NECESSARY) ASSOCIATED WITH THE NAPL COLLECTION SYSTEM (INCLUDING THE TRAILER AND SHED). CONTRACTOR SHALL TAKE CARE IN DISMANTLING AND REMOVING MATERIALS. EQUIPMENT AND MATERIALS ASSOCIATED WITH THE NAPL COLLECTION SYSTEM SHALL BE TEMPORARILY STORED IN A LOCATION TO BE DETERMINED BY GE OR GE'S REPRESENTATIVE. CONTRACTOR SHALL INSTALL CONCRETE COLLARS AND PADS (SEE DRAWING 8, DETAILS 7 AND 8) PRIOR TO INSTALLATION OF THE ENGINEERED BARRIER. ALL NAPL COLLECTION MATERIALS AND EQUIPMENT SHALL BE RESTORED TO THEIR ORIGINAL LOCATION AND CONDITION. ANY DAMAGE TO THE NAPL COLLECTION SYSTEM SHALL BE REVIEWED WITH GE OR GE'S REPRESENTATIVE TO DETERMINE RESPONSIBILITY FOR REPAIR.
9. CONTRACTOR SHALL PERFORM CLEARING AND, IF NECESSARY, GRUBBING ACTIVITIES IN ALL AREAS SUBJECT TO RESPONSE ACTIONS (i.e., EXCAVATION AREAS AND AREAS SUBJECT TO INSTALLATION OF ENGINEERED BARRIERS).

X: 30193X00, X01, X02.DWG
L: ON=*, OFF= *REF, |CONT*, |VEGETATION
P: PAGESET/SYR-CDL
3/3/05 SYR-85-LAF SDL LAF
N/30193004/RAA/30193G02.DWG

Graphic Scale
50' 0 50' 100'
1"=50'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. **USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.**

| Date | Revisions | Init |
|---|---|---|



Professional Engineer's Name
Professional Engineer's No.
State | Date Signed

| Project Mgr. | Designed by | Drawn by |
|---|---|---|
| ACC | CAA | NES |

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

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA II RAA REMEDIAL ACTION

# SITE PREPARATION PLAN

TECHNICAL DRAWINGS

BBL Project No. 301.93
Date MARCH 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

2

GE WILL WORK WITH THE CONTRACTOR TO OBTAIN THE APPROPRIATE CONSTRUCTION PROCEDURES FROM WMECO (OR OTHER APPROPRIATE UTILITY COMPANIES) PRIOR TO INITIATING REMOVAL ACTION(S) IN THE VICINITY OF HIGH TENSION TOWERS. CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES WHEN EXCAVATING IN THE VICINITY OF TOWERS DUE TO: (1) POSSIBLE GROUNDING WIRE(S) LOCATED AT AN UNKNOWN DEPTH BELOW GROUND SURFACE. ANY DAMAGE TO WIRE(S) WILL BE REPAIRED IMMEDIATELY IN ACCORDANCE WITH UTILITY REGULATION SPECIFICATIONS/REQUIREMENTS AND AT CONTRACTOR'S EXPENSE AND; (2) UNKNOWN DIMENSIONS AND CONDITION OF THE FOOTER(S) BENEATH THE TOWERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EXISTING CONDITION OF THE TOWERS AND FOOTER(S) DURING IMPLEMENTATION OF REMOVAL ACTIONS AND ANY DAMAGE TO THE TOWERS, FOOTER(S), AND ANCILLARY EQUIPMENT AND/OR INTERRUPTION OF SERVICE DURING REMOVAL ACTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF THE 48" REINFORCED CONCRETE SANITARY SEWER MAIN (AS-BUILT TOP OF PIPE IS APPROXIMATELY ELEVATION 976).

CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF THE 48" REINFORCED CONCRETE SANITARY SEWER MAIN (AS-BUILT TOP OF PIPE IS APPROXIMATELY ELEVATION 976).

CONTRACTOR SHALL REMOVE AND REPLACE EXISTING ROCK CHECK DAM (2/9)

CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF THE 20" REINFORCED CONCRETE SANITARY SEWER MAIN (AS-BUILT TOP OF PIPE IS APPROXIMATELY ELEVATION 976).

NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. EXCAVATIONS SHALL BE FULLY COMPLETED TO DEPTH OR ELEVATION INDICATED WITHIN SPECIFIED LIMITS. ALL EXCAVATED MATERIALS TO BE DISPOSED OF AT THE BUILDING 71 OPCA.
3. NEWLY RESTORED TREES AND RIPRAP WITHIN THE AREA PREVIOUSLY ADDRESSED AS PART OF THE UPPER 1/2-MILE REACH SHALL BE PROTECTED OR RESTORED TO EXISTING CONDITION.
4. MONITORING WELLS NOT SUBJECT TO DECOMMISSIONING SHALL BE PROTECTED DURING REMOVAL ACTIONS AND EXTENDED, IF NECESSARY, AS SHOWN ON DETAIL 3, DRAWING 9. ALL OTHER MONITORING WELLS SHALL BE DECOMMISSIONED AND ABANDONED.
5. CONTRACTOR IS REQUIRED TO PERFORM THE EXCAVATION OF ANCHOR TRENCHES ASSOCIATED WITH THE INSTALLATION OF ENGINEERED BARRIERS AND ALL EXCAVATION ACTIVITIES NECESSARY TO ACHIEVE THE ENGINEERED BARRIER/POST-RESTORATION GRADES WITH THE EXCAVATION ACTIVITIES SPECIFIED ON THIS TECHNICAL DRAWING SUCH THAT THE GUIDELINES SPECIFIED IN NOTE 15 ON THE TECHNICAL DRAWING 9 ARE SATISFIED.
6. CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES IN THE VICINITY OF UTILITY POLES THROUGHOUT THE IMPLEMENTATION OF REMOVAL ACTIONS.
7. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THIS INVENTORY SHALL BE SUBMITTED TO GE OR GE'S REPRESENTATIVE. THE CONTRACTOR SHALL SHEAR/SHRED ALL TREES AND SHRUBS (INCLUDING ROOTS) REMOVED DURING THE PERFORMANCE RESPONSE ACTIONS FOR TRANSPORTATION TO THE OPCAS FOR POTENTIAL FUTURE USE/DISPOSAL (AS APPROPRIATE).

LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- INDEX ELEVATION CONTOUR
- CHAIN LINK FENCE
- WOODEN FENCE
- OVERHEAD WIRES
- SANITARY SEWER
- STORM DRAIN
- ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- EDGE OF WATER
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- 1' AREA OF REMOVAL AND DEPTH OF EXCAVATION (SEE NOTE 2)
- ELEV. 981 AREA OF REMOVAL AND REQUIRED ELEVATION OF EXCAVATION (SEE NOTE 2)
- AREA PREVIOUSLY ADDRESSED AS PART OF THE UPPER 1/2-MILE REACH (SEE NOTE 3)
- N2SC-08 MONITORING WELL (SEE NOTE 4)
- N2SC-14 ACTIVE NAPL/GROUNDWATER RECOVERY WELL (SEE NOTE 4)
- CONCRETE PAD

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=REF*, |VEGETATION*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES GMS LAF
N/30193004/RAA/30193G06.DWG

Graphic Scale
50' 0 50' 100'
1"=50'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. **USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.**

| Date | Revisions | Init |
|---|---|---|



Professional Engineer's Name

Professional Engineer's No.

State | Date Signed

| Project Mgr. | Designed by | Drawn by |
|---|---|---|
| ACC | CAA | NES |

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NEWELL STREET AREA II RAA REMEDIAL ACTION

# EXCAVATION LIMITS

TECHNICAL DRAWINGS

BBL Project No. 301.93

Date MARCH 2005

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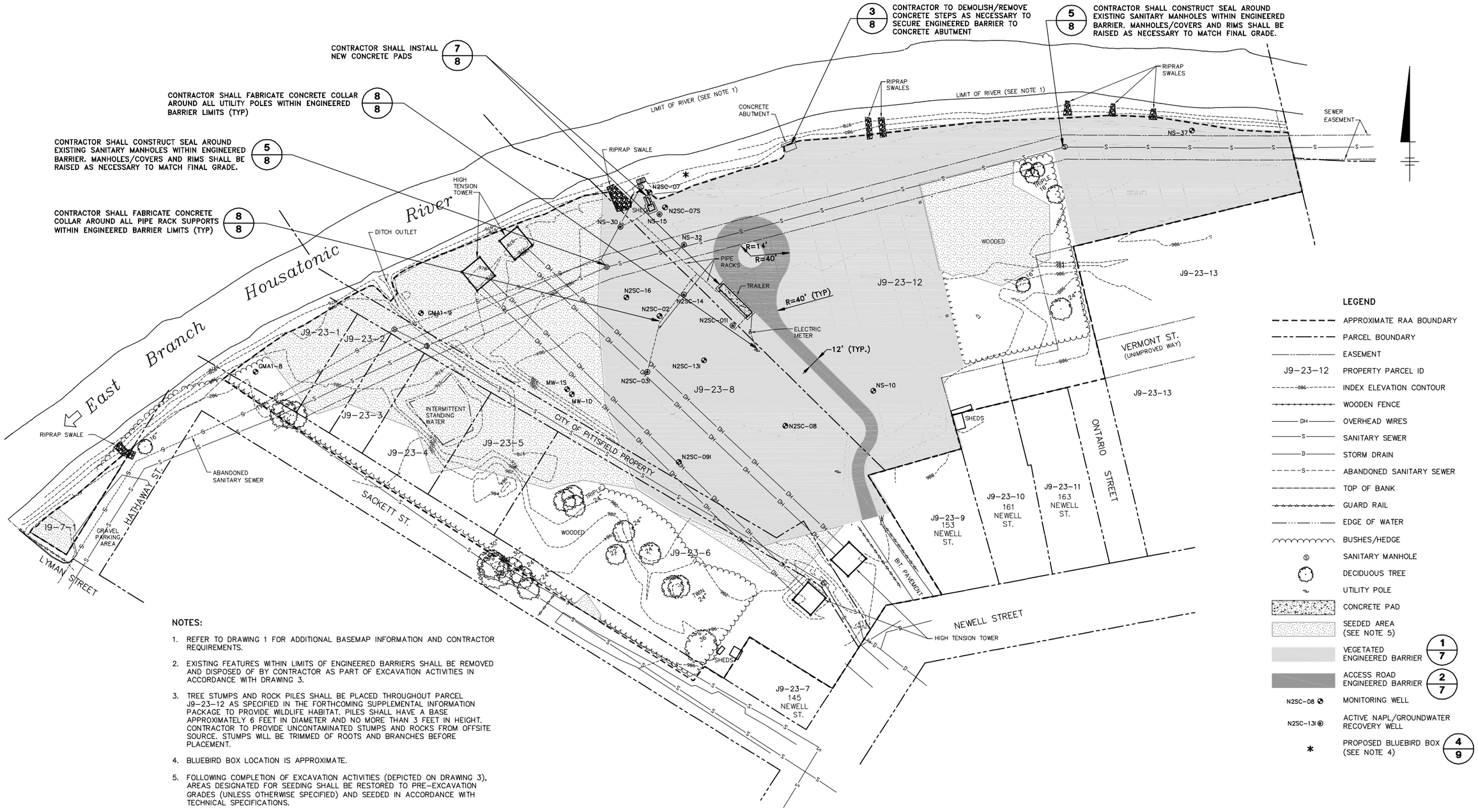
3




**NOTES:**

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. EXISTING FEATURES WITHIN LIMITS OF ENGINEERED BARRIERS SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR AS PART OF EXCAVATION ACTIVITIES IN ACCORDANCE WITH DRAWING 3.
3. TREE STUMPS AND ROCK PILES SHALL BE PLACED THROUGHOUT PARCEL J9-23-12 AS SPECIFIED IN THE FORTHCOMING SUPPLEMENTAL INFORMATION PACKAGE TO PROVIDE WILDLIFE HABITAT. PILES SHALL HAVE A BASE APPROXIMATELY 6 FEET IN DIAMETER AND NO MORE THAN 3 FEET IN HEIGHT. CONTRACTOR TO PROVIDE UNCONTAMINATED STUMPS AND ROCKS FROM OFFSITE SOURCE. STUMPS WILL BE TRIMMED OF ROOTS AND BRANCHES BEFORE PLACEMENT.
4. BLUEBIRD BOX LOCATION IS APPROXIMATE.
5. FOLLOWING COMPLETION OF EXCAVATION ACTIVITIES (DEPICTED ON DRAWING 3), AREAS DESIGNATED FOR SEEDING SHALL BE RESTORED TO PRE-EXCAVATION GRADES (UNLESS OTHERWISE SPECIFIED) AND SEEDED IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

**LEGEND**

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- INDEX ELEVATION CONTOUR
- WOODEN FENCE
- OVERHEAD WIRES
- SANITARY SEWER
- STORM DRAIN
- ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- EDGE OF WATER
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- CONCRETE PAD
- SEEDED AREA (SEE NOTE 5)
- VEGETATED ENGINEERED BARRIER 1/7
- ACCESS ROAD ENGINEERED BARRIER 2/7
- N2SC-08 MONITORING WELL
- N2SC-13I ACTIVE NAPL/GROUNDWATER RECOVERY WELL
- * PROPOSED BLUEBIRD BOX (SEE NOTE 4) 4/9

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=*REF, |FL_CHAINLINK, |GATE*, |VEGETATION*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES DMW LAF
N/30193D04/RAA/30193G04.DWG

Graphic Scale
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1"=50'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. **USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.**

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| Professional Engineer's Name | | |
| Professional Engineer's No. | | |
| State | Date Signed | |
| Project Mgr. | Designed by | Drawn by |
| ACC | CAA | NES |

