Detailed Work Plan for On-Plant Consolidation Areas

General Electric Company
Pittsfield, Massachusetts

June 1999

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

Corporate Environmental Programs
General Electric Company
100 Woodlawn Ave., Pittsfield, MA 01201

June 11, 1999

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Re: On-Plant Consolidation Areas

Dear Messrs. Cavagnero, Olson, and Weinberg:

Enclosed is General Electric's *Detailed Work Plan for On-Plant Consolidation Areas.*

Should you have any questions, please call me at 413-494-3177.

Sincerely,

John F. Novotny /DCK for

John F. Novotny
Remediation Project Engineer

Enclosure

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1. Introduction

1.1 General

This *Detailed Work Plan for On-Plant Consolidation Areas* (Detailed Work Plan) presents the plans proposed by the General Electric Company (GE) for the design, construction, operation, closure, and post-closure monitoring of at least two and possibly three future on-plant consolidation areas located within the GE Plant Area in Pittsfield, Massachusetts (Figure 1). Subject to certain limitations, these areas will be utilized for the permanent consolidation of materials (e.g., soil, sediment, debris, etc.) generated during the performance of response actions conducted within the GE Plant Area and several other areas within and around Pittsfield (henceforth referred to as the Pittsfield/Housatonic River Site, or the Site). The general nature and scope of these response actions, including the use of on-plant consolidation areas, were initially established in a September 1998 settlement agreement reached between GE and the United States Environmental Protection Agency (USEPA), the Massachusetts Department of Environmental Protection (MDEP), and several other governmental agencies (all collectively referred to as the Agencies). With respect to on-plant consolidation areas, GE has performed several activities since the September 1998 settlement agreement to evaluate and select, and perform preliminary design activities for, several potential areas; a discussion of the activities performed by GE prior to and leading up to the preparation of this Detailed Work Plan is provided in Section 1.2 of this document. These activities resulted in the selection of three on-plant consolidation areas, as identified below and generally shown on Figure 2:

- Hill 78 Consolidation Area;
- Building 71 Consolidation Area; and
- New York Avenue / Merrill Road Consolidation Area.

Additional information regarding the evaluation processes and other considerations involved in the selection of the above areas is summarized in Section 1.2 below.

For each consolidation area, this Detailed Work Plan presents general information concerning the anticipated design, construction, operation, active-use monitoring, closure, and post-closure monitoring for each area. While such information is important in defining the final conditions associated with each consolidation area, and establishing a basis for more detailed design activities, the primary objective of this Detailed Work Plan is to summarize the near-term design, construction, and operation activities necessary to support use of two of the above-

identified areas -- the Hill 78 and the Building 71 Consolidation Areas. These areas will be used for the permanent consolidation of materials generated during response actions conducted within certain portions of the Site (initial use of these two consolidation areas may occur as soon as early July 1999). As a result, the contents of this Detailed Work Plan have been developed so that USEPA review and approval, and subsequent construction of an appropriate portion of these consolidation areas, can be performed in as expedited a manner as possible.

1.2 Background Information

In September 1998, GE and the Agencies reached a settlement agreement regarding the performance of future response actions (and related activities) for several areas within the Pittsfield/Housatonic River Site. The settlement agreement established, among other things, the response actions that GE would perform to address polychlorinated biphenyls (PCBs) and other hazardous constituents present in soils, sediment, and groundwater. Since the time that the settlement agreement was reached, GE and the Agencies have continued to discuss and negotiate the terms of a Consent Decree (and accompanying Statement of Work) to embody the contents of the agreement. At present time, several remaining issues must be resolved before a final agreement can be reached between the parties. Subsequently, the final Consent Decree will be "lodged" in federal court, and will be subject to public comment and court review before it is entered by the court and legally binding on the parties involved. However, for certain areas within the Pittsfield/Housatonic River Site, GE has agreed with the Agencies that it will perform certain response actions after lodging but prior to entry of the Consent Decree. These response actions include sediment and bank soil removal for the upper ½-mile reach of the Housatonic River between the Newell Street and Lyman Street bridges (Upper ½-Mile Reach) and soil removal from the Allendale School Property. In addition to these activities, GE may also demolish some buildings within its facility as part of its separate Brownfields re-development agreement with the City of Pittsfield.

The activities identified above will result in the generation of materials (e.g., soils, sediments, demolition debris, etc.) that will require disposition. Under the settlement agreement between GE and the Agencies, such materials may be permanently placed (subject to several conditions) into one or more consolidation areas located within the GE Plant Area. Subsequent to the September 1998 settlement agreement, GE identified and evaluated several potential consolidation areas within the GE Plant Area, and identified three areas for further detailed development -- the Hill 78, Building 71, and New York Avenue / Merrill Road Consolidation Areas (Figure 2). These locations were selected based on several considerations, including the potential volume and type of materials subject to future on-plant consolidation; the size, location, and capacity of potential consolidation areas; the location of potential areas

relative to active plant operations, floodplain areas, or future re-development areas; and prior and current use of the areas under consideration. The information utilized to initially screen and evaluate several candidate consolidation locations, toward the selection of the three consolidation areas identified above, was presented in a document entitled *Conceptual Work Plan for Future On-Plant Consolidation Areas* (Conceptual Work Plan), which was submitted to USEPA in March 1999.

The evaluation and selection process described above and summarized in the Conceptual Work Plan also considered, to a certain extent, limitations (established under the settlement agreement) related to the types of materials that could be permanently consolidated within the GE Plant. For example, prohibited from any future on-plant consolidation are free liquids, free product, intact drums and capacitors, and any other equipment that contains PCBs within its internal components (such materials, if encountered, must be transported off-site to an appropriate facility for disposal). In addition, while soils, sediments, and other debris generated as a result of response actions are generally suitable for on-plant consolidation, certain limitations regarding the acceptable location(s) for on-plant consolidation were established. Specifically, materials to be placed at the Hill 78 Consolidation Area (which was formerly used by GE for the placement of excess soils generated during various plant excavations/upgrades) must be limited to materials that contain less than 50 ppm PCBs (as determined by an appropriate composite averaging technique approved by USEPA) (referred to herein as Toxic Substances Control Act, or TSCA, materials) and do not constitute hazardous waste under USEPA's regulations pursuant to the Resource Conservation and Recovery Act (RCRA). Such materials shall be consolidated within the other on-plant consolidation areas (e.g., the Building 71 Consolidation Area).

Based on preliminary estimates concerning the volume and type of material subject to future consolidation and the capacities of the Hill 78 and Building 71 Consolidation Areas, it appears possible that most, if not all, of the materials generated as part of the overall response actions within the Site may be consolidated within these two areas. However, as future Removal Design/Removal Action (RD/RA) activities are conducted for the various areas comprising the Site, removal volume estimates will be updated. In the event that the anticipated volume of materials subject to future consolidation exceeds the anticipated capacity of the Hill 78 and Building 71 Consolidation Areas, GE will develop the third consolidation area, located in the vicinity of New York Avenue and Merrill Road. Given the current uncertainties regarding the future needs related to on-plant consolidation, this area has been retained as a potential future on-plant consolidation area. However, for the reasons discussed above and in Section 1.1, only preliminary and conceptual information concerning this area is presented in this Detailed Work Plan. Additional discussion concerning the scope and schedule of future response actions within the Pittsfield/ Housatonic River

Site, and the corresponding development, operation, and closure of on-plant consolidation areas, is presented in Section 1.4 below.

1.3 Anticipated 1999 Response Actions and On-Plant Consolidation Activities

As described in Section 1.2, GE has agreed with the Agencies that it will initiate certain response actions within the Pittsfield/Housatonic River Site following lodging but prior to the entry of the Consent Decree. As a result, concurrent with the design and development of the Hill 78 and Building 71 Consolidation Areas, GE has been active in the performance of RD/RA activities related to Removal Actions for the Allendale School Property and the Upper ½-Mile Reach of the Housatonic River. These activities have been conducted with the intent of initiating response actions (following USEPA review and approval of the appropriate work plans and lodging of the Consent Decree) beginning in the summer of 1999. To facilitate the near-term design and construction of the appropriate portions of the Hill 78 and Building 71 Consolidation Areas, it was necessary to identify, to the extent possible, the volume of soil subject to on-plant consolidation.

To accommodate the 1999 response actions anticipated for the Allendale School Property and the Upper ½-Mile Reach, the total volume of material (soils and sediments) subject to transport to and placement within the Hill 78 and Building 71 Consolidation Areas is conservatively estimated as 36,000 cubic yards. A breakdown of this volume estimate is presented below:

Area	Hill 78 Consolidation Area	Building 71 Consolidation Area
Allendale School Property	24,000 cy	5,000 cy
Upper ½-Mile Reach	3,000 cy	4,000 cy
Total	27,000 cy	9,000 cy

The above information provided the basis for the near-term design activities presented in this Detailed Work Plan, and specifically those portions of the Hill 78 and Building 71 Consolidation Areas that would need to be developed to support the 1999 response actions.

1.4 Coordination of Future Design and Construction Activities

As previously indicated, the majority of the technical design information contained in this Detailed Work Plan relates to the near-term activities necessary to support the 1999 response actions. For example, a significant level of technical detail is presented concerning the construction of that portion of the Building 71 Consolidation Area that will be needed for the next several months (as discussed in subsequent sections of this work plan, this area requires a significantly greater level of development, relative to the Hill 78 Consolidation Area, due to the extent of site preparation activities, the installation of a base liner system, and other area-specific conditions). Separate from the near-term design and construction activities, it is important that the 1999 consolidation activities are conducted in such a manner that is consistent with future consolidation activities. To achieve this objective, it was necessary to perform several technical evaluations to quantify the anticipated final conditions associated with each consolidation area.

Preliminary information concerning the design, construction, and final configuration of the Hill 78 and Building 71 Consolidation Areas was initially presented in the Conceptual Work Plan. Since that time, GE has conducted several activities to further define the anticipated final conditions and configuration of these areas. This updated information for each consolidation area has been used to delineate the final configuration of these areas (described in Section 2), and to support the selection and design of various support facilities and locations (e.g., access roads, stormwater management, access restrictions, etc.). This information also served as the starting point for the near-term activities associated with the 1999 response actions.

Beyond the response actions targeted for 1999, it will be necessary to further assess and coordinate future response actions within the Site and the corresponding need to develop/expand the consolidation areas to accommodate the materials generated by such response actions. As the need for expansion of the consolidation area(s) is identified, supplemental design, construction, operation, and monitoring activities will be conducted and provided to the Agencies in future RD/RA submittals. Such submittals will be prepared by GE and submitted to USEPA in a manner that reflects the sequence of the anticipated use of each consolidation area. For example, GE will periodically assess the volume of materials that may be subject to consolidation, and the corresponding need for additional consolidation space or new consolidation areas, as well as potential closure and post-closure activities. This approach allows GE to properly and efficiently sequence the activities related to the on-plant consolidation areas.

additional space @ Merrill Road / New York Avenue

1.5 Format of Detailed Work Plan

The remainder of this Detailed Work Plan is presented in nine sections. The title and brief overview of each section follows:

Section 2 - General Requirements for On-Plant Consolidation Areas, presents information that serves as the overall basis for the design, construction, operation, monitoring, closure, and post-closure monitoring of the future on-plant consolidation areas. Included in this section are the Performance Standards for the on-plant consolidation areas, the identification and discussion of Applicable or Relevant and Appropriate Requirements (ARARs), and the various components involved in the construction of the consolidation areas. Using this information, the anticipated final conditions of the Hill 78 and Building 71 Consolidation Areas, and the New York Avenue/Merrill Road area (if needed), have been developed and presented in this section.

Section 3 - Pre-Design Activities, summarizes the activities recently conducted by GE to supplement the available site information and support the design of the Hill 78 and Building 71 Consolidation Areas. Included is a summary of recent topographic and subgrade utility surveys, and pre-design soil and groundwater investigations.

Section 4 - Overview of 1999 Design Activities, describes the near-term design activities performed for the Hill 78 and Building 71 Consolidation Areas to support the 1999 response actions for the Allendale School Property and Upper ½-Mile Reach of the Housatonic River. The information presented in this section applies the general requirements presented in Section 2 for the specific portion of the consolidation areas identified for development in 1999.

Section 5 - 1999 Construction Activities, describes the activities that will be conducted prior to, during, and following the construction of the select portions of the consolidation areas. Several implementation-related details are presented in this section, including pre-mobilization activities, site preparation activities, construction sequencing and details, monitoring, and interim closure of these areas following their use in 1999. Also included in this section is information regarding the anticipated project organization and roles of the USEPA, MDEP, GE, and GE's Contractors; and the anticipated contractor procurement process.

Section 6 - Consolidation Area Operations, describes the general day-to-day activities involved in the operation of the on-plant consolidation areas, including the process of transporting, placing, grading and compacting the various consolidation materials; dust control; water management; equipment cleaning; and documentation.

Section 7 - Restoration Activities, describes the anticipated interim and final closure measures that will be taken at the consolidation areas and adjacent areas.

Section 8 - Future Groundwater Monitoring Program, describes the program that will be developed, once additional groundwater investigation results are received, to monitor groundwater quality during and following use of the consolidation areas.

Section 9 - Post-Closure Care, describes, generally, the types and scope of activities that will be performed once use of the on-plant consolidation areas has been discontinued and the areas are capped.

Section 10 - Schedule and Reporting, describes the anticipated performance and documentation of 1999 construction activities.

Throughout this Detailed Work Plan, numerous tables and figures and attachments are referenced. These materials supplement the text and provide more detailed information concerning various aspects of the consolidation areas. In addition, technical drawings are included as attachments to this Detailed Work Plan depicting the design for the construction of the 1999 portions of the consolidation areas. These drawings, in combination with other technical information, have been provided to a select list of qualified contractors for bidding and constructing the 1999 consolidation areas.

2. General Requirements for Consolidation Areas

2.1 General

This section of the Detailed Work Plan summarizes the information that has been and will be utilized to design, construct, and operate the on-plant consolidation areas. Initially, this section summarizes the Performance Standards for the on-plant consolidation areas (Section 2.2). Then, a discussion of various ARARs is provided (Section 2.3). The remainder of this section builds upon the general information presented in Sections 2.2 and 2.3 and describes the various components involved in the construction of the consolidation areas, including the installation, in certain cases, of a base liner system (and related facilities) and final consolidation area cap (Section 2.4), and the anticipated final conditions and configurations associated with each consolidation area (Section 2.5). Finally, Section 2.6 identifies several future design and construction components that will be evaluated and incorporated as appropriate.

The contents of this section are intended to provide general information concerning the overall design, construction, and operation of the future on-plant consolidation areas. This information was utilized in the near-term design of the consolidation areas to support the 1999 response actions, and will be applied to future efforts concerning the expansion/addition of existing or new consolidation areas. Finally, the majority of the information presented herein is related to the design and construction of the on-plant consolidation areas. Several other operational requirements associated with the consolidation areas, including daily activities, monitoring, closure, and post-closure monitoring, are addressed in separate sections of this Detailed Work Plan.

2.2 Performance Standards for On-Plant Consolidation Areas

The Performance Standards for the on-plant consolidation areas are as follows:

1. The maximum horizontal extent and maximum height of materials to be placed in the on-plant consolidation areas shall not exceed the following criteria:

Consolidation Area	Approximate Horizontal Extent of Consolidation Area [1]	Approximate Maximum Elevation of Consolidation Area [2]
Hill 78 Consolidation Area	5.6 acres	1,050
Building 71 Consolidation Area	4.4 acres	1,048
New York Avenue / Merrill Road Area	1.6 acres	1,027

1 Area does not include adjacent ancillary facilities.

2 Elevation is based on the National Geodetic Vertical Datum (NGVD).

In addition to the above criteria, the slope of the final surface topography for each consolidation area shall be between 4 and 33 percent.

2. GE may use the on-plant consolidation areas for the permanent consolidation of materials that are excavated or otherwise removed as part of Removal Actions to be conducted by GE for areas outside the Housatonic River, the Upper ½-Mile Reach of the Housatonic River, and building demolition debris from Brownfields re-development activities, subject to the limitations identified below.

3. USEPA may use the on-plant consolidation areas for the permanent consolidation of materials that are excavated or otherwise removed from the Housatonic River sediments and banks as part of a Removal Action to be conducted by USEPA for the 1½-Mile Reach of the Housatonic River between the Lyman Street bridge and the confluence of the East and West Branches of the River, subject to the limitations identified below and subject to the provisions of an Access and Services Agreement being negotiated between GE and USEPA for the 1½-Mile Reach Removal Action.

4. Materials to be consolidated within the Hill 78 Consolidation Area shall be limited to materials that contain less than 50 ppm PCBs (as determined by an appropriate composite sampling technique or other techniques approval by USEPA) and are not classified as a hazardous waste under regulations issued pursuant to RCRA.

5. Materials to be placed in the on-plant consolidation areas shall not include free liquids, free product, intact drums and capacitors, or other equipment that contains PCBs within its internal components. Such materials, if any, shall be sent to an appropriate off-site facility for disposal.

6. GE shall operate the on-plant consolidation areas in accordance with the operations plan and requirements set forth in Section 6 of this Detailed Work Plan.

7. Upon completion of use, GE shall cover the on-plant consolidation areas with an engineered landfill/consolidation area cap, as described in Section 2.4.1 of this Detailed Work Plan.

8. GE shall perform post-closure inspections and maintenance of the on-plant consolidation areas in accordance with a Post-Removal Site Control Plan for such areas to be submitted by GE, as approved by USEPA.

9. GE shall conduct groundwater monitoring associated with the on-plant consolidation areas in accordance with the groundwater monitoring requirements outlined in Section 8 of this Detailed Work Plan and to be described further in supplemental groundwater monitoring proposals to be submitted by GE, as they are approved by USEPA.

2.3 Applicable or Relevant and Appropriate Requirements (ARARs)

This section describes, for the on-plant consolidation areas, the applicable or relevant and appropriate requirements (ARARs) under federal and state environmental laws. Under the National Contingency Plan (NCP) under CERCLA, removal actions must attain ARARs only to the extent practicable considering the exigencies of the situation (40 CFR 300.415(j)). A requirement under federal and state environmental laws may be either "applicable" or "relevant and appropriate" to a removal action. "Applicable requirements" are those cleanup standards, standards of control and other substantive requirements, criteria, or limitations that are promulgated under federal or state environmental laws and that specifically addresses a hazardous substance, pollutant, contaminant, response action, location, or other circumstance found at the site (40 CFR 300.5). "Relevant and appropriate requirements" are those promulgated cleanup standards, standards of control, and other substantive requirements, criteria, or limitations that, while not applicable to a hazardous substance, pollutant, contaminant, response action, or other circumstance at the site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site *(ibid.)*. Only those state substantive standards that are identified in a timely manner and that are more stringent than federal requirements are ARARs *(ibid.)*.

To constitute an ARAR, a federal or state standard or requirement must be substantive in nature. Administrative requirements, such as those relating to permitting, documentation, reporting, and record keeping, are not ARARs.

In addition, to constitute an ARAR, the standard or requirement must have been formally promulgated by a federal or state agency. Federal and state advisories and guidance documents that have not been formally promulgated as binding laws or regulations do not constitute ARARs. Such items need not be complied with, although they may be considered in formulating a removal action.

In determining whether compliance with an ARAR is practicable, the lead agency may consider all appropriate factors including: 1) the urgency of the situation; and 2) the scope of the removal action [40 CFR 300.415(j)]. In addition, even if compliance with an ARAR is deemed practicable based on consideration of the above factors, compliance may nonetheless be waived under any of the circumstances for which CERCLA allows a waiver for remedial actions [see section 121(d)(4) of CERCLA; 40 CFR 300.430(f)(1)(ii)(c)]. These circumstances, which also apply to removal actions (see 40 CFR 300.415(j); USEPA, 1991), include the following:

- **Greater Risk:** Compliance with the ARAR will result in greater risk to (or less protection of) human health and the environment than an alternative;

- **Technical Impracticability:** Compliance with the ARAR is technically impracticable from an engineering perspective, such as when a state surface water discharge standard requires the treatment of contaminants to below analytical detection limits;

- **Equivalent Standards of Performance:** An alternative to ARAR compliance will allow a standard of performance equivalent to (or better than) that required by the ARAR; and

- **Inconsistent Application:** a proposed state ARAR has not been applied consistently to other response actions within the state.

The ARARs identified for the on-plant consolidation areas are set forth in Tables 1 and 2. These tables include a proposal regarding attainment of each listed ARAR. For ARARs that will not or may not be attained, the tables note that fact and present the basis for waiver of such ARARs.

2.4 Consolidation Area Construction Components

All on-plant consolidation areas will be subject to the installation of a multi-layer, low-permeability cap following their active use. A base liner will be installed prior to the use of the Building 71 Consolidation Area (as well as

the New York/Merrill Road Consolidation Area, if that area is utilized in the future for consolidation activities). A summary of these construction components is presented below.

2.4.1 Final Cover System

A final cover system will be constructed over the consolidation areas as they reach their final condition and configuration. The objectives of the final cover system for these areas are to restrict the potential for direct contact with the consolidation materials, and limit the possibility for constituent migration via erosion/runoff, infiltration, and airborne pathways. The proposed final cover system will generally consist of the following components, from bottom to top, as shown on Figure 3:

- A geosynthetic clay layer (GCL) over surfaces with a slope of less than 10 percent;
- A 60-mil textured high density polyethylene (HDPE) flexible membrane liner (FML);
- A geosynthetic drainage composite (GDC) layer;
- An 18-inch thick (minimum) soil cover layer; and
- A 6-inch thick (minimum) topsoil layer with vegetative cover.

The final cover system illustrated on Figure 3 will satisfy the requirements of the Massachusetts Contingency Plan (MCP) for the construction and performance of engineered barriers [310 CMR 40.0996(4)(c)], which include the following key elements:

- Prevent direct contact with contaminated media;
- Control vapors or dust emanating from contaminated media;
- Minimize erosion and any infiltration of precipitation that could jeopardize the integrity of the barrier or result in potential migration of contaminants;
- Be constructed of materials resistant to degradation;
- Be consistent with the pertinent technical standards under RCRA (40 CFR Part 264, Subpart N) and state hazardous waste regulations (310 CMR 30.600) or equivalent standards (as described below);
- Be constructed to include a defining layer (e.g., geotextile) to visually identify the beginning of the impermeable layer;
- Be monitored and maintained to ensure the long-term integrity and performance of the barrier; and

- Be constructed to not include an existing building, structure, or cover unless these features are designed and constructed as an engineered barrier.

The proposed cap will also be consistent with the pertinent technical standards under RCRA and state hazardous waste regulations for final cover design and construction [40 CFR 264.310(a) and 310 CMR 30.633(1)], which consist of the following :

- Provide long-term minimization of migration of liquids through the closed landfill;
- Function with minimum maintenance;
- Promote drainage and minimize erosion of the cover or abrasion of the cover;
- Accommodate settling or subsidence so that the cover's integrity is maintained;
- Sustain vegetative growth (where applicable) to enhance habitat quality; and
- Have a permeability less than or equal to the permeability of any bottom liner system (e.g., pavement) or the natural subsoils present.

Note that installation of a final cover system, as presented above, will not occur in 1999. As the need for a final cover system is anticipated in the future GE will prepare, for USEPA review and approval, detailed and technical design information concerning the final cover system.

2.4.2 Base Liner System

Under the settlement agreement, the subbase of any *new* on-plant consolidation area must be suitably prepared, although a liner and leachate collection system are not required. However, GE has elected to enhance the subbase of the Building 71 Consolidation Area (and the New York Avenue/Merrill Road Consolidation Area, if constructed) to include additional containment and demarcation prior to the placement of materials in these consolidation areas. Specifically, following the performance of site preparation activities (e.g., removal of vegetation and grading of the existing surface), a multi-component base liner system with provisions for leachate collection and handling will be installed, as shown on Figure 4.

2.5 Anticipated Final Conditions

By incorporating the information presented in Sections 2.2 through 2.4, the anticipated final configuration of the Hill 78, Building 71, and New York Avenue/Merrill Road Consolidation Areas has been determined. Figure 5 provides an illustration of the anticipated final conditions.

2.6 Future Design and Construction Considerations

As previously described, given the expedited nature of the near-term activities associated with the Hill 78 and Building 71 Consolidation Areas, the focus of this Detailed Work Plan is on those activities necessary to support the anticipated 1999 response actions. In addition, several future design/construction components have been evaluated preliminarily based on the anticipated final conditions and configuration of the consolidation areas. For example, for the Building 71 Consolidation Area, the presence of a base liner system necessitates the design and installation of a leachate collection system and associated facilities. For this system, the technical details and installation requirements for 1999 were developed and are presented in this Detailed Work Plan. However, to support this information, it was necessary to evaluate the overall system requirements that may be needed under a long-term or large-scale operation of this consolidation area. Similarly, for both the Hill 78 and Building 71 Consolidation Areas, a stormwater management program (with appropriate facilities and controls) has been preliminarily evaluated with the pertinent components incorporated as necessary into the 1999 design. Finally, several preliminary evaluations (e.g., evaluations of slope stability, settlement/subsidence, cap soil erosion, etc.) have been performed to support certain of the Performance Standards presented in this section. Additional details concerning these evaluations will be presented as appropriate in future design submittals to the USEPA (e.g., a future stormwater management plan associated with the final consolidation areas).

3. Pre-Design Activities

3.1 General

Over the last few months, several activities related to the on-plant consolidation areas have been conducted, including the:

- Identification, evaluation, selection and preliminary design of potential consolidation areas;
- Performance of a detailed topographic survey to update the previously available information and support future design and construction activities;
- Performance of a detailed utility location survey; and
- Performance of pre-design soil and groundwater investigation activities.

These pre-design activities are discussed in detail in the following sections.

3.2 Topographic Survey

GE recently prepared a detailed topographic survey of the Hill 78 and Building 71 areas. This survey included the identification/location of existing above- and below-grade utilities and structures, current surface cover types and conditions, presence and type of vegetation, and surface topography (one-foot contours). The survey has facilitated the development of a detailed site base map (presented as Drawing A-1 in Attachment A), that has been used to support the performance of detailed technical design activities discussed in Section 4 of this Detailed Work Plan.

3.3 Utility Location Survey

GE has recently performed a utility survey at the GE Plant Area in the vicinity of the Hill 78 and Building 71 Consolidation Areas. The survey identified above-ground and below-grade utilities including, but not limited, to the following:

- Subsurface drainage lines;
- Overhead steam lines;
- Underground electric, sanitary, and water lines; and
- Overhead utilities.

The survey also identified the location of several other pertinent structures, including easements, wells (both supply and monitoring), fire hydrants, and electric manholes. The information obtained from the survey is presented on Drawing A-2, and has been used during the development of the detailed technical design of the consolidation areas.

3.4 Pre-Design Field Investigations

3.4.1 Soil Investigations

GE has conducted a supplemental soil sampling and analysis investigation in the areas associated with the Hill 78 and Building 71 Consolidation Areas. Sampling was distributed over the two areas as shown on Figure 6. The sampling locations were selected to supplement previously collected soil sample data in these areas. The previous sampling locations are also shown on Figure 6, and the results of those investigations were presented in the Conceptual Work Plan.

Between May 25 and 28, 1999, GE collected and analyzed 27 soil samples from a total of nine soil boring locations. Samples were collected utilizing direct-push sampling methods to a depth of 15 feet below grade. In addition, one soil sample was collected near boring/well H78B-28/28R from a depth of 1- to 6-feet to supplement existing data in this area. All soil sampling procedures were conducted in accordance with GE's Sampling and Analysis Plan/Data Collection and Analysis Quality Assurance Plan (SAP/DCAQAP) (draft dated October 1998). Upon completion, the boreholes were abandoned by backfilling with bentonite. Boring logs are included as Attachment B to this Detailed Work Plan.

At each new boring location, soil samples were collected from the 0- to 1-foot, 1- to 6-feet, and 6- to 15-feet depth intervals and analyzed for PCBs, while five soil samples were analyzed for those non-PCB constituents listed in Appendix IX of 40 CFR 264, plus 2-chloroethyl vinyl ether, benzidene, and 1,2-diphenylhydrazine (Appendix IX+3), excluding herbicides and pesticides. The supplemental soil sample collected at boring H78B-28/28R was analyzed for PCBs. The results of these analyses are presented in Tables 3 and 4.

3.4.2 Groundwater Investigations

As described in Section 8 of this Detailed Work Plan, GE will conduct a groundwater monitoring program to assess potential impacts to groundwater quality that may be attributable to the consolidation areas. To provide information on existing groundwater conditions at and near the consolidation areas, and to serve as a basis for comparison to

future monitoring results, GE is conducting preliminary groundwater investigations prior to construction of the consolidation areas. This "baseline" groundwater sampling program involves a total of twelve monitoring wells selected to provide spatial representation on all sides of the consolidation areas (i.e., upgradient, downgradient, and cross-gradient). The locations of the wells are shown on Figure 7. Included in this program are four existing wells (78-1, 78-6, H78B-15, and NY-4) and eight new wells (OPCA-MW-1 to OPCA-MW-8).

The new monitoring wells were installed between May 26 and June 8, 1999. These wells were screened to intercept the water table, which was encountered at depths between 10 and 18 feet below grade. Well construction information for each monitoring well is presented in Table 5.

The new wells have just recently been installed and developed, and will be allowed to equilibrate for approximately one week prior to sampling. At that time, the groundwater elevation at each monitoring well will be measured to provide information on the direction of groundwater flow in this area. Then, groundwater samples will be collected from each of the twelve monitoring wells and submitted for laboratory analysis of Appendix IX+3 constituents, excluding herbicides and pesticides. The results of the baseline groundwater sampling event will be submitted in an addendum to this Detailed Work Plan following completion of the laboratory analyses.

What about direction of GW flow (currently)?

4. Overview of 1999 Design Activities

4.1 General

This section summarizes the technical design activities that have been conducted for the 1999 portion of the Hill 78 and Building 71 Consolidation Areas. For the Hill 78 Consolidation Area, relatively limited design activities were necessary, since (a) a base liner system will not be installed in this area, (b) an interim surface cover was installed in this area in 1991 so that very little additional site preparation activities are needed, and (c) the area identified for use is within a relatively flat portion of the former landfill area. During the 1999 consolidation activities, approximately 27,000 cubic yards of material will be placed within the limits of the Hill 78 Consolidation Area. Subsequently, a temporary 3- to 6-inch thick interim soil cover will be placed over all exposed consolidation materials, as described in Section 6 of this Detailed Work Plan.

The Building 71 Consolidation Area will be utilized for the consolidation of TSCA- and RCRA-regulated materials. For 1999, construction and consolidation activities will be generally limited to the southeast area of the Building 71 Consolidation Area as depicted on Figure 8. Based on the design information presented in this Detailed Work Plan, it is anticipated that up to approximately 18,000 cubic yards of material can be placed within the limits of the 1999 portion of the Building 71 Consolidation Area. This material will be placed and graded in such a manner to facilitate future construction of the consolidation area and installation of the final cover system.

Drawings A-1 through A-12 to this Detailed Work Plan summarize engineering design that has been completed for the construction of the subgrade, liner system, and leachate collection system, as appropriate, for the 1999 portion of the Hill 78 and Building 71 Consolidation Areas. The following design drawings are included in that attachment:

- Drawing A-1 - Existing Site Plan;
- Drawing A-2 - Existing Utilities Plan;
- Drawing A-3 - Site Development Plan;
- Drawing A-4 - Subgrade Plan;
- Drawing A-5 - Top of Liner and Leachate Collection System Plan;
- Drawing A-6 - Storm Sewer Relocation Plan and Profile;
- Drawing A-7 - Liner System Details;
- Drawing A-8 - Leachate Collection System Details;
- Drawing A-9 - Leachate Collection Manhole Details;
- Drawing A-10 - Storm Sewer Relocation Details;

- Drawing A-11 - Drainage Details; and
- Drawing A-12 - Stormwater Basin and Erosion Control Details.