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# SITE RESTORATION PLAN

TECHNICAL DRAWINGS

BBL Project No. 301.93

Date MARCH 2005

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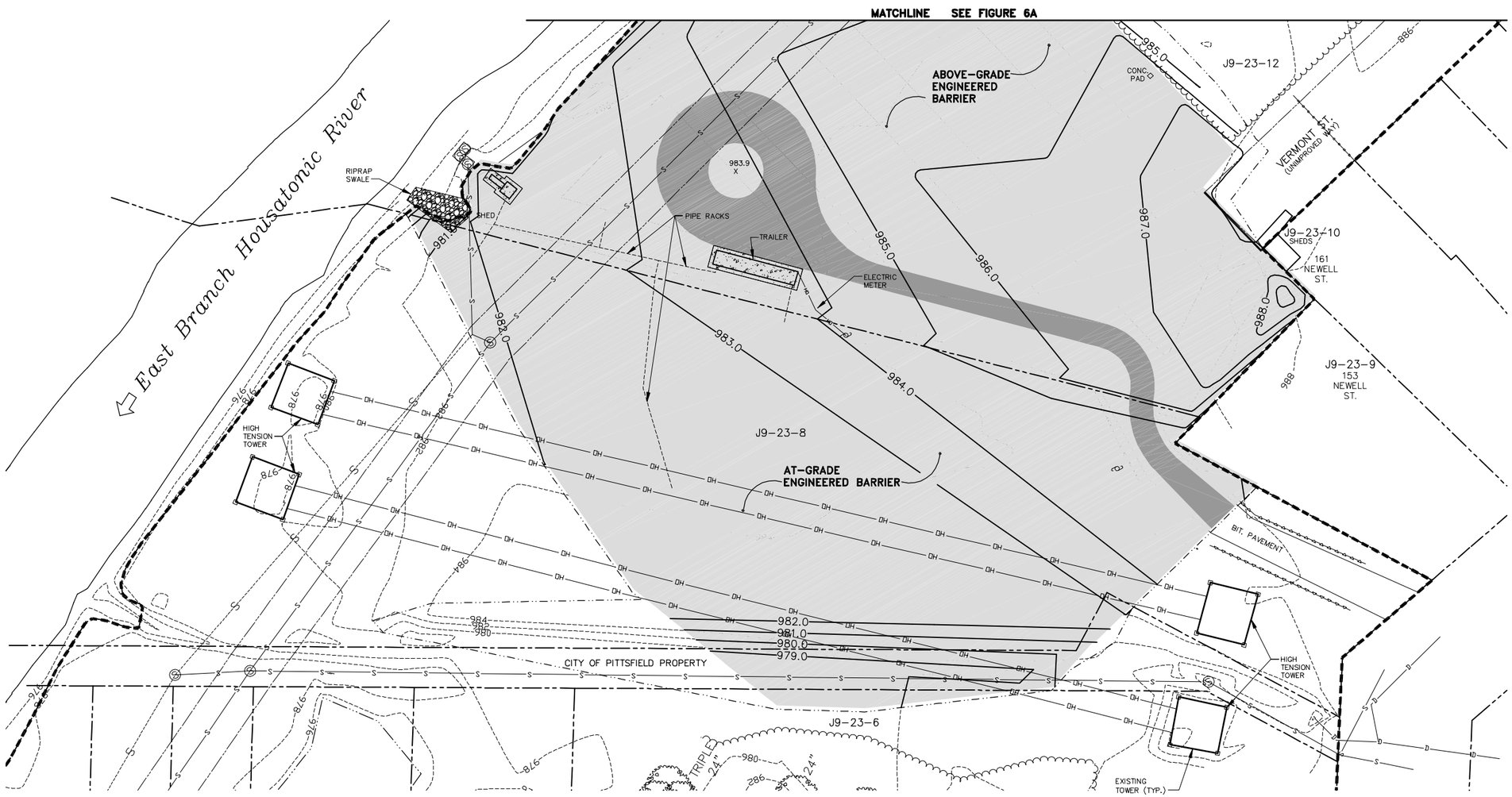
Syracuse, NY 13214
315-446-9120

4




LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- 392 INDEX ELEVATION CONTOUR
- LIMITS OF GRADING
- 988.0 PROPOSED SUBGRADE CONTOURS (SEE NOTE 3)
- WOODEN FENCE
- DH OVERHEAD WIRES
- S SANITARY SEWER
- D STORM DRAIN
- S ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- CONCRETE PAD
- VEGETATIVE ENGINEERED BARRIER (1/7)
- ACCESS ROAD ENGINEERED BARRIER (2/7)
- 983.9 X SPOT ELEVATION

NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. PROPOSED CONTOUR INTERVAL IS 1 FOOT. EXISTING CONTOUR INTERVAL IS 2 FEET.
3. PROPOSED GRADING REPRESENTS TOP OF PREPARED SUBGRADE (i.e., BARRIER GEOSYNTHETICS SUBGRADE).
4. REFER TO DRAWING 5B AND DETAIL DRAWINGS FOR ADDITIONAL CONSTRUCTION INFORMATION (e.g., DRAINAGE PIPE INVERTS, CULVERT LOCATIONS, AND ANCHOR TRENCHES).

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=*REF, |50-*, |FL_CHAINLINK, |GATE*, |VEGETATION*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES DMW LAF
N/30193004/RAA/30193G15.DWG

Graphic Scale
30' 0 30' 60'
1"=30'

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| Date | Revisions | Init |
|---|---|---|



Professional Engineer's Name

Professional Engineer's No.

State | Date Signed

Project Mgr. ACC | Designed by CAA | Drawn by NES

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NEWELL STREET AREA II RAA REMEDIAL ACTION

# ENGINEERED BARRIER PLAN SUBGRADE

TECHNICAL DRAWINGS

BBL Project No. 301.93

Date MARCH 2005

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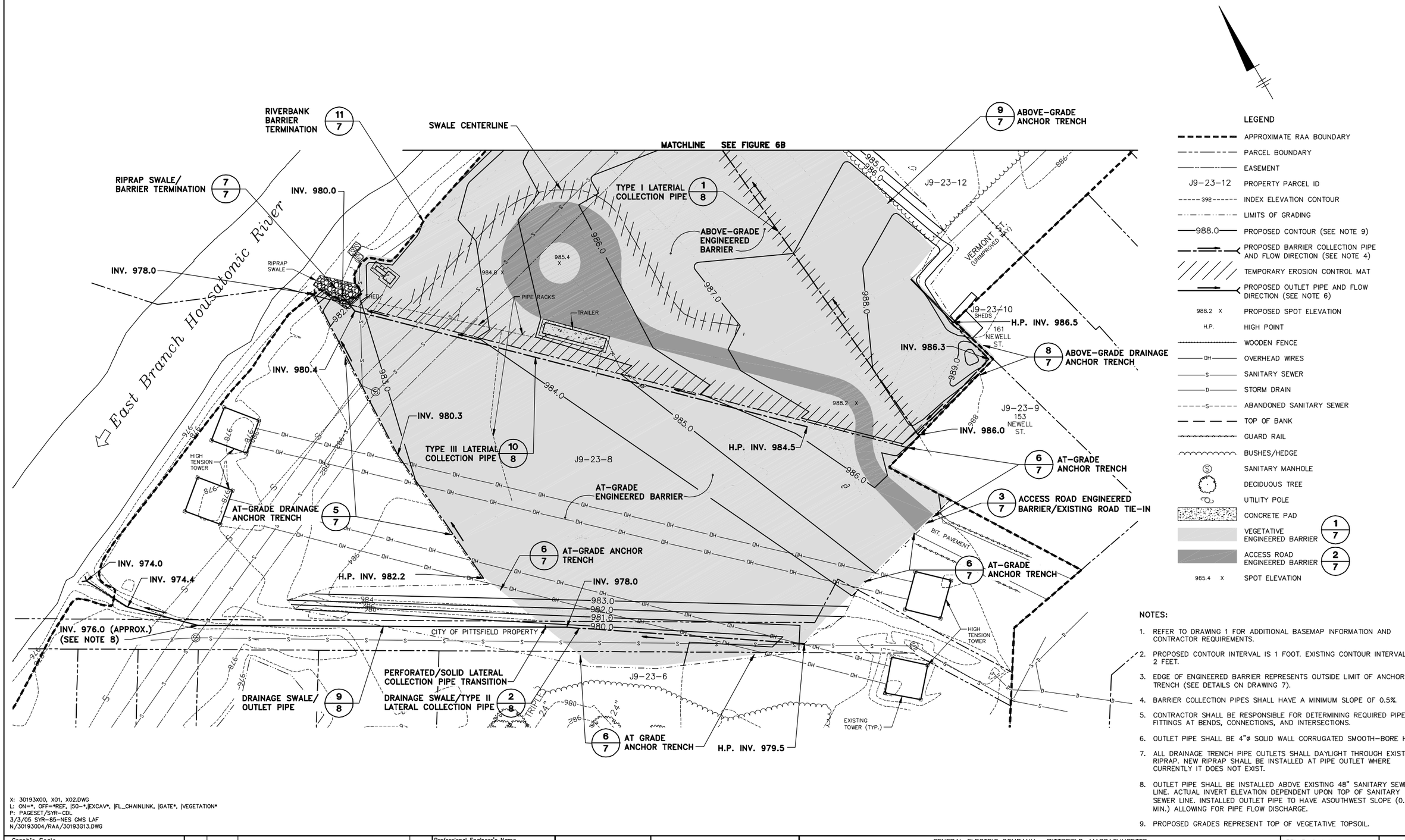
5A




NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. PROPOSED CONTOUR INTERVAL IS 1 FOOT. EXISTING CONTOUR INTERVAL IS 2 FEET.
3. EDGE OF ENGINEERED BARRIER REPRESENTS OUTSIDE LIMIT OF ANCHOR TRENCH (SEE DETAILS ON DRAWING 7).
4. BARRIER COLLECTION PIPES SHALL HAVE A MINIMUM SLOPE OF 0.5%.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING REQUIRED PIPE FITTINGS AT BENDS, CONNECTIONS, AND INTERSECTIONS.
6. OUTLET PIPE SHALL BE 4"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE.
7. ALL DRAINAGE TRENCH PIPE OUTLETS SHALL DAYLIGHT THROUGH EXISTING RIPRAP. NEW RIPRAP SHALL BE INSTALLED AT PIPE OUTLET WHERE CURRENTLY IT DOES NOT EXIST.
8. OUTLET PIPE SHALL BE INSTALLED ABOVE EXISTING 48" SANITARY SEWER LINE. ACTUAL INVERT ELEVATION DEPENDENT UPON TOP OF SANITARY SEWER LINE. INSTALLED OUTLET PIPE TO HAVE ASOUTHWEST SLOPE (0.5% MIN.) ALLOWING FOR PIPE FLOW DISCHARGE.
9. PROPOSED GRADES REPRESENT TOP OF VEGETATIVE TOPSOIL.

X: 30193X00, X01, X02.DWG
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P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES GMS LAF
N/30193004/RAA/30193G13.DWG

Graphic Scale
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| Professional Engineer's No. | | |
| State | Date Signed | |
| Project Mgr. | Designed by | Drawn by |
| ACC | CAA | NES |

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NEWELL STREET AREA II RAA REMEDIAL ACTION

# ENGINEERED BARRIER PLAN FINAL GRADE

TECHNICAL DRAWINGS

BBL Project No. 301.93

Date MARCH 2005

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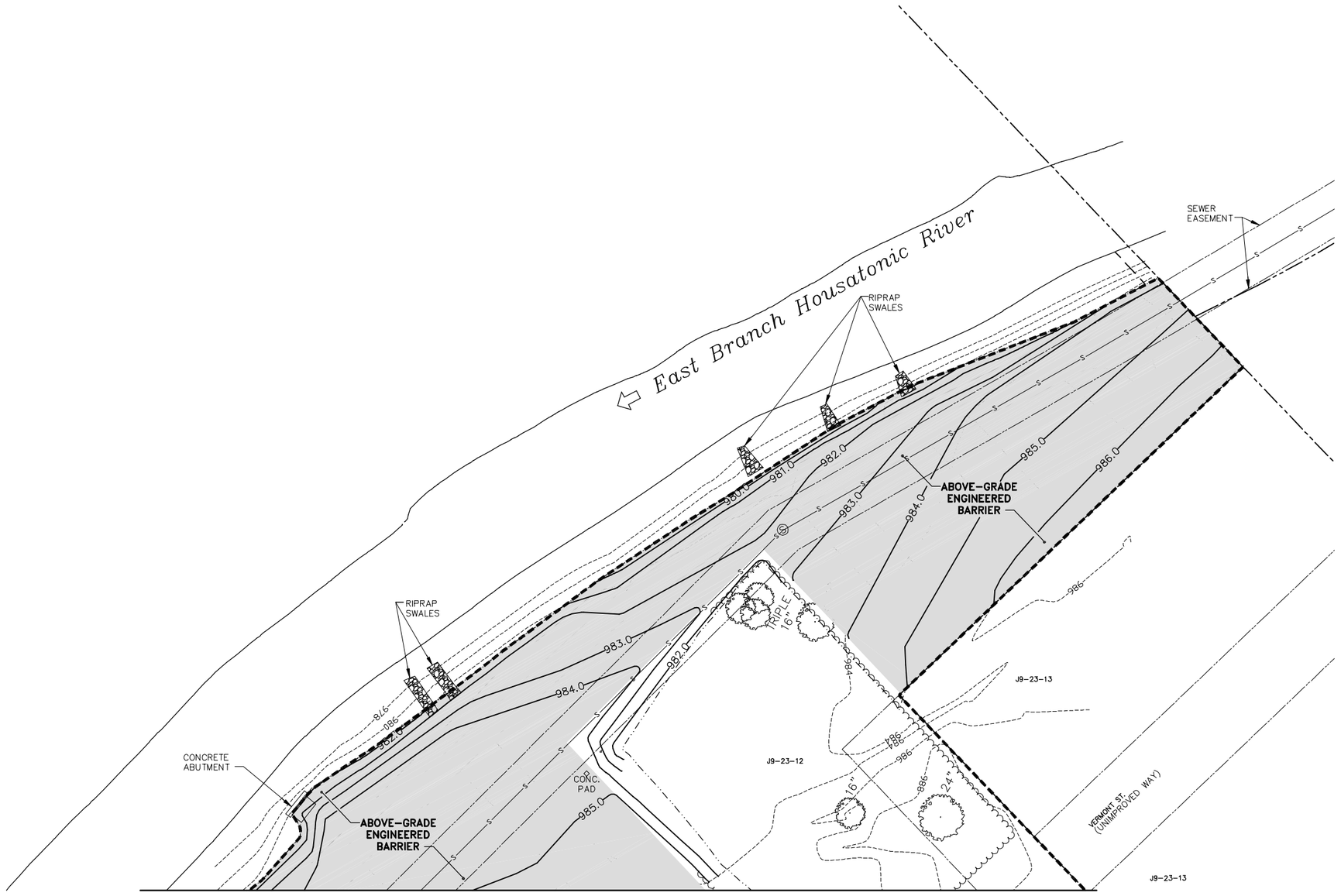
315-446-9120

5B




MATCHLINE SEE FIGURE 5A

LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- 392 INDEX ELEVATION CONTOUR
- LIMITS OF GRADING
- 988.0 PROPOSED SUBGRADE CONTOURS (SEE NOTE 3)
- WOODEN FENCE
- OH OVERHEAD WIRES
- S SANITARY SEWER
- D STORM DRAIN
- S ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- VEGETATIVE ENGINEERED BARRIER (1/7)

NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. PROPOSED CONTOUR INTERVAL IS 1 FOOT. EXISTING CONTOUR INTERVAL IS 2 FEET.
3. PROPOSED GRADING REPRESENTS TOP OF PREPARED SUBGRADE (i.e., BARRIER GEOSYNTHETICS SUBGRADE).
4. REFER TO DRAWING 6B AND DETAIL DRAWINGS FOR ADDITIONAL CONSTRUCTION INFORMATION (e.g., DRAINAGE PIPE INVERTS, CULVERT LOCATIONS, AND ANCHOR TRENCHES).