The remainder of this section provides additional information related to the technical design of the 1999 portions of the Hill 78 and Building 71 Consolidation Areas. For the reasons identified in Section 4.1 above, the majority of this section pertains to the design of the Building 71 Consolidation Area.

4.2 Subgrade Preparation

To support the installation of the base liner system (refer to Section 2.4) and subsequent operations, several activities will be performed to prepare the subgrade for the 1999 portion of the Building 71 Consolidation Area. The existing ground surface will be cleared and grubbed, removing all organic and deleterious materials. Any removed vegetation will be chipped and stockpiled on-site for future use by GE. Building 71 (and related structures) will also be demolished, and the superstructure will be removed to accommodate subgrade preparation. Subsurface foundations associated with Building 71, and the adjacent concrete storage tank dike, will be removed as necessary to accommodate the subgrade grading plan. Following clearing, grubbing, and demolition activities the existing subgrade will be prepared according to Drawing A-4 - Subgrade Grading Plan.

4.3 Storm Sewer Relocation Design

The storm sewer system located within the eastern portion of the Building 71 Consolidation Area conveys stormwater from the adjacent General Dynamics parking lot to a pipe located near the entrance to the U.S. Generating Company facility, and ultimately across Merrill Road as shown on Drawing A-2. The system is comprised of 15-inch-diameter clay and concrete pipes, concrete manholes, a drainage swale, a 20-inch-diameter steel pipe, and a 12-inch-diameter concrete pipe. Since the 1999 portion of the Building 71 Consolidation Area occupies portions of this system, the affected components of the system will either be removed or abandoned-in-place, and replaced at a new location.

Based on hydraulic calculations, the capacity of the current system is approximately 8.4 cubic feet per second (cfs). To avoid surcharge conditions and possible flooding at upstream locations, the new storm sewer system was designed to provide approximately the same hydraulic capacity as the current system. Specifically, the capacity of the new system components is approximately 8.9 cfs. Also, design parameters included relocating the new system to a location and depth that would allow for ease of construction, and minimize disturbance to existing site features such as the fence line and overhead steam pipe.

Drawing A-6 depicts the design of the new storm sewer system and its relocation around the Building 71 Consolidation Area. The upgradient portion of the new storm sewer begins at a new storm sewer manhole located in the parking area approximately 60 feet east of Building 71 (referred to as MH No. 1 on Drawing A-6). A new 15-inch-diameter polyvinyl chloride (PVC) pipeline will be installed in the southern wall of the new manhole, and will continue in a southeasterly direction for approximately 184 feet to a new 4-foot-diameter concrete manhole (referred to as MH No. 2 on Drawing A-6). From this location, the 15-inch-diameter PVC pipeline will continue in a southerly direction for approximately 220 feet to a new 4-foot-diameter concrete manhole (referred to as MH No. 3 on Drawing A-6). From this location the 15-inch-diameter PVC pipeline will continue westerly for approximately 95 feet to a new 4-foot-diameter concrete manhole (referred to as MH No. 4 on Drawing A-6). Manhole No. 4 is designed with a vertical drop between the inlet and outlet inverts of approximately 3 feet. From this manhole the 15-inch PVC pipeline continues in a westerly direction for approximately 180 feet to a new 5-foot-diameter concrete manhole (referred to as MH No. 5 on Drawing A-6). Manhole No. 5 is located at the intersection of an existing 20-inch-diameter steel storm sewer pipeline, and an existing 12-inch-diameter concrete pipeline. The 20-inch-diameter steel pipeline will be removed to allow for both the installation of MH No. 5 an a new 15-inch-diameter PVC pipe from the Building 71 Consolidation Area stormwater basin as shown on Drawing A-4. The new MH No. 5 will be installed such that the existing 12-inch-diameter concrete pipeline discharges from MH No. 5.

4.4 Well Abandonment

As shown on Drawing A-3, there are several monitoring wells located in the anticipated 1999 portion of the Building 71 Consolidation Area. Prior to the installation of the base liner system (Section 4.5), these wells will be abandoned in accordance with MDEP requirements concerning such activities. In addition to the above, there is one inactive production well that will be abandoned per MDEP requirements and with consent from the U.S. Generating Company.

4.5 Base Liner System

Following subgrade preparation, the demolition of Building 71, the relocation of the existing storm sewer line, and well abandonment activities, a base liner system will be installed within the portion of the Building 71 Consolidation Area to be utilized in 1999 (1999 portion). The liner system is depicted on Drawing A-7 and consists of the following components from bottom to top:

- A 6-inch thick (minimum) select fill subbase layer; and
- A 60-mil textured HDPE FML.

Side Slope Liner System

- A non-woven geotextile; and
- a 60-mil textured HDPE FML.

A 6-inch thick subbase layer will be utilized as a grading layer for the FML where necessary. The subbase soil will be a general fill material free from deleterious matter such as roots, stumps, trash, and other debris. Based on the extent of subgrade preparation (i.e., surface grading to attain the design grades) and the suitability of the existing soils, such materials may be utilized for construction of the subbase layer. If not possible, materials will be brought in from an off-site location and used to construct the subbase layer.

Sixty-mil-thick, textured HDPE FML will extend across the Building 71 Consolidation Area, extend up the perimeter berms and existing embankment and terminate in an anchor trench as shown on Drawing A-7. An interior berm will also be constructed on the north and west sides of the 1999 portion of the Building 71 Consolidation Area as part of the leachate management system and temporary stormwater controls. The FML will extend over the interior berm, terminating approximately 10-feet outside of the interior berm. This 10-foot extension will facilitate future construction phases as the Building 71 Consolidation Area is expanded.

Soil materials used during construction of the liner system will meet the geotechnical requirements presented in the Construction Quality Assurance Plan (CQAP) included as Attachment C to this Detailed Work Plan. Screening and other mechanical means of modification may be necessary to achieve the quality assurance/quality control (QA/QC) requirements. The anticipated material quantities for the liner system installation are presented below.

Anticipated Material Quantities for the 1999 Base Liner System Installation	
Base Liner Component	**Estimated Material Quantity**
Subbase Fill (including Berms)	2,500 cubic yards
60 mil Textured HDPE FML	82,000 square feet

It should be noted that the majority of the required subbase fill material may be available from on-site (i.e., from within the Building 71 Consolidation Area).

As part of the base liner system, a perimeter berm will be constructed along the southern and western sides of the Building 71 Consolidation Area as shown on Drawing A-4. The purpose for the perimeter berm is to provide sufficient height of the liner system above the consolidation area floor to allow for leachate containment and for anchorage of both the liner and final cover systems. The berm will be constructed to a minimum height of 3 feet above the consolidation area floor and have 3 horizontal to 1 vertical side slopes.

As discussed above, to facilitate temporary termination of the liner system and to provide for temporary stormwater management, an interior berm will be constructed along the northwestern side of the Building 71 Consolidation Area as shown on Drawing A-5. As with the perimeter berm, the interior berm will be constructed to a minimum height of three feet above the consolidation area floor and have 3 horizontal to 1 vertical side slopes. The interior berm and associated temporary, exterior grading will allow for interception and conveyance of stormwater run-on away from the lined consolidation area.

4.6 Leachate Management System

The 1999 portion of the Building 71 Consolidation Area will include the installation of a leachate management system. The leachate management system will provide for collection, conveyance, and interim storage of leachate generated during 1999 operations. Portions of the system were also designed to accommodate the future expansion of the leachate management system during future construction phases.

A geosynthetic drainage composite (GDC) layer, will be used to collect any leachate that percolates through the consolidation material to the liner system. Any leachate will then flow by gravity through the GDC to a 6-inch diameter perforated HDPE leachate collection pipe, located within the 1999 portion of the Building 71 Consolidation Area. The leachate collection pipe will penetrate the perimeter berm, as presented on Drawing A-8, and discharge into a subgrade manhole. To allow for future expansion of the Building 71 Consolidation Area, the leachate collection pipe will penetrate the interior berm as shown on Drawing A-5. At the penetration point, the leachate collection pipe will be converted from perforated to a solid pipe as it passes though the berm. The pipe will daylight on the opposite side of the berm and be fitted with a temporary cap. Subsequent construction of the Building 71 Consolidation Area will utilize this section of pipe to connect into and expand the existing leachate management system. Once leachate drains to the pumping manhole, it will be pumped to an on-site interim, leachate storage tank.

For the 1999 construction phase of the Building 71 Area, the leachate storage tank will likely consist of a temporary 20,000-gallon Frac tank. The leachate stored within the Frac tank will be removed and treated at GE's existing 64-G Groundwater Treatment Facility or, alternatively, to an appropriate off-site location. Once the final cover system is constructed, use of the temporary storage tanks will be discontinued and a permanent storage tank will be installed to contain the leachate. The design capacity of the storage tank will be determined based on the anticipated rate and volume of leachate generation from the Building 71 Consolidation Area following completed closure activities.

4.7 Stormwater Management

Stormwater will be managed both during construction and for the post-closure period of the Hill 78 and Building 71 Consolidation Areas. The objective of stormwater management is to collect, convey, and discharge stormwater runoff away from the consolidation areas in a manner that minimizes the potential for flooding, soil erosion, and sediment migration into the surrounding areas.

During construction and shortly thereafter, the design objective for stormwater runoff control is to reduce the potential for erosion of recently placed soil and areas disturbed due to construction activities. Temporary sediment control devices (i.e., silt fences, hay bales, diversion berms) will be employed until a permanent, vegetative stand is established and the temporary devices are no longer required. The minimum locations identified for devices are shown on Drawing A-3. Additional locations may be determined during construction based on changing site conditions.

Once the final cover system construction is completed, permanent stormwater control structures will be installed. The final cover system design will include a comprehensive stormwater management system that will collect stormwater runoff and convey it to select locations for controlled discharge. Drainage structures (e.g., ditches, mid-slope swales and culverts) will be constructed and maintained throughout the post-closure period. Stormwater basins will be employed where necessary, to attenuate peak flows from the consolidation areas.

Permanent stormwater control structures proposed for the Hill 78 and Building 71 Consolidation Areas have been, or will be, designed to accommodate the anticipated peak flow conditions associated with both the 2- and 10-year, 24-hour storm events. Permanent stormwater control devices to be constructed during 1999 include a perimeter drainage ditch located along the interior of the paved perimeter access road as well as a stormwater basin located to the south of the Building 71 Consolidation Area.

The perimeter drainage ditch will serve to intercept runoff resulting from the perimeter access road and from the side slope of the consolidation area perimeter berm. The interior surface of the ditch will be stabilized with vegetation. Temporary erosion control matting will be placed and maintained within the ditch to minimize the potential for erosion of the ditch surface until vegetation is sufficiently established. The perimeter ditch will convey collected runoff to the stormwater basin as shown on Drawing A-4.

The stormwater basin is provided to attenuate peak flow conditions associated with development of the Building 71 Consolidation Area. Inflow to the stormwater basin will be discharged to the existing storm sewer system located immediately south of the basin. The basin will serve to moderate post-development stormwater flows to the existing storm sewer system at discharge rates which do not exceed those presently estimated for the existing Building 71 Consolidation Area.

In addition to the perimeter ditch and stormwater basin, two drainage culverts will be installed within the perimeter drainage ditch at the southern end of the Building 71 Consolidation Area to facilitate access to the perimeter berm, leachate collection manhole, and stormwater basin. The inlet and outlet ends of the culverts will include to use of either loose or reinforced riprap to dissipate flow velocities and to minimize the potential for erosion.

5. 1999 Construction Activities

5.1 General

Prior to constructing the Building 71 Consolidation Area base liner system and initiating subsequent consolidation activities at this and the Hill 78 Consolidation Area, several site preparation activities will be performed. These activities will include provisions for site security, installation of erosion/sedimentation control measures, clearing of vegetation, demolition and disposal of existing structures, and relocation of site utilities and other facilities. Each of these activities is further described below.

5.2 Project Organization

During the course of constructing and operating the consolidation areas, several different organizations will be involved, with the role of each depending on the particular aspect of the project. This section identifies the organizations expected to be involved with this project, and their associated roles and responsibilities. Included is a listing of key personnel, descriptions of duties, and lines of authority during the project. Additional information regarding the organizations/personnel and their associated responsibilities is provided below.

5.2.1 United States Environmental Protection Agency

The USEPA will serve as the lead regulatory agency for this project. The USEPA will provide a Project Manager (PM) to coordinate the USEPA's involvement and to receive all notices, reports, plans, and other documents prior to, during, and following the project. The identified PM for this project is:

Michael Nalipinski
U.S. Environmental Protection Agency
Site Evaluation and Response Section I (HBR)
One Congress Street
Boston, MA 02203
(617) 918-1268
Fax (617) 917-1494

In addition to the PM, other USEPA personnel (or designated contractors) will be involved in this project, and likely provide a continuous on-site presence. However, absence of a USEPA representative will not be cause for delay or stoppage of work. Where necessary, the USEPA will be responsible for coordinating efforts of other regulatory agencies (e.g., the MDEP).

5.2.2 Massachusetts Department of Environmental Protection

The MDEP will assist the USEPA in reviewing and overseeing the various RD/RA activities associated with this project removal action. The MDEP will provide a Project Manager to administer MDEP's responsibilities and all notices, reports, plans, and other documents prior to, during, and following the project. The identified MDEP Project Manager for this project is:

John Ziegler
Project Manager
Bureau of Waste Site Cleanup
Department of Environmental Protection
436 Dwight Street
Springfield, MA 01103
(413) 755-2250
Fax (413) 784-1149

5.2.3 General Electric Company

GE will be responsible for the overall performance and management of the project. Such responsibilities include, but are not limited to, the following:

- Serve as primary point of contact with the USEPA, MDEP, and local officials;
- Review all written notices, reports, plans, and other documents prior to submittal to the Agencies;
- Provide updates of project activities and schedule to the Agencies;
- Assess and resolve potential modifications to the proposed project activities, and communicate proposed modifications to the Agencies;
- Direct/coordinate activities of the contractor, supervising contractor, and other GE-contracted organizations involved with this project;
- Ensure that all work is performed in conformity with the conditions of this Detailed Work Plan and associated submittals;

- Conduct construction progress meetings as needed;

- Monitor quality assurance/quality control (QA/QC) activities during construction; and

- Coordinate the performance of this and other concurrent removal actions and consolidation activities within the Pittsfield/Housatonic River Site.

GE will provide a Project Coordinator to administer GE's role on this project. The identified GE Project Coordinator for this project is:

John F. Novotny, P.E.
General Electric Company
100 Woodlawn Avenue
Building 11-250
Pittsfield, MA 01201
(413) 494-3177
Fax (413) 494-2700

5.2.4 Supervising Contractor

GE will utilize a supervising contractor to assist in the overall management of the project. Responsibilities of the supervising contractor include, but are not limited to, the following:

- Review various submittals provided by the Contractor;

- Provide on-site observation of project activities;

- Provide documentation of project activities;

- Provide technical assistance/issue resolution related to the implementation of the project;

- Implement monitoring activities, prior to, during, and following project activities; and

- Assist GE in verifying that activities are performed in accordance with this Detailed Work Plan.

For this project, GE will utilize Blasland, Bouck & Lee, Inc as the supervising contractor. BBL's primary contact will be:

James M. Nuss, P.E., LSP
Blasland, Bouck & Lee, Inc.
6723 Towpath Road, P.O. Box 66
Syracuse, NY 13214-0066
(315) 446-9120
Fax (315) 445-9161

5.2.5 Contractor

GE will select one or more contractors to perform the activities associated with this project. The primary role of the contractor will be to implement the activities outlined in this Detailed Work Plan and provide all labor, materials, equipment, and services necessary to perform the project. Additionally, the Contractor will participate in construction progress meetings to address the project status, schedule, test results, observations and findings, technical issues, design changes, and upcoming activities.

5.3 Contractor Procurement

A Request for Proposal (RFP) for construction and operation of the 1999 portions of the consolidation areas has been prepared and distributed to solicit bids for performance of the work. The primary functions of the RFP are to: 1) identify to prospective contractors the scope of work necessary to complete the project; 2) provide a basis by which contractors can develop a cost proposal; and 3) indicate the specific materials, equipment, and standards to be utilized in performing the construction activities. As discussed previously, the drawings included as Attachment A to this Detailed Work Plan will be utilized as the basis for contractor bidding. Additionally, technical specifications will be included within the RFP.

Concurrent with USEPA review of this Detailed Work Plan, GE is in the process of procuring a contractor to perform the activities outlined in this Detailed Work Plan, including a pre-bid meeting and site visit with prospective contractors, receipt and analysis of contractor proposals, and the identification of and contracting with the selected contractor. As discussed in Section 10 of this Detailed Work Plan, the activities described above will be completed in late June to allow initiation of on-site activities shortly after lodging the Consent Decree and receiving USEPA approval of this document.

5.4 Pre-Mobilization Activities

Subsequent to the submittal of this Detailed Work Plan and prior to the initiation of on-site activities, a number of pre-mobilization activities will be conducted. Following selection, the Contractor will be required to prepare, and submit to GE for review, several documents. For most elements of construction, the Contractor will prepare and submit detailed plans, schematics, and other construction-related documents for GE's review. The objective of this requirement is to monitor the Contractor's understanding of the project and the Detailed Work Plan requirements, and prevent any misinterpretation of the technical specifications that may otherwise impact the project objectives or schedule. The required submittals are expected to include the following:

- Health, Safety, and Contingency Plan;
- Site Operations Plan;
- Work schedule;
- A summary of materials and procedures to be used to construct and operate the consolidation areas;
- Name, locations, and quantity of proposed backfill materials; and
- Name(s) of subcontractor(s) to be used for the project.

Collectively, the above submittals are intended to demonstrate that the Contractor (a) has an adequate understanding of the scope of the project; (b) has developed a project 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. Two of the submittals identified above -- the Health, Safety, and Contingency Plan (HSCP) and the Site Operations Plan -- are discussed in more detail below.

Health, Safety, and Contingency Plan

The Contractor will be required to implement a project-specific HSCP. This project-specific HSCP must meet the minimum requirements established in the *General Facility Health and Safety Plan* (GE, June 1993) and 29 CFR 1910 and 1926. The plan must address those activities scheduled to be undertaken by the contractor and present required information including, but not limited to, 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, equipment cleaning, and material safety data sheets. A Contingency Plan will also be included within the HSCP, and will set forth procedures for responding to emergency conditions or events that may

occur during the performance of the project. In addition, the Contingency Plan will include discussion on the following topics:

- Storm water control in the event of heavy precipitation to control the potential migration of PCB-containing materials off site;
- Procedures for controlling fires, dust, odor, and noise;
- Actions to be taken during severe weather conditions;
- Actions to be performed during equipment breakdown periods; and
- Emergency procedures to be performed when accidents (serious and minor) occur.

In addition to the preparation of the HSCP by the Contractor, any other contractors or subcontractors to either GE or the primary contractor will be responsible for developing and implementing a task-specific worker health and safety plan. The same requirements/provisions referenced above regarding the HSCP will be addressed in each task-specific plan.

Site Operations Plan

The purpose of the Site Operations Plan will be to summarize the materials, procedures, timelines, and controls that the Contractor intends to utilize during the project. This plan will be prepared in consultation with GE and its supervising contractor and will address, but not be limited to, the following items:

- Detailed work schedule;
- Proposed excavation stabilization measures;
- Excavation Plan;
- Materials Handling and Staging Plan;
- Dewatering and Water Management Plan;
- Equipment cleaning procedures;
- List of equipment to be used on-site;
- Property protection procedures; and
- Dust control measures.

GE will conduct one or more project kick-off meetings with personnel from the USEPA, MDEP, Contractor, U.S. Generating Company, and General Dynamics. The intent of these meetings will be to discuss the anticipated project

sequence and schedule, present any modifications to the removal actions as presented in this Detailed Work Plan, summarize the health, safety, contingency, and security measures that will be implemented and maintained during the removal actions, and discuss specific questions and concerns identified by the meeting attendees.

5.5 Site Controls

Site controls are currently in place which restrict access to the portions of the plant where consolidation area construction, and related work will be performed. Fencing is located along Tyler Street Extension, and along the General Dynamics parking lot which immediately abut the consolidation areas. Security fencing also surrounds the GE property to the south and west of the consolidation areas, thereby entirely enclosing the plant property which the consolidation areas are situated on. Access to the plant property from New York Avenue is controlled by remotely activated gates. Persons are not allowed on the property without clearance from security personnel.

Additional warning signs may be posted along the perimeter fencing in the vicinity of the entrance gates to prevent trespassers from entering the area. To restrict access during construction activities, security fencing may be installed at certain locations such as cleaning areas, stockpile areas, etc. Also, for the duration of construction activities, a sign-in/sign-out sheet will be maintained at the site. All on-site personnel and site visitors will be required to sign in upon entering the site and sign out upon leaving.

Implementation of safe work practices will also provide for additional site security during construction activities. Safe work practices that will contribute to overall site security include the following:

- Maintaining temporary construction fencing around all open excavations and other potentially dangerous areas;
- Parking heavy equipment within designated areas each night and removing keys;
- Maintaining an organized work area, including proper storage of all tools and equipment; and
- Conducting a daily security review.

5.6 Site Access Locations and Roads

The consolidation areas may be accessed using two different plant entrance locations. The selected locations will be dependent on several factors including the location from which the consolidation materials are being generated, the time of day, traffic patterns, etc. Potential entrance locations are shown on Figure 9, and include the entrance at

Tyler Road leading to the Building 78 Area, and the entrance at New York Avenue leading to the Building 78 Complex and Building 14-E.

To provide equipment access to the consolidation areas, temporary and permanent access roads will be constructed. The temporary access roads will be constructed by performing some limited grading (if necessary), then placing geotextile followed by gravel. Permanent access roads will be paved. Figure 9 and Drawings A-3 and A-11 indicate the anticipated locations of access roads. The actual location of the access roads will be selected in the field based upon equipment limitations and requirements, and the progression of consolidation activities.

5.7 Contractor Mobilization

A project start-up meeting will be scheduled before the Contractor mobilizes to the site. Specifically, the objectives of this meeting will be to:

- Review contract requirements;
- Establish a detailed project schedule;
- Review the roles and responsibilities of all project participants; and
- Resolve any other issues raised by the parties.

Prior to the start of construction activities, the Contractor will mobilize the appropriate personnel, subcontractors, equipment, and materials to the construction area. The mobilization of these items may occur in phases or as needed based on the specific purpose and timing of their use. In addition to the above, the contractor will also mobilize temporary office and sanitary facilities. All materials, equipment, etc. brought on to the site will be located in an area that will not interfere with subsequent construction activities.

5.8 Survey Control

Prior to the commencement of soil removal activities, a detailed site survey will be conducted. Included in this survey activity will be the following:

- Re-establishment of the existing survey control and baseline information;
- General layout of the anticipated site operations; and
- Locations of above- and below-grade utilities and site features that may be affected by the project.

5.9 Erosion and Sedimentation Controls

The selection of specific erosion and sedimentation control measures for the construction and restoration activities will depend on a number of considerations, including the scope of activities, site topography, and operational/maintenance considerations. In addition to the various physical types of erosion control measures that can be installed, certain operational and management practices will be implemented throughout the construction project to provide an additional measure of erosion and sedimentation control. This section describes some of the temporary controls that will be installed before initiating earthwork activities. Drawing A-3 indicates the approximate locations of the erosion and sedimentation control measures to be installed during construction activities in 1999. The specific types and locations of these controls, will be determined and adjusted in the field based on site-specific considerations related to drainage, topography, work activities, etc.

Before initiating earthwork activities, appropriate erosion control measures will be installed to minimize the potential for rainfall-induced migration of soils into or out of the areas subject to construction. These measures may include the placement of geotextile fencing and/or hay bales along the edges of disturbed areas. Geotextile fencing consists of a woven geotextile fabric material suspended between support posts and anchored into the ground. The geotextile fence limits the velocity and the amount of suspended materials in the runoff water, thus limiting the downgradient transport of soils.

Similar to geotextile fences, staked hay bales minimize velocities associated with overland flow, and provide filtration to minimize the downgradient migration of suspended soils. Hay bales may be installed around the perimeter(s) of work areas as required and will be imbedded into the existing ground surface by wooden stakes. Hay bales may be used alone or in combination with geotextile fences.

After the erosion and sedimentation control measures have been installed, remaining site preparation activities will be performed. The erosion and sedimentation control devices will be maintained for the duration of the project until such time that site restoration activities have provided a final vegetated surface cover (as appropriate) in all areas. During this time, erosion and sedimentation control devices will be inspected on a regular basis and maintained and/or adjusted as necessary, based on site conditions and site activities.

5.10 Removal and Disposal of Vegetation

After the erosion controls are in place, and before construction activities begin within a given area, brush and trees will be removed to allow project activities to occur without significant obstructions. Vegetation clearing will only be performed within the proposed consolidation areas, or as necessary to provide access to these areas. To the extent practical, efforts will be made to minimize the removal of vegetation currently surrounding the areas planned for consolidation activities to provide a visual and sound buffer during active consolidation activities. Above-grade materials that are cleared from the construction areas will be chipped, shredded, and/or cut for subsequent use as landscaping materials, or for stabilizing wet or soft material delivered to the consolidation area (if any). Below-grade materials (i.e., tree stumps and roots) that are removed as part of the clearing activities will be chipped and/or shredded, and used for stabilizing wet material delivered to the consolidation area (if any), or mixed with dry materials as the materials are consolidated. Cleared materials will not be disposed of off-site.

Equipment used during clearing activities will be cleaned prior to leaving the construction area using appropriate equipment cleaning procedures (refer to Section 6.15).

5.11 Identification and Removal / Abandonment of Utilities

Utilities within the work area that may impede construction of the consolidation areas will either be abandoned or rerouted around the proposed consolidation areas. Based on a review of utilities in this area, it appears that a number of below-grade pipelines and structures are located within the horizontal limits of the consolidation areas (refer to Drawing A-2).

Several subgrade pipelines and related appurtenances located within the eastern portion of the Building 71 Consolidation Area will either be removed, abandoned in-place, or relocated as part of the Building 71 demolition activities. Specifically, the following below-grade pipelines and structures will be removed or abandoned in-place as part of Building 71 demolition activities:

- Foundation drains associated with the former tank dike (6-inch diameter asbestos pipes), and Building 71 (8-inch diameter asbestos pipes) will be abandoned in-place;
- The 60-foot long, 8-inch diameter asbestos pipe draining the former tank dike into a catch basin located at the southeast corner of Building 71 will be abandoned in-place;

- Three catch basins located at the southwest and southeast corners of Building 71, and at the southeast corner of the former tank dike, will be removed;
- The 220-foot long, 8-inch diameter asbestos pipe currently draining stormwater from Building 71, into an open ditch south of Building 71 will be abandoned in-place;
- The 380-foot long, 15-inch diameter RCP that currently drains stormwater from the adjacent General Dynamics parking lot into a drainage ditch south of Building 71 will be removed or abandoned in-place. The two in-line manholes related to this stormwater drain line will be removed; and
- The 20-inch diameter steel culvert crossing beneath the access road leading to the U.S. Generating Company facility will be modified (as discussed below).

As discussed in Section 4, a new 15-inch diameter PVC pipe will be constructed to convey stormwater from the adjacent General Dynamics parking lot into a new manhole located at the southwest corner of the Building 71 Consolidation Area. The new manhole will collect stormwater runoff from the Building 71 Consolidation Area and the General Dynamics parking lot, and convey it to the existing 20-inch steel culvert pipe (modified to accommodate the new piping and manhole). Discussion related to the design and construction of the new stormwater drainage system at the Building 71 Consolidation Area is provided in Section 4.

While above-grade utilities will not impede construction of the consolidation areas, the Contractor will be required to contact the appropriate utility locating services, prior to performance of the work, to identify all utilities (above or below ground) that may be present in the work area. Appropriate measures will be taken by the Contractor to protect these utilities (if any).

5.12 Subgrade Preparation

Since a base liner will be constructed within the Building 71 Consolidation Area, the current ground surface will be prepared prior to liner installation. Subgrade activities in this area will entail regrading the surface within the consolidation area to an approximate slope of two percent, and regrading the earthen bank located along the eastern edge of the consolidation area to form a level and smooth surface. The proposed subgrade grading plan is presented on Drawing A-4. Following regrading activities, all objects greater than three inches, as well as any other deleterious materials (e.g., sticks, roots, broken glass, etc.), will be removed from the bank along the eastern perimeter of the consolidation area. Due to the steepness of the bank, a nonwoven geotextile will then be installed as a cushion layer in lieu of a soil subbase layer.

Along the base of the consolidation area, all objects greater than six inches and other deleterious materials will be removed, and a 6-inch thick layer of clean soil will be installed. Both subgrade preparation activities will result in a uniform surface over the entire consolidation area free of any materials that could potentially puncture or otherwise damage the overlying FML. Installation of the subgrade materials (i.e., geotextile and soil materials) will be in accordance with the CQAP provided as Attachment C to this Detailed Work Plan.

5.13 Base Liner Installation

Following the performance of subgrade preparation activities, an FML will be installed within the designated portion of the Building 71 Consolidation Area (approximately 85,000 square feet). The purpose of the FML is to provide a barrier separating the consolidation materials from the underlying native soils. The FML will be 60 mil-thick, textured on both sides, and will be constructed of HDPE. The FML will be placed over the designated 1999 portion of the consolidation area, and will be anchored in a 2-foot deep anchor trench at perimeter locations where future consolidation activities will not extend beyond. The CQAP attached to this Detailed Work Plan provides a discussion related to the minimum allowable material qualities, acceptable installation techniques, and the testing required for acceptance of the FML.

5.14 Leachate Collection System

A leachate collection system will be installed over the FML to collect and convey any residual water that may be entrained in the materials placed in the consolidation area, or water that enters the consolidation area via rainfall or snowmelt. The leachate collection system will be comprised of a GDC, in combination with 6-inch diameter HDPE perforated drainage piping.

GDC consists of an HDPE drainage net with nonwoven geotextile bonded to both sides of the net. The GDC will be installed directly on top of the FML and anchored within the same perimeter trench. The purpose of the GDC is to collect consolidation and infiltration water, and convey it to the central collection piping network. Installation and testing of the GDC will be in accordance with the CQAP provided as Attachment C to this Detailed Work Plan.

Leachate collection piping will be utilized with the Building 71 Consolidation Area to efficiently convey leachate from within the GDC to the perimeter of the consolidation area, and ultimately to the leachate storage manhole. The HDPE piping will be six inches in diameter, and will have two lines of ½-inch perforations along its length. The piping will be installed along the low point of the base liner system to provide for maximum collection. To provide

protection from equipment operating above the collection piping, an approximate 2-foot berm of clean gravel will be placed over the pipe prior to the placement of any consolidation materials over the pipe. A nonwoven geotextile will be placed over the gravel berm to provide a filter against silt and sand infiltration into the gravel and pipe.

Solid-walled pipe (i.e., no perforations) will be used once the collection piping penetrates the perimeter berm. As an added safety measure, the 6-inch diameter pipe will be placed within a 10-inch diameter solid pipe, thereby providing a double-contained system outside of the consolidation area.

5.15 Leachate Storage

A leachate holding facility will be constructed at the southern end of the Building 71 Consolidation Area to temporarily store leachate until it is transported either off-site or an existing GE facility for treatment. At this time, given the current scheduling constraints, only the critical components of the storage facility will be constructed prior to the initiation of consolidation activities in 1999. These components include a leachate storage manhole, pumps, and temporary storage tank(s). The layout of the system is depicted on Drawing A-5.