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=REF*, *50-*, |FL_CHAINLINK, |VEGETATION*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES GMS LAF
N/30193004/RAA/30193G16.DWG

Graphic Scale
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1"=30'

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|---|---|---|
| Professional Engineer's No. | | |
| State | Date Signed | |
| Project Mgr. | Designed by | Drawn by |
| ACC | CAA | NES |

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NEWELL STREET AREA II RAA REMEDIAL ACTION

# ENGINEERED BARRIER PLAN SUBGRADE

TECHNICAL DRAWINGS

BBL Project No. 301.93
Date MARCH 2005

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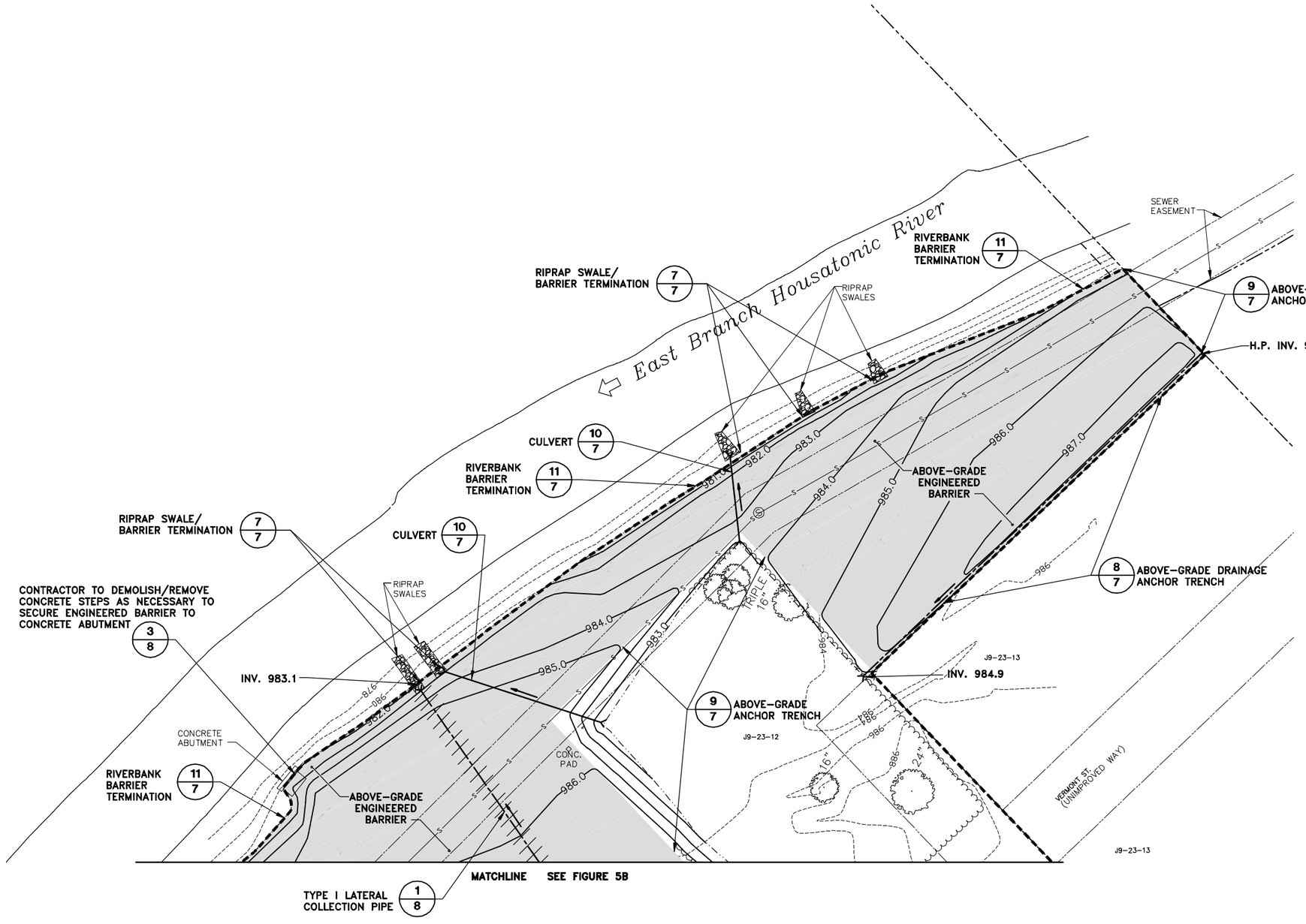
Syracuse, NY 13214
315-446-9120

6A




LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PROPERTY PARCEL ID
- 392 INDEX ELEVATION CONTOUR
- LIMITS OF GRADING
- 988.0 PROPOSED CONTOUR
- PROPOSED BARRIER COLLECTION PIPE AND FLOW DIRECTION (SEE NOTE 4)
- TEMPORARY EROSION CONTROL MAT
- H.P. HIGH POINT
- WOODEN FENCE
- OH OVERHEAD WIRES
- S SANITARY SEWER
- D STORM DRAIN
- S ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- BUSHES/HEDGE
- S SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- VEGETATIVE ENGINEERED BARRIER 1/7

NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL BASEMAP INFORMATION AND CONTRACTOR REQUIREMENTS.
2. PROPOSED CONTOUR INTERVAL IS 1 FOOT. EXISTING CONTOUR INTERVAL IS 2 FEET.
3. EDGE OF ENGINEERED BARRIER REPRESENTS OUTSIDE LIMIT OF ANCHOR TRENCH (SEE DETAILS ON DRAWING 7).
4. BARRIER COLLECTION PIPES SHALL HAVE A MINIMUM SLOPE OF 0.5%.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING REQUIRED PIPE FITTINGS AT BENDS, CONNECTIONS, AND INTERSECTIONS.
6. ALL DRAINAGE TRENCH PIPE OUTLETS SHALL DAYLIGHT THROUGH EXISTING RIPRAP. NEW RIPRAP SHALL BE INSTALLED AT PIPE OUTLET WHERE CURRENTLY IT DOES NOT EXIST.

X: 30193X00, X01, X02.DWG
L: ON=*, OFF=REF*, *50-*, |FL_CHAINLINK, |VEGETATION*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-NES GMS LAF
N/30193004/RAA/30193G14.DWG

Graphic Scale
30' 0 30' 60'
1"=30'

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|---|---|---|
| Professional Engineer's No. | | |
| State | Date Signed | |
| Project Mgr. | Designed by | Drawn by |
| ACC | CAA | NES |

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NEWELL STREET AREA II RAA REMEDIAL ACTION

# ENGINEERED BARRIER PLAN FINAL GRADE

TECHNICAL DRAWINGS

BBL Project No. 301.93
Date MARCH 2005

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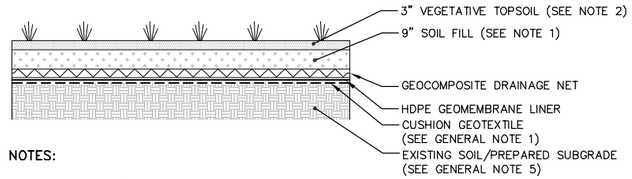
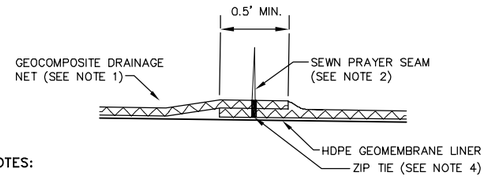



**NOTES:**

1. AT CONTRACTOR'S DISCRETION AND EXPENSE, SOIL FILL MAY BE REPLACED WITH TOPSOIL. ADDITIONAL SOIL FILL THICKNESS REQUIRED ADJACENT TO ACCESS ROAD ENGINEERED BARRIER.
2. TOPSOIL SHALL BE VEGETATED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

## VEGETATIVE ENGINEERED BARRIER 1

NOT TO SCALE

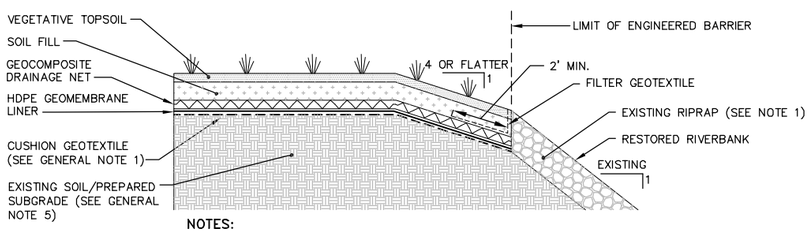



**NOTES:**

1. ALL GEOCOMPOSITE SHALL SHINGLE DOWNSLOPE.
2. THE TOP GEOTEXTILE COMPONENTS OF THE TWO GEOCOMPOSITE LAYERS SHALL BE PEELED BACK SO THAT A PRAYER SEAM MAY BE SEWN ABOVE THE GEOCOMPOSITE OVERLAP.
3. IF GEOTEXTILE IS UNABLE TO BE PEELED BACK 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' ALONG ADJACENT PANELS AND EVERY 6" ALONG BUTT SEAMS AND IN ANCHOR TRENCHES.

## TYPICAL GEOCOMPOSITE SEAM 4

NOT TO SCALE

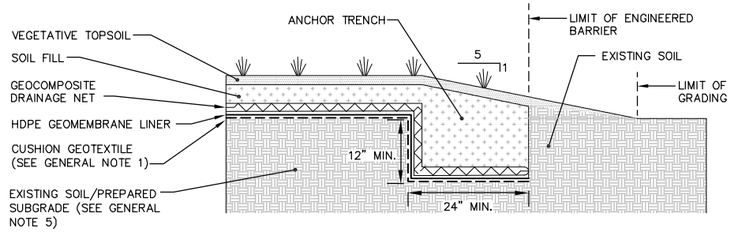



**NOTES:**

1. CONTRACTOR SHALL MINIMIZE DISTURBANCE OF EXISTING RIPRAP DURING INSTALLATION OF ENGINEERED BARRIER. DISTURBED RIPRAP TO BE REPLACED TO ORIGINAL LOCATION.

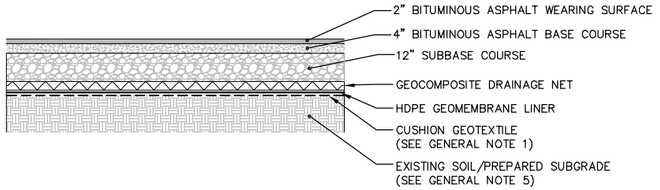
## RIPRAP/SWALE BARRIER TERMINATION 7

NOT TO SCALE



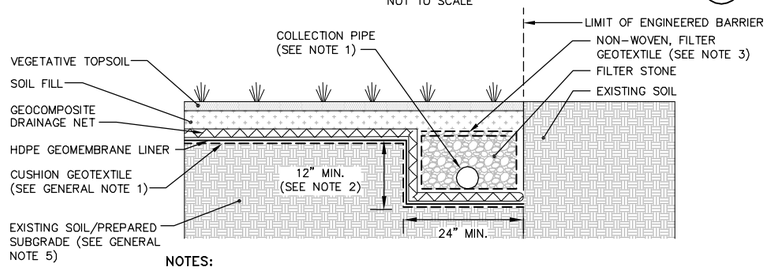

## ABOVE-GRADE ANCHOR TRENCH 9

NOT TO SCALE




## ACCESS ROAD ENGINEERED BARRIER 2

NOT TO SCALE

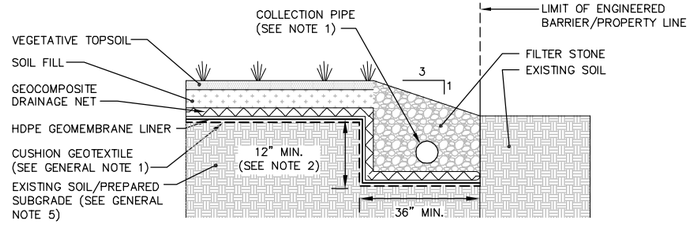



**NOTES:**

1. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
2. ANCHOR TRENCH DEPTH MAY EXCEED 12-INCH MINIMUM AS NECESSARY TO ACHIEVE COLLECTION PIPE INVERT ELEVATIONS SHOWN ON DRAWINGS 5B AND 6B.
3. GEOTEXTILE TO BE OVERLAPPED FULL WIDTH OF TRENCH.

## AT-GRADE DRAINAGE ANCHOR TRENCH 5

NOT TO SCALE

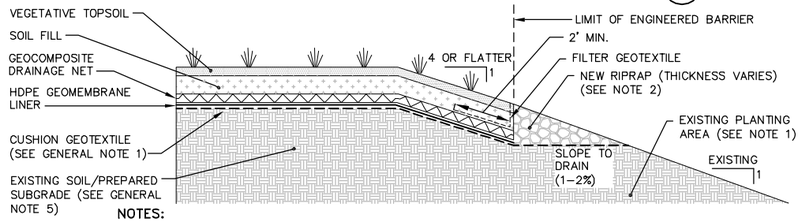



**NOTES:**

1. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
2. ANCHOR TRENCH DEPTH MAY EXCEED 12-INCH MINIMUM AS NECESSARY TO ACHIEVE COLLECTION PIPE INVERTS SHOWN ON DRAWINGS 5 AND 6.

## ABOVE-GRADE DRAINAGE ANCHOR TRENCH 8

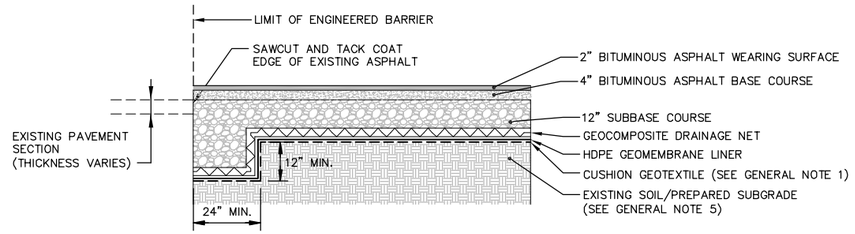
NOT TO SCALE




**NOTES:**

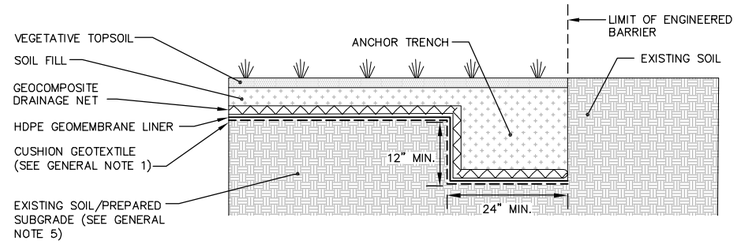
1. CONTRACTOR SHALL MINIMIZE DISTURBANCE OF EXISTING PLANTING AREA DURING INSTALLATION OF ENGINEERED BARRIER. DISTURBED PLANTING AREA TO BE REPLACED TO ORIGINAL LOCATION.
2. NEW RIPRAP TO BE PROVIDED ALONG ENTIRE ABOVE-GRADE TERMINATION AT THE RIVERBANK.

## RIVERBANK BARRIER TERMINATION 11



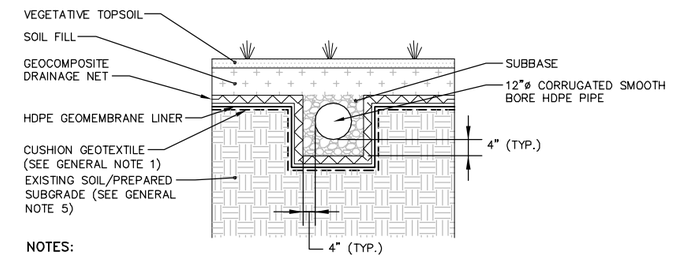

## ACCESS ROAD ENGINEERED BARRIER/EXISTING ROAD TIE-IN 3

NOT TO SCALE




## AT-GRADE ANCHOR TRENCH 6

NOT TO SCALE




**NOTES:**

1. PIPE SHALL HAVE A MINIMUM SLOPE OF 1%.
2. INLET/OUTLET INVERT ELEVATIONS TO BE DETERMINED BASED ON FIELD CONDITIONS AT TIME OF CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH GE OR GE'S REPRESENTATIVE TO DETERMINE INVERT ELEVATIONS.
3. RIPRAP TO BE PLACED AROUND INLET OF CULVERT.
4. CULVERT OUTLET SHALL EXTEND THROUGH EXISTING RIPRAP SWALE. ADDITIONAL NEW RIPRAP TO BE PLACED AROUND CULVERT OUTLET AS REQUIRED TO CREATE A UNIFORM PIPE FLOW TRANSITION INTO THE SWALE.

## CULVERT 10

NOT TO SCALE

**GENERAL NOTES:**

1. NON-WOVEN CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE EXISTING SOIL/PAVEMENT.
2. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
3. "AT-GRADE" REFERS TO ENGINEERED BARRIERS THAT ARE RECESSED INTO EXISTING GRADE.
4. "ABOVE-GRADE" REFERS TO ENGINEERED BARRIERS THAT ARE CONSTRUCTED ON TOP OF EXISTING GRADE.
5. PREPARED SUBGRADE INCLUDES FILLED AND COMPACTED SUBGRADE OR EXCAVATED SUBGRADE.
6. RIPRAP SHALL BE COMPOSED OF CRUSHED ROCK AND HAVE $D_{MIN}$ = 3", $D_{50}$ = 4", $D_{MAX}$ = 6".

X: 30193X00.DWG
L: ON=*, OFF=REF
P: PAGESET/SYR-CDL
3/3/05 SYR-85-KMD GMS LAF
N/30193004/RAA/30193G07.DWG

Graphic Scale: NOT TO SCALE

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| Date | Revisions | Init |
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| Professional Engineer's Name | | |
|---|---|---|
| Professional Engineer's No. | | |
| State | Date Signed | |
| Project Mgr. | Designed by | Drawn by |
| ACC | CAA | NES |

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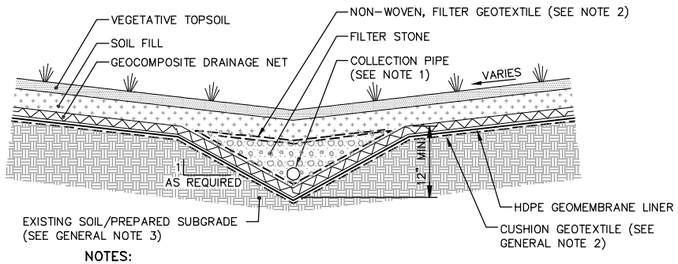
NEWELL STREET AREA II RAA REMEDIAL ACTION

# DETAILS

TECHNICAL DRAWINGS

BBL Project No. 301.93
Date MARCH 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

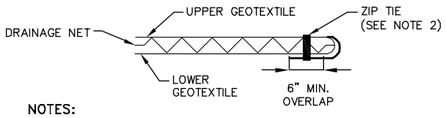



NOTES:

1. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH BORE CORRUGATED HDPE.
2. GEOTEXTILE TO BE OVERLAPPED FULL WIDTH OF TRENCH.

## TYPE I LATERAL COLLECTION PIPE (1)

NOT TO SCALE

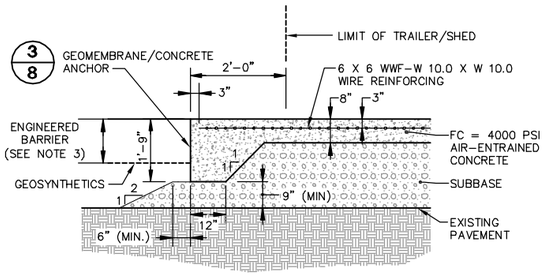



NOTES:

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' ALONG THE EDGES OF THE GEOCOMPOSITE.

## GEOCOMPOSITE TERMINATION (4)

NOT TO SCALE




NOTES:

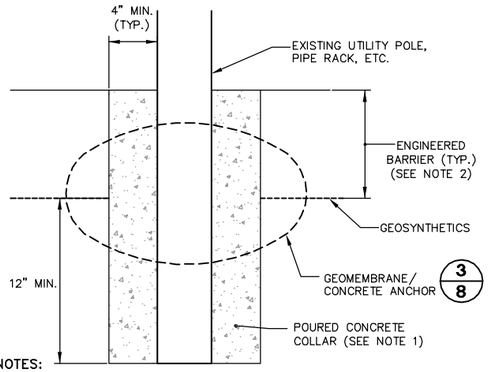
1. THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGN TO GE OR GE'S REPRESENTATIVE FOR APPROVAL.
2. THE CONTRACTOR SHALL SUBMIT CONCRETE PAD CONSTRUCTION SEQUENCE AND SCHEDULE TO GE OR GE'S REPRESENTATIVE.
3. COVER MATERIALS NOT SHOWN FOR CLARITY.

## CONCRETE PAD DETAIL (7)

NOT TO SCALE

GENERAL NOTES:

1. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. NON-WOVEN CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE EXISTING SOIL/PAVEMENT.
3. PREPARED SUBGRADE INCLUDES COMPACTED SUBGRADE OR POSSIBLE EXCAVATION OF EXISTING MATERIAL.
4. RIPRAP SHALL BE COMPOSED OF CRUSHED ROCK AND HAVE $D_{MIN}$ = 3", $D_{50}$ = 4", $D_{MAX}$ = 6".

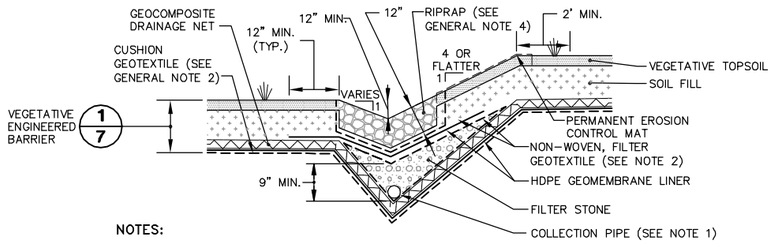



NOTES:

1. THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGN TO GE OR GE'S REPRESENTATIVE FOR APPROVAL.
2. COVER MATERIALS NOT SHOWN FOR CLARITY.

## CONCRETE COLLAR (8)

NOT TO SCALE

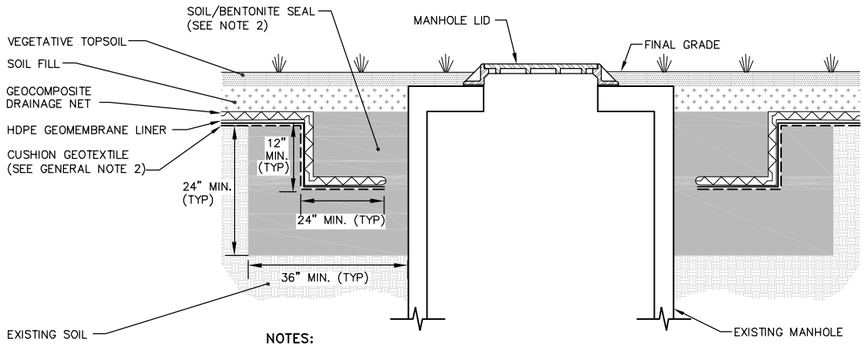



NOTES:

1. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
2. GEOTEXTILE PLACED AROUND FILTER STONE TO BE OVERLAPPED FULL WIDTH OF TRENCH.

## DRAINAGE SWALE/TYPE II LATERAL COLLECTION PIPE (2)

NOT TO SCALE

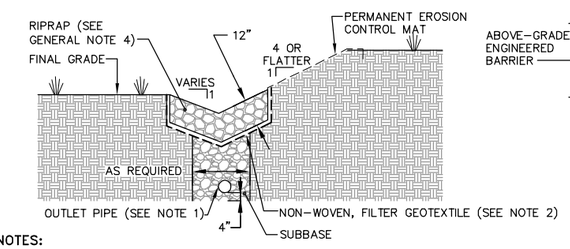



NOTES:

1. REFER TO DRAWING 4 FOR LOCATION OF EXISTING MANHOLES.
2. SOIL/BENTONITE SEAL TO CONSIST OF A MIXTURE OF SOIL FILL AND POWDERED BENTONITE. SOIL FILL SHALL BE UNIFORMLY BLENDED WITH 5 TO 10% BENTONITE.

## MANHOLE DETAIL (5)

NOT TO SCALE

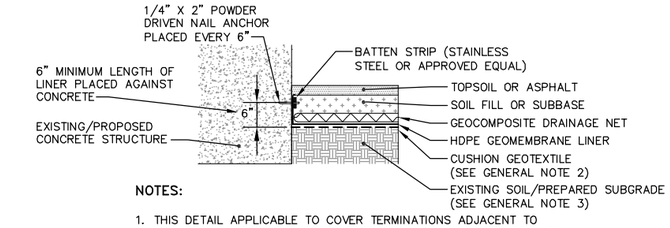



NOTES:

1. COLLECTION PIPE SHALL BE 4"ø SOLID SMOOTH-BORE CORRUGATED HDPE.

## DRAINAGE SWALE/OUTLET PIPE (9)

NOT TO SCALE

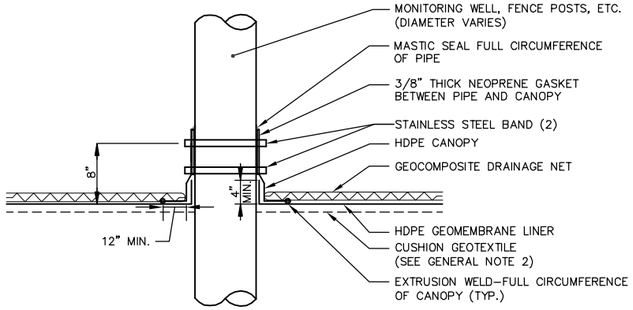



NOTES:

1. THIS DETAIL APPLICABLE TO COVER TERMINATIONS ADJACENT TO CONCRETE SLABS, CONCRETE STRUCTURES, AND CONCRETE COLLARS.

## GEOMEMBRANE/CONCRETE ANCHOR (3)

NOT TO SCALE

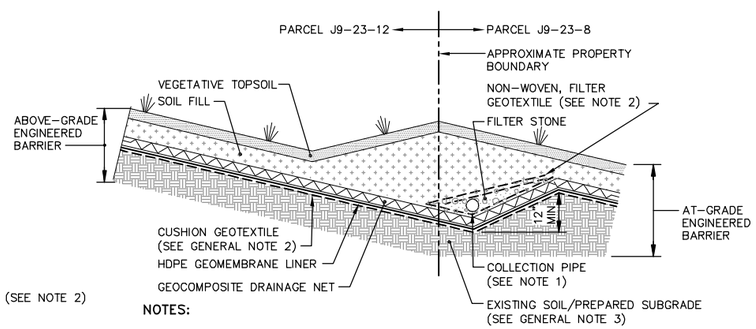



NOTES:

1. CERTAIN COVER MATERIALS (i.e., SOIL FILL, TOPSOIL/ASPHALT) NOT SHOWN FOR CLARITY.

## GEOSYNTHETICS PENETRATION SEAL (6)

NOT TO SCALE




NOTES:

1. COLLECTION PIPE SHALL BE 6"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
2. GEOTEXTILE TO BE OVERLAPPED FULL WIDTH OF TRENCH.

## TYPE III LATERAL COLLECTION PIPE (10)

NOT TO SCALE

X: 30193X00.DWG
L: ON=*, OFF=REF*
P: PAGESET/SYR-CDL
3/3/05 SYR-85-KMD SDL LAF
N/30193004/RAA/30193G10.DWG

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| Graphic Scale: NOT TO SCALE | | Professional Engineer's Name | |
| | | Professional Engineer's No. | |
| | | State | Date Signed |
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|  | Project Mgr. ACC | Designed by CAA | Drawn by NES |

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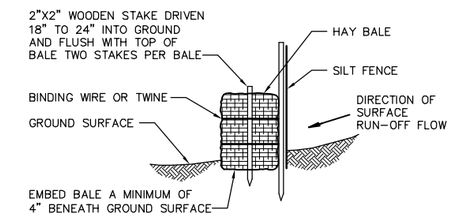
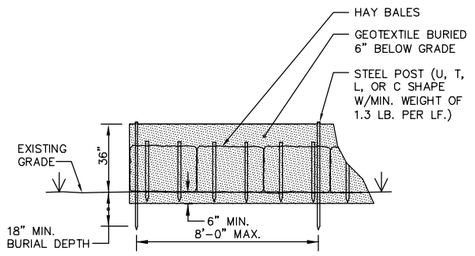


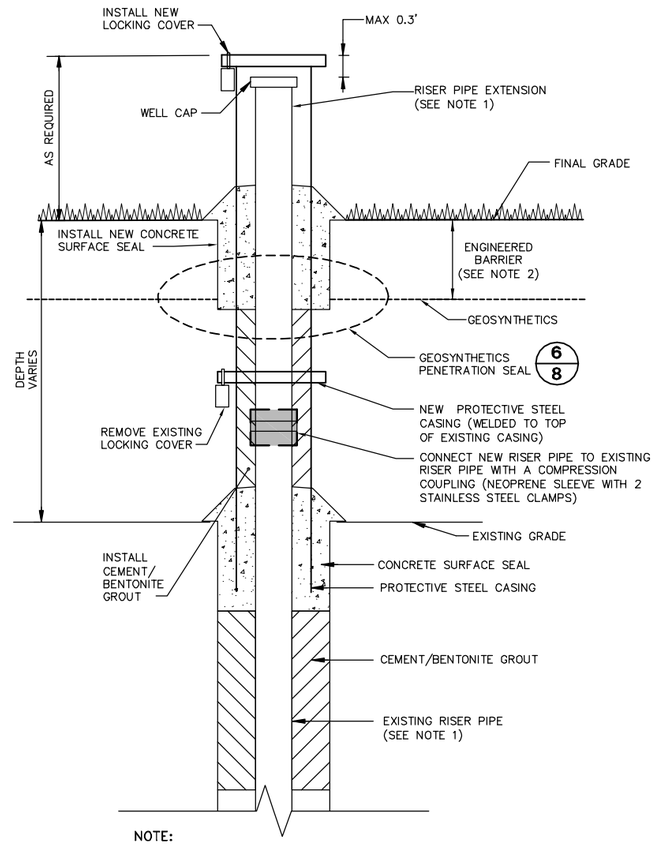




NOTES:

1. UNTIL SUCH TIME THAT ALL EXCAVATION ACTIVITIES 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 OFF-SITE TRANSPORT AND DISPOSAL.
2. ONCE BACKFILL HAS BEEN PLACED, THE CONTRACTOR SHALL REMOVE SILT ACCUMULATIONS WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF OF THE HEIGHT OF SILT FENCE.
3. HAY BALES/SILT FENCE WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE OR GE'S REPRESENTATIVE. CONTRACTOR SHALL BACKFILL EXCAVATIONS AS NECESSARY AND RESTORE SURFACE COVER.
4. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE HAY BALES/SILT FENCING AS LONG AS THEY ARE NECESSARY.

## HAY BALE/SILT FENCE (1)

NOT TO SCALE




NOTE:

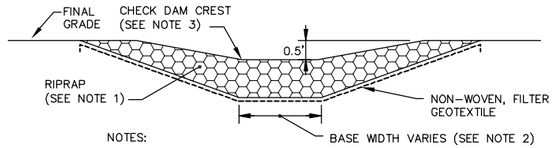
1. RISER PIPE AND STEEL CASING SIZES AND TYPES MAY DIFFER FOR EACH WELL. NEW WELL EXTENSION MATERIALS TO BE OF THE SAME SIZE AND TYPE AS EXISTING.
2. COVER MATERIALS NOT SHOWN FOR CLARITY.