6. Consolidation Area Operations

6.1 General

This section summarizes the type and scope of activities that will be involved in the day-to-day and year-to-year operation of the on-plant consolidation areas. While several sections of this Detailed Work Plan are related specifically to the 1999 portions of the consolidation areas, this section includes information that is generally applicable to the overall operations of any future on-plant consolidation area. The operational procedures and activities discussed in this section include the following:

- Site Security;
- Waste Characterization and Transport;
- Vehicle Access;
- Construction Equipment;
- Environmental Monitoring;
- Material Placement;
- Dust Control;
- Surface Water Management;
- Leachate Management;
- Erosion Control;
- Odor Control;
- Daily and Interim Cover Placement;
- Vehicle and Equipment Cleaning; and
- Contingency Plan

Other operational controls, including air monitoring, groundwater monitoring, and site health and safety are discussed in other sections of this Detailed Work Plan.

6.2 Site Security Plan

As discussed in Section 5, security fencing is currently located along the entire perimeter of the GE Plant property within which the Hill 78 and Building 71 Consolidation Areas are located. Remotely monitored and controlled gates operated by GE security personnel restrict access to the site to authorized personnel only. Additionally, site security personnel routinely patrol the plant property to ensure its security. The perimeter fencing and gates will be

maintained during construction and operation of the consolidation areas. If it necessary to remove portions of the fence to provide access to certain area of the consolidation areas (e.g., to make repairs, replace vegetation, etc.), the following site security measures will be taken:

- Only the minimum quantity of fence necessary to perform the required work will be removed;
- Additional warning signs will be placed at the locations where the fence was removed (if not already present);
- The work required at that location will be performed as expeditiously as possible to limit the time the fence is removed; and
- Temporary fencing will be installed and maintained at the location through the duration of the work performance.

To further restrict access during operational activities, security fencing may be installed at certain locations such as cleaning areas, stockpile areas, etc. Also, for the duration of consolidation activities, a sign-in/sign-out sheet will be maintained at the site for all on-site personnel and site visitors.

6.3 Material Characterization

Materials that are generated as part of the response actions conducted for the areas comprising the Site will have been characterized as part of the RD/RA activities specific to those areas. At a minimum, characterization activities for soils and sediments (which comprise the majority of the materials subject to consolidation) will consist of sampling results for PCBs and other non-PCB Appendix IX+3 constituents. The results of these characterizations will serve as the basis for the identification and performance of the necessary response actions. In addition, for those areas where the response actions will involve soil removal and on-plant consolidation, the available site data will be used to assess the appropriate consolidation area. For the most part, it is anticipated that the presence of PCBs (rather than Appendix IX+3 constituents) will dictate the specific consolidation area to be utilized. However, in the event that elevated levels of Appendix IX+3 constituents are present in the materials subject to consolidation, testing to determine whether the materials would constitute hazardous waste under RCRA will be performed. Collectively, the sampling results will determine the proper consolidation location. Non-TSCA, non-RCRA materials will be consolidated at the Hill 78 Consolidation Area; while TSCA-/RCRA-regulated materials will be consolidated at the Building 71 Consolidation Area.

In addition to chemical characterizations of the materials subject to consolidation as described above, certain other provisions will be established regarding the characterization and suitability of the materials subject to consolidation.

For example, prior to the transport of materials from its point of origin (i.e., the area within which the response actions are being undertaken), testing will be performed if necessary to confirm that the materials do not contain excess moisture; such testing will utilize the standard paint filter test.

6.4 Waste Transport

Waste transport to the consolidation areas will be performed by the various contractors performing the response actions at each area within the Pittsfield/Housatonic River Site (e.g., the Allendale School Property, the Upper ½-Mile Reach, building demolitions, etc.). Once materials are adequately characterized as described in Section 6.3, such materials will be transported to the appropriate consolidation areas or off-site for proper disposal, as needed. Details regarding the method(s) of transportation, and transportation routes will be developed as part of the RD/RA activities for each specific area of the Site.

6.5 Vehicle Access

Vehicles transporting consolidation materials will access the Hill 78 and Building 71 Consolidation Areas using the existing plant roadways. Additional roads will be constructed within GE property to gain access to the consolidation areas where necessary. These roads may be incorporated into the consolidation area as they are no longer needed, or removed upon final closure of the consolidation area.

6.6 Construction Equipment

Construction equipment to be used during the consolidation activities at the Hill 78 and Building 71 Consolidation Areas will likely include bulldozers, compactors, payloaders, and excavators. Since separate consolidation areas are available for wastes with different characteristics (e.g., TSCA versus non-TSCA materials), separate equipment will be utilized at each area. Other equipment used will include dump trucks (or other appropriate transport vehicles) and water trucks for dust control. During periods when the consolidation areas are in active use, the equipment (excluding the transport trucks) will be dedicated to the consolidation areas, and left on-site at the end of each day. Prior to any equipment leaving the working area of an on-plant consolidation area, cleaning will be conducted in accordance with Section 6.15 of this Detailed Work Plan. The operation, coordination, and cleaning of the equipment will be the responsibility of the Contractors performing the Response Actions.

6.7 Air Monitoring

During all on-site activities that could potentially produce dust, an air monitoring program for particulates will be conducted to assess potential impacts to ambient air due to these activities, and the need for dust control measures. Such a particulate monitoring program will be in addition to any other monitoring performed by the on-site contractors as part of their overall health and safety monitoring. Such monitoring will be conducted at four stations located in a generally symmetrical pattern around the perimeter of the property, as shown on Drawing A-3. The specific locations for these stations will be selected based on the location and nature of the site activities, predominant wind direction, location of potential receptors, availability of power, site accessibility, site security, and existing ambient air monitoring data.

At each station, real-time particulate monitoring will be performed using a MIE dataRAM Model pDR-1000. The dataRAM uses a passive sampling technique and light scattering photometer to determine particulate concentrations. The data RAM has a measurement range of 0.001 to 400 mg/m^3. Monitoring will be conducted for approximately 10 hours daily, from 7 am to 5 pm, during construction-related activities. Particulate data will be recorded and averaged by the instruments' datalogger for each hour of the day.

For each day of monitoring and at regular intervals during each day, the particulate data from the downwind monitor will be compared with the data from the background (upwind) monitor. If the average 10-hour PM_{10} concentration at the downwind monitor exceeds the average concentration at the background monitor, the downwind concentrations will then be compared with a 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 OSC, and GE's Project Coordinator will discuss with the OSC the need for and type of response actions. In the event that perimeter air monitoring action levels are exceeded on a daily average basis, or the instantaneous readings indicate a significant increase in upwind/downwind readings, or visible dust related to site operations is observed, dust control measures will be implemented. Such measures may include water spray, modification of work procedures, and/or suspension of work. If such measures do not result in reductions of perimeter air monitoring levels to below the action levels, work will be stopped pending further evaluation of work practices, potential upwind particulate sources, and additional control measures. Also, certain other site controls and practices will be implemented to limit the potential for and amount of dust generation at the Property. These include covering exposed soil areas when not in active use,

covering soil stockpiles, reducing vehicle speeds, and utilizing water sprays as necessary (e.g. in roads, work areas, etc.).

In addition to the above, GE will also conduct ambient air monitoring for PCBs during construction and operation of the consolidation areas. GE is currently developing a separate monitoring plan for the activities to be submitted to the Agencies for review. That plan will propose the specific monitoring locations, protocols, frequency, etc., and will be submitted to the USEPA prior to implementation of site construction activities.

6.8 First Lift Placement

To avoid any damage to the GDC or FML, certain precautions will be taken during placement of the first lift of consolidation materials within the consolidation area. Specifically, the first lift of material will consist of select soils or sediments that are free of sharp objects, materials greater than 6-inches in diameter, or any other deleterious materials that could potentially damage the underlying geosynthetics. As an added precaution, the first layer of material will be placed in a single, 2-foot-thick lift to prevent damage to the underlying geosynthetics caused by the equipment placing and/or handling the consolidation materials.

6.9 Material Placement/Progression

Materials will be placed in the consolidation areas in a way that reduces the daily working area, provides flexibility for material segregation (e.g., building debris), and allows for maximum consolidation capacity. Materials will be placed in 2-foot-thick lifts progressing, in sequence, across the extent of the consolidation area and, in the case of the Building 71 Consolidation Area, starting at the lowest point and progressing upgradient. A minimum of five passes will be made on each entire lift with an appropriately-sized vibratory smoothdrum or sheepsfoot roller. Additional lifts will be placed as material is delivered to the site. Placing the consolidation materials in lifts will allow for the following operational controls:

- A larger area allows for equipment maneuverability when placing and compacting the consolidation materials;
- Stormwater can be managed within the area and away from active consolidation activities;
- Materials can be adequately compacted to minimize voids, and reduce potential for future differential settlement and slope failure; and
- Non-soil/non-sediment wastes (e.g., construction debris, vegetative matter, etc.) can be segregated, processed, and managed separately.

The consolidation materials will be placed in lifts until the maximum proposed interim grades (or in some instances, final grades) are achieved or until material is no longer generated for that particular construction season.

6.10 Dust Control

The potential for dust generation at the Hill 78 and Building 71 Consolidation Areas will be controlled throughout the consolidation activities using a variety of mitigative measures (both temporary and permanent). Dust will be controlled based on visual observations and/or the results of airborne particulate monitoring to be conducted during construction and consolidation activities, as described in Section 6.7.

During the consolidation activities, dust will be controlled by the use of limited quantities of water (as necessary), and temporary silt fencing, as wind barriers, while certain other site controls and practices will be implemented to limit the potential for and amount of dust generation at the consolidation areas. These include covering exposed soil areas when not in active use, reducing vehicle speeds, and minimizing work activities (to the extent possible) during windy, dry days. Finally, daily and interim covers, as described in Section 6.14, will be used as warranted, throughout the fill progression activities to reduce dust generation.

6.11 Surface Water Management

Surface water run-off generated by precipitation or snow melt will be managed throughout the consolidation activities. During the 1999 activities, temporary diversion berms, swales, silt fencing and/or hay bales will be used, as necessary, to direct surface water run-off away from the active portion of the consolidation area, while more permanent measures will be designed and constructed as the use of the consolidation areas increase. The anticipated locations of these diversion methods are shown on Drawing A-3. In addition, daily and interim cover systems will be utilized to direct any surface water run-off to the perimeter of the consolidation areas.

6.12 Leachate Handling

Leachate generated within the Building 71 Consolidation Area will be managed using the leachate collection, conveyance, and storage systems described in Section 5. For 1999, leachate management activities will consist of the installation of pumps within the new leachate manhole, and pumping of leachate to a temporary storage tank(s). Leachate in the storage tank(s) will be removed on an as-needed basis and transported either off-site or to GE's treatment facility for treatment.

A permanent and more automated handling system, possibly consisting of a pumping station, and an above-grade, double contained tank will be considered and evaluated as a means to manage leachate in subsequent years of consolidation activities.

6.13 Erosion Control

The potential for erosion at the Hill 78 and Building 71 Consolidation Areas will be minimized throughout the consolidation activities using a variety of temporary and permanent measures. During the consolidation activities, erosion may be controlled with a combination of temporary, small earthen berms, silt fencing, check dams, and/or hay bales. These controls will be established at critical areas along the consolidation areas, and relocated/ supplemented as necessary during consolidation activities. Approximate locations of temporary erosion controls at the consolidation areas are shown on Drawing A-3.

6.14 Daily and Interim Covers

A daily cover will be installed over the active portions of the Hill 78 and Building 71 consolidation areas at the end of each working day. The cover will consist of polyethylene sheeting (20 mil) or similar materials. Sandbags, soil piles, or other heavy objects will be installed along the perimeter of the sheeting to secure the sheeting. The purpose of the daily cover is to minimize precipitation from entering the underlying consolidation materials and generating leachate and to minimize the potential for migration of PCBs and other constituents via airborne dust. The cover will be removed at the beginning of each day of consolidation activities.

Once a portion of the consolidation areas reaches the final design height, but is not large enough to warrant installation of a final cover, or when the consolidation activities are completed for a given year and final design heights have not been achieved, an interim cover will be installed. The interim cover will consist of a 3- to 6-inch thick layer of clean soil capable of supporting vegetation. Depending on the season that the interim cover is installed, the cover may be seeded with a quickly germinating rye grass to establish an erosion resistant vegetative cover. The interim cover will provide cover for the underlying consolidation materials, and potentially serve as a subbase for the future final cover system. Given its thickness, the interim cover would not be removed prior to future consolidation activities in that area (if any).

6.15 Vehicle and Equipment Cleaning

Equipment cleaning will be utilized to prevent the transport of PCBs or other potential site materials that may be present on any equipment used for consolidation activities. Contractors will be responsible for establishing and implementing specific equipment cleaning procedures, including the following:

- Construction of an equipment cleaning area consisting of an impermeable barrier sloped to a collection sump;
- Visual inspection of each transport vehicle prior to leaving the unloading area. Accumulations of soil or sediment on the vehicle tires or other exterior surfaces will be removed manually or, if necessary, by using a high-pressure water spray in the equipment cleaning area;
- Cleaning of material handling equipment used to move PCB-containing soils or sediment in the equipment cleaning area before it enters non-work areas, handles "clean" materials (e.g., daily cover materials) or leaves the work area. Equipment cleaning will be performed utilizing a high-pressure, low volume water spray;
- Collection and transport of liquid materials (and other residual material collected during equipment cleaning) to GE's existing treatment facility for treatment by GE; and
- Wipe sampling of equipment in accordance with TSCA regulations following final cleaning prior to demobilization from the work area.

6.16 Operations Documentation

Construction activity reports will be completed on a daily basis to document construction activities. The daily reports will include the following information:

- Date;
- Weather and temperature;
- Description of the activities performed;
- Listing of the equipment and labor used;
- Estimate of the amount of materials placed on that date based on the number of trucks;
- Description of the materials placed on that date; and
- Description of any problems encountered, and the mitigative measures implemented.

6.17 Contingency Plan

An *Emergency Preparedness and Contingency Plan* (Contingency Plan) has been developed and is provided as Attachment D to this Detailed Work Plan. This plan addresses the appropriate actions to be taken in the case of emergencies or unexpected, non-routine events during operation of the consolidation areas. The Contingency Plan is designed to minimize potential risks or hazards to worker and public health and the environment from any unplanned sudden or non-sudden events related to the consolidation areas. Separately, as discussed in Section 5, the Contractor selected by GE to construct the consolidation areas will also be required to prepare a contingency plan for those specific activities.

This plan includes a list of all emergency equipment that will be available at the consolidation areas, including fire extinguishing equipment, spill control equipment, communications and alarm systems (internal and external) and decontamination equipment. The Contingency Plan will be amended whenever: 1) there are changes in design, construction activities, operation or maintenance, or other conditions occur which could materially increase the potential for releases; 2) the list of emergency coordinators changes; or 3) the list of emergency equipment changes.

The Contingency Plan also provides contingency measures for potential spills and discharges from materials handling and/or transportation. It also presents the following:

- A description of the means, methods and facilities required to minimize impacts to soil, water, air, structures, equipment or materials resulting from a spill or release;
- Equipment and personnel to perform emergency measures required to contain any spill/release and to remove and properly dispose of any impacted media; and
- Equipment and personnel to perform cleaning measures that may be required for impacted structures, equipment, or material.

The Contingency Plan also provides the phone numbers for emergency agencies, including police departments, fire departments, state and federal emergency response teams, and hospitals that may be contacted in the case of emergencies.

6.18 Schedule Maintenance and Progress Reporting

The project status will be monitored and updated as part regular progress meetings and progress reporting. Progress meetings will be held periodically to discuss the status of day-to-day operations, schedule, health and safety items, outstanding issues, and overall project implementation issues.

In addition, GE will prepare monthly progress reports to be submitted to the Agencies, with copies to other pertinent parties. The monthly progress reports will include the following:

- Description of the activities performed;
- Results of any testing or investigations;
- Diagrams or drawings (if any) associated with the activities performed;
- Identification of any reports received or prepared;
- Supporting documentation of activities performed; and
- Brief descriptions of activities to be performed in the following month.

6.19 Record Drawings

During construction, the Contractor will be required to maintain one set of drawings at the site, on which the Contractor will show all scope of work changes. These drawings will be kept current on a day-to-day basis in concert with the progress of the work. Where applicable, any changes marked on the drawings will include the notation "per Change Order No. ___", or similar reference that cites the reason for the change.

The following items are examples of some of the types of changes that could occur and must be recorded by the Contractor:

- Change in limits/extent of construction;
- Change in construction materials;
- Change in topographical contours of finished grades;
- Additions to project activities;
- Elimination of a project component; and
- Unforeseen modifications made to existing underground utilities, fences, etc. made necessary by requirements of the work.

Upon completion of the project, the Contractor will provide the Record Drawings to GE for use in preparation of the Final Completion Report. In addition, a set of drawings will be retained on site to record the location of samples collected, final soil depths, changes to extent of consolidation activities, etc.

7. Restoration Activities

7.1 General

Once a consolidation area (or a significant portion of it) approaches its final design capacity, it will be subject to closure and restoration activities. Closure and restoration activities will consist of the installation of a final cover system over the entire area, the construction of appropriate drainage features, and establishment of vegetation on the surface of the cover and at other appropriate areas (e.g., buffer vegetation at the perimeter of the consolidation areas). These closure and restoration activities are further discussed below. The scope of other site restoration activities, particularly at the Hill 78 Consolidation Area (which will be subject to habitat enhancements), is currently under discussion, and will be addressed separately at a future date.

7.2 Restoration Activities

Each on-plant consolidation area will be capped with a final cover system as described in Section 2.4 of this Detailed Work Plan. As part of the closure/capping for each consolidation area, the surface of the final cover system will be vegetated as generally described in Section 2.4. Other site restoration activities will include the planting of vegetative species that will provide suitable erosion control, without interfering with the integrity of the surface cover. Areas adjacent to the consolidation areas will also be restored as necessary, including the removal of temporary access roads, and the repair/restoration of areas disturbed by the construction, use, and closure of the consolidation areas.

In addition to restoration of those areas affected by the on-plant consolidation activities, GE will also perform certain activities to possibly preserve and maintain areas that are located adjacent to, but not directly affected by, the consolidation areas. For example, to the extent practicable, GE will refrain from removing trees and other vegetation that may provide a visual barrier from off-plant locations. Furthermore, GE will evaluate possible measures that could be implemented prior to or during initial use of the consolidation areas, or upon closure of those areas, that could provide a visual barrier or other aesthetic value (e.g., planting of appropriate trees and other vegetation in areas offset from but along the outer perimeter of the consolidation areas).

Need to make sure we have a good system since we are publicly relying on this.

8. Future Groundwater Monitoring Program

8.1 General

now & in the future, if necessary.

to assess what the "baseline" groundwater conditions are at the areas)

This section describes the general groundwater monitoring program that GE will develop in connection with the operation and closure of the consolidation areas. The purpose of this program is to assess potential changes in groundwater conditions during consolidation activities at these areas, and to support evaluations concerning the need for further response actions, if ~~necessary~~. In addition, the results of this groundwater monitoring program will provide a groundwater data set that can be utilized in conjunction with a separate large-scale groundwater monitoring program (to be described in the *Statement of Work for Removal Actions Outside the River*, which will be attached to the Consent Decree).

Following receipt of the results of the "baseline" groundwater investigation described in Section 3, GE will forward these results to the Agencies in a separate submittal, together with a detailed proposal outlining the specific components of the groundwater monitoring program.

→ We may want to keep a complete gw monitoring system in place throughout.

GE's proposal for this monitoring program will identify the particular monitoring wells to be sampled, the frequency of sampling, and any modifications to the list of Appendix IX+3 constituents for which the groundwater samples will be analyzed. As a starting point, all monitoring wells that were utilized during the baseline monitoring investigation will be considered for inclusion in this monitoring program. Initially, this program may include a phased approach, in which a subset of the monitoring well network will be monitored to evaluate potential impacts from the initial consolidation activities in the discrete portions of the consolidation areas being utilized. Other wells may be added to the program as consolidation activities proceed to other sections of the consolidation areas.

GE's proposal will also present the proposed procedures and criteria for evaluating the sampling data from each monitoring event. These procedures will include a statistical comparison of the monitoring data from each event, on a location-by-location basis, with the prior monitoring data, including the "baseline" data, to identify instances in which the current data indicate an increase in the concentrations of dissolved-phase constituents relative to prior conditions. GE's proposal will also specify the response actions that GE will consider and propose to the Agencies, as appropriate, in the event that a statistically significant increase in dissolved-phase constituents is detected in the sampling results from a given event, relative to prior data.

The following sections present a preliminary summary of the anticipated groundwater monitoring program during use of the consolidation areas. This program is subject to change based on an evaluation of the results of the

baseline groundwater monitoring event, future modifications in the design of the consolidation areas, or the scheduling of consolidation activities. As previously stated, the specific details of this program, based on the results of the pre-design investigation, will be proposed in conjunction with the submittal of the baseline groundwater monitoring results.

8.2 Groundwater Monitoring During Active Consolidation Activities

Is this enough to evaluate GW relationship to the school?

The initial monitoring wells to be included in this program were identified in Section 3, which described the baseline groundwater monitoring which GE has conducted. A total of 12 monitoring wells are available for inclusion in this program, including three upgradient wells (78-1, 78-6, and NY-4) and nine downgradient/cross-gradient wells (OPCA-MW-1 through OPCA-MW-8, and H78B-15), as shown in Table 5 and on Figure 7. Groundwater samples will be collected utilizing low-flow sampling techniques and will be tentatively analyzed for Appendix IX+3 constituents, excluding herbicides/pesticides (or other parameters as may be proposed by GE and approved by the Agencies). Depth to groundwater measurements will also be collected in conjunction with the sampling events to provide information on overall groundwater flow patterns near the consolidation areas.

Upon receipt from the laboratory, the groundwater monitoring data shall be presented in the next monthly progress report for overall work at the site. In addition, following each monitoring event, GE will prepare and submit to the Agencies a summary report describing the field activities, presenting the sampling results, and presenting the results of the required evaluations of the monitoring data. GE shall provide an evaluation of any elevated groundwater results that may be potentially attributable to activities at the consolidation areas, and if necessary, propose response actions to address such results. In these reports, GE may also propose modifications to the groundwater monitoring program, including, but not limited to, changes in the wells to be monitored, the frequency of monitoring at selected wells, or the constituents to be analyzed for.

We already have the NAPL problem. We may (will) need to evaluate response actions on a faster track.

8.3 Groundwater Monitoring During Post-Closure Period

Following the completion of consolidation activities at the consolidation areas and closure of those areas, GE will submit a proposal to USEPA for a post-closure groundwater monitoring program for the consolidation areas. That proposal will include a statistical assessment of all prior monitoring data, and will present an evaluation of, and proposed plan for post-closure future groundwater monitoring. It will also identify, for the post-closure monitoring program, the specific monitoring well locations, the frequency of future monitoring and reporting, the constituents

scheduled for analysis, the procedures for evaluation of the groundwater data, and the criteria for further response actions (if any).

9. Post-Closure Care

9.1 General

This section presents information pertaining to the anticipated post-closure activities for the consolidation areas. Certain activities must be performed after closure to ensure that the consolidation areas are performing as designed. Post-closure care activities include groundwater monitoring, regular periodic inspections and maintenance of the final cover system, as well as other components of the consolidation areas (e.g., the surface water drainage system and leachate management system), inspections and maintenance of certain other ancillary components (e.g., fences, warning signs, etc.), and the repair or replacement of items exhibiting deficiencies or performance below designed levels. The activities described in this section will continue until GE proposes, and USEPA approves, a modification or termination of any such activity.

9.2 Groundwater Monitoring

As discussed in Section 8, GE will submit a proposal to USEPA for a post-closure groundwater monitoring program for the consolidation areas. That proposal will identify the specific monitoring well locations, the frequency of future monitoring and reporting, the constituents slated for analysis, the procedures for evaluation of the groundwater data, and the criteria for further response actions.

9.3 Inspection and Maintenance

Following closure of the consolidation areas, GE will continue to inspect and maintain those consolidation areas, and to perform repair/replacement activities as needed, to ensure that the consolidation areas are performing as intended. These activities will include semi-annual inspections and maintenance of the final cover system, other components of the consolidation areas (i.e., the surface water drainage system, leachate management system, etc.), and certain ancillary components (e.g., fences, warning signs, etc.). Each of these inspection activities is discussed in the sections below.

9.3.1 Final Cover System

The overall integrity of the final cover systems will be assessed during periodic inspections. Consolidation area covers will be visually inspected for evidence of topsoil erosion, damage to the geosynthetic cover components (i.e., GDC, FML, and/or GCL), uneven settlement relative to the surrounding areas, and overall integrity. The final

cover system will be inspected to verify that vegetation has become established, and bare or sparsely vegetated areas will be repaired. In addition, the surfaces will be inspected for deficiencies in the soil layer overlying the geosynthetic cover components. Deficiencies may be evident as excessive erosion, vehicle ruts, surface water ponding, depressions, exposed or damaged geosynthetic cover components, or other abnormalities. GE will perform repairs and replacement at any areas exhibiting deficiencies or potential problems within the appropriate time period based on the severity of the deficiency or problem.

9.3.2 Surface Water Drainage System

The surface water drainage system will be included as part of the semi-annual inspection and maintenance activities. Components of the surface water drainage system, include:

- Perimeter ditches and swales;
- Drainage swales located along the slopes of the consolidation areas;
- Sedimentation basin(s); and
- Culverts and drainage pipes.

These components will be periodically monitored to determine whether they are performing as designed or whether erosion and/or blockage is occurring and their performance is being effected. The surface water drainage system components will be periodically inspected for evidence of erosion due to sparse vegetation, flow currents, storm-related surges, or are be detrimentally affected by obstructions. In areas where inspections indicate a decrease in the performance of a particular component due to erosion, steps will be taken to restore the condition by increasing the thickness of the erosion protection layer (e.g., grass, rip rap, etc.) to the original design depth. In areas where inspections indicate a decrease in the performance of a particular component due to a blockage, the item(s) obstructing the flow will be removed.

9.3.3 Leachate Handling System

Inspections and maintenance of the leachate pumping and storage system will also be performed by GE throughout the post-closure period. Inspection activities will consist of inspecting all mechanical parts (including pumps, float levels, piping, flow meters, etc.) and ensuring their proper performance. Periodic tests will also be performed on the auto-dialer system to verify its performance, and to confirm the line-of-contact is correct and accurate. Changes

to the names and telephone numbers within the auto-dialer system will be made as required. Mechanical repairs to the leachate pumping and storage system (when necessary) will be performed by a local subcontractor to GE qualified to make such repairs.

9.3.4 Perimeter Vegetation

During the two-year period following the planting and installation of vegetative material along the perimeter of the consolidation areas, the plantings will be inspected in April and October of each year to ensure that the vegetation is growing as anticipated and is providing the necessary erosion control and visual buffer. If needed, additional planting of similar size and species of plants and will be done to replace any dead or dying vegetation.

9.3.5 Ancillary Components

Ancillary components (e.g., fencing, warning signs, etc.) will be inspected to verify that these items are intact and functioning properly. GE will repair or correct any identified damages or deficiencies of such ancillary components. If warranted the components may be replaced with new components.

9.4 Documentation

Documentation of the inspection of consolidation areas will be maintained by GE, and will be provided to the Agencies as part of the monthly reporting program (when inspection and or maintenance activities were performed during that month for which the report is being submitted for). Monitoring reports will be prepared following the inspection activities, and will include the following information:

- A description of the type and frequency of inspection, maintenance, and/or monitoring activities conducted;
- A description of any significant modifications to inspection, maintenance and/or monitoring programs made since the submission of the preceding monitoring report;
- A description of any conditions or problems noted during the inspection and/or monitoring period which are or may be affecting the performance of the consolidation areas;
- A description of any measures taken to correct conditions which are affecting the performance of the consolidation areas;
- The results of sampling analyses and screening conducted as part of the monitoring and/or inspection program; and

- A description of any measures that may need to be performed to correct any conditions affecting performance of the consolidation areas.

10. Schedule and Reporting

10.1 Schedule for 1999 Construction Activities

At this time, it is anticipated that the Contractor will mobilize and begin construction in early July 1999. However, achievement of this mobilization date is dependent on receiving timely USEPA approval of this Detailed Work Plan and obtaining any other approvals necessary to commence work. Achievement of this mobilization date is also dependent upon lodging of the Consent Decree with the Court prior to the mobilization date.

Once a qualified contractor has been selected and all necessary approvals have been obtained, on-site activities can begin. On-site work to prepare the consolidation areas for use this year is estimated to take approximately one month.

Please note that the anticipated project schedule outlined above relates to the Hill 78 and Building 71 Consolidation Areas. The actual use of these areas, however, is contingent upon Agency approvals of the work plans prepared for the 1999 Removal Actions (i.e., the Upper ½- Mile Reach Removal Action and the Allendale School Removal Action). Delays in those approvals will require modification to the project schedule discussed herein.

10.2 Project Status

During the performance of 1999 consolidation activities, the project status will be reported in monthly reports to the USEPA and MDEP. Included will be a description of the construction and operation activities associated with the consolidation areas, including the results of any sampling, approximate quantities of materials consolidated, and documentation of any difficulties encountered (if applicable). Also, these reports will document deviations from the approved Detailed Work Plan (if any).

Tables

TABLE 1

ARARs for Hill 78 Consolidation Area

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
Federal ARARs				
TSCA Regulations (PCB Remediation Waste)	40 CFR 761.61	Establishes cleanup options for PCB remediation waste, including PCB-contaminated soils. Options include risk-based approval by EPA. Parties seeking risk-based approval must demonstrate that cleanup plan will not pose an unreasonable risk of injury to health or the environment.	Applicable to the extent Hill 78 Consolidation Area contains preexisting materials with PCBs ≥ 50 ppm.	Materials subject to this regulation will not be added to Hill 78 Consolidation Area. However, to the extent this area already contains TSCA-regulated wastes, this requirement will be attained based on EPA finding that construction and use of this Consolidation Area per Work Plan will not pose an unreasonable risk to human health or the environment.
TSCA Regulations (Decontamination)	40 CFR 761.79	Establishes decontamination standards and procedures for removing PCBs from non-porous surfaces.	Applicable to decontamination of equipment used in consolidation excavation activities.	Will be attained in the event that equipment used in Hill 78 Consolidation Area requires decontamination for PCBs.
Clean Water Act NPDES Regulations (Stormwater Discharges)	40 CFR 122.26(c)(ii)(C) 40 CFR 122.44(k) 40 CFR 125.100-.104	Discharges of stormwater associated with construction activities are required to implement best management practices to control pollutants in stormwater discharges during and after construction activities.	Applicable to discharges of stormwater.	Will be attained by implementating erosion controls and stormwater management measures in accordance with Sections 4.7 and 6.1.3 of Work Plan.

TABLE 1

ARARs for Hill 78 Consolidation Area

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
Federal ARARs (cont'd)				
RCRA Regulations for Hazardous Waste Management/Disposal Facilities (Landfill Closure and Post-Closure Care)	40 CFR 264.111 40 CFR 264.117 40 CFR 264.310	Standards for closure and final cover of hazardous waste landfills. Also, requirement for post-closure monitoring and maintenance.	Relevant and appropriate for capping and post-capping monitoring and maintenance of Consolidation Area to the extent it already contains materials that constitute RCRA hazardous waste.	Final cover will meet standards in 264.310(a) for cover design/construction. Post-closure monitoring and maintenance will be conducted in accordance with Sections 8 and 9 of Work Plan. These post-closure activities may not meet all requirements referenced in 264.111 and 264.117. To the extent such requirements will not be met, they should be waived as technically impracticable to achieve.
RCRA Regulations for Hazardous Waste Management/Disposal Facilities (Corrective Action Groundwater Monitoring and Protection)	40 CFR 264.100	Regulated units must monitor groundwater and comply with groundwater protection standards; hazardous constituents that exceed maximum concentration levels or alternative concentration levels must be removed or treated.	Relevant and appropriate to the extent Consolidation Area already contains materials that constitute RCRA hazardous waste.	Groundwater monitoring will be conducted in accordance with Section 8 of Work Plan, to be further described in Statement of Work for Removal Actions Outside the River (SOW). Criteria for further response actions to meet groundwater protection standards will be as set forth in SOW, which will be generally consistent with 264.100. To the extent these measures do not meet all requirements in that regulation, such requirements should be waived as technically impracticable to achieve.