## MONITORING WELL EXTENSION (3)

NOT TO SCALE

# THE FOLLOWING GENERAL NOTES APPLY TO DRAWINGS 2 THROUGH 6

1. THE SOILS SUBJECT TO EXCAVATION AND HANDLING AS PART OF THIS CONTRACT POTENTIALLY CONTAIN PCBs AND OTHER HAZARDOUS CONSTITUENTS AND SHOULD BE HANDLED 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. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING SURVEY CONTROL TO VERIFY EXISTING GRADES AND POST-EXCAVATION ELEVATIONS. GE WILL IDENTIFY LOCATION(S) AND ELEVATION(S) OF SUITABLE BENCHMARKS TO BE USED FOR SURVEY CONTROL.
3. THE DRAWINGS MAY NOT INDICATE ALL SURFACE FEATURES SUBJECT TO REPLACEMENT AS PART OF SITE RESTORATION ACTIVITIES. THIS WILL NOT RELIEVE THE CONTRACTOR FROM REMOVING AND REPLACING (IF NECESSARY) ANY AND ALL SUCH ITEMS AT NO ADDITIONAL COST TO GE.
4. LOCATIONS OF UNDERGROUND UTILITIES AND STRUCTURES ARE APPROXIMATE. 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.
5. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE 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 EXCAVATION.
6. EXCAVATION LIMITS SHOWN ON THE TECHNICAL DRAWINGS REPRESENT SOILS THAT REQUIRE REMOVAL TO ACHIEVE THE NECESSARY REMOVAL ACTION OUTCOME. ADDITIONAL REMOVAL BEYOND THAT SHOWN MAY BE REQUIRED, AT NO EXPENSE TO GE, TO FACILITATE CONSTRUCTION ACCESS, RESTORATION, ETC.
7. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE MEASURES TO AVOID DAMAGE TO STRUCTURES 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 AT NO ADDITIONAL COST TO GE.
8. THE CONTRACTOR SHALL COORDINATE SITE ACTIVITIES TO AVOID INFRINGEMENT UPON NORMAL TRAFFIC FLOW ON ADJACENT ROADWAYS.
9. ABOVEGROUND PORTIONS OF ITEMS SUBJECT TO REMOVAL AND REPLACEMENT TO ACCOMMODATE EXCAVATION ACTIVITIES (E.G., FENCING, ETC.) MAY BE SALVAGED FOR REUSE UPON APPROVAL BY GE OR GE'S REPRESENTATIVE. APPROVED SALVAGED MATERIALS MAY BE USED 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 SHALL BE REPLACED AS PART OF SITE RESTORATION ACTIVITIES.
10. THE CONTRACTOR SHALL SHEAR/SHRED ALL TREES AND SHRUBS (INCLUDING ROOTS) REMOVED DURING THE PERFORMANCE OF RESPONSE ACTIONS FOR TRANSPORTATION TO THE OPCA FOR POTENTIAL FUTURE USE/DISPOSAL (AS APPROPRIATE).
11. THE CONTRACTOR SHALL PROVIDE A WATER TRUCK AND APPROPRIATE EQUIPMENT FOR DUST SUPPRESSION WITHIN SOIL EXCAVATION, STAGING, AND LOADING AREAS. THESE AREAS SHALL BE WATERED BASED ON VISUAL OBSERVATIONS, THE RESULTS OF AIR MONITORING ACTIVITIES, AND/OR DIRECTION BY GE OR GE'S REPRESENTATIVE.
12. THE CONTRACTOR SHALL ENSURE PERIMETER AIR MONITORING (TO BE PERFORMED BY OTHERS) IS BEING PERFORMED DURING EXCAVATION OR OTHER EXISTING SOIL HANDLING ACTIVITIES.
13. THE HORIZONTAL LIMITS OF EXCAVATION ACTIVITIES WILL BE PHYSICALLY DELINEATED IN THE FIELD BY THE CONTRACTOR. WITHIN THESE LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXECUTING AND VERIFYING THE SPECIFIED DEPTH OR ELEVATION OF EXCAVATION IN ACCORDANCE WITH OSHA REQUIREMENTS.
14. THE CONTRACTOR MAY CONSTRUCT TEMPORARY SOIL STOCKPILES FOR EXCAVATED MATERIALS AT AREAS APPROVED BY GE OR GE'S REPRESENTATIVE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING PERIMETER EROSION AND SEDIMENTATION CONTROLS (IN THE FORM OF SILT FENCING, HAY BALES, AND/OR SHEET PILING, AS INDICATED), RUN-OFF WATER COLLECTION, AND DUST SUPPRESSION IN THIS AREA. THE CONTRACTOR SHALL COVER THE STOCKPILED MATERIALS WITH POLYETHYLENE LINERS WHEN NO ACTIVITIES ARE BEING PERFORMED IN THE STOCKPILE AREA.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING EXCAVATED/REMOVED MATERIALS TO THE BUILDING 71 OPCA. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE THREE DAYS NOTICE TO GE OR GE'S REPRESENTATIVE PRIOR TO TRANSPORTATION OF EXCAVATED/STOCKPILED MATERIALS TO THE OPCA. THE CONTRACTOR IS REQUIRED TO PROVIDE NO LESS THAN 32 TRUCK LOADS OF MATERIAL, CONSISTING OF NO LESS THAN 10 CUBIC YARDS PER LOAD, PER DAY WHEN TRANSPORTING MATERIALS TO THE OPCAS FOR CONSOLIDATION.
16. CONTRACTOR SHALL INSTALL AN INTERIM COVER (E.G., POLYETHYLENE SHEETING) OVER WORK AREAS WHERE EXCAVATION ACTIVITIES ARE YET TO BE COMPLETED. THE INTERIM COVER SHALL BE PROPERLY ANCHORED TO RESIST WIND FORCES AND PREVENT STORMWATER FROM ENTERING SUCH WORK AREAS.
17. PAVEMENT SUBJECT TO PARTIAL REMOVAL SHALL BE REMOVED VIA SAW-CUT. RESTORATION SHALL MEET ALL LOCAL AND/OR STATE BUILDING CODES. CONTRACTOR SHALL OBTAIN ALL APPROPRIATE BUILDING PERMITS ASSOCIATED WITH RESTORATION ACTIVITIES.
18. WITHIN THE LIMITS OF EXCAVATION, THE CONTRACTOR SHALL RESTORE ALL PREVIOUSLY VEGETATED AREAS BY PLACING AND COMPACTING FILL MATERIALS (TO ACHIEVE A GRADE OF APPROXIMATELY 3 INCHES BELOW PRE-REMOVAL GRADE, WHERE APPROPRIATE), TOPSOIL, AND SEED. OTHER SURFACE FEATURES SHALL BE REPLACED OR RESTORED AS INDICATED.
19. UPON BACKFILLING OF EXCAVATED AREAS, THE CONTRACTOR SHALL MAINTAIN IN PLACE OR INSTALL ADDITIONAL EROSION CONTROLS IN THE LOCATIONS INDICATED ON EACH WORK SITE DRAWING. THE EROSION CONTROLS WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE OR GE'S REPRESENTATIVE.
20. BACKFILLED AND RESTORED AREAS WILL BE SUBJECT TO FINAL SURVEY VERIFICATION (BY THE CONTRACTOR). THE CONTRACTOR SHALL REPAIR ANY ITEMS THAT ARE NOT RESTORED TO THE LOCATIONS AND/OR ELEVATIONS REQUIRED BY THIS CONTRACT.
21. THE CONTRACTOR SHALL RESTORE TO PRE-REMEDIATION CONDITIONS ALL SUPPORT AREAS THAT ARE IMPACTED BY REMEDIATION ACTIVITIES, INCLUDING EQUIPMENT AND MATERIALS STORAGE AREAS, SOIL LOADING AND STAGING AREAS, AND PARKING AREAS.
22. ALL EQUIPMENT OPERATED WITHIN THE LIMITS OF EXCAVATION SHALL BE CLEANED PRIOR TO USE OR STORAGE ELSEWHERE ON THE SITE OR TRANSPORTED OFF-SITE. A CONTAINED/LINED WHEEL WASH AREA SHALL BE PROVIDED BY THE CONTRACTOR TO BE USED AS NECESSARY 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 CONTAINERIZED AND TRANSPORTED FOR APPROPRIATE OFF-SITE DISPOSAL/TREATMENT BY THE CONTRACTOR.
23. SELECT SITE FEATURES MAY OR MAY NOT BE SHOWN ON DRAWINGS (E.G., ADDITIONAL CONCRETE PADS, MANHOLES, ETC.). CONTRACTOR SHALL PROTECT THESE FEATURES AS REQUIRED (REFER TO DRAWINGS 7 THROUGH 9).

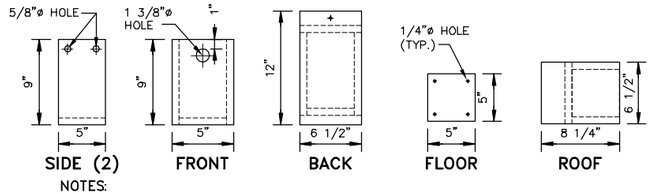



NOTES:

1. RIPRAP SHALL BE COMPOSED OF CRUSHED ROCK AND HAVE $D_{MIN}=3"$, $D_{50}=4"$, $D_{MAX}=6"$.
2. CHECK DAM BASE WIDTH DIMENSIONS TO MATCH EXISTING DITCH.
3. CHECK DAM CREST (IN DIRECTION OF FLOW) TO HAVE A MINIMUM TOP LENGTH OF 12" AND A MINIMUM BASE LENGTH OF 3'.

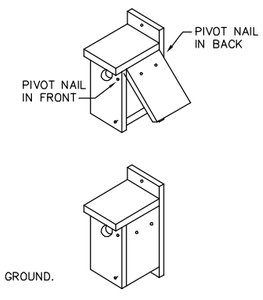
## ROCK CHECK DAM CROSS-SECTION (2)

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 HOUSE POSTS ARE TO BE INSTALLED OUTSIDE THE LIMITS OF ENGINEERED BARRIER.
4. BLUEBIRD HOUSES TO BE MOUNTED ON POSTS A MINIMUM OF 6' (NOT TO EXCEED 15') ABOVE THE GROUND.




## BLUEBIRD HOUSE (4)

NOT TO SCALE

X: 30193X00.DWG
L: ON=*, OFF=REF
P: PAGESET/SYR-CDL
3/3/05 SYR-85-KMD LJP LAF
N/30193004/RAA/30193G11.DWG

| | |
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| Graphic Scale | NOT TO SCALE |
| Professional Engineer's Name | |
| Professional Engineer's No. | |
| State / Date Signed | |
| Project Mgr. / Designed by / Drawn by | ACC / CAA / NES |

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| Date | Revisions | Init |
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BLASLAND, BOUCK & LEE, INC. engineers, scientists, economists

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# GENERAL NOTES AND DETAILS

TECHNICAL DRAWINGS

BBL Project No. 301.93
Date MARCH 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
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315-446-9120

# *Attachment C*

## Technical Specifications

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

# ATTACHMENT C

## MATERIALS & PERFORMANCE SPECIFICATIONS

Section 02200 – Earthwork

Section 02207 – Restoration of Surfaces

Section 02212 – Topsoil, Seeding, and Mulch

Section 02219 – Geocomposite

Section 02222 – Fill Materials

Section 02232 – Geotextile Fabric

Section 02234 – Flexible Membrane Liner

Section 02600 – Bituminous Concrete Pavements

# 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 MP-02207 – Restoration of Surfaces

B. Section MP-02222 – Fill Materials

C. Final RD/RA Work Plan, Section 5.3 – Soil Removal Activities

D. Final RD/RA Work Plan, Section 7.4.5 – Erosion and Sedimentation Control Measures

E. Final RD/RA Work Plan, Section 7.5.3 – Soil Removal, Material Handling, and Transportation and Disposal

F. Final RD/RA Work Plan, Section 7.6 – Perimeter Air Monitoring

### 1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM).

### 1.04 SUBMITTALS

A. Prior to earthwork activities, Contractor shall submit proposed equipment and compaction method(s).

## PART 2 - PRODUCTS

See following sections.

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 specified in Section MP-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 later subsections of this section and to the percentage compaction outlined therein. 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 Section MP-02222 - Fill Materials.

B. 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 is 12 inches (measured prior to compaction).

J. For backfill placed directly over geosynthetics (i.e., in areas where engineered barriers are installed), the minimum installed lift thickness is 9 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 shall produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support.

2. 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.

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: Unless otherwise specified on the Technical Drawings or in this Work Plan, equipment for compaction shall be consistent with space limitations of the work areas and the need to protect adjacent facilities.

1. 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.

2. If the proposed method does not produce the degree of compaction required, an alternate method shall be adopted until the required compaction is achieved.

3. 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 this Work Plan, the degree of compaction specified for the various items listed in Table 1 shall be the minimum allowable.

2. Unless the Contractor can successfully demonstrate that its methods shall produce the required degree of compaction, materials to be compacted shall be placed in layers not exceeding the uncompacted thicknesses listed in Table 1.

3. In-place density tests shall be required at a minimum of one test per each lift of backfill placed or at a frequency of 1 passing test per 2,500 square feet of subgrade, 100 cubic yards of soil fill, or 100 linear feet of pipe bedding, whichever results in the greatest frequency.

4. GE or GE's Representative may order additional in-place density tests to ascertain conformance with the compaction requirements shown in Table 1.

5. 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.

6. 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.

7. The Contractor shall anticipate time needed due to testing procedures and shall not have claims for extra compensation occasioned by such time.

8. Minimum compaction requirements in Table 1 are expressed as a percentage of the maximum dry unit weight of the material compacted using the Modified Proctor Compaction Test (ASTM D1557).

**TABLE 1**

| Type of Backfill | Maximum Uncompacted Lift Thickness[1] (inches) | Minimum Compaction (percent) |
|---|---|---|
| 1. Subgrade - Existing Soil | Not applicable | Proof-rolling |
| 2. Embankments and Fills | 12 | 90 |
| 3. Pipe Bedding | 8 | 92 |
| 4. Road Subbase | 11 | 95 |
| 5. Topsoil | 8 | Compact by placing/grading only |

Note:
1. Maximum uncompacted lift thicknesses do not apply to backfill placed directly over geosynthetics in areas receiving engineered barriers.

9. Laboratory compaction curves for the full range of soil materials shall be provided by the Contractor.

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, conduits and their appurtenances. These facilities may or may not be shown on the Technical Drawings. However, the sizes, locations, and heights or 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 upon request of the Contractor.

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. The surface of all roadways shall have temporary pavement.

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.

- 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 MP-02200 – Earthwork

B. Section MP-02212 – Topsoil, Seeding, and Mulch

C. Section MP-02222 – Fill Materials

D. Section MP-02600 – Bituminous Concrete Pavements

### 1.03 SUBMITTALS

A. A schedule of restoration operations shall be submitted by the Contractor for review.

B. Material cut sheets for chain link fencing shall be submitted by the Contractor for review.

C. Name of proposed fencing installer shall be submitted by the Contractor for review.

### 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: in lawn or earth areas, drive fence posts to depth of 4' minimum.

## 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 or as shown on the Technical Drawings.

2. After compaction, the surface shall conform to the slope and grade of the area being replaced 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, AND MULCH

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Work under this section consists of furnishing and placing of topsoil, fertilizer, seed, mulch, erosion control matting, and maintenance of seeded areas until final acceptance.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork

B. Section MP-02207 – Restoration of Surfaces

C. Final RD/RA Work Plan, Section 5.5 – Backfilling Excavations

D. Final RD/RA Work Plan, Section 7.5.11 – Restoration of Disturbed Vegetation

### 1.03 SUBMITTALS

A. Analysis of the seed (to demonstrate compliance with the seed mix identified in Section 2.01D of this specification) and fertilizer (to identify chemical composition), and proposed application rates (to demonstrate compliance with the fertilizer application rate identified in Section 3.01B of this specification).

B. Should hydroseed be used, the Contractor shall submit all data including material and application rates and methods.

C. Sample of topsoil to be tested by GE for chemical contaminants as discussed in this Work Plan, Section 5.5 – Backfilling Excavations

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Any offsite topsoil shall be unfrozen, friable, natural loam and shall be free of clay lumps, brush needs, litter, stumps, stones, and other extraneous matter. The topsoil shall have an organic content between 5% and 20%, and a pH between 5.5 and 7.5.

B. Fertilizer shall be a standard quality commercial carrier of available plant food elements (i.e., a complete prepared and packaged material containing a minimum of 5% nitrogen, 10% phosphoric acid, and 10% potash).

1. Each bag of fertilizer shall bear the manufacturer’s guaranteed statement of analysis.

C. Seed mixtures 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.

D. Seed mix to be used within the GE Newell Street parking lot area within Parcel J9-23-12 shall be a mixture of native warm-season grass and wildflower species, such as big bluestem (*Andropogon gerardi*), little bluestem (*Andropogon scoparius*), indian grass (*Scorghastrum nutans*), wild blue lupine (*Lupinus perennis*), Canada wild-rye (*Elymus canadensis*), Canada goldenrod (*Solidago Canadensis*), common milkweed (*Asclepias syriaca*), beard tongue (*Pestamon digitalis*), grass-leaved goldenrod (*Euthamia graminifolia*), blue verain showy tick-trefoil (*Desmodium canadense*), roundhead blush clover (*Lespidesa capitata*), and wild bergamont (*Monarada fistulosa*). To ensure soil stability and prevent erosion, a nurse crop of annual rye-grass (*Lolium temulentum*) will be added to the seed mixture. The seed mixture will be seeded at a rate of 25 pounds per acre.

E. Seed mix to be used in vegetated areas other than the GE Newell Street parking lot area shall consist of 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.

F. Mulch shall be stalks of oats, wheat, rye, or other approved crops free from noxious weeds and coarse materials.

G. Temporary erosion control matting shall be S75 as manufactured by North American Green, or equivalent.

H. Permanent erosion control matting shall be P300P as manufactured by North American Green, or equivalent.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. The topsoil shall be applied in a single loose lift of not less than 3 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. The fertilizer shall be applied to the surface uniformly at the rate of 20 pounds per 1,000 square feet.

1. 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.

a. After the soil surface has been fine-graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate specified by the seed manufacturer.

b. The seed shall be raked lightly into the surface.

c. Seeding and mulching shall not be done during windy weather.

d. Mulch (where used) shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches in uniform thickness at loose measurement with a minimum of 90% surface coverage. Excessive amounts or bunching of mulch shall not be permitted.

e. Unless otherwise specified, mulch shall be left in place and allowed to decompose.

2. Any mulch that has not disintegrated at time of first mowing shall be removed.

a. 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.

b. 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.

c. Temporary and permanent erosion control matting shall be installed in accordance with manufacturer's specifications.

3.02 MAINTENANCE

A. All erosion rills or gullies within the topsoil layer shall be filled with additional approved topsoil, graded smooth, and re-seeded and mulched.

B. 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.

- END OF SECTION -

# 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 MP-02200 – Earthwork

B. Section MP-02232 – Geotextile Fabric

C. Section MP-02234 – Flexible Membrane Liner

### 1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society of Testing and Materials (ASTM) – test method and associated properties;

1. D1505 Specific Gravity
2. D1238 Melt Flow Index
3. D1603 Carbon Black Content
4. D374 Thickness
5. D4716 Constant Head Transmissivity
6. D3776 Weight
7. D1777 Thickness
8. D4632 Grab Tensile and Grab Elongation
9. D4833 Puncture
10. D4751 Apparent Opening Size (AOS)
11. D4533 Trapezoidal Tear
12. D4491 Water Flow Rate
13. D413 Ply Adhesion

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 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. Geocomposite material sample.

D. Manufacturer's quality assurance/quality control program.

E. Written certification that the Minimum Average Roll Values (MARVs) provided under 1.04A of this section are guaranteed by the Manufacturer.

F. Contractor's proposed transportation, handling, and storage techniques.

G. Written certification by the Contractor that the field delivered geocomposite has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to the installation of the geocomposite.

H. Prior to installing the geocomposite, the Installer shall certify in writing that the surface on which the geocomposite will be installed is acceptable. The certification is subject to the review and approval or rejection by GE or GE's Representative.

I. Prior to installation, the Contractor shall provide the Installer's written verification that the geocomposite has not been damaged due to improper transportation, handling, or storage.

J. All personnel performing installation shall be qualified by previous experience.

K. The Contractor shall provide shop drawings depicting installation details, a panel layout diagram, and a description of proposed installation techniques.

L. The Contractor shall provide quality control certificates for the geocomposite, which identifies the sections of field delivered material they represent, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include lot and roll identification numbers, testing procedures and results of quality control 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 D413).
- Transmissivity Testing (ASTM D4716).

Quality control tests for the first three parameters listed above shall be performed at least once every 40,000 $ft^2$ of geocomposite produced. Quality control tests for transmissivity testing shall be performed at least once every 100,000 $ft^2$ of geocomposite produced.

M. The Contractor shall submit written certification that the delivered material meets the manufacturer's specifications. The Contractor shall also provide the lot and roll number for the material delivered to the site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. GSE Lining Technology, Inc.

B. TENAX.

C. 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 conformance testing:

1. Composited Materials

| Property | Test Method | Minimum Test Value |
|---|---|---|
| Transmissivity ($m^2/s$) | ASTM D4716* | $5.2 \times 10^{-3}$ |
| Ply Adhesion (lb/in width) | ASTM D413 | 0.5 |

* Conformance test methods to be performed with the following modifications:

| | |
|---|---|
| Substrate Material: | 60-mil HDPE geomembrane |
| Superstrate Material: | Neoprene or 6 inches of representative soil |
| Applied Normal Compressive Load: | 5,000 lbs/sq.ft. |
| Seating Time: | 100 hours (minimum) |
| Hydraulic Gradient: | 0.1 |

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 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 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 MARV, 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 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. Field delivered material shall meet the specification values according to the manufacturer's specification sheet and meet or exceed the requirements in this specification, as required for alternative materials.

B. The manufacturer shall have developed and shall adhere to its own quality assurance 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 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 1.04.H 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, every 6 inches on butt seams, and every 6 inches in the anchor trench.

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 Specified

1. Work under this section shall include, but not necessarily be limited to, supplying all labor and materials, excavating, transporting, dumping, spreading, and compacting fill material in the locations and to the depth shown on the Technical Drawings and/or as directed by GE or GE's Representative.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork

B. Final RD/RA Work Plan, Section 5.5 – Backfilling Excavations

C. Final RD/RA Work Plan, Section 7.5.6 – Backfilling of Excavations

### 1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society for Testing Materials (ASTM).

B. American Association of State Highway and Transportation Officials (AASHTO).

C. Massachusetts Highway Department Standard Specifications for Highways and Bridges (MHD).

### 1.04 SUBMITTALS

A. Sieve analysis of all granular materials.

B. Sample of soil to be tested for chemical contaminants as discussed in this Work Plan, Section 5.5 – Backfilling Excavations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fill materials shall be of the types listed below:

1. Soil 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. Subbase/Gravel:

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 Designation | Percent Passing |
|---|---|
| 2 inch | 100 |
| 1 ½ 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. Filter Stone:

a. Material placed around collection piping shall be washed, rounded run-of-bank gravel, with a $d_{max}$ of 1 ½ inches and a $d_{min}$ of ¾ inches.

b. Filter stone shall be wrapped with non-woven geotextile as shown on the Technical Drawings.

B. Backfill material shall be inspected prior to placement and all roots, vegetation, organic matter, or other foreign debris shall be removed.

C. With the exception of riprap, stones larger than 6 inches in any dimension shall be removed or broken. Additional size requirements for backfill placed within 6 inches of the bottoms of engineered barriers are as specified above.

D. Stones shall not be allowed to form clusters with voids.

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 Section MP-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 or vibrators as specified in Section 3.02. 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.

3.02 FIELD TESTING AND QUALITY CONTROL

A. In-place nuclear density testing (ASTM D2922 and D3017) shall be performed by an independent testing laboratory, at the Contractor's expense, at the frequency specified in Section MP-02200 – Earthwork to meet the minimum compaction requirements presented in Table 1 of that section.

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 –

# 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 MP-02219 – Geocomposite

B. Section MP-02234 – Flexible Membrane Liner

### 1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. D5261 Unit Weight
2. D4632 Grab Tensile and Grab Elongation
3. D3786 Mullen Burst
4. D4833 Puncture
5. D4533 Trapezoidal Tear
6. D4355 Ultraviolet Resistance
7. D4751 Filtration
8. D4491 Permeability

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 geotextile 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 geotextile.

C. Geotextile material sample.

D. Manufacturer's quality assurance/quality control program.

E. Quality control test results conducted by the Manufacturer during the manufacturing of the geotextile fabric delivered to the project site. The results shall identify the sections/panels of the fabric they represent. The Contractor shall also provide the lot and roll number for the fabric delivered to the site.

F. Written certification that the MARVs provided under 2.02 of this section are guaranteed by the Manufacturer.

G. Contractor's proposed transportation, handling, storage, and installation techniques.

H. Shop drawings depicting installation details and a description of proposed installation techniques.

I. Manufacturer's standard warranty provided for the geotextiles.

J. Written certification by the Contractor that the field delivered material meets the manufacturer's specifications.

K. Written certification by the Contractor that the field delivered geotextile has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to installation of the geotextile.

L. Prior to installing the geotextile, the Installer shall certify in writing that the surface on which the geotextile will be installed is acceptable. The certification is subject to the review and approval or rejection by GE or GE's Representative.

M. The Contractor shall provide quality control tests conducted by the Manufacturer. The quality control testing 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:

   a. Unit weight (ASTM D5261).

   b. Grab strength (ASTM D4632).

   c. Trapezoidal tear strength (ASTM D4533).

   d. Burst strength (ASTM D3786).

   e. Puncture structure (ASTM D4833).

   f. UV resistance (ASTM D4355).

   g. Filtration (ASTM D4751).

   h. Permeability (ASTM D4491) not required for cushioning geotextile.

PART 2 - PRODUCT

2.01 ACCEPTABLE MANUFACTURERS

A. Synthetics Industries.

B. Amoco.

C. Approved equal.

2.02 MATERIALS

A. For these specifications and the Technical Drawings, 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 FML shall have the MARV for each physical property listed below:

| Property | Unit of Measure | Test Method | Minimum Test Value |
|---|---|---|---|
| Grab Tensile | lbs. | ASTM D4632 | 203 |
| Grab Elongation | % | ASTM D4632 | 50 |
| Puncture | lbs. | ASTM D4833 | 79 |
| Unit Weight | $oz./yd.^2$ | ASTM D5261 | 16 |

D. The non-woven geotextile indicated on the Technical Drawings for use with filter stone around subsurface collection pipes shall have the MARV for each physical property listed below:

| Property | Unit of Measure | Test Method | Minimum Test Value |
|---|---|---|---|
| Grab Tensile | lbs. | ASTM D4632 | 158 |
| Grab Elongation | % | ASTM D4632 | 50 |
| Puncture | lbs. | ASTM D4833 | 56 |
| Trapezoidal Tear | lbs. | ASTM D4533 | 56 |
| Permittivity | $sec^{-1}$ | ASTM D4491 | 0.2 |
| Apparent Opening Size | mm | ASTM D4751 | 70/140 |

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 quality assurance 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 will be followed during the geotextile installation.

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.

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. No horizontal seams shall be allowed on slopes.

2. Seaming and Repairing

   a. Geotextiles shall be continuously sewn using a polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile.

   b. 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.

2. The Contractor shall be responsible for all Quality Assurance/Quality Control (QA/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 MP-02219 – Geocomposite

B. Section MP-02232 – Geotextile Fabric

### 1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. D638 Tensile Properties of Plastics

2. D792 Specific Gravity and Density of Plastics by Displacement

3. D1004 Initial Tear Resistance of Plastic Film and Sheeting

4. D1505 Density of Plastics by the Density Gradient Technique

5. D1603 Carbon Black in Olefin Plastics

6. D5397 Environmental Stress-Cracking of Ethylene Plastics

7. D5994 Core Thickness of Textured Geomembrane

8. D5596 Microscopical Examination of Pigment Dispersion in Plastic Compounds

9. D4833 Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

10. D4218 Carbon Black Content

11. D4437 Integrity of Field Seams

B. Geosynthetic Research Institute (GRI)

1. GRI Test Method GM 13: Test Properties, Testing Frequencies and Recommended Warranty for High-Density Polyethylene (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. FML Manufacturer

1. The Contractor shall submit to GE or GE's Representative for approval the following information regarding the FML Manufacturer:

a. Corporate background and information.

b. Manufacturing capabilities including:

1) Quality control procedures for manufacturing; and

2) List of material properties including certified test results, to which FML samples are attached.

c. Origin (resin supplier's name, resin production plant) and identification (brand name, number) of the resin.

d. Copies of dated quality control certificates issued by the resin supplier.

e. Written certification that the MARVs given in the specification are guaranteed by the Manufacturer.

B. Installer

1. The Contractor shall submit to GE or GE's Representative for approval the following written information, relative to the Installer:

a. Copy of Installer's letter of approval or license by the Manufacturer.

C. The Installer of the FML materials shall prepare and the Contractor shall submit to GE or GE's Representative, record drawings 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. The Contractor shall submit the following items for approval at least one week prior to installation:

1. Shop drawings that shall include:

a. Layout Plan;

b. Quality control program manuals covering all phases of manufacturing and installation; and

c. 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 these specifications and the condition of its warranty.

E. The Contractor shall obtain and submit to GE or GE's Representative from the Manufacturer a standard warranty provided for the FML.

F. The Contractor shall provide quality control tests conducted by the Manufacturer. The quality control testing 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); and

6. Tear strength (ASTM D1004).

G. The FML Installer shall certify in writing that the final surface on which the FML is to be installed is acceptable to both GE and the Contractor prior to installation of the FML.

H. Quality Control/Quality Assurance

1. Written certification by the Contractor that the field-delivered FML has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to the installation of the FML.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Solmax Geosynthetics.

B. GSE Lining Technology, Inc.

C. 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 |
| 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<br>All 10 views in categories 1, 2 or 3 |
| Thickness (nominal)<br>Thickness (min. avg.)<br>lowest individual 8 of 10 values<br>lowest individual of 10 values | ASTM D5994 | 60 mil<br>57 mil<br>54 mil<br>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 |
| Puncture Resistance (min.) | ASTM D4833 | 90 lbs |
| Stress Crack Resistance | ASTM D5397 | 200 hrs |

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 surface 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 the Section MP-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 in 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 material 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 succession 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 nondestructive 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 nondestructive 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 at Yield (lb/in width) | ASTM D4437 | 120 ppi |
| Peel Adhesion – Fusion | ASTM D4437 | 91 ppi and Film tear bond |
| Peel Adhesion - Extrusion | ASTM D4437 | 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 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 replacement of bituminous concrete paving over removed driveways or other paved areas as shown on the drawings and as specified herein.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02222 – Fill Materials

### 1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Society of State Highway and Transportation Officials (AASHTO).

B. Massachusetts Highway Department Standard Specification for Highways and Bridges (Mass Highway 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 as presented in Section MP 02222.

2.02 BASE COURSE AGGREGATE

A. The crushed aggregate for the bituminous concrete base course shall conform to the requirements of the Mass Highway Specifications.

2.03 BITUMINOUS BINDER

A. The binder shall be asphalt cement conforming to the requirements of AASHTO 20.

2.04 WEARING SURFACE

A. The wearing surface shall be Type 1-2. The material shall conform to quality requirements as stated in the Mass Highway 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 or Portland cement concrete 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.

C. Joints

1. Make joints between old and new pavements or between successive days' work, to ensure a continuous bond between adjoining work. Construct joints to have same texture and smoothness as other sections of bituminous concrete. Clean concrete surfaces and apply 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 -

# *Attachment D*

# Flood Storage Capacity Calculations

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

**ATTACHMENT D**

**FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA II**

**GENERAL ELECTRIC COMPANY**
**PITTSFIELD, MASSACHUSETTS**

## CHANGES IN FLOOD STORAGE CAPACITY

GE utilized Terra Model™ computer software in order to further evaluate the impacts to flood storage capacity caused by the performance of the response actions proposed in the Final RD/RA Work Plan. This software models existing and post-remediation topography to determine the net change in flood storage capacity.