TABLE 1

ARARs for Hill 78 Consolidation Area

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
State ARARs				
Mass. Hazardous Waste Management Facility Regulations (Landfill Closure and Post-Closure Care)	310 CMR 30.582 310 CMR 30.592 310 CMR 30.633	Standards for closure and final cover of hazardous waste landfills. Also, requirements for post-closure monitoring and maintenance.	Applicable to the extent Consolidation Area already contains materials that constitute hazardous waste.	Final cover will meet standards in 30.633(1) for cover design/ construction. Post-closure monitoring and maintenance will be conducted in accordance with Sections 8 and 9 of Work Plan. These post-closure activities may not meet all post-closure requirements of 30.582 and 30.592. To the extent such requirements will not be met, they should be waived as technically impracticable to achieve.
Mass. Hazardous Waste Management Facility Regulations (Corrective Action Groundwater Monitoring and Protection)	310 CMR 30.672	Regulated units must monitor groundwater and comply with groundwater protection standards; hazardous constituents that exceed maximum concentration levels or alternative concentration levels in groundwater must be removed or treated.	Applicable to the extent that Consolidation Area already contains materials that constitute hazardous waste.	Groundwater monitoring will be conducted in accordance with Section 8 of Work Plan, to be further described in Statement of Work for Removal Actions Outside the River (SOW). Criteria for further response actions to meet groundwater protection standards will be as set forth in SOW, which will be generally consistent with 30.672. To the extent these measures do not meet all requirements in that regulation, such requirements should be waived or technically impracticable to achieve.

TABLE 1

ARARs for Hill 78 Consolidation Area

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
State ARARs (cont'd)				
Mass. Air Pollution Control Requirements	310 CMR 7.09	Prohibition against creating condition of air pollution in connection with dust generating activities.	Applicable to construction and site alteration activities generating dust.	Will be attained by implementating dust control measures and air monitoring in accordance with Sections 6.7 and 6.10 of Work Plan.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
Federal ARARs				
TSCA Regulations (PCB Remediation Waste)	40 CFR 761.61	Establishes disposal options for PCB remediation waste, including PCB-contaminated soils and sediments. Options include risk-based approval by EPA. Parties seeking risk-based approval must demonstrate that method will not pose an unreasonable risk of injury to health or the environment.	Applicable to disposal of PCB remediation waste, which includes soils and sediments at concentrations $\geq$ 50 ppm PCBs that were contaminated prior to April 18, 1978 and any PCB waste contaminated after that date where the original source was $\geq$ 500 ppm beginning on April 18, 1978, or $\geq$ 50 ppm beginning on July 2, 1979.	Will be attained based on EPA finding that construction and use of these on-plant consolidation areas per Work Plan will not pose an unreasonable risk of injury to health or the environment.
TSCA Regulations (Decontamination)	40 CFR 761.79	Establishes decontamination standards and procedures for removing PCBs from non-porous surfaces.	Applicable to decontamination of equipment used in consolidation activities.	Will be attained by implementing equipment cleaning procedures in accordance with Section 6.15 of Work Plan.
RCRA Regulations for Hazardous Waste Management/Disposal Facilities (Preparedness and Prevention)	40 CFR Part 264, Subpart C	Various requirements for design and operation of a hazardous waste facility to minimize possibility of fire, explosion, or sudden release.	Relevant and appropriate to placement of federal hazardous waste (if any) in these on-plant consolidation areas.	Will be attained. Operation of on-plant consolidation areas will comply with Section 6.17 of Work Plan and with the Health, Safety, and Contingency Plan that will be prepared by the contractor selected to perform the project.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
Federal ARARs (cont'd)				
RCRA Regulations Hazardous Waste Management/Disposal Facilities (General)	40 CFR 264.13-.19	Various requirements relating to waste analysis, security, inspections, personnel training, precautions to prevent accidental ignition or reaction of wastes, location standards, and construction quality assurance program.	Relevant and appropriate to placement of federal hazardous waste (if any) in these on-plant consolidation areas.	Will be attained. On-plant consolidation areas will be operated in accordance with Section 6.2 and Appendix C of Work Plan and with the Health, Safety, and Contingency Plan that will be prepared by contractor selected to perform the project.
RCRA Regulations for Hazardous Waste Management/Disposal Facilities (Landfill Closure and Post-Closure Care)	40 CFR 264.111 40 CFR 264.117 40 CFR 264.310	Standards for closure and final cover of hazardous waste landfills. Also, requirements for post-closure monitoring and maintenance.	Relevant and appropriate to closure and post-closure care of these on-plant consolidation areas.	Final covers will meet standards in 264.301(a) for cover design/construction. Post-closure monitoring and maintenance will be conducted in accordance with Sections 8 and 9 of Work Plan. These post-closure activities may not meet all requirements referenced in 264.111 and 264.117. To the extent such requirements will not be met, they should be waived as technically impracticable to achieve.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
Federal ARARs (cont'd)				
RCRA Regulations for Hazardous Waste Management/Disposal Facilities (Corrective Action Groundwater Monitoring and Protection)	40 CFR 264.100	Regulated units must monitor groundwater and comply with groundwater protection standards; hazardous constituents that exceed maximum concentration levels or alternative concentration levels in groundwater must be removed or treated.	Relevant and appropriate to placement of RCRA hazardous waste (if any) in these on-plant consolidation areas.	Groundwater monitoring will be conducted in accordance with Section 8 of Work Plan, to be further described in Statement of Work for Removal Actions Outside the River (SOW). Criteria for further response actions to meet groundwater protection standards will be as set forth in SOW, which will be generally consistent with 264.100. To the extent these measures do not meet all requirements in that regulation, those requirements should be waived as technically impracticable to achieve.
Clean Water Act NPDES Regulations (Stormwater Discharges)	40 CFR 122.26(c)(ii)(C) 40 CFR 122.44(k) 40 CFR 125.100-.104	Discharges of stormwater associated with construction activities are required to implement best management practices to control pollutants in stormwater discharges during and after construction activities.	Applicable to discharges of stormwater.	Will be attained by implementing erosion controls and stormwater management measures in accordance with Sections 4.7 and 6.13 of Work Plan.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
State ARARs				
Mass. Hazardous Waste Management Facility Regulations (General)	310 CMR 30.513-30.516	Various requirements relating to waste analysis, security, inspections, and personnel training.	Applicable to placement of Mass. hazardous waste other than ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Will be attained. On-plant consolidation areas will be operated in accordance with Section 6.2 of Work Plan and the Health, Safety, and Contingency Plan that will be prepared by the contractor selected to perform the project.
Mass. Hazardous Waste Management Facility Regulations (Ignition/Reaction)	310 CMR 30.560	Various requirements relating to precautions to prevent accidental ignition or reaction of wastes.	Applicable to placement of Mass. hazardous waste other than ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Will be attained. On-plant consolidation areas will be operated in accordance with the Health, Safety, and Contingency Plan that will be prepared by the contractor selected to perform the project.
Mass. Hazardous Waste Management Facility Regulations (Landfill Closure and Post-Closure Care)	310 CMR 30.582 310 CMR 30.592 310 CMR 30.633	Standards for closure and final cover of hazardous waste landfills. Also, requirements for post-closure monitoring and maintenance.	Applicable to placement of Mass. hazardous waste other than ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Final covers will meet standards in 30.633(1) for cover design/construction. Post-closure monitoring and maintenance will be conducted in accordance with Sections 8 and 9 of Work Plan. These post-closure activities may not meet all post-closure requirements of 30.582 and 30.592. To the extent such requirements will not be met, they should be waived as technically impracticable to achieve.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
State ARARs (cont'd)				
Mass. Hazardous Waste Management Facility Regulations (Corrective Action Groundwater Monitoring and Protection)	310 CMR 30.672	Regulated units must monitor groundwater and comply with groundwater protection standards; hazardous constituents that exceed maximum concentration levels or alternative concentration levels in groundwater must be removed or treated.	Applicable to placement of Mass. hazardous waste other than ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Groundwater monitoring will be conducted in accordance with Section 8 of Work Plan, to be further described in SOW. Criteria for further response actions to meet groundwater protection standards will be as set forth in SOW, which will be generally consistent with 30.672. To the extent these measures do not meet all requirements in that regulation, those requirements should be waived as technically impracticable to achieve.
Mass. Hazardous Waste Management Facility Regulations (Landfill Design)	310 CMR 30.622	Various design and operating requirements for landfills.	Applicable to placement of Mass. Hazardous Waste of the then ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Construction and operation of consolidation areas will be in accordance with Work Plan. Liner and leachate collection system may not meet all requirements of 30.622. To the extent such requirements will not be met, they should be waived as technically impracticable to achieve.

TABLE 2

ARARs for Building 71 Consolidation Area
and Potential Consolidation Area at New York Ave./Merrill Road

Regulation	Citation	Requirements	Applicability/Appropriateness	Proposal Re Attainment
State ARARs (cont'd)				
Mass. Hazardous Waste Management Facility Regulations (Land Disposal Restrictions)	310 CMR 30.757(6) 310 CMR 30.760	Prohibits land disposal of certain hazardous wastes without treatment.	Applicable to placement of certain Mass. hazardous waste other than ≥ 50 ppm PCB waste in these on-plant consolidation areas.	Construction and operation of consolidation areas will be in accordance with Work Plan. These requirements will largely be met because GE will not dispose of any free liquids or free product in the on-plant consolidation areas, and its analyses to date of areas to be excavated have not identified any wastes that are subject to these restrictions. To the extent that the areas to be excavated contain such wastes that the Consent Decree does not otherwise require to be sent off-site for disposal, these requirements should be waived as technically impracticable to achieve.
Mass. Air Pollution Control Requirements	310 CMR 7.09	Prohibition against creating condition of air pollution in connection with dust-generating activities.	Applicable to construction and site alteration activities generating dust.	Will be attained by implementing dust control measures and air monitoring in accordance with Sections 6.7 and 6.10 of Work Plan.

TABLE 3

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SUMMARY OF PCBs DETECTED IN SOIL BORING SAMPLES
(Results are presented in dry-weight parts per million, ppm)

Sample ID	Depth(Feet)	Date Collected	Aroclor-1254	Aroclor-1260	Total PCBs
OPCA-1	0-1	5/26/99	ND(0.043)	ND(0.043)	ND(0.043)
	1-6	5/26/99	ND(0.039)	0.093	0.093
	6-15	5/26/99	ND(0.038)	0.045	0.045
OPCA-2	0-1	5/26/99	0.051	ND(0.046)	0.051
	1-6	5/26/99	ND(0.039)	0.47	0.47
	6-15	5/26/99	ND(0.039)	ND(0.039)	ND(0.039)
OPCA-3	0-1	5/25/99	ND(0.036)	0.58	0.58
	1-6	5/25/99	100	ND(18)	100
	6-15	5/25/99	84	ND(18)	84
OPCA-4	0-1	5/26/99	ND(0.038)	0.073	0.073
	1-6	5/26/99	ND(35)	65	65
	6-15	5/26/99	ND(0.038)	0.16	0.16
OPCA-5	0-1	5/25/99	ND(0.75)	22	22
	1-6	5/25/99	0.044	ND(0.037)	0.044
	6-15	5/25/99	0.022 J	ND(0.038)	0.022
OPCA-6	0-1	5/26/99	ND(0.038)	0.077	0.077
	1-6	5/26/99	0.024 J	ND(0.036)	0.024
	6-15	5/26/99	ND(0.036)	ND(0.036)	ND(0.036)
OPCA-7	0-1	5/25/99	ND(0.037)	0.78	0.78
	1-6	5/25/99	ND(0.037) [ND(0.037)]	0.18 [0.18]	0.18 [0.18]
	6-15	5/25/99	ND(0.038)	ND(0.038)	ND(0.038)
OPCA-8	0-1	5/26/99	ND(0.038) [ND(0.037)]	0.22 [0.22]	0.22 [0.22]
	1-6	5/26/99	ND(0.035)	ND(0.035)	ND(0.035)
	6-15	5/26/99	ND(0.036)	ND(0.036)	ND(0.036)
OPCA-9	0-1	5/28/99	ND(0.043)	0.038 J	0.038
	1-6	5/28/99	ND(0.19)	3.7	3.7
	6-15	5/28/99	ND(0.040) [ND(0.040)]	0.34 [0.19]	0.34 [0.19]
H78B-28/28R	1-6	5/27/99	40	ND(2.1)	40

Notes:

1) Samples were collected by Blasland, Bouck & Lee, Inc., and were submitted to CT&E Environmental Services, Inc. for analysis of PCBs.
2) ND - Analyte was not detected. The value in parentheses is the associated detection limit.
3) J - Indicates an estimated value less than the CLP-required quantitation limit.
4) Duplicate results are presented in brackets, [ ].
5) Only constituents detected in one or more samples are shown.

TABLE 4

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SUMMARY OF APPENDIX IX+3 CONSTITUENTS DETECTED IN SOIL BORING SAMPLES
(Results are presented in dry-weight parts per million, ppm)

Sample ID	OPCA-1	OPCA-2	OPCA-4
Sample Depth(Feet)	0-1	0-1	0-1
Date Collected	5/26/99	5/26/99	5/26/99
Volatile Organics			
None Detected	--	--	--
Semivolatile Organics			
Aniline	ND(0.42)	ND(0.51)	ND(0.49)
Furans			
2,3,7,8-TCDF	0.0000037	0.0000040	0.0000061
TCDFs (total)	0.000023	0.000050	0.000095
1,2,3,7,8-PeCDF	ND(0.0000010)	0.0000013	ND(0.0000014)
2,3,4,7,8-PeCDF	0.0000016	0.0000017	0.0000025
PeCDFs (total)	0.000021	0.000052	0.000069
1,2,3,4,7,8-HxCDF	0.0000042	0.0000044	0.0000028 J
1,2,3,6,7,8-HxCDF	0.0000021 J	0.0000033	0.0000045
1,2,3,7,8,9-HxCDF	ND(0.00000015)	0.00000019 J	0.00000021 J
2,3,4,6,7,8-HxCDF	0.0000016 J	0.0000018 J	0.0000022 J
HxCDFs (total)	0.000020	0.000029	0.000043
1,2,3,4,6,7,8-HpCDF	0.0000072	0.0000076	0.000011
1,2,3,4,7,8,9-HpCDF	0.0000011 J	0.0000014 J	0.0000017 J
HpCDFs (total)	0.000013	0.000014	0.000022
OCDF	0.0000033 J	0.0000042 J	0.000011
Total Furans	0.000080	0.00015	0.00024
Dioxins			
2,3,7,8-TCDD	0.00000017 J	ND(0.00000021)	ND(0.00000023)
TCDDs (total)	0.0000013	0.0000015	0.0000018
1,2,3,7,8-PeCDD	0.00000054 J	ND(0.00000057)	ND(0.00000073)
PeCDDs (total)	0.0000014	ND(0.00000057)	ND(0.00000073)
1,2,3,4,7,8-HxCDD	ND(0.00000043)	0.00000076 J	0.00000066 J
1,2,3,6,7,8-HxCDD	0.00000057 J	ND(0.00000052)	0.00000097 J
1,2,3,7,8,9-HxCDD	0.00000093 J	0.00000086 J	0.0000012 J
HxCDDs (total)	0.0000043	0.0000046	0.0000076
1,2,3,4,6,7,8-HpCDD	0.0000029 J	0.0000042	0.0000075
HpCDDs (total)	0.0000059	0.0000074	0.000014
OCDD	0.000011	0.000018	0.000059
Total Dioxins	0.000024	0.000032	0.000082
MDEP TEF	0.0000047	0.0000075	0.0000098
EPA TEF	0.0000023	0.0000025	0.0000032
Inorganics			
Arsenic	4.70	5.80	4.30
Barium	58.3	64.7	30.7
Beryllium	0.390	ND(0.210)	0.270
Cadmium	0.660	0.670	0.390
Chromium	14.5	16.0	6.40
Cobalt	10.3	12.1	7.10
Copper	21.9	22.1	14.0
Lead	11.4	10.2	12.1
Nickel	19.9	21.7	11.7
Sulfide	ND(6.50)	ND(7.00)	9.40
Vanadium	17.0	18.3	7.70
Zinc	59.0	59.5	44.2

(See Notes on Page 3)

TABLE 4

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SUMMARY OF APPENDIX IX+3 CONSTITUENTS DETECTED IN SOIL BORING SAMPLES
(Results are presented in dry-weight parts per million, ppm)

Sample ID Sample Depth(Feet) Date Collected	OPCA-6 0-1 5/26/99	OPCA-8 0-1 5/26/99
Volatile Organics		
None Detected	--	--
Semivolatile Organics		
Aniline	0.82	ND(0.41) [ND(0.40)]
Furans		
2,3,7,8-TCDF	0.000010	0.0000087 [ND(0.0000031)]
TCDFs (total)	0.00014	0.00076 [0.00025]
1,2,3,7,8-PeCDF	0.0000021	0.0000015 [ND(0.0000018)]
2,3,4,7,8-PeCDF	0.0000030	0.0000037 [ND(0.0000060)]
PeCDFs (total)	0.00015	0.0012 [0.00065]
1,2,3,4,7,8-HxCDF	0.0000063	0.0000097 [0.0000086]
1,2,3,6,7,8-HxCDF	0.000011	0.000064 [0.000055]
1,2,3,7,8,9-HxCDF	ND(0.00000025)	0.00000025 J [ND(0.00000073)]
2,3,4,6,7,8-HxCDF	0.0000025 J	0.000012 [0.000013]
HxCDFs (total)	0.000094	0.00082 [0.00060]
1,2,3,4,6,7,8-HpCDF	0.000011	0.000063 [0.000039]
1,2,3,4,7,8,9-HpCDF	0.0000018 J	0.0000030 [ND(0.0000021)]
HpCDFs (total)	0.000019	0.00014 [0.000039]
OCDF	0.0000055 J	0.000014 [0.000015]
Total Furans	0.00041	0.0029 [0.0016]
Dioxins		
2,3,7,8-TCDD	ND(0.00000041)	ND(0.00000046) [0.0000020]
TCDDs (total)	0.0000014	0.0000017 [0.0000020]
1,2,3,7,8-PeCDD	0.00000079 J	0.0000011 J [ND(0.0000012)]
PeCDDs (total)	0.00000079	0.0000042 [ND(0.0000012)]
1,2,3,4,7,8-HxCDD	ND(0.00000089)	0.0000013 J [ND(0.0000019)]
1,2,3,6,7,8-HxCDD	0.0000012 J	0.0000019 J [ND(0.0000023)]
1,2,3,7,8,9-HxCDD	ND(0.0000014)	0.0000020 J [ND(0.0000027)]
HxCDDs (total)	0.0000068	0.000015 [ND(0.0000019)]
1,2,3,4,6,7,8-HpCDD	0.0000078	0.000015 [0.000011]
HpCDDs (total)	0.000015	0.000031 [0.000011]
OCDD	0.000039	0.00011 [0.000077]
Total Dioxins	0.000063	0.00016 [0.000090]
MDEP TEF	0.000017	0.000096 [0.000055]
EPA TEF	0.0000050	0.000013 [0.000010]
Inorganics		
Arsenic	5.50	5.60 [5.70]
Barium	28.9	24.0 [33.9]
Beryllium	0.360	0.220 [0.240]
Cadmium	0.370	0.480 [0.450]
Chromium	9.40	6.60 [6.50]
Cobalt	10.1	8.30 [8.00]
Copper	16.4	13.5 [14.5]
Lead	15.4	20.1 [20.6]
Nickel	17.2	10.8 [12.4]
Sulfide	9.40	9.10 [7.20]
Vanadium	10.8	10.0 [10.8]
Zinc	59.2	42.9 [41.2]

(See Notes on Page 3)

TABLE 4

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SUMMARY OF APPENDIX IX+3 CONSTITUENTS DETECTED IN SOIL BORING SAMPLES
(Results are presented in dry-weight parts per million, ppm)

Notes:

1) Samples were collected by Blasland, Bouck & Lee, Inc., and were submitted to CT&E Environmental Services, Inc. for analysis of Appendix IX+3 constituents (excluding herbicides and pesticides).
2) ND - Analyte was not detected. The number in parentheses is the associated quantitation limit for volatiles and semivolatiles, and the associated detection limit for other constituents.
3) J - Indicates an estimated value less than the CLP-required quantitation limit.
4) Total dioxins/furans determined as the sum of the total homolog concentrations; non-detect values considered as zero.
5) Total 2,3,7,8-TCDD toxicity equivalents (TEQs) were calculated using both MDEP's and EPA's Toxicity Equivalency Factors (TEFs) for all PCDD/PCDF congeners, although GE does not accept the validity of these TEFs.
6) Duplicate results are presented in brackets, [ ].
7) Only constituents detected in one or more samples are shown.

(See Notes on Page 3)

TABLE 5

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS
PROPOSED GROUNDWATER MONITORING PROGRAM

SUMMARY OF MONITORING WELL SPECIFICATIONS

WELL ID	WELL DIAMETER (Inches)	GROUND ELEVATION (Feet AMSL)	MEASURING POINT ELEVATION (Feet AMSL)	DEPTH TO TOP OF SCREEN (Feet BGS)	SCREEN LENGTH (Feet)	TOP OF SCREEN ELEVATION (Feet AMSL)	BASE OF SCREEN ELEVATION (Feet AMSL)	APPROX. DEPTH TO WATER (Feet BMP)	APPROX. GROUND-WATER ELEVATION (Feet AMSL)
78-1	4	1027.4	1026.34	8	15	1019.4	1004.4	10	1016
78-6	4	1013.1	1011.99	3	15	1010.1	995.1	6	1006
H78B-15	0.75	1009.8	1012.73	6	10	1003.8	993.8	11	1002
NY-4	4	1024.8	1024.53	17	15	1007.8	992.8	9	1016
OPCA-MW-1	2	NA	NA	20.1	10	NA	NA	NA	NA
OPCA-MW-2	2	NA	NA	13	10	NA	NA	NA	NA
OPCA-MW-3	2	NA	NA	18	10	NA	NA	NA	NA
OPCA-MW-4	2	NA	NA	12	10	NA	NA	NA	NA
OPCA-MW-5	2	NA	NA	9.8	10	NA	NA	NA	NA
OPCA-MW-6	2	NA	NA	15	10	NA	NA	NA	NA
OPCA-MW-7	2	NA	NA	14	10	NA	NA	NA	NA
OPCA-MW-8	2	NA	NA	13.5	10	NA	NA	NA	NA

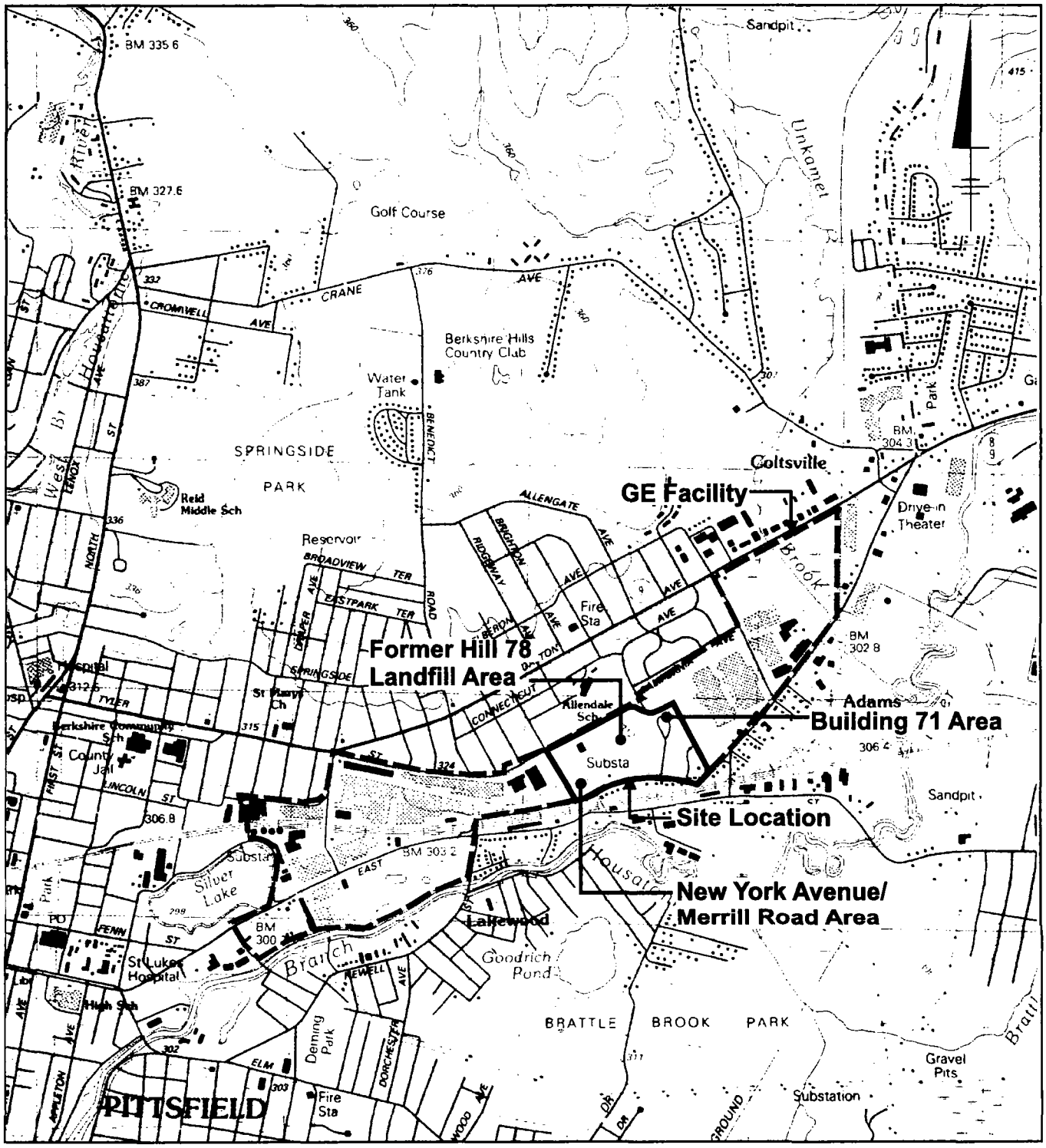
NOTES:

1. Newly-installed wells OPCA-MW-1 through OPCA-MW-8 have yet to be surveyed, therefore elevation data is not available for these wells.
2. NA: Not Available.
3. Feet AMSL: Feet above Mean Sea Level.
4. Feet BGS: Feet Below Ground Surface.
5. Feet BMP: Feet Below Measuring Point.

Figures

Need
Cut &
fill elevation
maps

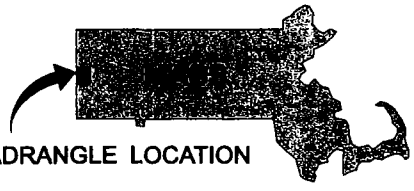
Original includes color coding.



REFERENCE: PITTSFIELD EAST, MASS. USGS QUADS., 7.5 MIN. SERIES, 1988

2000' 0 2000'

APPROXIMATE SCALE: 1" = 2000'



QUADRANGLE LOCATION

03/99 SYR-D54-DJH
20185003/20185n01.CDR

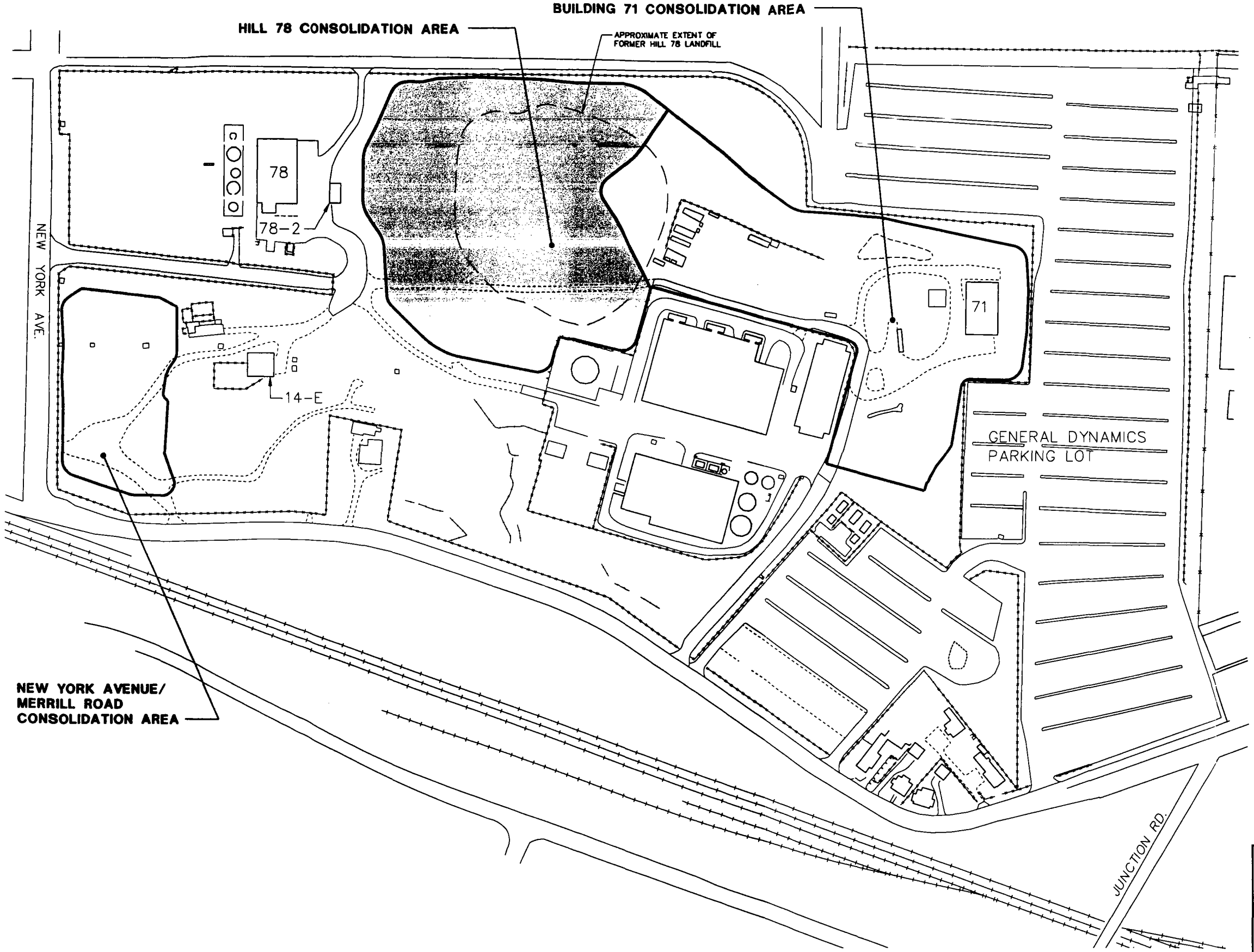
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SITE LOCATION MAP

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

FIGURE 1



LEGEND:

- NON-TSCA/NON-RCRA AREA
- TSCA/RCRA AND NON-TSCA/NON-RCRA AREA
- APPROXIMATE AREA OF PROPOSED CONSOLIDATION ACTIVITIES
- EXISTING SECURITY FENCE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. -FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND, BOUCK & LEE, INC. (BBL) CONSTRUCTION PLANS, AND ON OBSERVATIONS DURING A SITE VISIT BY BBL PERSONNEL ON DECEMBER 3, 1997.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

100' 0 100' 200'
GRAPHIC SCALE

Original includes color coding.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

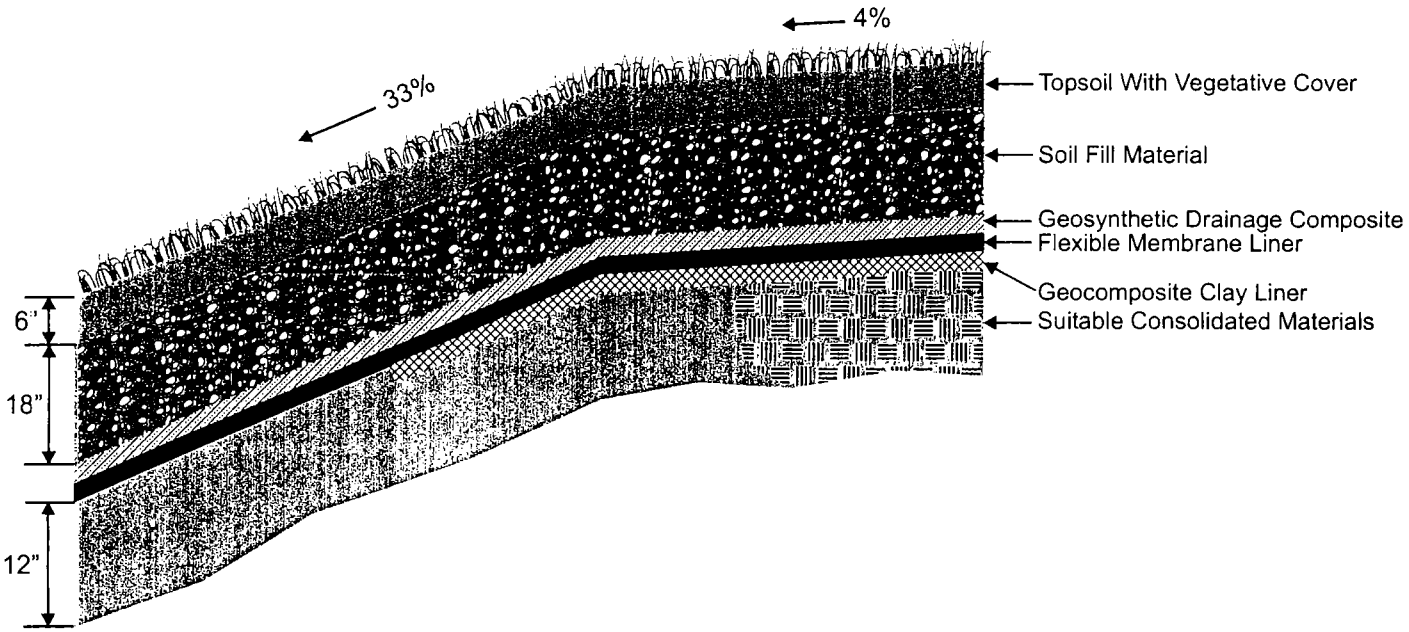
IDENTIFIED ON-PLANT CONSOLIDATION AREAS

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

FIGURE 2

X: 20185X01.DWG
L: ON=*; OFF=*REF*
P: STD-PCP/DL.PCP
6/10/99 SYR-54-GMS KLN GMS
20185003/REPORT/20185B01.DWG

Original includes color coding.



FINAL COVER SYSTEM

NOT-TO-SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD/HOUSATONIC RIVER SITE
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

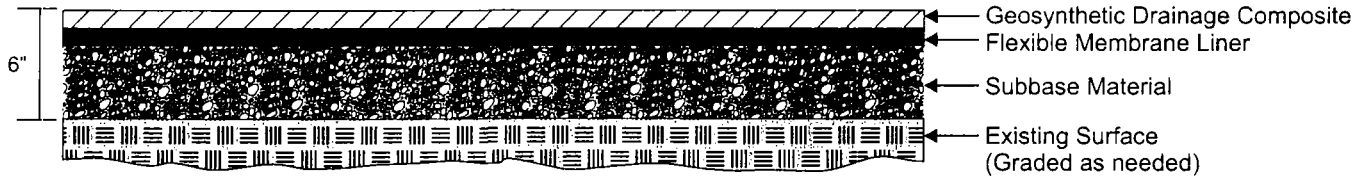
FINAL COVER SYSTEM

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

FIGURE 3

05/99 SYR-D54-DJH ycc
20185003/20185n09.cdr

Original includes color coding.



BASE LINER SYSTEM

NOT-TO-SCALE

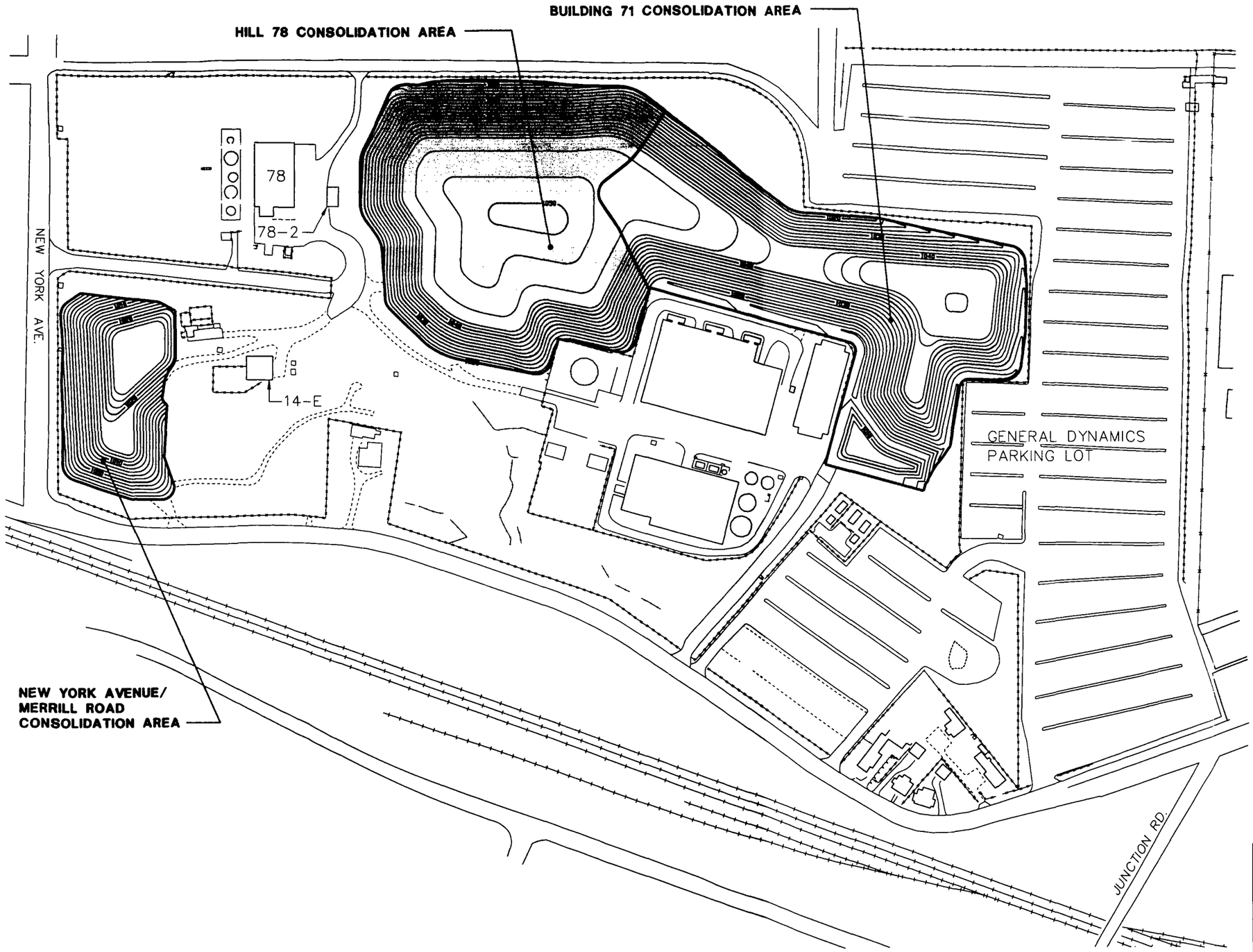
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

BASE LINER SYSTEM FOR BUILDING 71 CONSOLIDATION AREA

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

FIGURE 4

05/99 SYR-D54-DJH
20185003/20185g08.cdr



Original includes color coding.

LEGEND:

- NON-TSCA/NON-RCRA AREA
- TSCA/RCRA AND NON-TSCA/NON-RCRA AREA
- APPROXIMATE AREA OF PROPOSED CONSOLIDATION AREAS
- EXISTING SECURITY FENCE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. -FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND, BOUCK & LEE, INC. (BBL) CONSTRUCTION PLANS, AND ON OBSERVATIONS DURING A SITE VISIT BY BBL PERSONNEL ON DECEMBER 3, 1997.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

100' 0 100' 200'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

FINAL CONFIGURATION OF ON-PLANT CONSOLIDATION AREAS

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

FIGURE 5

X: 20185X01.DWG
L: ON=*, OFF=*REF*
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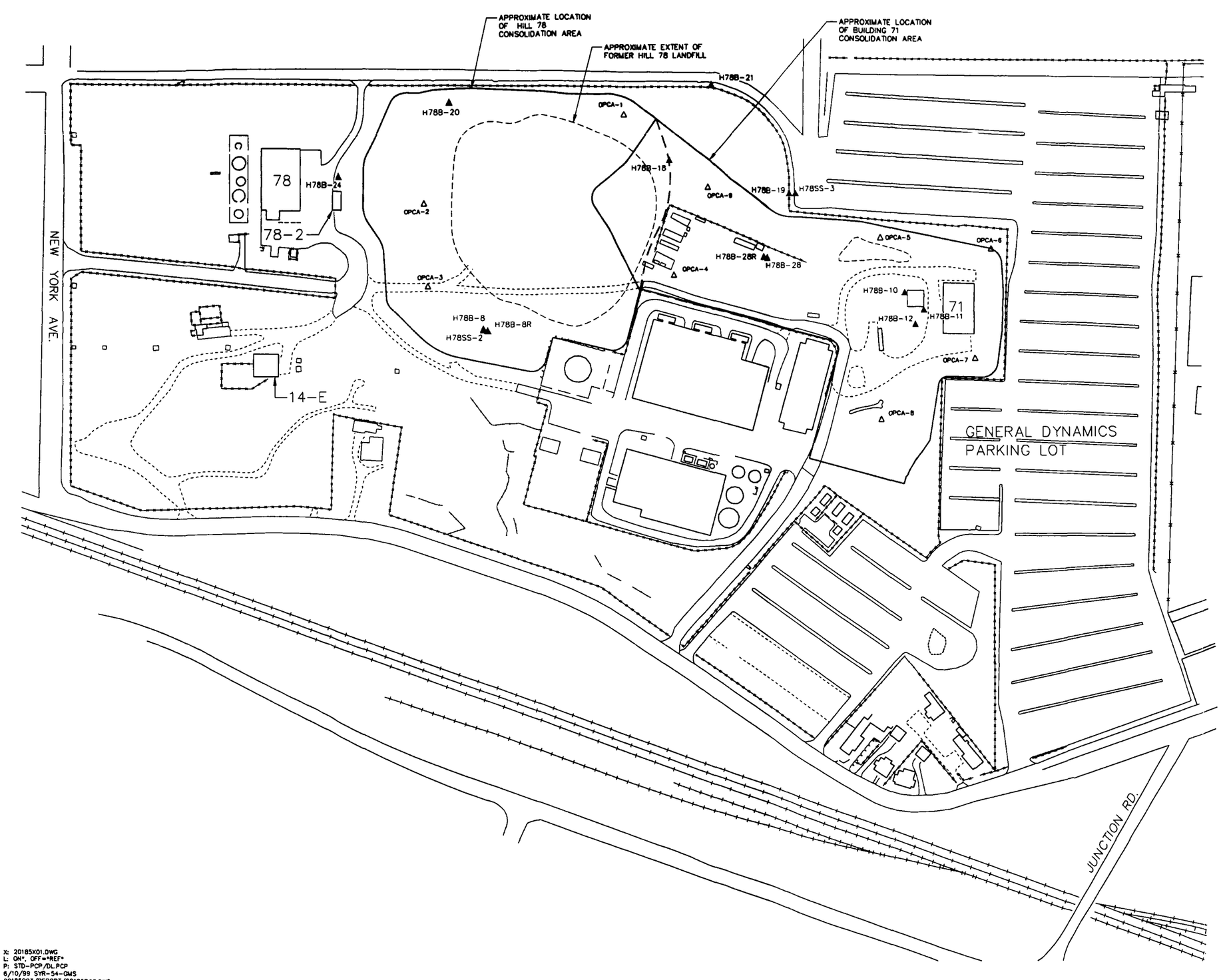
6/10/99 SYR-54-KLH GWS
20185003/REPORT/20185B06.DWG



LEGEND:

- △ OPCA-1 — MAY 1999 SOIL BORING
- ▲ H78B-10 — JULY – NOVEMBER 1996 SOIL BORING
- ———— FENCE

Original includes color coding.

100' 0 100' 200'
GRAPHIC SCALE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990 AND ADDITIONAL INFORMATION FROM THE MCP PHASE II SCOPE OF WORK AND PROPOSAL FOR RCRA FACILITY INVESTIGATION, FIGURE 2 (O'BRIEN & GERE ENGINEERS, INC., MAY, 1995).
2. SITE BOUNDARIES ARE APPROXIMATE.
3. ONLY LOCATIONS OF EXISTING SURFACE AND SUBSURFACE SAMPLING POINTS LOCATED IN OR NEAR THE PROPOSED CONSOLIDATION AREAS ARE SHOWN.
4. SAMPLE LOCATIONS ARE APPROXIMATE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

PRE-DESIGN SOIL INVESTIGATIONS

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

FIGURE 6

X: 20185X01.DWG
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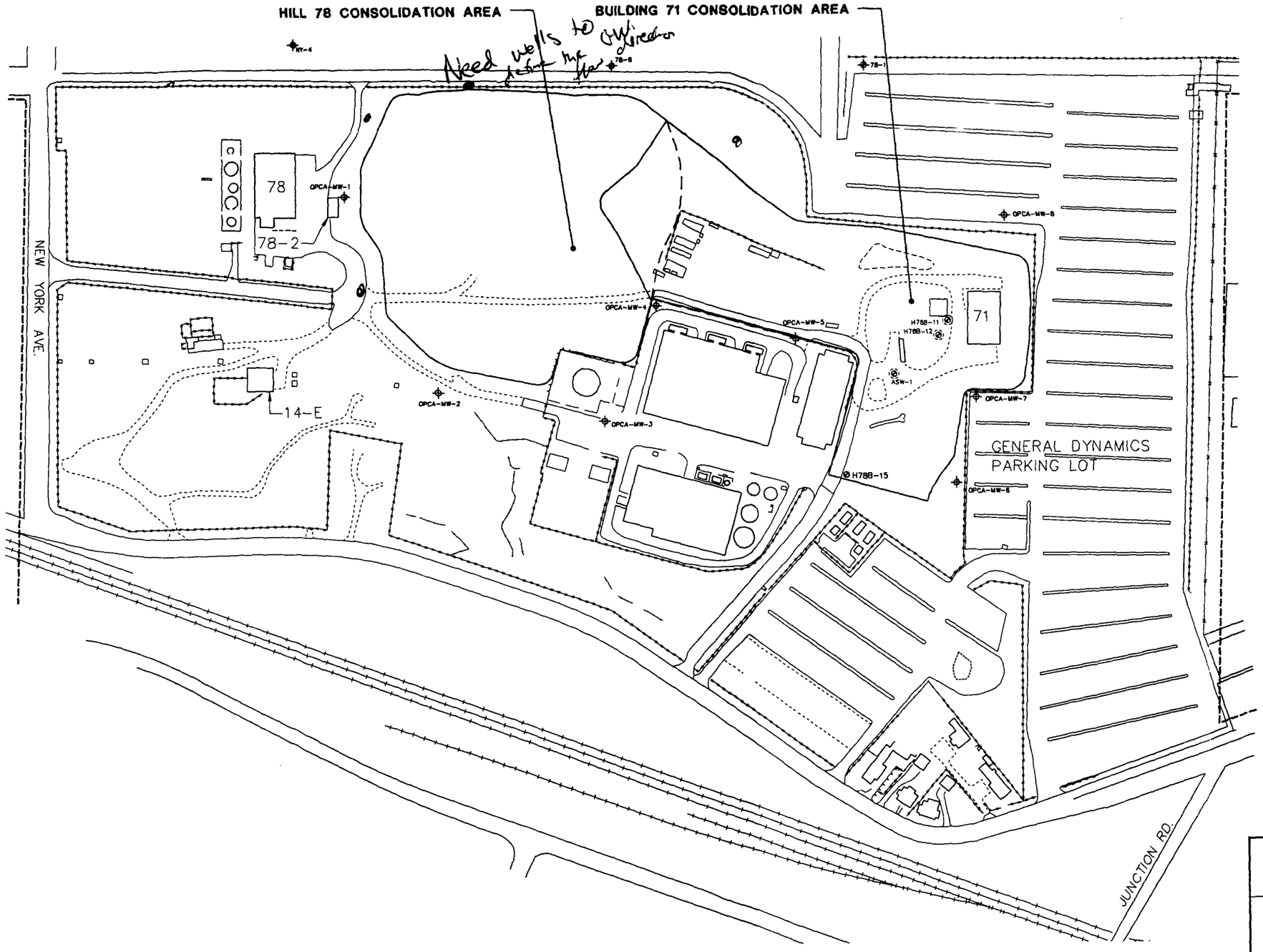
8/10/99 SYR-54-GMS
20185003/REPORT/20185B03.DWG



Original Well Locations

LEGEND:

- APPROXIMATE AREA OF PROPOSED CONSOLIDATION AREAS
- EXISTING SECURITY FENCE
- 78-6 — EXISTING WELL PROPOSED AS PART OF CONSOLIDATION AREA MONITORING PROGRAM
- OPCA-MW-1 — NEW WELL TO BE ADDED TO CONSOLIDATION AREA MONITORING PROGRAM
- H788-12 — EXISTING MONITORING WELL TO BE ABANDONED PRIOR TO 1999 CONSOLIDATION ACTIVITIES

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. -FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND, BOUCK & LEE, INC. (BBL) CONSTRUCTION PLANS, AND ON OBSERVATIONS DURING A SITE VISIT BY BBL PERSONNEL ON DECEMBER 3, 1997.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. NEW WELL LOCATIONS ARE APPROXIMATE.

100' 0 100' 200'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR
ON-PLANT CONSOLIDATION AREAS

PROPOSED GROUNDWATER MONITORING PROGRAM

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

FIGURE 7

X: 20185X01.DWG
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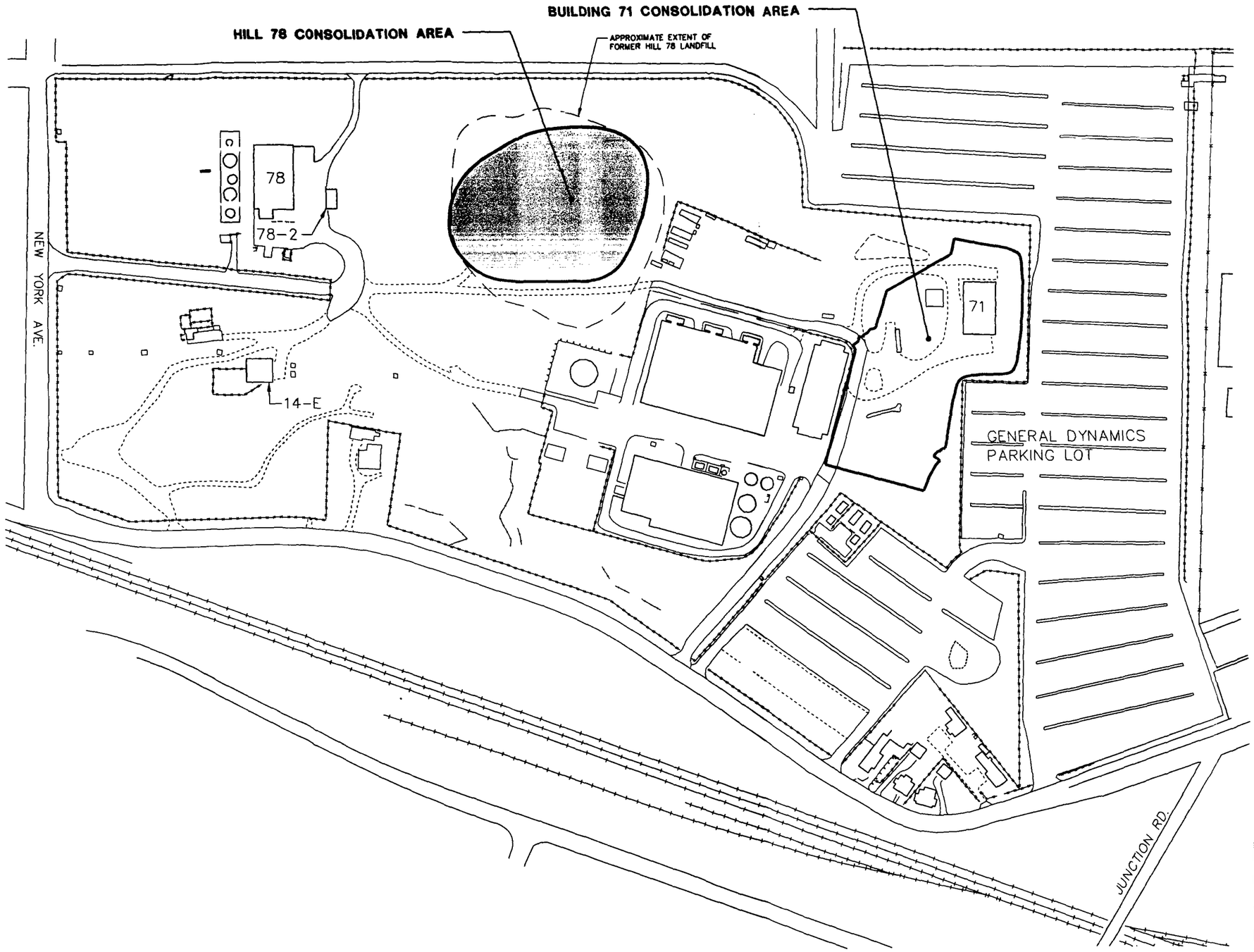
P: STD-PCP/DL.PCP
5/10/99 SYR-54-GMS
20185003/REPORT/20185B02.DWG



Original illegible color coding.

LEGEND:

- NON-TSCA/NON-RCRA AREA
- TSCA/RCRA AND NON-TSCA/NON-RCRA AREA
- APPROXIMATE AREA OF PROPOSED 1999 CONSOLIDATION ACTIVITIES
- EXISTING SECURITY FENCE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. -FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND, BOUCK & LEE, INC. (BBL) CONSTRUCTION PLANS, AND ON OBSERVATIONS DURING A SITE VISIT BY BBL PERSONNEL ON DECEMBER 3, 1997.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

100' 0 100' 200'
GRAPHIC SCALE

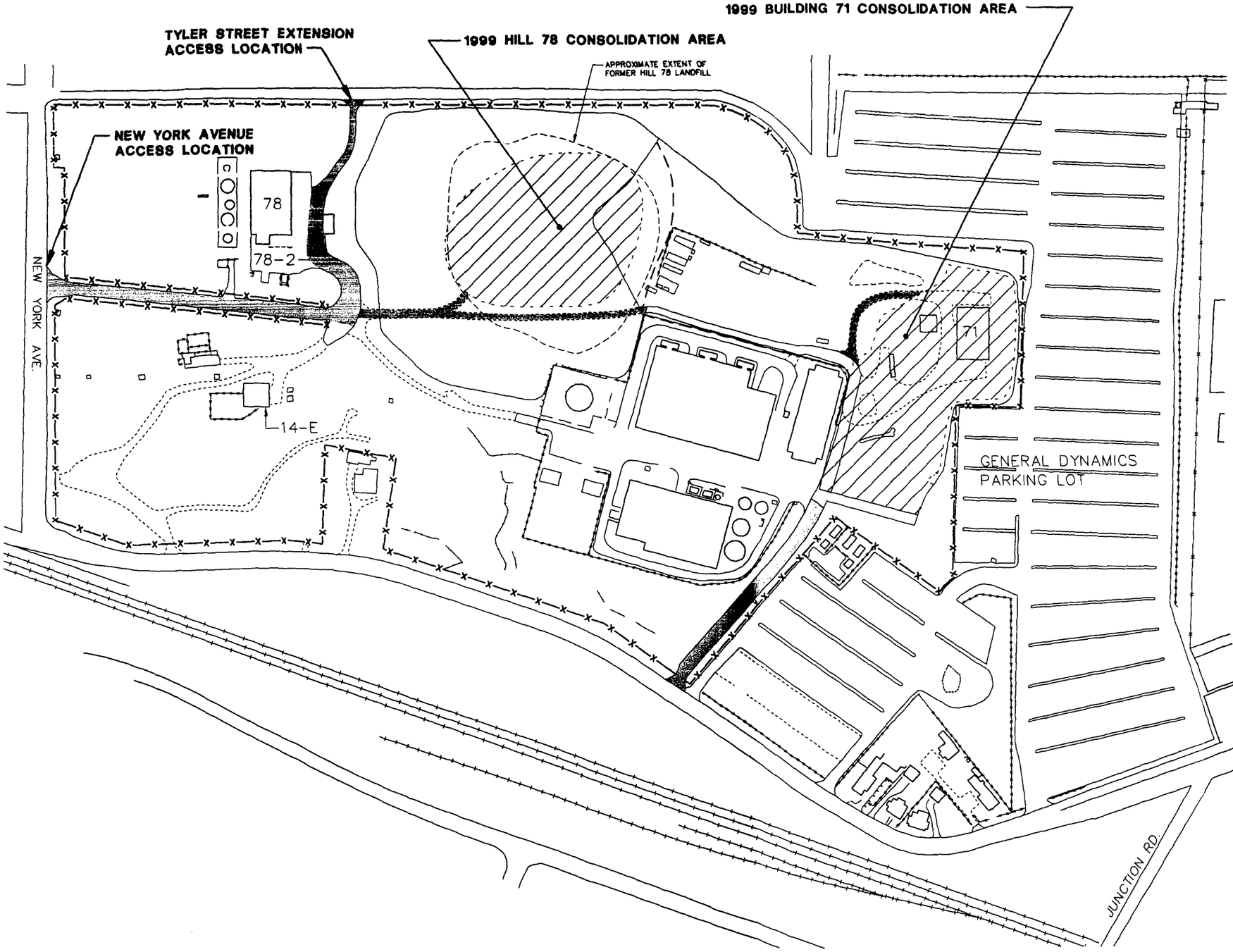
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

1999 CONSOLIDATION AREAS

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

FIGURE 8

X: 20185X01.DWG
L: ON=*, OFF=*REF*
F: STD-PCP/DL_PCP
6/10/99 SYR-54-GMS KLN GMS
20185003/REPORT/20185B04.DWG



Original includes coloring.

LEGEND:

- EXISTING PAVED SITE ROAD
- APPROXIMATE LOCATION OF PROPOSED TEMPORARY ACCESS ROAD
- APPROXIMATE LOCATION OF PROPOSED PAVED PERMANENT ACCESS ROAD
- APPROXIMATE AREA OF 1999 CONSOLIDATION ACTIVITIES
- —X—X— EXISTING SECURITY FENCE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. -FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND, BOUCK & LEE, INC. (BBL) CONSTRUCTION PLANS, AND ON OBSERVATIONS DURING A SITE VISIT BY BBL PERSONNEL ON DECEMBER 3, 1997.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

100' 0 100' 200'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR
ON-PLANT CONSOLIDATION AREAS

SITE FENCING, ACCESS, AND ROAD LOCATIONS

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

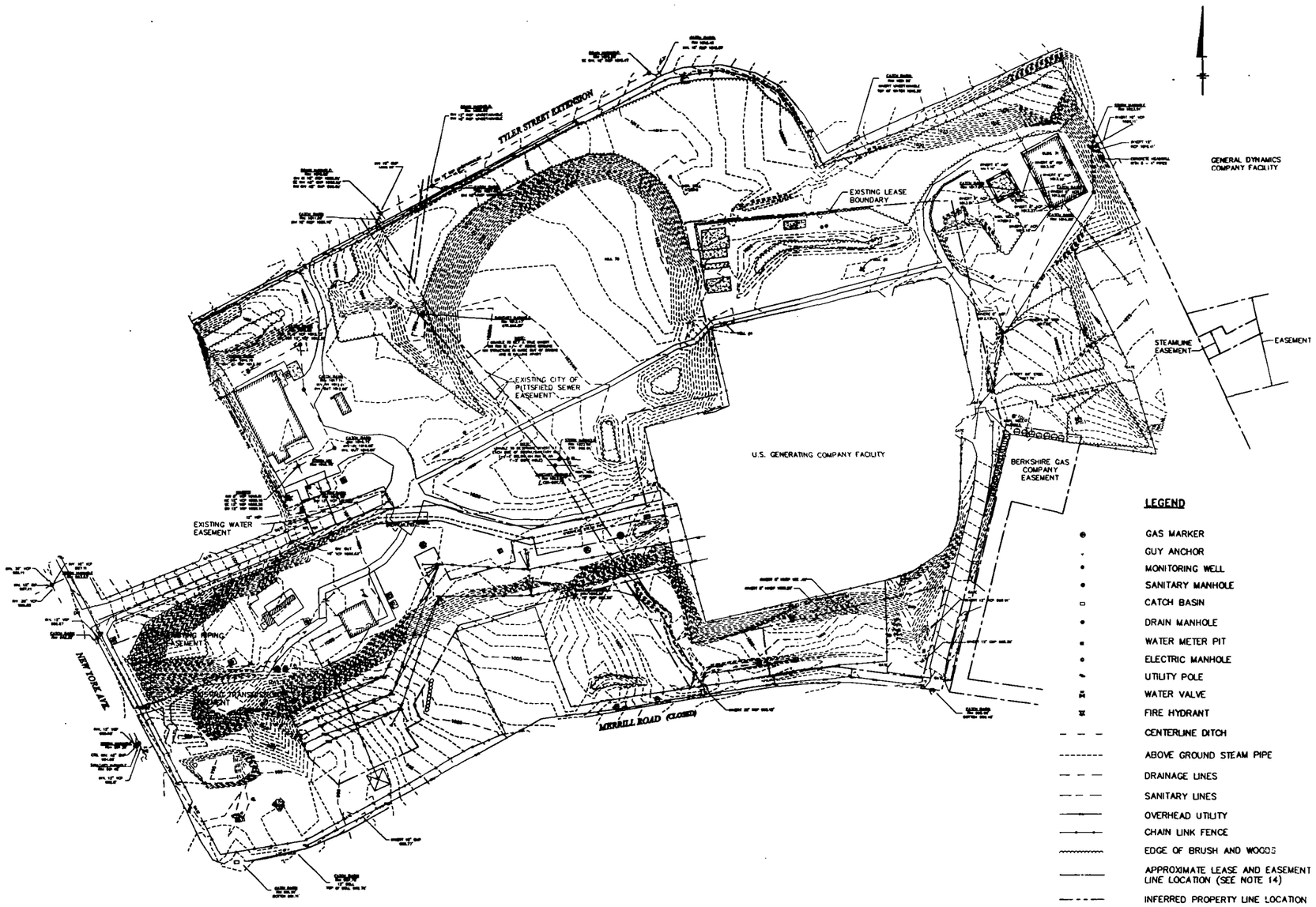
FIGURE 9

X: 20185X01.DWG
L: ON=*, OFF=*REF*, PER-FENCE
P: STD-PCP/DL-PCP
6/10/99 SYR-54-GMS KLN GMS
20185003/REPORT/20185B05.DWG

Attachment A

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Technical Drawings



LEGEND

- GAS MARKER
- GUY ANCHOR
- MONITORING WELL
- SANITARY MANHOLE
- CATCH BASIN
- DRAIN MANHOLE
- WATER METER PIT
- ELECTRIC MANHOLE
- UTILITY POLE
- WATER VALVE
- FIRE HYDRANT
- CENTERLINE DITCH
- ABOVE GROUND STEAM PIPE
- DRAINAGE LINES
- SANITARY LINES
- OVERHEAD UTILITY
- CHAIN LINK FENCE
- EDGE OF BRUSH AND WOODS
- APPROXIMATE LEASE AND EASEMENT LINE LOCATION (SEE NOTE 14)
- INFERRED PROPERTY LINE LOCATION
- INDEX CONTOUR LINE
- INTERMEDIATE CONTOUR LINE