Based on the attached calculations performed by Terra Model, an estimated 6,270 cubic yards of flood storage will be lost due to the performance of the response actions proposed herein. To offset this loss in flood storage capacity, GE will obtain the necessary flood storage compensation through gains in flood storage capacity resulting from other projects within the 100-year floodplain.

# SURFACE TO SURFACE VOLUME REPORT

Blasland Bouck & Lee, Inc.
6723 Towpath Road
Syracuse, New York 13214-0066, USA
1-315-446-2570

Project: V:\GE_Pittsfield_CD_Newell_St_Area_II_Confidential\Notes and Data\TM\30193.pro

Report Generated: Tuesday, March 01, 2005 12:15:41 PM

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Where the second surface is above the first the volume is reported as fill.
Where the second surface is below the first the volume is reported as excavation.

---

Shrinkage/swell factors: Excavation 1.0000 Fill 1.0000

| First Surface Layer Name | Number of Points | Second Surface Layer Name | Number of Points |
|---|---|---|---|
| E-TIN (Existing Grade) | 10,244 | P-TIN (Proposed Grade) | 696 |

Volume limited to that within the constraining boundary - Object 26807
Area within boundary: 170,603.25 Sq. Ft. (3.9165 Acres)
Total triangulated area: 164,703.74 Sq. Ft. (3.7811 Acres)

| Excavation Volume (Cu. Yd.) | Fill Volume (Cu. Yd.) |
|---|---|
| 1,351 | 7,617 |

Net Difference: 6,266 Cu. Yd. Fill

*Attachment E*

# Contractor Submittal Tracking Form

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

**Attachment E**
**General Electric Company**
**Pittsfield, Massachusetts**

**Newell Street Area II**

**Contractor Submittal Tracking Form**

| Item No. | Submittal Description | Specification Reference (see Note 2) | Date Received | Review Conducted by: | | Interim Status/Date (see Note 1) | Final Status/Date (see Note 1) | Notes |
|---|---|---|---|---|---|---|---|---|
| | | | | GE Project Manager | Design Engineer | | | |
| 1 | Operations Plan - The Plan shall address, but not be limited to the following items: | Section 7.3 | | | | | | |
| | • List of Equipment to be used on-site. | Section 7.3 | | | | | | |
| | • Recreational property protection procedures. | Section 7.3 | | | | | | |
| | • Work Schedule | Section 7.3 | | | | | | |
| | • The Contractor's proposed plan for controlling vehicular and pedestrian traffic while performing construction and operational activities.. | Section 7.3 | | | | | | |
| | • Proposed sheetpiling design (if applicable) or alternate excavation stabilization measures (Section 5.4). | Section 7.3 | | | | | | |
| | • The Contractor's qualifications package (if requested by GE). | Section 7.3 | | | | | | |
| | • Stormwater (including run-on and run-off), erosion, noise, and dust control measures. | Section 7.3 | | | | | | |
| | • The Contractor's proposed excavation approach | Section 7.3 | | | | | | |
| | • Materials handling and staging approach. | Section 7.3 | | | | | | |
| | • Equipment cleaning procedures. | Section 7.3 | | | | | | |
| 2 | Health and Safety Plan - The Plan shall address, but not be limited to the following items (Refer to Note 3): | Section 7.3 | | | | | | |
| | • Identification of Key Personnel | Section 7.3 | | | | | | |
| | • Training | Section 7.3 | | | | | | |
| | • Medical Surveillance | Section 7.3 | | | | | | |
| | • Site Hazards | Section 7.3 | | | | | | |
| | • Work Zones | Section 7.3 | | | | | | |
| | • Personal Safety Equipment and Protective Clothing | Section 7.3 | | | | | | |
| | • Personal Air Monitoring | Section 7.3 | | | | | | |
| | • Personnel Decontamination | Section 7.3 | | | | | | |
| | • Confined Space Entry | Section 7.3 | | | | | | |
| | • Material Safety Data Sheets | Section 7.3 | | | | | | |
| | • Construction Safety Procedures | Section 7.3 | | | | | | |
| | • Standard Operating Procedures | Section 7.3 | | | | | | |
| 3 | Contingency Plan - The Plan shall address, but not be limited to the following items: | Section 7.3 | | | | | | |
| | • Spill prevention control and countermeasures plan for all materials brought on site. | Section 7.3 | | | | | | |
| | • Emergency vehicular access/egress. | Section 7.3 | | | | | | |
| | • Evacuation procedures of personnel from the work sites. | Section 7.3 | | | | | | |
| | • For work sites that include or are adjacent to a surface water drainage way, a flood control contingency plan to identify measures to protect the work site(s) and the waterway from impacts in the event of a high water and/or flood conditions. | Section 7.3 | | | | | | |
| | • List of all contact personnel with phone numbers and procedures for notifying each. | Section 7.3 | | | | | | |
| | • Routes to local hospitals | Section 7.3 | | | | | | |
| | • 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. | 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). | Section 7.3/9.0 | | | | | | |
| 5 | 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. | Section 8.2 | | | | | | |

**Attachment E**
**General Electric Company**
**Pittsfield, Massachusetts**

**Newell Street Area II**

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|---|---|---|---|---|---|---|---|---|
| | | | | GE Project Manager | Design Engineer | | | |
| 6 | Daily Construction Reports prepared by GE's Representative will include documentation of problems and/or deficiencies noted during construction (e.g., when construction material or activity is observed or tested that does not meet the specified requirements), and corrective action employed to address the problems or deficiencies. The documentation reports will be cross-referenced to the reports, data sheets, forms, and check lists that contain data or observations leading to the determination of a problem or deficiency. Problem and deficiency identification an corrective action documentation. | -- | | | | | | |
| 7 | Earthwork - Proposed equipment and compaction method(s). | Materials and Performance - Section 02200 (1.04)(A) | | | | | | |
| 8 | Restoration of Surfaces - A schedule of restoration operations. | Materials and Performance - Section 02207 (1.03)(A) | | | | | | |
| 9 | Restoration of Surfaces - Material cut sheets for chain link fencing. | Materials and Performance - Section 02207 (1.03)(B) | | | | | | |
| 10 | Restoration of Surfaces - Name of proposed fencing installer. | Materials and Performance - Section 02207 (1.03)(C) | | | | | | |
| 11 | Topsoil, Seeding and Mulch - Analysis of the seed and fertilizer, and proposed application rates. | Materials and Performance - Section 02212 (1.03)(A) | | | | | | |
| 12 | Topsoil, Seeding and Mulch - Should hydroseed be used, the Contractor shall submit all data including material and application rates. | Materials and Performance - Section 02212 (1.03)(B) | | | | | | |
| 13 | Topsoil, Seeding and Mulch - Sample of topsoil to be tested by GE for chemical contaminants. | Materials and Performance - Section 02212 (1.03)(C) | | | | | | |
| 14 | Geocomposite - Manufacturer's data for the geocomposite including physical properties and roll size. | Materials and Performance - Section 02219 (1.04)(A) | | | | | | |
| 15 | Geocomposite - The origin and identification of the geotextile and geonet used to fabricate the geocomposite. | Materials and Performance - Section 02219 (1.04)(B) | | | | | | |
| 16 | Geocomposite - Geocomposite material sample. | Materials and Performance - Section 02219 (1.04)(C) | | | | | | |
| 17 | Geocomposite - Manufacturer's installation procedures and specifications. | -- | | | | | | |
| 18 | Geocomposite - Manufacturer's quality assurance/quality control program. | Materials and Performance - Section 02219 (1.04)(D) | | | | | | |
| 19 | Geocomposite - Written certification that the MARVs provided under 1.04A of this section are guaranteed by the Manufacturer. | Materials and Performance - Section 02219 (1.04)(E) | | | | | | |
| 20 | Geocomposite - Contractor's proposed transportation, handling, and storage techniques. | Materials and Performance - Section 02219 (1.04)(F) | | | | | | |
| 21 | Geocomposite - Written certification by the Contractor that the field delivered geocomposite has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to the installation of the geocomposite. | Materials and Performance - Section 02219 (1.04)(G) | | | | | | |
| 22 | Geocomposite - Prior to installation, the Installer shall certify in writing that the surface on which the geocomposite will be installed is acceptable. The certification is subject to the review and approval or rejection by GE or GE's Representative. | Materials and Performance - Section 02219 (1.04)(H) | | | | | | |
| 23 | Geocomposite - Prior to installation, the Contractor shall provide the Installer's written verification that the geocomposite has not been damaged due to improper transportation, handling, or storage. | Materials and Performance - Section 02219 (1.04)(I) | | | | | | |
| 24 | Geocomposite - Each of the installer's personnel shall have recorded 500,000 sq. ft. of successful material installation. | Materials and Performance - Section 02219 (1.04)(J) | | | | | | |
| 25 | Geocomposite - The Contractor shall provide shop drawings depicting installation details, a panel layout diagram, and a description of proposed installation techniques. | Materials and Performance - Section 02219 (1.04)(K) | | | | | | |

**Attachment E**
**General Electric Company**
**Pittsfield, Massachusetts**

**Newell Street Area II**

**Contractor Submittal Tracking Form**

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|---|---|---|---|---|---|---|---|---|
| | | | | GE Project Manager | Design Engineer | | | |
| 26 | Geocomposite -The Contractor shall provide quality control certificates for the geocomposite, which identifies the sections of field delivered material they represent, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include lot and roll identification numbers, testing procedures and results of quality control tests. At a minimum, results shall be given for the following: • Unit weight (geotextile component) (ASTM D5261). • Thickness (ASTM D1777). • Geotextile-geonet ply adhesion (ASTM D413). • Transmissivity Testing (ASTM D4716*) (See Note 5). * Test methods to be performed with the following modifications: Substrate Material: 60-mil HDPE geomembrane Superstrate Material: Neoprene or 6 inches of representative soil Applied Normal Compressive Load: 5,000 lbs/sq.ft. Seating Time: 100 hours (minimum) Hydraulic Gradient: 0.1 | Materials and Performance - Section 02219 (1.04)(L) | | | | | | |
| 27 | Geocomposite - The Contractor shall submit written certification that the delivered material meets the manufacturer's specifications. The Contractor shall also provide the lot and roll number for the material delivered to the site. | Materials and Performance - Section 02219 (1.04)(M) | | | | | | |
| 28 | Fill Materials - Sieve analysis of all granular materials. | Materials and Performance - Section 02222 (1.04)(A) | | | | | | |
| 29 | Fill Materials - Sample of soil to be tested for chemical contaminants as discussed in this Work Plan. | Materials and Performance - Section 02222 (1.04)(B) | | | | | | |
| 30 | Geotextile Fabric - Manufacturer's data for geotextile including, at a minimum, physical properties, packaging, and installation techniques. | Materials and Performance - Section 02232 (1.04)(A) | | | | | | |
| 31 | 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 geotextile. | Materials and Performance - Section 02232 (1.04)(B) | | | | | | |
| 32 | Geotextile Fabric - Geotextile material sample. | Materials and Performance - Section 02232 (1.04)(C) | | | | | | |
| 33 | Geotextile Fabric - Manufacturer's installation procedures and specifications. | -- | | | | | | |
| 34 | Geotextile Fabric - Manufacturer's quality assurance/quality control program. | Materials and Performance - Section 02232 (1.04)(D) | | | | | | |
| 35 | Geotextile Fabric - Quality control test results conducted by the Manufacturer during the manufacturing of the geotextile fabric delivered to the project site. The results shall identify the sections/panels of the fabric they represent. The Contractor shall also provide the lot and roll number for the fabric delivered to the site. | Materials and Performance - Section 02232 (1.04)(E) | | | | | | |
| 36 | Geotextile Fabric - Written certification that the MARVs provided under 2.02 of this section are guaranteed by the Manufacturer. | Materials and Performance - Section 02232 (1.04)(F) | | | | | | |
| 37 | Geotextile Fabric - Proposed transportation, handling, storage, and installation techniques. | Materials and Performance - Section 02232 (1.04)(G) | | | | | | |
| 38 | Geotextile Fabric - Shop drawings depicting installation details and a description o proposed installation techniques. | Materials and Performance - Section 02232 (1.04)(H) | | | | | | |
| 39 | Geotextile Fabric - Manufacturer's standard warranty provided for the geotextiles. | Materials and Performance - Section 02232 (1.04)(I) | | | | | | |
| 40 | Geotextile Fabric - Written certification by the Contractor that the field delivered material meets the manufacturer's specifications. | Materials and Performance - Section 02232 (1.04)(J) | | | | | | |
| 41 | Geotextile Fabric - Written certification by the Contractor that the field delivered geotextile has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to installation of the geotextile. | Materials and Performance - Section 02232 (1.04)(K) | | | | | | |

**Attachment E**
**General Electric Company**
**Pittsfield, Massachusetts**

**Newell Street Area II**

**Contractor Submittal Tracking Form**

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|---|---|---|---|---|---|---|---|---|
| | | | | GE Project Manager | Design Engineer | | | |
| 42 | Geotextile Fabric - Prior to installing the geotextile, the Installer shall certify in writing that the surface on which the geotextile will be installed is acceptable. The certification is subject to the review and approval or rejection by GE or GE's Representative. | Materials and Performance - Section 02232 (1.04)(L) | | | | | | |
| 43 | Geotextile Fabric -The Contractor shall provide quality control tests conducted by the Manufacturer. The quality control testing results shall include lot and roll identification numbers representative of the field-delivered material. At a minimun results shall be given in accordance with the Technical Drawings and Specifications for:<br>Unit weight (ASTM D5261),Grab strength (ASTM D4632), Trapezoidal tear strength (ASTM D4533), Burst strength (ASTM D3786), Puncture structure (ASTM D4833), UV resistance (ASTM D4355), Filtration (ASTM D4751), Permeability (ASTM D4491, not required for cushioning geotextile). | Materials and Performance - Section 02232 (1.04)(M) | | | | | | |
| 44 | Flexible Membrane Liner - FML Manufacturer's corporate background and information. | Materials and Performance - Section 02234 (1.04)(A1.a) | | | | | | |
| 45 | Flexible Membrane Liner - Manufacturing capabilities including: quality control procedures for manufacturing, and list of material properties including certified test results, to which FML samples are attached. | Materials and Performance - Section 02234 (1.04)(A1.b) | | | | | | |
| 46 | Flexible Membrane Liner - Origin (resin supplier's name, resin production plant) and identification (brand name, number) of the resin. | Materials and Performance - Section 02234 (1.04)(A1.c) | | | | | | |
| 47 | Flexible Membrane Liner - Copies of dated quality control certificates issued by the resin supplier. | Materials and Performance - Section 02234 (1.04)(A1.d) | | | | | | |
| 48 | Flexible Membrane Liner - Written certification that the MARVs given in the specification are guaranteed by the Manufacturer. | Materials and Performance - Section 02234 (1.04)(A1.e) | | | | | | |
| 49 | Flexible Membrane Liner - Copy of FML Installer's letter of approval or license by the Manufacturer. | Materials and Performance - Section 02234 (1.04)(B1.a) | | | | | | |
| 50 | Flexible Membrane Liner - Upon completion, the Contractor shall submit record drawings 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; and Location of all patches, repairs, and destructive testing samples. | Materials and Performance - Section 02234 (1.04)(C) | | | | | | |
| 51 | Flexible Membrane Liner - Shop drawings, including the following: Layout plan; Quality control program manuals covering all phases of manufacturing and installation; and 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 these specifications and the condition of its warranty. | Materials and Performance - Section 02234 (1.04)(D) | | | | | | |
| 52 | Flexible Membrane Liner - The Contractor shall obtain and submit to GE or GE's Representative from the Manufacturer a standard warranty provided for the FML. | Materials and Performance - Section 02234 (1.04)(E) | | | | | | |
| 53 | Flexible Membrane Liner - The Contractor shall provide quality control tests conducted by the Manufacturer. The quality control testing 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), and Tear strength (ASTM D1004). | Materials and Performance - Section 02234 (1.04)(F) | | | | | | |
| 54 | Flexible Membrane Liner - The FML Installer shall certify in writing that the final surface on which the FML is to be installed is acceptable to both GE and the Contractor prior to installation of the FML. | Materials and Performance - Section 02234 (1.04)(G) | | | | | | |

**Attachment E**
**General Electric Company**
**Pittsfield, Massachusetts**

**Newell Street Area II**

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|---|---|---|---|---|---|---|---|---|
| | | | | GE Project Manager | Design Engineer | | | |
| 55 | Flexible Membrane Liner - Quality Control/Quality Assurance: Written certificatio by the Contractor that the field-delivered FML has not been damaged due to improper transportation, handling, or storage. This certification shall be provided prior to the installation of the FML. | Materials and Performance - Section 02234 (1.04)(H) | | | | | | |
| 56 | Concrete - Contractor shall submit concrete mix design | Technical Drawing 8, Details 7 and 8 | | | | | | |
| 57 | Concrete - Contractor shall submit concrete pad construction sequence and schedule. | Technical Drawing 8, Detail 7 | | | | | | |

**Notes:**

1. Submittal status nomenclature is as follows:
   R - Reviewed
   N - Reviewed and noted
   S - Resubmit
   J - Rejected

2. All Section, Specification, and Drawing references are to the *Final RDRA Work Plan* (BBL, March 2005).

3. The Health and Safety Plan is required for GE record-keeping purposes only and therefore GE and BBL will conduct a review of 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. Shaded item numbers indicate submittals required by GE but not subject to submittal to EPA as part of the supplemental information package.