NOTES:

1. BASE MAP INFORMATION SHOWN ON THIS DRAWING WAS DEVELOPED FROM FIELD SURVEY DATA OBTAINED BY BLASLAND, BOUCK & LEE, INC. ON FEBRUARY 10, 1999. CONDITIONS SHOWN ARE APPROXIMATE ONLY DUE TO SNOW AND ICE ACCUMULATIONS EXISTING AT TIME OF SURVEY.
2. ELEVATIONS SHOWN ARE REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM (NGVD) 1929.
3. HORIZONTAL DATUM IS REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD 1927).
4. CONTOUR INTERVAL EQUALS 1 FOOT.
5. DIFFERENCES NOTED BY THE CONTRACTOR BETWEEN BASE MAP INFORMATION AND ACTUAL SITE CONDITIONS, WHICH MAY AFFECT THE DESIGN CONFIGURATION, SHALL BE SUBMITTED TO GE. MODIFICATIONS MAY BE MADE TO THE DESIGN CONFIGURATION DURING PERFORMANCE OF THE SITE WORK AT THE DISCRETION OF GE.
6. CONTRACTOR SHALL VERIFY THE PRESENCE AND LOCATION OF ALL ABOVE GROUND AND UNDER GROUND SITE FEATURES IN THE VICINITY OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO COMMENCEMENT OF SITE WORK. ADDITIONAL SITE FEATURES MAY BE PRESENT WHICH ARE NOT SHOWN ON THIS DRAWING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH GE TO DETERMINE THE PRESENCE AND LOCATION OF SUCH FEATURES SHOULD THEY EXIST AND THE LOCATION OF ON-SITE EASEMENTS LEASE LINES AND RIGHT-OF-WAYS.
7. INFORMATION REGARDING SITE SURVEY CONTROL WILL BE PROVIDED BY GE FOR CONTRACTOR USE PRIOR TO COMMENCEMENT OF SITE WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY FOR ESTABLISHING AND MAINTAINING CONSTRUCTION SURVEY CONTROL DURING PERFORMANCE OF THE CONTRACT WORK.
8. CONTRACTOR SHALL ASSUME EXISTING FENCING AT PERIMETER OF SITE IS GE's PROPERTY LINE. NO WORK SHALL BE PERFORMED OUTSIDE THE PROPERTY LINE WITHOUT GE's PRIOR APPROVAL. GE WILL OBTAIN APPROVALS FOR ANY WORK WITHIN IDENTIFIED LEASE OR EASEMENT AREAS.
9. CONTRACTOR SHALL PROVIDE ALL LOCAL (NON-ENVIRONMENTAL) PERMITS AND MAKE ARRANGEMENTS FOR LOCAL INSPECTIONS (AS NECESSARY).
10. CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHTS DURING NIGHT HOURS TO SECURE SUCH PROTECTION.
11. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THIS CONTRACT. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTION TO PREVENT DAMAGE, INJURY, OR LOSS TO ALL EMPLOYEES ON THE WORK AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY.
12. EXISTING SURFACES OR FEATURES NOT SPECIFIED FOR MODIFICATION THAT ARE DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE RESTORED BY THE CONTRACTOR TO THIER PRECONSTRUCTION CONDITION IN A TIMELY MANNER.
13. ALL CONTRACTOR RELATED ACTIVITIES SHALL BE PERFORMED IN A MANNER WHICH ALLOWS FOR ALL NECESSARY OPERATING ACTIVITIES ASSOCIATED WITH THE U.S. GENERATING COMPANY AND GENERAL DYNAMIC COMPANY FACILITIES. ANY WORK DEEMED NECESSARY WHICH MAY AFFECT THOSE FACILITIES SHALL BE BROUGHT TO THE ATTENTION OF GE PRIOR TO COMMENCEMENT OF SUCH WORK. GE SHALL PROVIDE THE CONTRACTOR WITH AUTHORIZATION TO PROCEED PROVIDED GE AND THE AFFECTED PARTY(IES) DEEM THE ACTION NECESSARY AND ACCEPTABLE.
14. LEASE AND EASEMENT LINE LOCATIONS SHOWN ON THIS DRAWING DIGITIZED FROM PLAN PREPARED BY DESIGN GROUP, INC. ENTITLED "PLAN OF LAND SURVEYED FOR GENERAL ELECTRIC COMPANY", DATED FEBRUARY 18, 1993 (PROJECT NO. 930004) AND ARE APPROXIMATE ONLY.

X: 20185X01.DWG
L: ON=*; OFF=*REF*
P: STD-PCP/DL
6/10/99 SYR 54-NES NES GMS
20185003/WORKPLAN/20185G01.DWG

NOT FOR CONSTRUCTION

Graphic Scale
100' 0 100' 200'

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
Prof. Eng. _____
PE License _____

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

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

EXISTING SITE PLAN

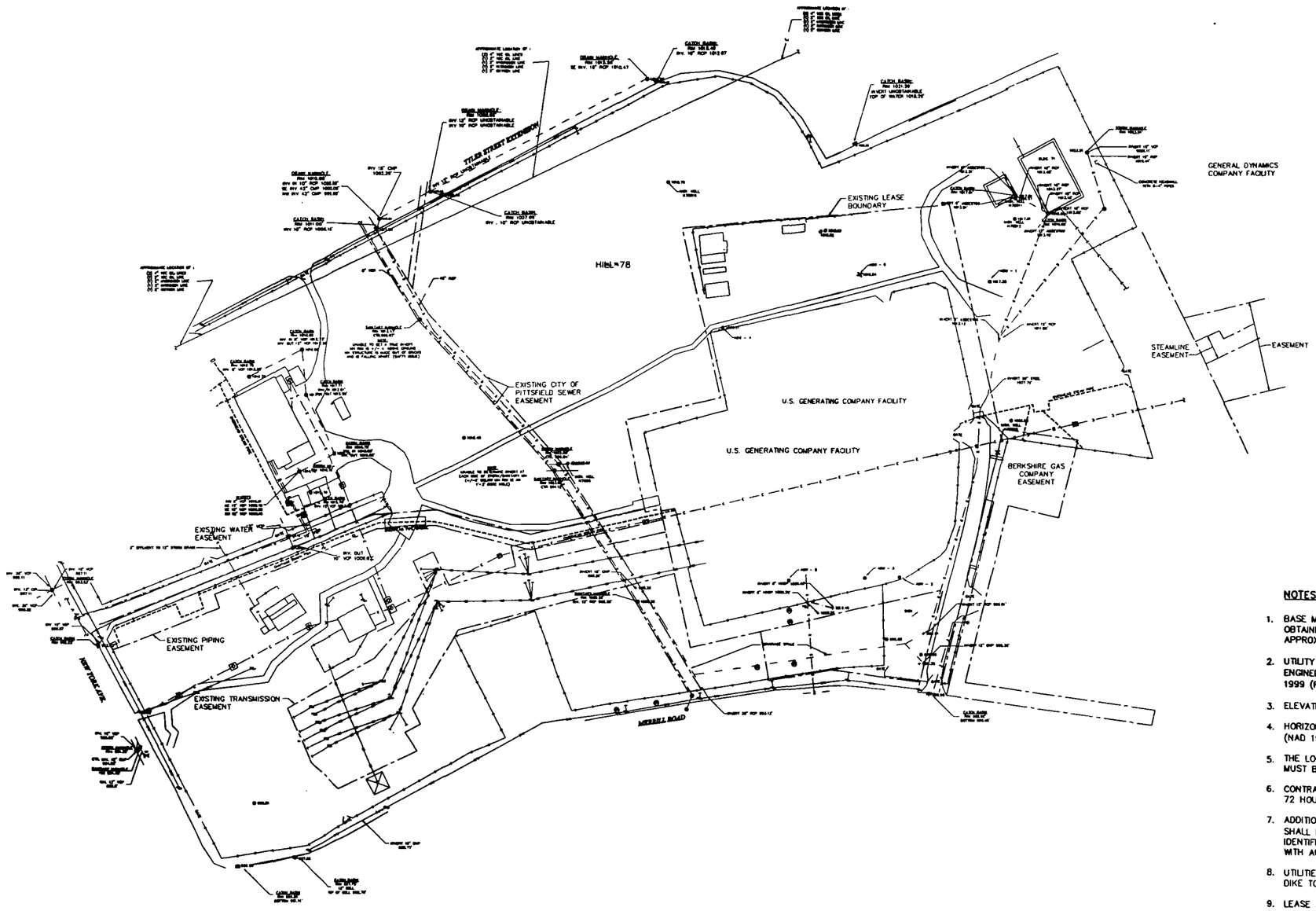
GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

A-1



LEGEND

- GAS MARKER
- GUY ANCHOR
- MONITORING WELL
- SANITARY MANHOLE
- CATCH BASIN
- DRAIN MANHOLE
- WATER METER PIT
- ELECTRIC MANHOLE
- UTILITY POLE
- WATER VALVE
- FIRE HYDRANT
- CENTERLINE DITCH
- ABOVE GROUND STEAM PIPE
- DRAINAGE LINES
- SANITARY LINES
- OVERHEAD UTILITY
- CHAIN LINK FENCE
- GROUNDWATER MONITORING OR SUPPLY WELLS
- DRAINAGE LINES (WE)
- UNDER GROUND ELECTRIC LINES (WE)
- SANITARY LINES (WE)
- WATER LINES (WE)
- SEWER AND WATER EASEMENT (WE)
- APPROXIMATE LEASE AND EASEMENT LINE LOCATION (SEE NOTE 9)
- INFERRED PROPERTY LINE LOCATION

NOTES:

1. BASE MAP INFORMATION SHOWN ON THIS DRAWING WAS DEVELOPED FROM FIELD SURVEY DATA OBTAINED BY BLASLAND, BOUCK & LEE, INC. ON FEBRUARY 10, 1999. CONDITIONS SHOWN ARE APPROXIMATE ONLY DUE TO HEAVY SNOW AND ICE ACCUMULATIONS EXISTING AT TIME OF SURVEY.
2. UTILITY INFORMATION DENOTED WITH (WE) IN LEGEND, OBTAINED FROM PLAN PREPARED BY WHITE ENGINEERING, INC., ENTITLED "GENERAL ELECTRIC SITE UTILITIES PLAN HILL 78 AREA", DATED MAY 5, 1999 (FILE NO. 99-04-09).
3. ELEVATIONS SHOWN ARE REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM (NGVD) 1929.
4. HORIZONTAL DATUM IS REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD 1927).
5. THE LOCATIONS OF UTILITIES ARE CONSIDERED APPROXIMATE ONLY. UTILITIES SHOWN ON THIS PLAN MUST BE VERIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
6. CONTRACTOR IS RESPONSIBLE FOR CONTACTING APPROPRIATE UTILITY LOCATING AGENCIES AT LEAST 72 HOURS PRIOR TO ANY WORK ACTIVITIES AT THE SITE.
7. ADDITIONAL DRAINAGE STRUCTURES MAY BE PRESENT WHICH ARE NOT SHOWN ON THIS DRAWING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY GE OF SUCH CONDITIONS AS THEY ARE IDENTIFIED DURING PERFORMANCE OF THE CONTRACT WORK. GE SHALL PROVIDE THE CONTRACTOR WITH AUTHORIZATION FOR ABANDONMENT, REMOVAL, OR MODIFICATION.
8. UTILITIES AND DRAINAGE FEATURES ASSOCIATED WITH BUILDING 71 AND ADJACENT FORMER TANK DIKE TO BE REMOVED OR ABANDONED IN-PLACE BY OTHERS.
9. LEASE AND EASEMENT LINE LOCATIONS SHOWN ON THIS DRAWING DIGITIZED FROM PLAN PREPARED BY DESIGN GROUP, INC. ENTITLED "PLAN OF LAND SURVEYED FOR GENERAL ELECTRIC COMPANY", DATED FEBRUARY 18, 1993 (PROJECT NO. 930004) AND ARE APPROXIMATE ONLY.
10. REFER TO DRAWING NO.1 FOR ADDITIONAL BASE MAP INFORMATION.

L: ON=*, OFF=*REF*
P: STD-PCP/DL
6/10/99 SYR 54-NES NES GMS
20185003/WORKPLAN/20185G02.DWG

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Graphic Scale
100' 0 100' 200'

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
Prof. Eng. _____
PE License _____

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

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

EXISTING UTILITIES PLAN

GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

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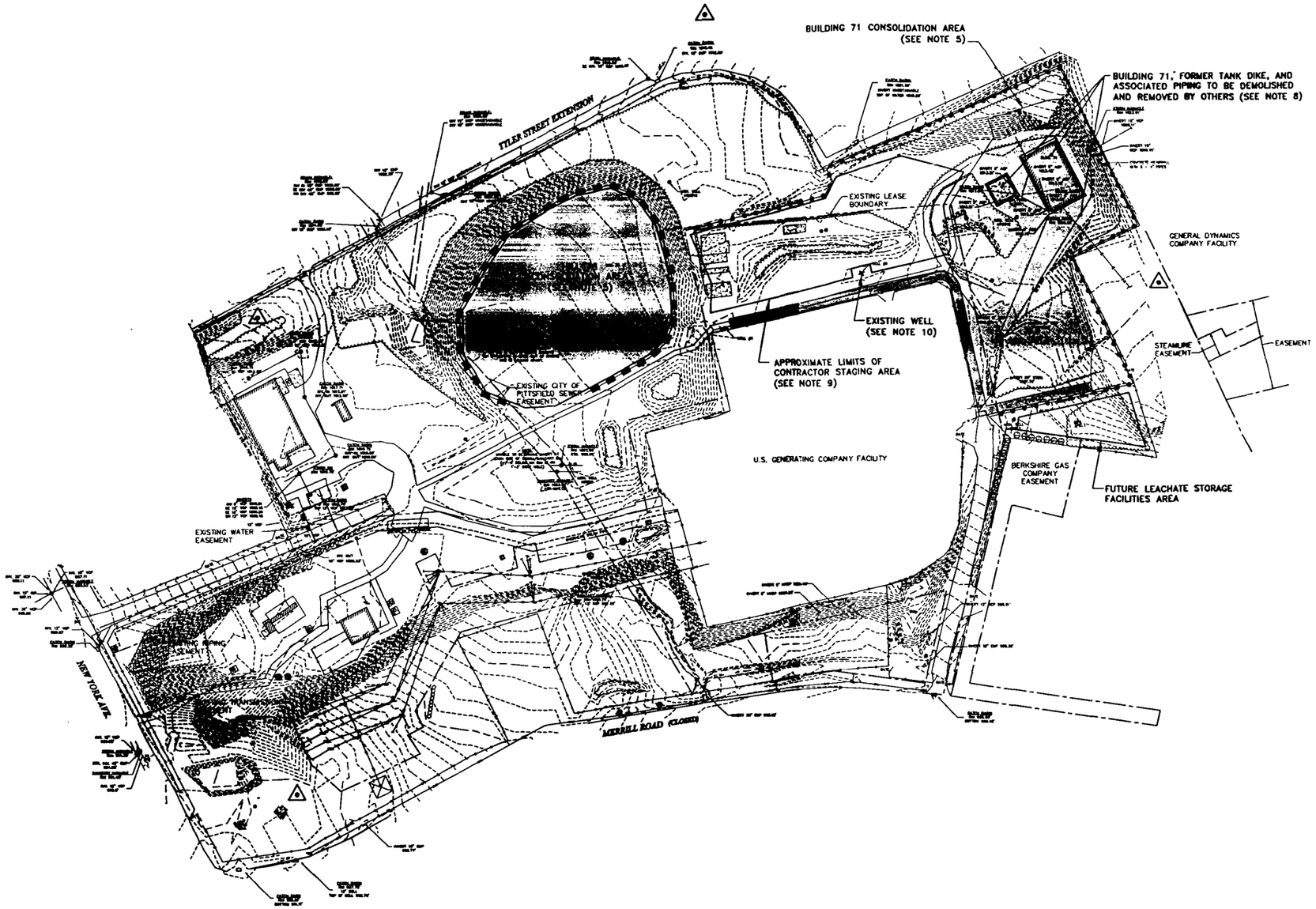

LEGEND

- APPROXIMATE SILT FENCE LOCATION (SEE NOTE 4)
- APPROXIMATE SILT FENCE/STRAW BALE LOCATION (SEE NOTE 4)
- APPROXIMATE CONSOLIDATION AREA (SEE NOTE 5)
- APPROXIMATE AIR MONITORING STATION (SEE NOTE 6)
- 15' WIDE PAVED PERIMETER ACCESS ROAD
- APPROXIMATE LEASE AND EASEMENT LINE LOCATION (SEE NOTE 11)
- INFERRED PROPERTY LINE LOCATION

NOTES:

1. BASE MAP INFORMATION SHOWN ON THIS DRAWING WAS DEVELOPED FROM FIELD SURVEY DATA OBTAINED BY BLASLAND, BOUCK & LEE, INC. ON FEBRUARY 10, 1999. CONDITIONS SHOWN MAY BE APPROXIMATE ONLY DUE TO HEAVY SNOW AND ICE ACCUMULATIONS EXISTING AT THE TIME OF THE SURVEY.
2. REFER TO DRAWING NO. 1 AND 2 FOR ADDITIONAL BASE MAP AND EXISTING UTILITIES INFORMATION.
3. REFER TO DRAWING NO. 4 THROUGH 12 FOR DETAILED CONSTRUCTION INFORMATION.
4. SILT FENCE AND STRAW BALES TO BE INSTALLED PRIOR TO COMENCEMENT OF CONSTRUCTION ACTIVITIES. THE LOCATION OF SILT FENCE AND STRAW BALES SHOWN ON THIS DRAWING MAY BE ADJUSTED AT TIME OF CONSTRUCTION BASED ON SITE CONDITIONS. ADDITIONAL SILT FENCE AND STRAW BALES MAY BE INSTALLED AT THE DESCRETION OF GE.
5. LIMIT OF HILL 78 CONSOLIDATION AREA REPRESENTS APPROXIMATE AREA FOR MATERIAL CONSOLIDATION PLACEMENT. LIMIT OF BUILDING 71 CONSOLIDATION AREA REPRESENTS APPROXIMATE AREA FOR MATERIAL CONSOLIDATION, ACCESS ROADS AND STORMWATER BASIN CONSTRUCTION.
6. AIR MONITORING STATIONS WILL BE INSTALLED (BY OTHERS) PRIOR TO COMENCEMENT OF CONSTRUCTION. THE LOCATION OF AIR MONITORING STATIONS SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY. ACTUAL LOCATIONS TO BE DETERMINED BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
7. EXISTING SANITARY SEWER AND STORMWATER DRAINAGE FEATURES (E.G., DITCHES, PIPES, AND CATCH BASINS) IN THE VICINITY OF THE CONSOLIDATION AREAS, ANCILLARY WORK AREAS, AND VEHICLE ACCESS ROUTES TO BE PROTECTED, AS NECESSARY, AGAINST DAMAGE AND POTENTIAL SOIL/SEDIMENT MIGRATION.
8. BUILDING 71 STRUCTURE AND ADJACENT FORMER TANK DIKE WILL BE DEMOLISHED AND REMOVED BY OTHERS. BUILDING DEBRIS WILL BE RELOCATED TO, AND STOCKPILED WITHIN, AN AREA NEAR THE FUTURE CONSOLIDATION AREA. SUBSURFACE PIPING AND STRUCTURES ASSOCIATED WITH BUILDING 71 WILL BE REMOVED OR ABANDONED IN-PLACE (BY OTHERS).
9. IF NECESSARY, MATERIALS CURRENTLY BEING STORED WITHIN THE DESIGNATED STAGING AREA WILL BE REMOVED BY OTHERS.
10. WELL #6 TO BE PROTECTED FROM DAMAGE THROUGHOUT PERFORMANCE OF SITE ACTIVITIES.
11. CONTRACTOR SHALL CLEAR ONLY THOSE AREAS NECESSARY FOR ITS OPERATIONS. TO THE EXTENT POSSIBLE, EXISTING VEGETATION SHALL REMAIN UNDISTURBED.
12. LEASE AND EASEMENT LINE LOCATIONS SHOWN ON THIS DRAWING DIGITIZED FROM PLAN PREPARED BY DESIGN GROUP, INC. ENTITLED "PLAN OF LAND SURVEYED FOR GENERAL ELECTRIC COMPANY", DATED FEBRUARY 18, 1993 (PROJECT NO. 930004) AND ARE APPROXIMATE ONLY.
13. MONITORING WELLS WITHIN LIMITS OF BUILDING 71 CONSOLIDATION AREA CONSTRUCTION WILL BE ABANDONED BY GE.

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Graphic Scale
100' 0 100' 200'

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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SITE DEVELOPMENT PLAN

GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

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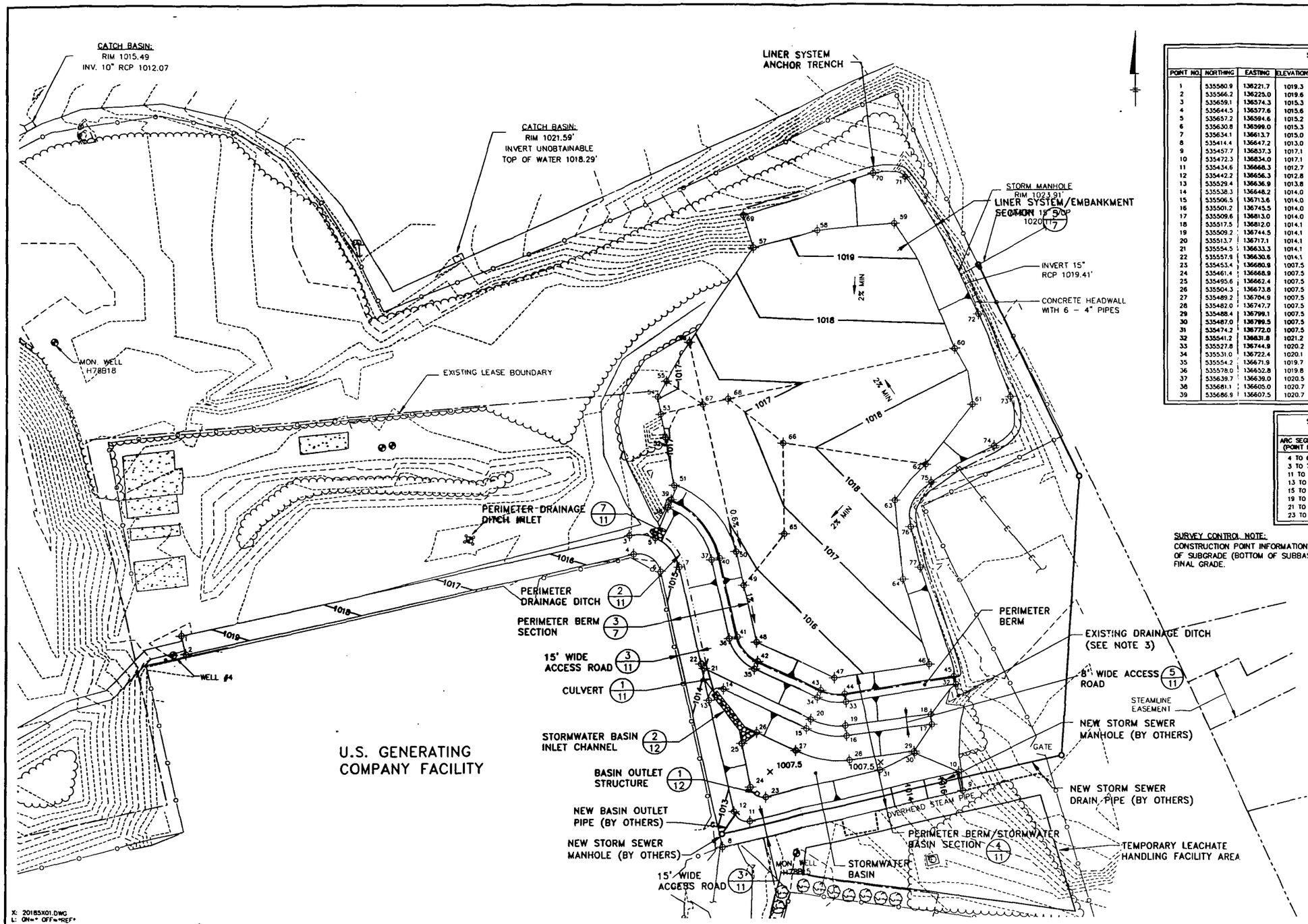

SURVEY CONTROL INFORMATION CONSTRUCTION POINTS									
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	535580.9	136221.7	1019.3	ROAD EDGE	40	535641.1	136645.3	1020.4	BERM CREST
2	535566.2	136225.0	1019.6	ROAD EDGE	41	535579.3	136659.0	1019.8	BERM CREST
3	535659.1	136574.3	1015.3	ROAD EDGE	42	535560.1	136674.5	1019.7	BERM CREST
4	535644.5	136577.6	1015.6	ROAD EDGE	43	535536.8	136725.1	1020.1	BERM CREST
5	535657.2	136594.6	1015.2	ROAD EDGE	44	535534.1	136743.9	1020.2	BERM CREST
6	535630.8	136599.0	1015.3	ROAD EDGE	45	535547.5	136830.1	1021.1	BERM CREST
7	535634.1	136613.7	1015.0	ROAD EDGE	46	535557.0	136810.7	1016.8	BERM TOE
8	535414.4	136847.2	1013.0	ROAD EDGE	47	535546.7	136735.8	1015.6	BERM TOE
9	535457.7	136837.3	1017.1	ROAD EDGE	48	535575.3	136673.8	1015.2	BERM TOE
10	535472.3	136834.0	1017.1	ROAD EDGE	49	535619.9	136663.9	1015.7	BERM TOE
11	535434.6	136868.3	1012.7	ROAD EDGE	50	535646.3	136658.0	1016.0	BERM TOE
12	535442.2	136856.3	1012.8	ROAD EDGE	51	535698.2	136609.5	1016.9	BERM TOE
13	535529.4	136636.9	1013.8	ROAD EDGE	52	535735.8	136602.4	1017.1	TEMP EDGE
14	535538.3	136648.2	1014.0	ROAD EDGE	53	535754.1	136599.0	1016.8	TEMP EDGE
15	535506.5	136713.6	1014.0	ROAD EDGE	54	535767.8	136596.5	1017.0	TEMP EDGE
16	535501.2	136745.5	1014.0	ROAD EDGE	55	535780.0	136603.5	1017.2	TEMP EDGE
17	535509.6	136813.0	1014.0	ROAD EDGE	56	535810.3	136621.6	1016.8	TEMP EDGE
18	535517.5	136812.0	1014.1	ROAD EDGE	57	535885.3	136671.3	1018.4	EMBANK CREST
19	535509.2	136744.5	1014.1	ROAD EDGE	58	535899.0	136722.2	1019.4	EMBANK CREST
20	535513.7	136717.1	1014.1	ROAD EDGE	59	535904.0	136783.2	1019.6	EMBANK CREST
21	535554.5	136633.3	1014.1	ROAD EDGE	60	535805.6	136830.9	1017.6	EMBANK CREST
22	535557.9	136630.6	1014.1	ROAD EDGE	61	535761.5	136845.0	1018.5	EMBANK CREST
23	535543.4	136680.8	1007.5	BERM TOE	62	535714.2	136807.8	1019.0	EMBANK CREST
24	535461.4	136668.9	1007.5	BERM TOE	63	535686.3	136783.7	1018.3	EMBANK CREST
25	535495.6	136662.4	1007.5	BERM TOE	64	535624.1	136790.2	1017.5	EMBANK CREST
26	535504.3	136673.8	1007.5	BERM TOE	65	535660.2	136695.9	1016.7	FLOOR
27	535489.2	136704.9	1007.5	BERM TOE	66	535731.4	136694.6	1017.7	FLOOR
28	535482.0	136747.7	1007.5	BERM TOE	67	535761.5	136632.4	1016.6	FLOOR
29	535488.4	136799.1	1007.5	BERM TOE	68	535765.9	136652.0	1016.7	FLOOR
30	535487.0	136799.5	1007.5	BERM TOE	69	535810.8	136663.4	1017.1	EMBANK CREST
31	535474.2	136772.0	1007.5	BERM TOE	70	535943.3	136766.7	1030.7	EMBANK CREST
32	535541.2	136831.8	1021.2	BERM CREST	71	535940.6	136791.9	1030.4	EMBANK CREST
33	535527.8	136744.9	1020.2	BERM CREST	72	535832.9	136849.7	1026.4	EMBANK CREST
34	535531.0	136722.4	1020.1	BERM CREST	73	535767.5	136874.7	1024.5	EMBANK CREST
35	535554.2	136671.9	1019.7	BERM CREST	74	535728.9	136861.8	1024.3	EMBANK CREST
36	535578.0	136652.8	1019.8	BERM CREST	75	535700.2	136812.2	1022.0	EMBANK CREST
37	535639.7	136639.0	1020.5	BERM CREST	76	535665.2	136796.4	1021.3	EMBANK CREST
38	535681.1	136605.0	1020.7	BERM CREST	77	535633.4	136803.7	1022.1	EMBANK CREST
39	535686.9	136607.5	1020.7	BERM CREST					

SURVEY CONTROL INFORMATION CONSTRUCTION RADIUS			
ARC SEGMENT (POINT NO.)	RADIUS (FT.)	ARC SEGMENT (POINT NO.)	RADIUS (FT.)
4 TO 6	18	25 TO 26	8
3 TO 7	33	27 TO 28	76.4
11 TO 12	10	33 TO 34	39.4
13 TO 14	8	35 TO 36	34.4
15 TO 16	57	37 TO 38	59
19 TO 20	49	39 TO 40	65.4
21 TO 22	5	41 TO 42	28
23 TO 24	10	43 TO 44	33

SURVEY CONTROL NOTE:
CONSTRUCTION POINT INFORMATION FOR BERM CREST, BERM TOE AND CENTER FLOOR REPRESENT TOP OF SUBGRADE (BOTTOM OF SUBBASE LAYER). ALL OTHER PROPOSED GRADES/ELEVATIONS REPRESENT FINAL GRADE.

LEGEND

- 1018 — PROPOSED CONTOUR LINE
- × 1018.2 SPOT ELEVATION
- CHANGE-IN-GRADE
- PERIMETER DRAINAGE DITCH
- (1/8) DETAIL REFERENCE NUMBER
- DRAWING REFERENCE NUMBER
- ⌖4 CONSTRUCTION SURVEY CONTROL POINT (SEE TABLE THIS DRAWING)

NOTES:

1. REFER TO DRAWING NOs. 1 AND 2 FOR ADDITONAL BASE MAP AND UTILITY INFORMATION.
2. PROPOSED GRADES/ELEVATIONS SHOWN WITHIN INBOARD CREST OF BERMS AND EMBANKMENT REPRESENT TOP OF SUBGRADE (BOTTOM OF SUBBASE LAYER OR GEOTEXTILE). ALL OTHER PROPOSED GRADES/ELEVATIONS REPRESENT FINAL GRADE.
3. EXISTING DRAINAGE DITCH TO BE EXTENDED TO FLOOR OF STORMWATER BASIN. NEWLY GRADED DITCH SHALL BE LINED WITH RIPRAP WHICH IS TO BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE.

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Graphic Scale
40' 0 40' 80'

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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

SUBGRADE PLAN

GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

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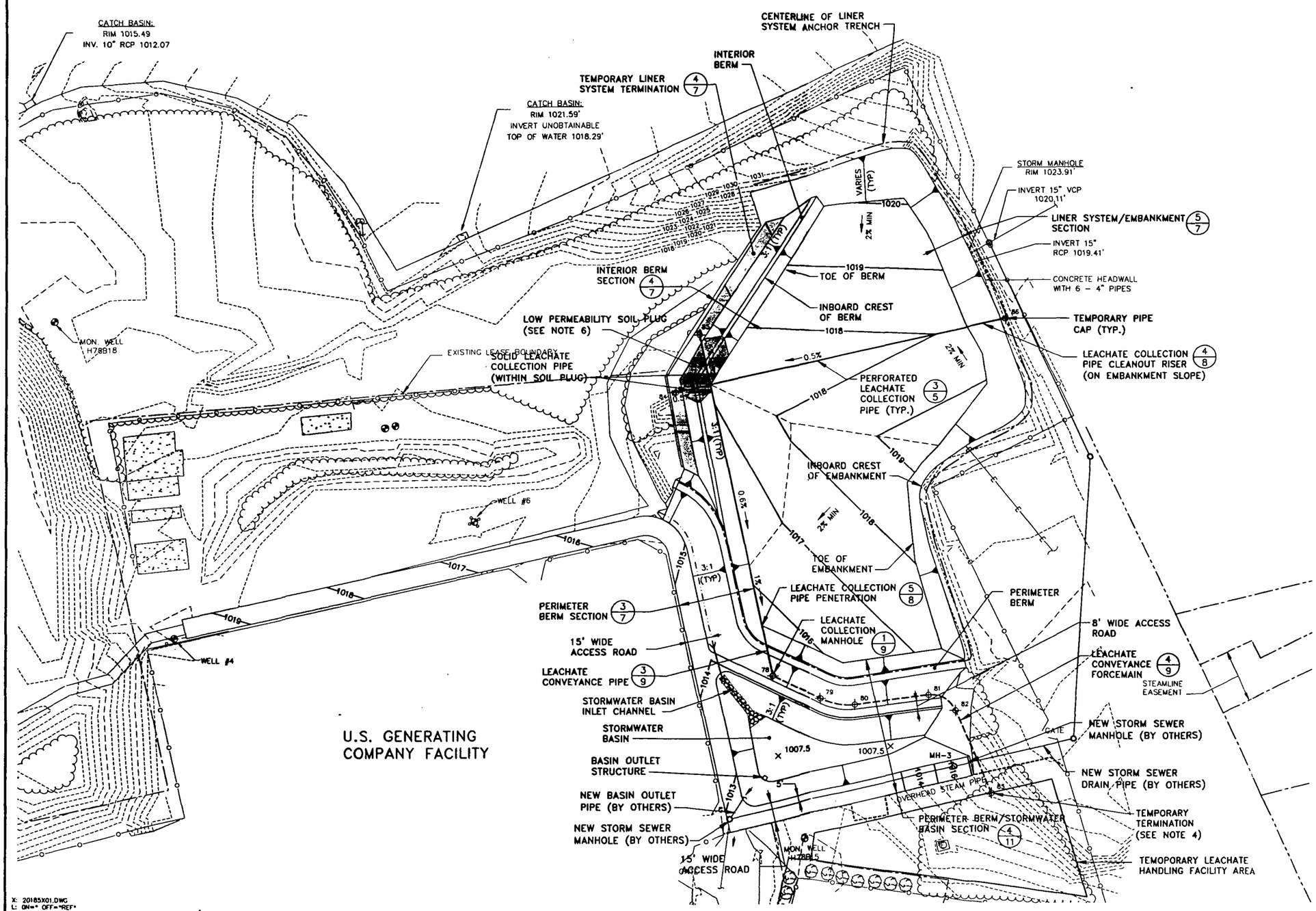

SURVEY CONTROL INFORMATION CONSTRUCTION POINTS				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
78	535535.6	136680.4	-	MANHOLE
79	535517.3	136718.0	-	FORCE MAIN
80	535512.8	136744.9	-	FORCE MAIN
81	535519.9	136802.4	-	FORCE MAIN
82	535508.1	136823.2	-	FORCE MAIN
83	535443.7	136851.2	-	FORCE MAIN
84	535755.5	136605.3	-	PIPE END
85	535800.5	136623.8	-	PIPE END
86	535812.6	136862.6	-	PIPE END

SURVEY CONTROL INFORMATION CONSTRUCTION RADIUS	
ARC SEGMENT (POINT NO.)	RADIUS (FT.)
78 TO 79	48
81 TO 82	20

SURVEY CONTROL NOTES:

1. REFER TO DETAILS ON DRAWING NO. 8 TO DETERMINE ELEVATIONS FOR LEACHATE COLLECTION PIPES.
2. REFER TO DETAILS ON DRAWING NO. 7 TO DETERMINE LOCATION FOR LINER SYSTEM ANCHOR TRENCH.

LEGEND

- 1019 — PROPOSED CONTOUR LINE
- × 1018.2 — SPOT ELEVATION
- CHANGE-IN-GRADE
- PERIMETER DRAINAGE DITCH
- CULVERT
- 1/8 — DETAIL REFERENCE NUMBER / DRAWING REFERENCE NUMBER
- ⌖4 — CONSTRUCTION SURVEY CONTROL POINT (SEE TABLE THIS DRAWING)

NOTES:

1. REFER TO DRAWINGS NO. 1 AND 2 FOR ADDITONAL BASE MAP AND EXISTING UTILITIES INFORMATION.
2. REFER TO DRAWING NO. 4 FOR ADDITIONAL CONSTRUCTION INFORMATION.
3. PROPOSED GRADES/ELEVATIONS SHOWN WITHIN INBOARD CREST OF BERMS AND EMBANKMENT REPRESENT TOP OF LINER SYSTEM (TOP OF GEOSYNTHETIC DRAINAGE COMPOSITE). ALL OTHER PROPOSED GRADES/ELEVATIONS REPRESENT FINAL GRADE.
4. LEACHATE CONVEYANCE FORCE MAIN TO BE TERMINATED WITH WATERTIGHT END CAP. POINT OF TERMINATION SHALL BE CLEARLY MARKED FOR FUTURE TIE-IN. CONTRACTOR TO COORDINATE WITH GE ON APPROPRIATE MARKER TYPE.
5. CONTRACTOR SHALL PROVIDE AND OPERATE TWO SUBMERSIBLE PUMPS, THE REQUIRED FOOTAGE OF HOSE (INCLUDING BACKUP HOSE), AND TWO MOBILE LEACHATE STORAGE TANKS AS PART OF ITS CONSOLIDATION AREA OPERATIONS. CONTRACTOR WILL BE RESPONSIBLE FOR TRANSPORTING LEACHATE TO GE TREATMENT FACILITY FOR TREATMENT BY GE.
6. INTERRIOR BERM SHALL BE CONSTRUCTED WITH A VALLEY TO ALLOW FOR PLACEMENT OF THE LEACHATE COLLECTION PIPE ABOVE THE BASE LINER SYSTEM. LOW PERMEABILITY SOIL WILL BE PLACED WITHIN THE BERM VALLEY AS SHOWN.

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Graphic Scale: 40' 0 40' 80'

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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

TOP OF LINER AND LEACHATE COLLECTION SYSTEM PLAN

GENERAL

File Number 201.85.XXF
Date JUNE 1999

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

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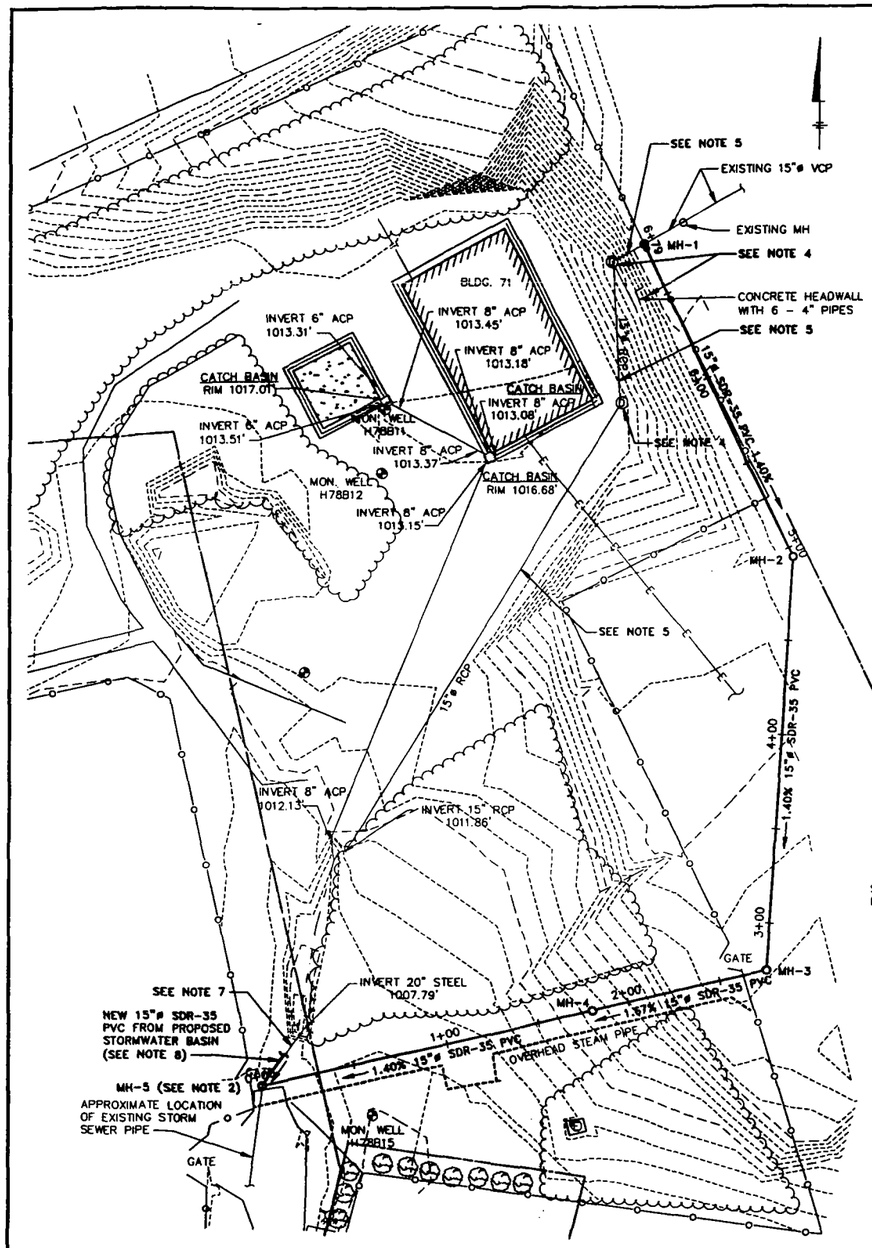
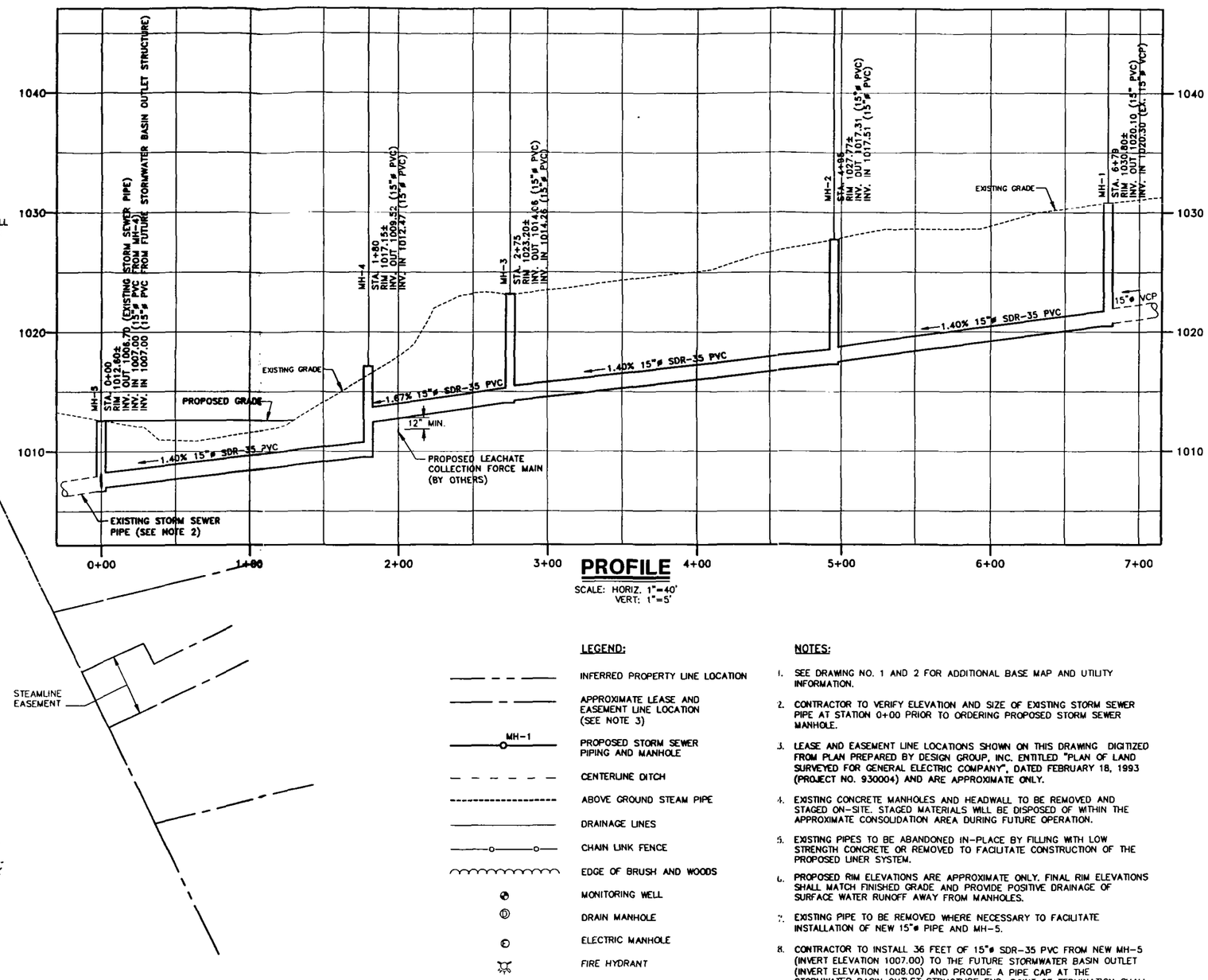


PLAN

SCALE: 1"=40'



PROFILE

SCALE: HORIZ. 1"=40'
VERT: 1"=5'

LEGEND:

- INFERRED PROPERTY LINE LOCATION
- APPROXIMATE LEASE AND EASEMENT LINE LOCATION (SEE NOTE 3)
- MH-1 — PROPOSED STORM SEWER PIPING AND MANHOLE
- CENTERLINE DITCH
- ABOVE GROUND STEAM PIPE
- DRAINAGE LINES
- CHAIN LINK FENCE
- EDGE OF BRUSH AND WOODS
- MONITORING WELL
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- FIRE HYDRANT

NOTES:

1. SEE DRAWING NO. 1 AND 2 FOR ADDITIONAL BASE MAP AND UTILITY INFORMATION.
2. CONTRACTOR TO VERIFY ELEVATION AND SIZE OF EXISTING STORM SEWER PIPE AT STATION 0+00 PRIOR TO ORDERING PROPOSED STORM SEWER MANHOLE.
3. LEASE AND EASEMENT LINE LOCATIONS SHOWN ON THIS DRAWING DIGITIZED FROM PLAN PREPARED BY DESIGN GROUP, INC. ENTITLED "PLAN OF LAND SURVEYED FOR GENERAL ELECTRIC COMPANY", DATED FEBRUARY 18, 1993 (PROJECT NO. 930004) AND ARE APPROXIMATE ONLY.
4. EXISTING CONCRETE MANHOLES AND HEADWALL TO BE REMOVED AND STAGED ON-SITE. STAGED MATERIALS WILL BE DISPOSED OF WITHIN THE APPROXIMATE CONSOLIDATION AREA DURING FUTURE OPERATION.
5. EXISTING PIPES TO BE ABANDONED IN-PLACE BY FILLING WITH LOW STRENGTH CONCRETE OR REMOVED TO FACILITATE CONSTRUCTION OF THE PROPOSED LINER SYSTEM.
6. PROPOSED RIM ELEVATIONS ARE APPROXIMATE ONLY. FINAL RIM ELEVATIONS SHALL MATCH FINISHED GRADE AND PROVIDE POSITIVE DRAINAGE OF SURFACE WATER RUNOFF AWAY FROM MANHOLES.
7. EXISTING PIPE TO BE REMOVED WHERE NECESSARY TO FACILITATE INSTALLATION OF NEW 15"ø PIPE AND MH-5.
8. CONTRACTOR TO INSTALL 36 FEET OF 15"ø SDR-35 PVC FROM NEW MH-5 (INVERT ELEVATION 1007.00) TO THE FUTURE STORMWATER BASIN OUTLET (INVERT ELEVATION 1008.00) AND PROVIDE A PIPE CAP AT THE STORMWATER BASIN OUTLET STRUCTURE END. POINT OF TERMINATION SHALL BE CLEARLY MARKED FOR FUTURE TIE-IN. CONTRACTOR TO COORDINATE WITH GE ON APPROPRIATE MARKER TYPE.

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Graphic Scale
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5' 0 5' 10'

No.	Date	Revisions	Init

Project Mgr. _____
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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

STORM SEWER RELOCATION PLAN AND PROFILE

GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

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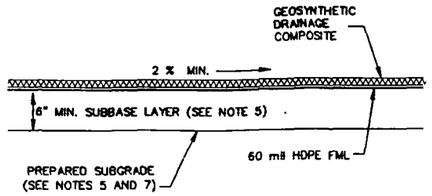
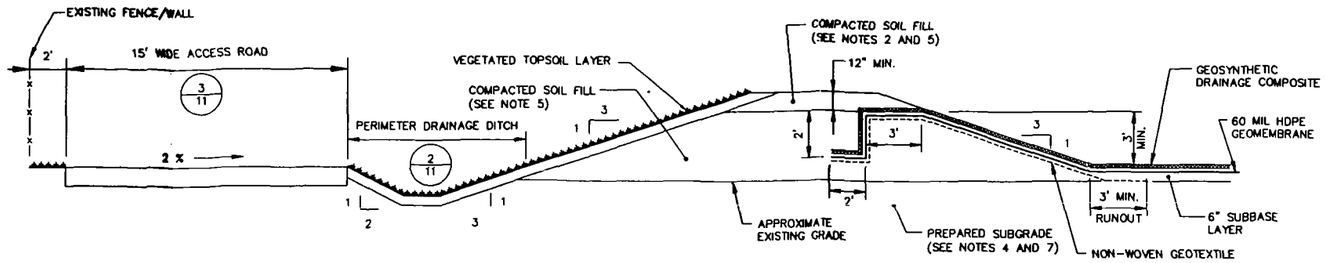


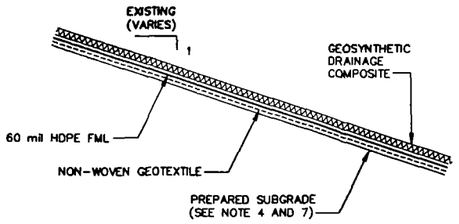
BASE LINER SYSTEM (1)

SCALE: 1"=1'



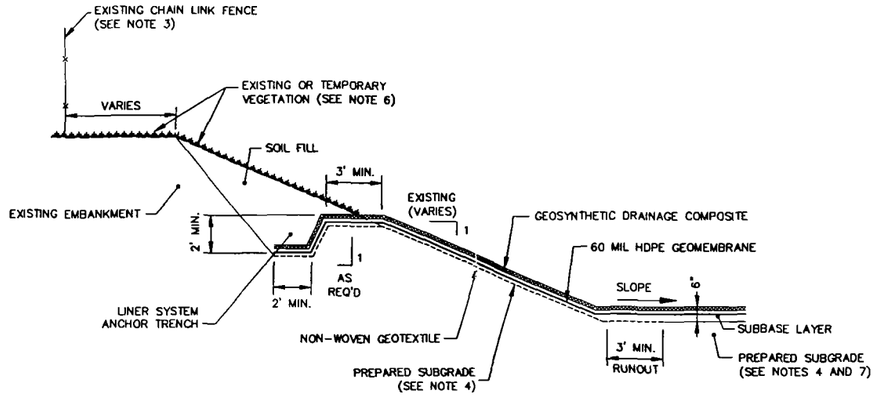
TYPICAL LINER SYSTEM/PERIMETER BERM DETAIL (3)

SCALE: 1"=4'



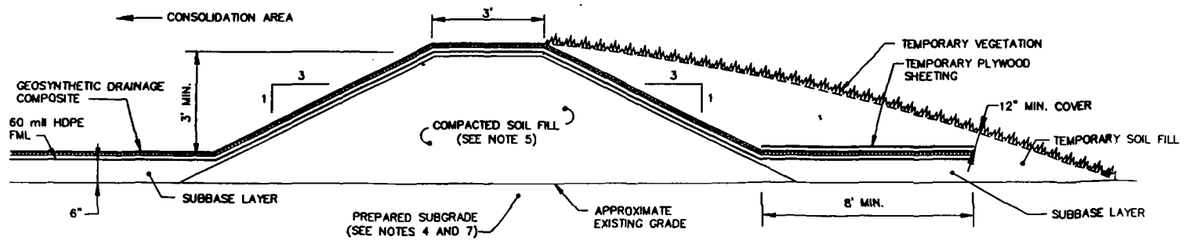
EMBANKMENT LINER SYSTEM (2)

NOT TO SCALE



TYPICAL LINER SYSTEM/EMBANKMENT DETAIL (5)

SCALE: 1"=4'



INTERIOR BERM DETAIL (4)

SCALE: 1"=2'

NOTES:

1. GEOSYNTHETIC MATERIALS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. A MINIMUM OF 12-INCHES OF PROTECTIVE SOIL MATERIAL MUST BE PLACED ABOVE ANCHOR TRENCH RUNOUT.
3. EXISTING CHAIN LINK FENCE TO BE REMOVED WHERE NECESSARY TO FACILITATE CONSTRUCTION OF LINER SYSTEM.
4. AREAS DESIGNATED FOR LINER AND BERM CONSTRUCTION SHALL BE CLEARED OF ALL DELETERIOUS MATERIAL (I.E. VEGETATION, STONES, CONCRETE, PIPES, MANHOLES, ETC.) AND REGRADED AND/OR FILLED AS NECESSARY WITH SUBBASE LINER MATERIAL, TO PROVIDE A FIRM, UNIFORM SOIL SURFACE FREE FROM PROTRUDING OBJECTS.
5. SOIL FILL MATERIAL USED FOR SUBBASE LAYER AND BERM CONSTRUCTION SHALL PROVIDE A FIRM, UNIFORM SOIL SURFACE FREE FROM STONES OR OTHER PROTRUDING OBJECTS.
6. EXISTING VEGETATION DISTURBED/REMOVED AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE REPLACED IMMEDIATELY FOLLOWING COMPLETION OF FINAL GRADING.
7. EXISTING SUBGRADE TO BE REGRADED AND/OR FILLED AS NECESSARY, TO ACHIEVE THE PROPOSED LINES AND GRADES SHOWN ON DRAWING NO. 4.

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P: STD-PCP/DL
6/10/99 SYR 54-NES KLN GMS
20185003/WORKPLAN/20185G13.DWG

NOT FOR CONSTRUCTION

Graphic Scale
2' 0 2' 4'
1"=2'
4' 0 4' 8'
1"=4'

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

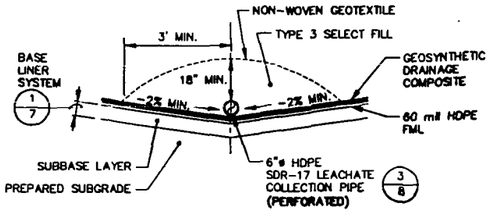
LINER SYSTEM DETAILS

GENERAL

File Number 201.85.XXF
Date JUNE 1999

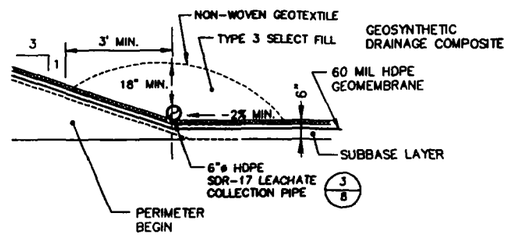
Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

A-7



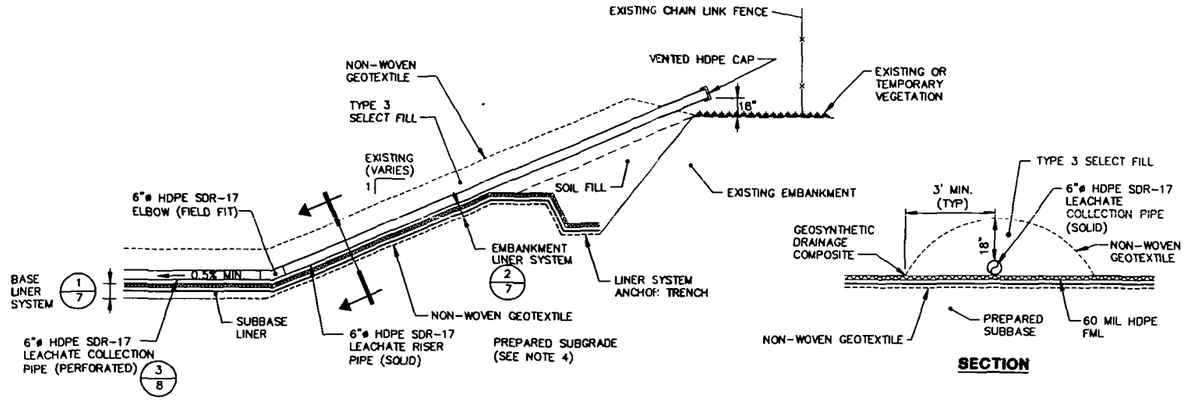
LEACHATE COLLECTION PIPE/ LINER SYSTEM DETAIL-1 (1)

NOT TO SCALE



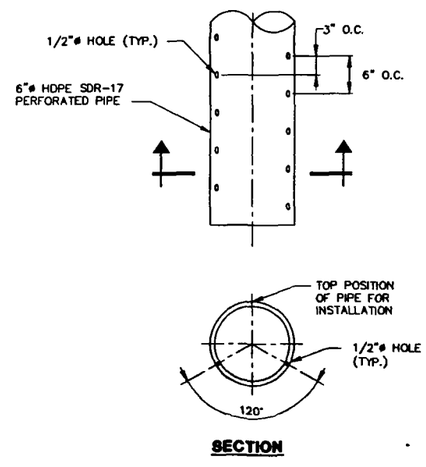
LEACHATE COLLECTION PIPE/ LINER SYSTEM DETAIL-2 (2)

NOT TO SCALE



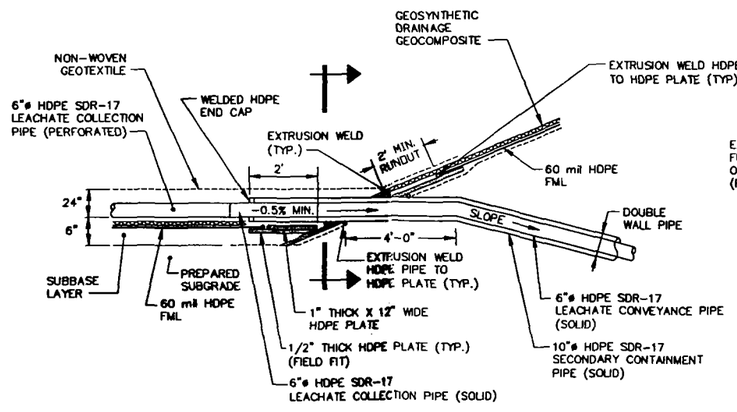
LEACHATE COLLECTION PIPE CLEANOUT RISER DETAIL (4)

NOT TO SCALE



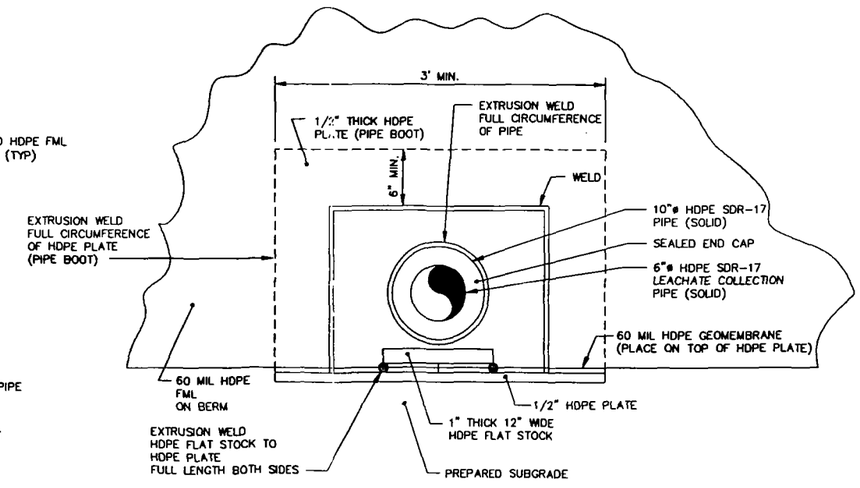
LEACHATE COLLECTION PIPE DETAIL (3)

NOT TO SCALE



LEACHATE COLLECTION PIPE PENETRATION DETAIL (5)

NOT TO SCALE



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100' 0 100' 200'					Project Mgr.
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DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

LEACHATE COLLECTION SYSTEM DETAILS

GENERAL

File Number 201.85.XXF
Date JUNE 1999

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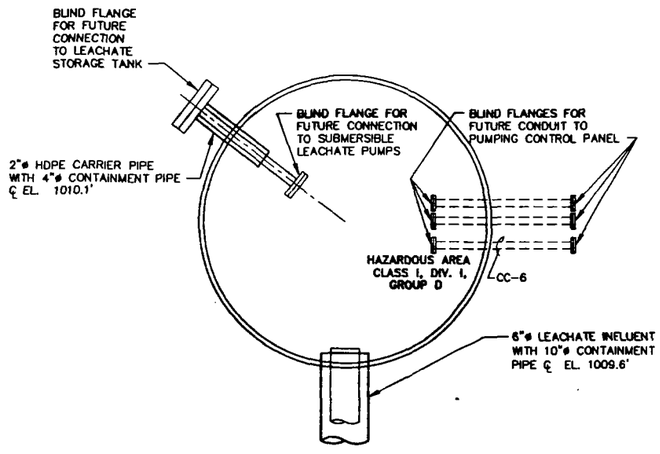
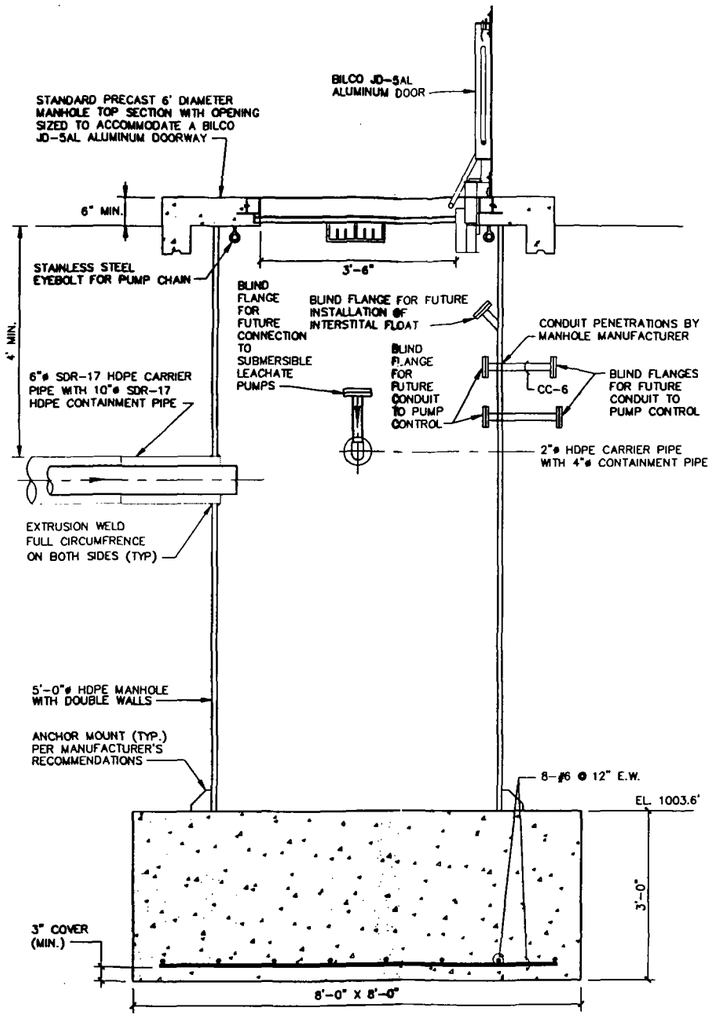


LEACHATE COLLECTION MANHOLE PLAN (1)

SCALE: 3/4"=1'-0"

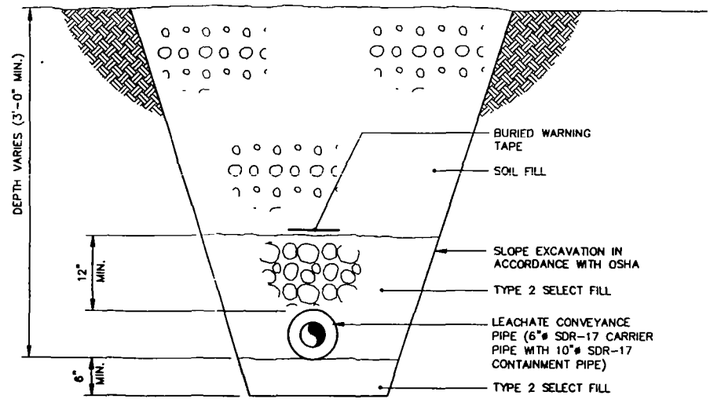


NOTES:

1. ATTACH MANHOLE TO CONCRETE BASE PER MANUFACTURER'S SPECIFICATIONS.
2. SECTION VIEW DOES NOT REFLECT ORIENTATION. SEE PLAN VIEW FOR ORIENTATION.
3. BACKFILL AROUND MANHOLE AND BELOW CONCRETE BASE WITH 18" MIN. OF TYPE 2 SELECT FILL. COMPACT 18" BELOW CONCRETE BASE AND CONCRETE MANHOLE TOP TO MIN. 92% MODIFIED PROCTOR DENSITY.