5. Geocomposite submittals to verify transmissivity shall be submitted as early as possible to prevent potential scheduling conflicts.

# *Attachment F*

# Ambient Air Monitoring Program

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

# SCOPE OF WORK

**for**

**Ambient Air PCB & Particulate Monitoring**
**at Newell Street Area II**

**General Electric Company**
**Pittsfield, Massachusetts**

Prepared by

**Berkshire Environmental Consultants, Inc.**
152 North Street, Suite 250
Pittsfield, MA 01201

January 2005

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1.0 Introduction

2.0 Sampling Objective

3.0 Site Activity

4.0 PCB Monitoring Program
- 4.1 High Volume PCB Sampling
- 4.2 Analytical Procedures

5.0 Particulate Monitoring

6.0 Quality Assurance and Quality Control Procedures

7.0 PCB Sample Documentation, Handling and Shipment

8.0 Meteorological Monitoring

9.0 Documentation and Reporting

10.0 Action Levels
- 10.1 PCBs
- 10.2 Particulate Matter

## 1.0 INTRODUCTION

This Scope of Work (SOW) describes the ambient air monitoring for polychlorinated biphenyls (PCBs) and particulate matter which will be conducted during soil remediation actions at the parcel numbers included in the Newell Street Area II Final Removal Design/Removal Action Work Plan (Final Work Plan). This Area II includes parcel numbers I9-7-1, J9-23-1 through J-23-6, J9-23-8, J9-23-12, and property owned by the City of Pittsfield on the north side of Newell Street along the Housatonic River, in Pittsfield, Massachusetts.

## 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 around the remedial site before and during remedial activities to insure that the activities are not causing an unacceptable increase in ambient air concentrations of PCB.

2. To obtain valid and representative data on ambient levels of particulate around the remedial site before and during soil remediation activities to insure that the remedial activities are not causing an unacceptable increase in ambient air concentrations of particulate.

## 3.0 SITE ACTIVITY

As described in the Final Work Plan, the on-site activities to be performed at Newell Street Area II include the performance of soil remediation activities (including soil removal/replacement and/or the installation of engineered barriers) at 10 parcels. It is anticipated that the remediation activities described in the Final Work Plan will be performed in a single phase of work. Performance of the remediation work presented in the Final Work Plan is subject to review and approval by the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MDEP) (together, the Agencies), as well as execution of owner access agreements.

This ambient air monitoring program includes particulate monitoring during soil remediation activities.

## 4.0 PCB MONITORING PROGRAM

### 4.1 *High Volume PCB Sampling*

The high volume PCB sampling program will include the following elements:

High-Volume Monitoring Locations 4

| | |
|---|---|
| Background Sites | 1 |
| Co-Located Sites (Field Duplicates) | 1 |
| Sampling Time | 24 hours per sampling event |
| Sampling Period | Duration of soil remediation activity |
| Frequency of Sampling | Twice prior to the onset of soil remediation activity and once every four weeks during remediation activity* |
| 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 |

* Sampling frequency may be increased if either PCB or particulate monitoring levels exceed threshold values.

Ambient air monitoring for PCBs will be conducted during soil remediation activities. Sampling will be conducted for two 24-hour periods prior to the initiation of remediation and will proceed once every 4 weeks during soil remediation. 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 proposed particulate notification level (i.e. 120 $\mu g/m^3$). "Consistently exceeding" will be defined as concentrations greater than 120 $\mu g/m^3$ on three consecutive 10-hour days or 5 days in any two-week period. Once PCB concentrations are below PCB action levels (see Section 10 of this Scope of Work) for two consecutive bi-weekly events, then PCB sampling frequency will revert to once every four weeks.

PCB background monitoring will be conducted prior to any on-site soil remediation activity at four locations on the perimeter of Newell Street Area II. During the soil remediation activity, PCB monitoring will be conducted at four locations surrounding the activity. A background monitor will be operated inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street. Preliminary monitoring sites have been identified for the soil remediation activity (as shown on Figure 1).

The specific sampling locations for monitors will be selected based on the location and nature of the soil remediation activity, predominant wind direction, the location of potential receptors, physical obstructions (i.e. trees, buildings), the availability of power, site security, site accessibility, etc.

The detection limit (DL) for PCB analysis of the high volume samples will be 0.0003 $\mu g/m^3$, in consideration of the following:

| | |
|---|---|
| Avg. Sampling Rate | 0.225 $m^3$/min. |
| Avg. Sample Volume | 324 $m^3$/PUF |

| | |
|---|---|
| Analytical DL | 0.1 $\mu$g/PUF |
| Project DL | 0.0003 $\mu g/m^3$ |

The sampling method to be used for PCBs in the high volume samples is US 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 absorbent 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 blue 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 will be recovered by Soxhlet extraction with 10% diethyl ether in hexane. The extracts will be reduced in volume using Kuderna-Danish (K-D) concentration techniques 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 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 | |

## 5.0 PARTICULATE MONITORING

Ambient air monitoring for particulate matter will be conducted during all soil remediation activities. Specifically, real-time ambient particulate monitoring will be performed during all active on-site soil remediation activities. Such monitoring will be conducted at four locations and at one appropriate background location inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street. Preliminary monitoring sites have been identified (Figure 1). The specific locations for stations will be selected based on the location and nature of the soil remediation activities, predominant wind direction, location of potential receptors, availability of power, site accessibility, and site security.

At the background and at least one on-site location, real-time particulate monitoring will be performed using a MIE dataRAM Model DR-2000 real time particulate monitor or equivalent. Each Model DR-2000 monitor or equivalent is equipped with a temperature conditioning heater and in-line impactor head to monitor and record particulate concentrations with a mean diameter less than 10 micrometers ($PM_{10}$). At the remaining three on-site locations, real-time particulate monitoring will be performed using a MIE dataRAM Model pDR-1000 or equivalent. Particulate monitoring will typically be conducted at all sites for approximately 10 hours daily, from 7 a.m. to 5 p.m., during soil remediation activities. Additional site activities may warrant a longer monitoring period. Particulate data will be recorded and averaged by the instruments' dataloggers every 15 minutes.

Calibrations and maintenance will be conducted at the frequency and in accordance with the procedures recommended by the manufacturer. All calibrations will be recorded.

## 6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Quality assurance and quality control (QA/QC) procedures for the PCB air sampling program follow those described in GE's *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP) and Method TO-4A. Quality assurance and quality control for the particulate sampling 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°C and shipped on blue 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

Meteorological data from the Climatronics Electronic Weather Station (EWS) operated at the GE facility in Pittsfield, Massachusetts will be included with the sampling results. This EWS has been operating continuously since 1991 at the GE facility in East Street Area 2 providing data to support other GE activities under the MCP. The EWS measures and records wind speed, wind direction, precipitation, temperature, relative humidity and integrated solar radiation. The siting of the meteorological station was established with the approval of DEP. The station was installed and continues to operate in accordance with EPA On-site Meteorological Program Guidance for Regulatory Modeling Applications and a Site Specific Meteorological Monitoring Quality Assurance Project Plan. The operation of the EWS has been successfully audited by Massachusetts Department of Environmental Protection (DEP).

## 9.0 DOCUMENTATION AND REPORTING

Particulate data will be summarized and reported to the GE Project Manager and the Blasland, Bouck & Lee (BBL) 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 BBL within one month 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
Signature of Individual Responsible For Monitoring Program

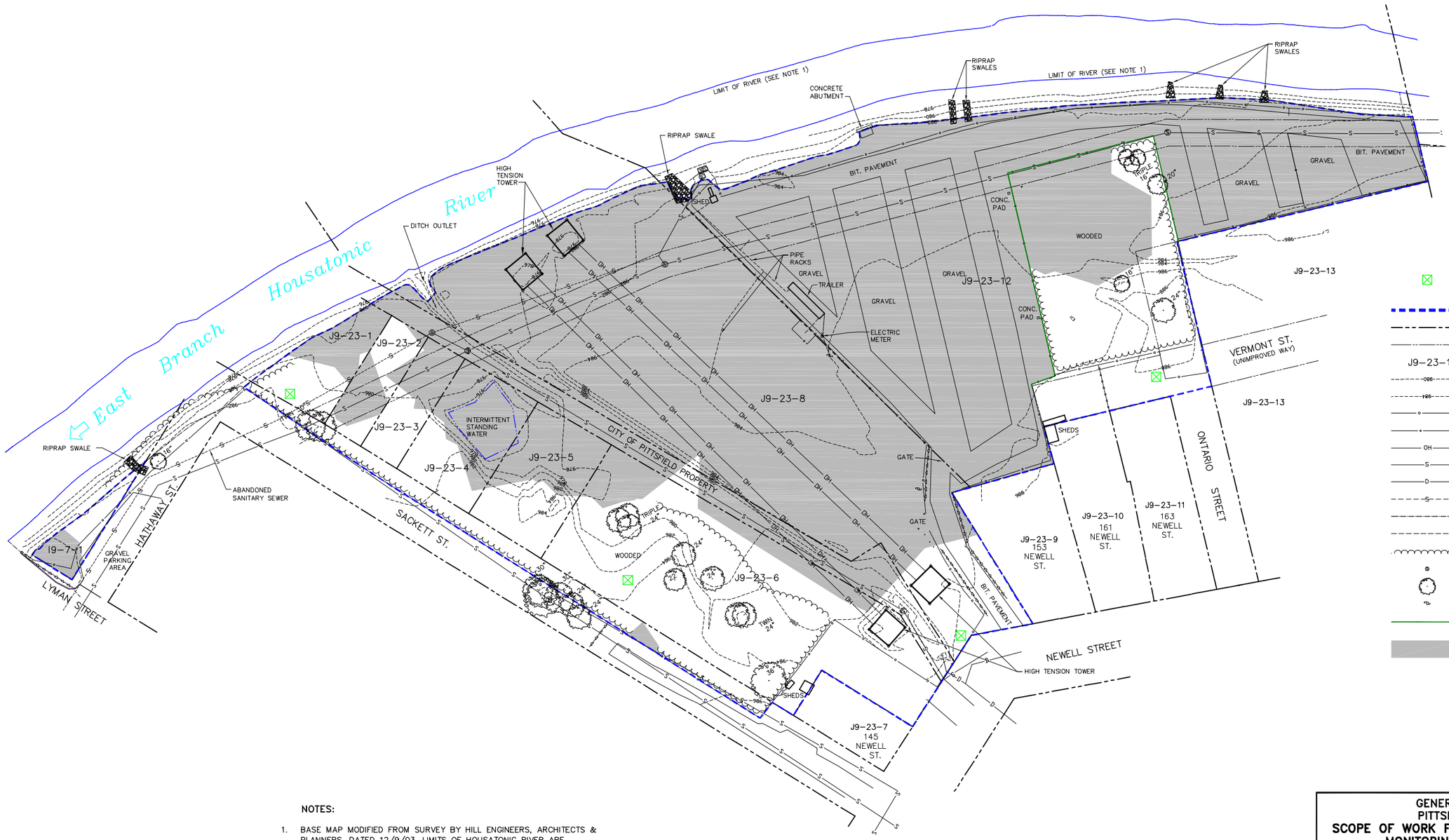
## 10.0 ACTION LEVELS

### 10.1 *PCBs*

The notification and action levels for PCB concentrations in ambient air are 0.05 $\mu g/m^3$ (24-hour average) and 0.1 $\mu g/m^3$ (24-hour average), respectively. These are the same levels established by EPA for the other remediation activities in Pittsfield. Any exceedance of the notification level will be immediately reported to the GE Project Manager.

### 10.2 *Particulate Matter*

For each day of monitoring, the particulate data from the on-site monitors will initially be compared with the data from the background monitor. If the average 10-hour $PM_{10}$ concentration at any on-site monitor exceeds the average concentration at the background monitor, the on-site concentrations will then be compared with the notification level of 120 $\mu g/m^3$ (micrograms per cubic meter) -- which represents 80 percent of the current 24-hour National Ambient Air Quality Standard (NAAQS) for $PM_{10}$ (150 $\mu g/m^3$). This level has been selected to allow notice to GE before concentrations reach the level of the 24-hour NAAQS. Any exceedances of the notification level or the NAAQS will be immediately reported to the GE Project Manager.




**LEGEND:**

- APPROXIMATE PROPOSED AMBIENT AIR PCB AND PARTICULATE MONITORING LOCATION
- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- EASEMENT
- J9-23-12 PARCEL ID
- INDEX ELEVATION CONTOUR
- INTERMEDIATE ELEVATION CONTOUR
- CHAIN LINK FENCE
- WOODEN FENCE
- OVERHEAD WIRES
- SANITARY SEWER
- STORM DRAIN
- ABANDONED SANITARY SEWER
- TOP OF BANK
- GUARD RAIL
- BUSHES/HEDGE
- SANITARY MANHOLE
- DECIDUOUS TREE
- UTILITY POLE
- J9-23-12 WOODED AREA
- LIMITS OF SOIL REMOVAL/ENGINEERED BARRIER INSTALLATION

0 50' 100'
GRAPHIC SCALE

**NOTES:**

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 12/9/03. LIMITS OF HOUSATONIC RIVER ARE APPROXIMATE.
2. 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 LOCATED.

X: 30193X01, X02.DWG
L: ON=*, OFF=*REF
P: PAGESET/SYR-DL
3/2/05 SYR-85-KMD LAF GHS
N/30193004/RAA/30193G03.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SCOPE OF WORK FOR AMBIENT AIR PCB PARTICULATE MONITORING NEWELL STREET AREA II

# PROPOSED AMBIENT AIR PCB AND PARTICULATE MONITORING LOCATIONS

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

FIGURE
F-1