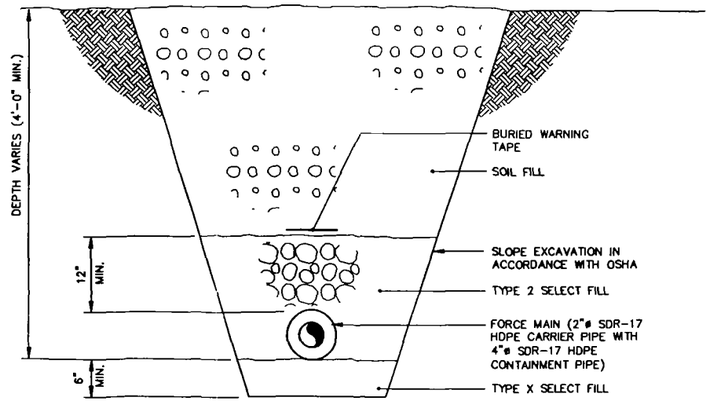
LEACHATE COLLECTION MANHOLE SECTION (2)

SCALE: 3/4"=1'-0"



LEACHATE CONVEYANCE PIPE TRENCH DETAIL (3)

NOT TO SCALE



LEACHATE FORCE MAIN TRENCH DETAIL (4)

NOT TO SCALE

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Graphic Scale
3/4"=1'-0" (2' 1' 0 1' 2')

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DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

LEACHATE COLLECTION MANHOLE DETAILS

GENERAL

File Number 201.85.XXF
Date JUNE 1999

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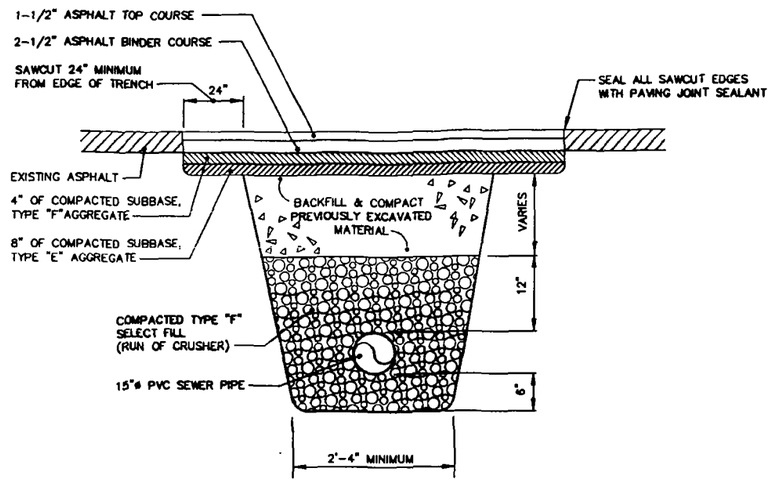
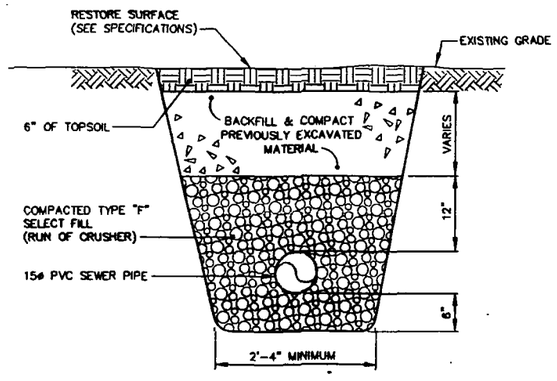


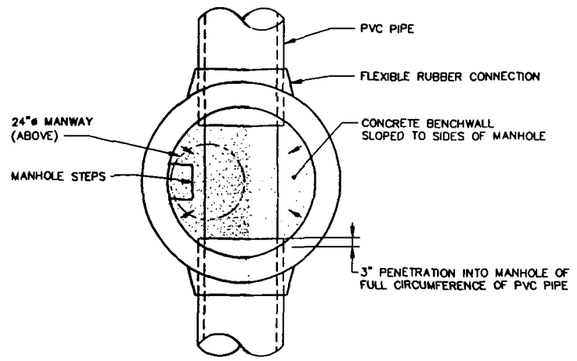
PIPE TRENCH DETAIL FOR PAVED AREAS (1)

NOT TO SCALE



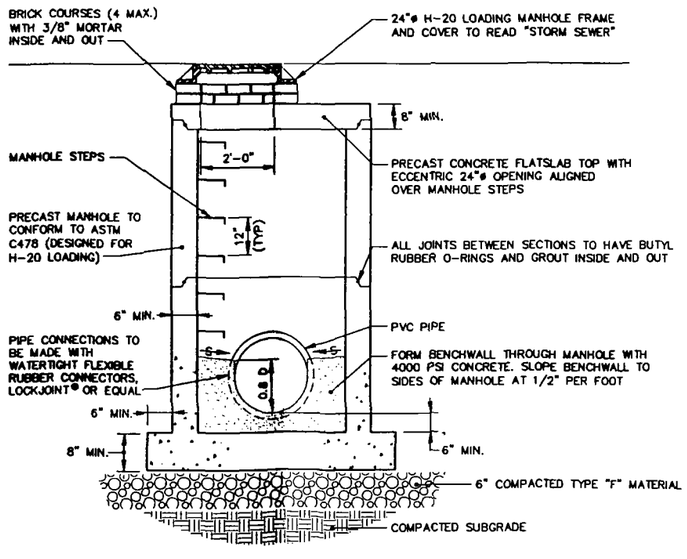
PIPE TRENCH DETAIL FOR NON-PAVED AREAS (2)

NOT TO SCALE



PRECAST CONCRETE MANHOLE PLAN (3)

NOT TO SCALE



PRECAST CONCRETE MANHOLE SECTION (4)

NOT TO SCALE

PRECAST CONCRETE MANHOLE SCHEDULE

MANHOLE NUMBER	MANHOLE INSIDE DIAMETER	RIM ELEVATION	INLET INVERT ELEVATION	DISCHARGE INVERT ELEVATION	LATERAL INVERT ELEVATION
1	4'-0"	1030.80'±	1020.30	1020.10	--
2	4'-0"	1027.77'±	1017.51	1017.31	--
3	4'-0"	1023.20'±	1014.26	1014.06	--
4	4'-0"	1017.15'±	1012.47	1009.52	--
5	5'-0"	1012.60'±	1007.00	1006.70	1007.00

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20185003/WORKPLAN/20185G12.DWG

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DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

STORM SEWER RELOCATION DETAILS

GENERAL

File Number 201.85.XXF
Date JUNE 1999

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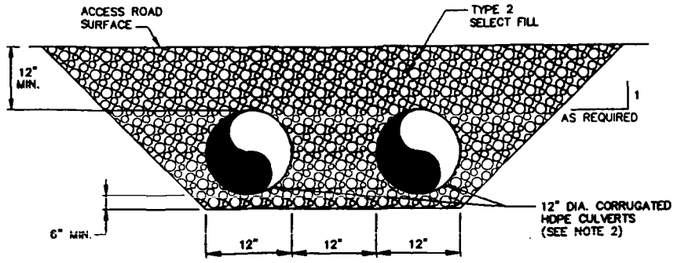
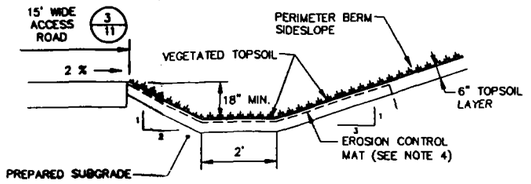


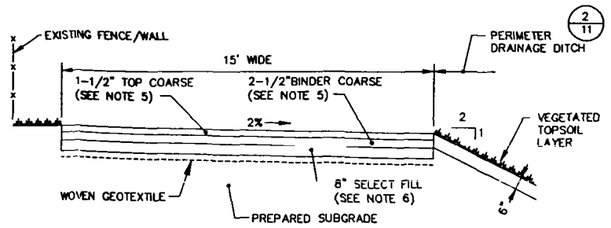
TYPICAL CULVERT SECTION (1)

NOT TO SCALE



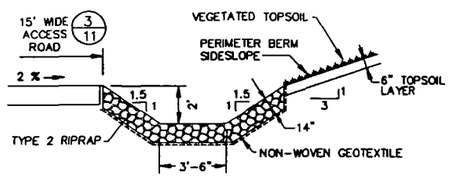
PERIMETER DRAINAGE DITCH DETAIL (2)

SCALE: 1"=3'

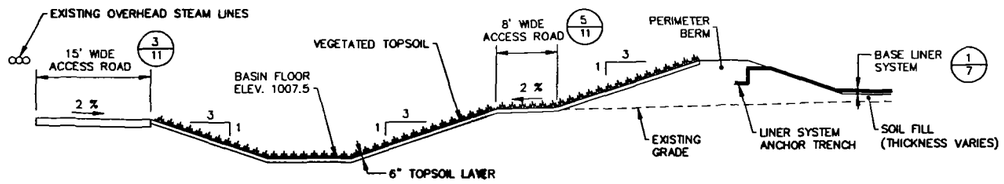


15' WIDE ACCESS ROAD DETAIL (3)

SCALE: 1"=3'

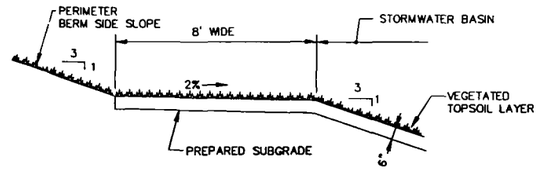


SECTION



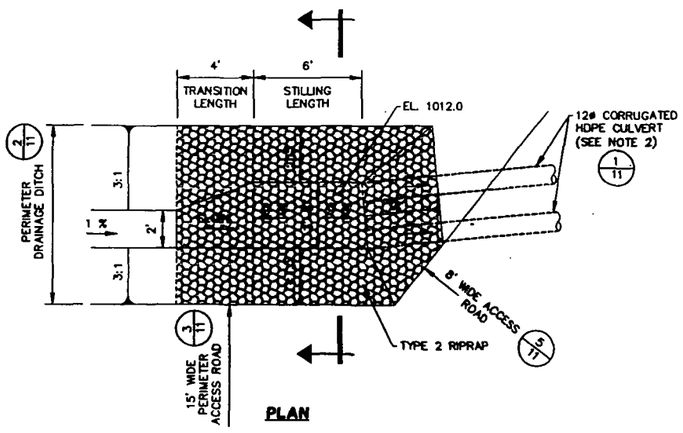
PERIMETER BERM/STORMWATER BASIN SECTION (4)

SCALE: 1"=10'

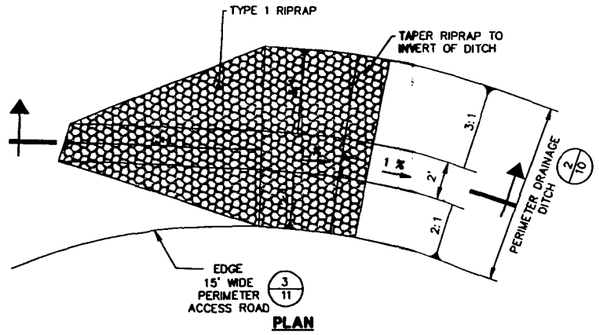


8' WIDE ACCESS ROAD DETAIL (5)

SCALE: 1"=3'



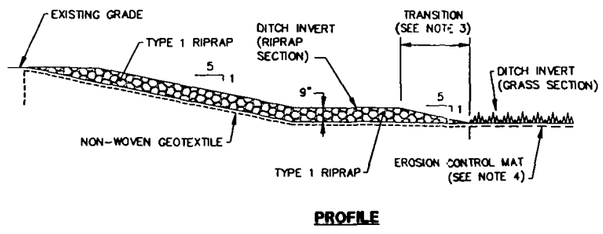
PLAN



PLAN

CULVERT INLET (6)

SCALE: 1"=4'



PROFILE

PERIMETER DRAINAGE DITCH INLET DETAIL (7)

SCALE: 1"=4'

NOTES:

1. GEOSYNTHETICS MATERIALS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. CORRUGATED HDPE CULVERTS AND COUPLINGS SHALL BE ADS N-12 OR EQUAL.
3. RIPRAP WITHIN DITCH TRANSITION LENGTH SHALL BE SORTED AND GRADED TO PROVIDE FOR MAXIMUM FLOW DISTRIBUTION AND VELOCITY DISSIPATION.
4. EROSION CONTROL MAT SHALL BE NORTH AMERICAN GREEN SC150 OR EQUAL INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
5. TOP COARSE AND BINDER COARSE SHALL BE CLASS I BITUMOUS CONCRETE, M3.11.00, OR EQUAL.
6. SELECT FILL SHALL BE DENSE GRADED CRUSHED STONE FOR SUB-BASE, M2.01.7, OR EQUAL.

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Graphic Scale
3' 0 3' 6'
1"=3'
4' 0 4' 8'
1"=4'

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DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

DRAINAGE DETAILS

GENERAL

File Number 201.85.XXF
Date JUNE 1999

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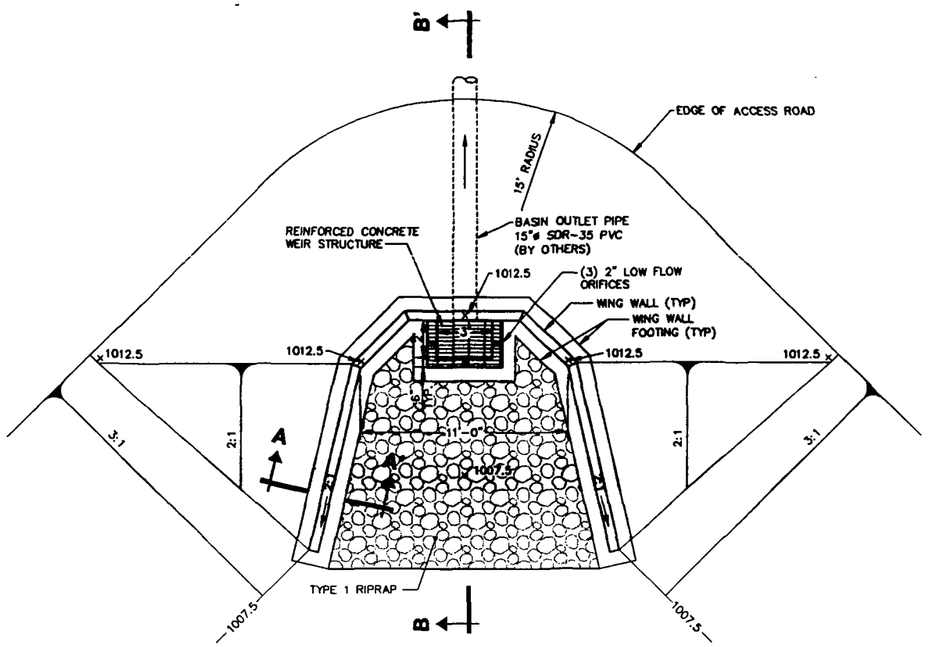
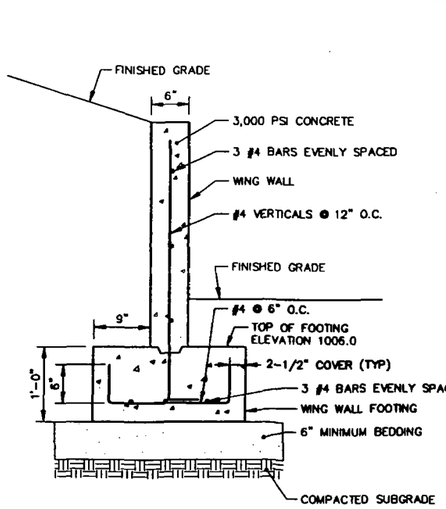


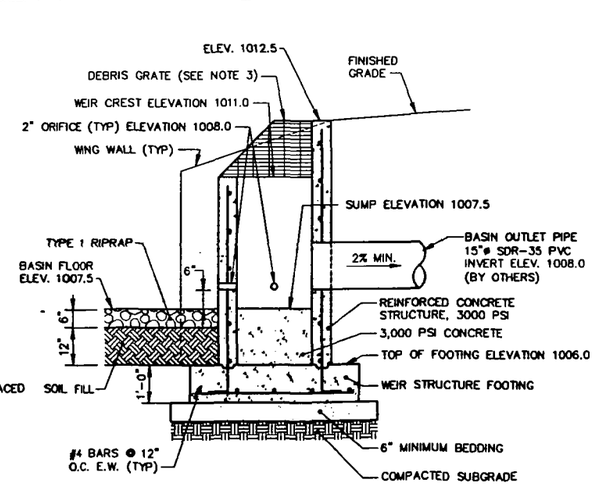
BASIN OUTLET STRUCTURE (1)

SCALE: 1"=4'



SECTION A-A'

N.T.S.



SECTION B-B'

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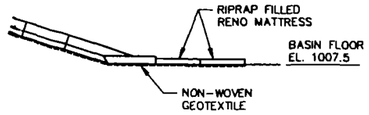
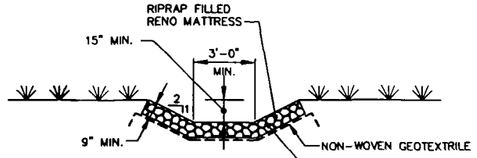


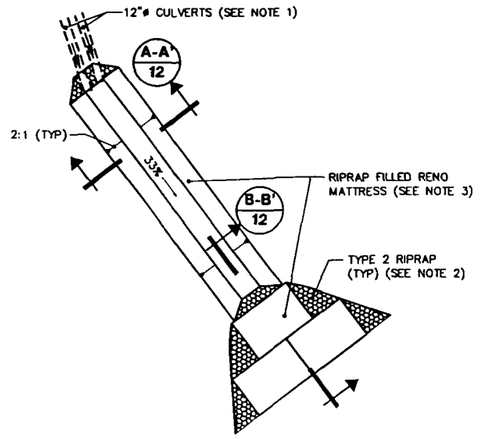
SECTION B-B'

N.T.S.



SECTION A-A'

N.T.S.



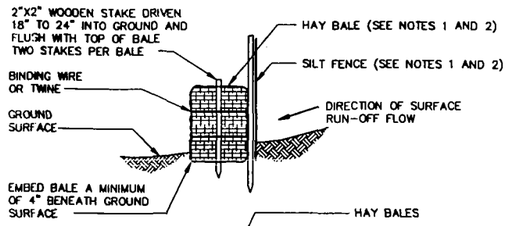
PLAN

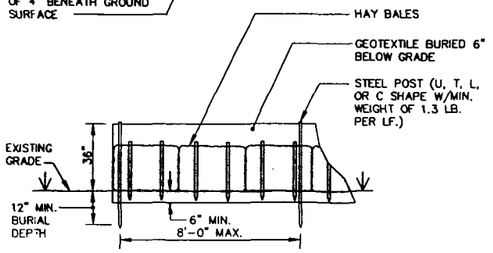
NOTES:

1. CULVERTS SHALL BE ADS N-12 CORRUGATED HDPE SMOOTH INTERIOR PIPE OR EQUIVALANT.
2. TYPE 2 RIPRAP SHALL BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE.
3. RENO MATTRESS SHALL BE 6' WIDE X 9' LONG X 9" THICK OR OTHER SUITABLE SIZE. FOR SIZE INDICATED, MATTRESS SHALL BE PLACED WITH LONG DIMENSION POSITIONED ACCROSS THE SLOPE.

STORMWATER BASIN INLET CHANNEL (2)

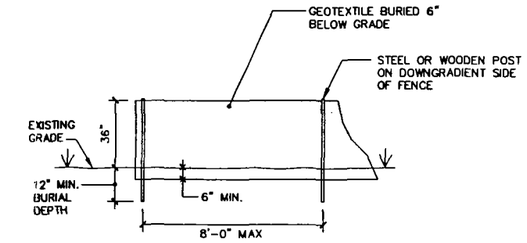
N.T.S.





HAY BALE/SILT FENCE (3)

NOT TO SCALE



SILT FENCE (4)

NOT TO SCALE

NOTES:

1. HAY BALES AND SILT FENCING WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY G.E.
2. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE HAY BALES/SILT FENCING AS LONG AS THEY ARE NECESSARY.
3. DEBRIS GRATE SHALL CONSIST OF #6 REBARS BENT TO REQUIRED SHAPE AND TACK WELDED TO A STEEL FRAME WHICH IS TO BE AT 6" O.C. EACH WAY. DEBRIS GRATE REBARS SHALL BE FIRMLY SECURED TO CONCRETE WEIR STRUCTURE AND BE REMOVABLE FOR CLEANOUT PURPOSES.

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DETAILED WORK PLAN FOR ON-PLANT CONSOLIDATION AREAS

STORMWATER BASIN AND EROSION CONTROL DETAILS

GENERAL

File Number
201.85.XXF

Date
JUNE 1999

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

A-12

Attachment B

BLASLAND, BOUCK & LEE, INC.
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Soil Boring Logs

Date Start/Finish: 5/26/99 - 5/26/99
Drilling Company: BBL
Driller's Name: Alex Marconi
Drilling Method: Direct Push
Bit Size: NA **Auger Size** : NA
Rig Type: AMS Power Probe 9600
Spoon Size:
Hammer Weight: NA-lb
Height of Fall: NA-in.

Northing:
Easting:
Borehole Depth: 15 ft.
Ground Surface Elev.: ft.

Descriptions by: Stephen Lewitt

Boring No. OPCA-1

Client:
General Electric Company

Site:
Hill 78/Building 71 Consolidation Area
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.4			Brown SILT and CLAY, trace fine Sand and organics, moist. (TOPSOIL)	
		(1-2')		NA	NA	1.0	0.5			Olive-brown SILT, little fine Sand, dry.	
		(2-4')		NA	NA	2.0	0.6			Olive-brown SILT and fine SAND, some Clay, little medium-coarse Sand, trace Gravel-Cobbles, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
5	-5	(4-6')		NA	NA	2.0	0.9			Olive-gray CLAY and SILT, trace fine Sand, Gravel, and Cobbles, dry. Moist at 6 feet.	
		(6-8')		NA	NA	1.5	0.9				
		(8-10')		NA	NA	1.5	0.6			Olive-brown SILT, little fine Sand and Clay, trace fine Gravel and Cobbles, moist.	
10	-10	(10-12')		NA	NA	1.0	0.4			Olive-brown SILT, trace fine Sand, wet.	
		(12-14')		NA	NA	1.0	0.4				
15	-15	(14-15')		NA	NA	0.5	0.9			Same as above, trace Gravel, wet. End of boring at 15.0' bgs.	

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Remarks:
Appendix IX+3 (excluding herbicide/pesticide) sample at 0-1' interval. PCB samples collected at 0-1', 1-6', and 6-15' intervals.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 5/26/99 - 5/26/99
Drilling Company: BBL
Driller's Name: Alex Marconi
Drilling Method: Direct Push
Bit Size: NA **Auger Size** : NA
Rig Type: AMS Power Probe 9600
Spoon Size:
Hammer Weight: NA-lb
Height of Fall: NA-in.

Northing:
Easting:
Borehole Depth: 15 ft.
Ground Surface Elev.: ft.

Descriptions by: Stephen Lewitt

Boring No. OPCA-2

Client:
General Electric Company

Site:
Hill 78/Building 71 Consolidation Area
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.2			Brown CLAY and SILT, some fine Sand, trace medium-coarse Sand, fine Gravel, and organics, moist. (TOPSOIL)	
		(1-2')		NA	NA	1.0	0.0			Brown fine SAND and SILT, trace medium-coarse Sand and fine Gravel, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
		(2-4')		NA	NA	2.0	0.1				
5	-5	(4-6')		NA	NA	2.0	0.1			Dark olive-gray fine SAND, little coarse Sand and Silt, trace fine Gravel, dry.	
		(6-8')		NA	NA	2.0	0.3			Olive-brown fine SAND and SILT, trace coarse Sand, moist.	
		(8-10')		NA	NA	2.0	0.1				
10	-10	(10-12')		NA	NA	2.0	0.2			Brown fine SAND, some medium Sand, moist.	
		(12-14')		NA	NA	2.0	0.3			Brown fine-coarse SAND, little fine Gravel and Silt, wet.	
15	-5	(14-15')		NA	NA	1.0	0.2			Brown fine SAND, little medium to coarse Sand, trace Silt and fine Gravel, wet.	

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Remarks:

Appendix IX+3 (excluding herbicide/pesticide) sample at 0-1' interval. PCB samples collected at 0-1', 1-6', and 6-15' intervals.

Saturated Zones

Date / Time	Elevation	Depth

Project: 201.85
Script: BBL-bor2
Date: 06/04/99

Date Start/Finish: 5/25/99 - 5/25/99 **Drilling Company:** BBL **Driller's Name:** Alex Marconi **Drilling Method:** Direct Push **Bit Size:** NA **Auger Size :** NA **Rig Type:** AMS Power Probe 9600 **Spoon Size:** **Hammer Weight:** NA-lb **Height of Fall:** NA-in.	**Northing:** **Easting:** **Borehole Depth:** 15 ft. **Ground Surface Elev.:** ft. **Descriptions by:** Stephen Lewitt	**Boring No. OPCA-3** **Client:** General Electric Company **Site:** Hill 78/Building 71 Consolidation Area Pittsfield, Massachusetts

DEPTH (ft)	ELEVATION (ft)	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
0	0									**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.3			Brown SILT and fine SAND, little coarse Sand, trace-little fine Gravel, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
		(1-2')		NA	NA	1.0	0.4				
		(2-4')		NA	NA	2.0	0.4			Red brick fragments, little fine Sand and Silt, trace coarse Sand, dry. [FILL]	
5	-5	(4-6')		NA	NA	2.0	0.2			Brown fine SAND and SILT, little medium-coarse Sand, trace fine Gravel and Cobbles, dry.	
		(6-8')		NA	NA	2.0	0.0			Brown SILT, some fine Sand, trace medium-coarse Sand and fine Gravel, moist.	
		(8-10')		NA	NA	2.0	0.0				
10	-10	(10-12')		NA	NA	2.0	0.0			Wet at 10 feet.	
		(12-14')		NA	NA	2.0	0.6			Brown-orange SILT, some fine Sand, trace medium-coarse Sand and fine Gravel, wet.	
15	-15	(14-15')		NA	NA	1.0	0.6			End of boring at 15.0' bgs.	

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Remarks:

PCB samples collected at 0-1', 1-6', and 6-15' intervals.
MS/MSD sample collected at 6-15' interval.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 5/26/99 - 5/26/99
Drilling Company: BBL
Driller's Name: Alex Marconi
Drilling Method: Direct Push
Bit Size: NA **Auger Size :** NA
Rig Type: AMS Power Probe 9600
Spoon Size:
Hammer Weight: NA-lb
Height of Fall: NA-in.

Northing:
Easting:
Borehole Depth: 15 ft.
Ground Surface Elev.: ft.

Descriptions by: Stephen Lewitt

Boring No. OPCA-4

Client:
General Electric Company

Site:
Hill 78/Building 71 Consolidation Area
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.7			Dark brown CLAY, little Silt and fine Sand, trace coarse Sand and fine Gravel, dry.	
		(1-2')		NA	NA	1.0	1.0			Brown fine SAND and SILT, trace coarse Sand and fine Gravel, dry.	
		(2-4')		NA	NA	2.0	1.3			Olive-gray SILT and fine SAND, little coarse Sand, trace-little fine Gravel, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
5	-5	(4-6')		NA	NA	2.0	1.4				
		(6-8')		NA	NA	2.0	1.3			Light brown fine SAND and SILT, little medium-coarse Sand, trace fine Gravel and Cobbles, dry.	
		(8-10')		NA	NA	2.0	0.7			Olive-brown SILT, little fine-coarse Sand, trace fine Gravel, dry.	
10	-10	(10-12')		NA	NA	2.0	1.0			Olive-brown SILT, little fine Sand and Clay, trace coarse Sand, dry.	
		(12-14')		NA	NA	2.0	0.6			Wet at 12 feet.	
15	-15	(14-15')		NA	NA	1.0	0.8			End of boring at 15.0' bgs.	

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Remarks:

Appendix IX+3 (excluding herbicide/pesticide) sample at 0-1' interval. PCB samples collected at 0-1', 1-8', and 8-15' intervals.

Saturated Zones

Date / Time	Elevation	Depth

Project: 20185
Script: BBL-bor2
Date: 06/04/99

Date Start/Finish: 5/25/99 - 5/25/99
Drilling Company: BBL
Driller's Name: Alex Marconi
Drilling Method: Direct Push
Bit Size: NA **Auger Size :** NA
Rig Type: AMS Power Probe 9600
Spoon Size:
Hammer Weight: NA-lb
Height of Fall: NA-in.

Northing:
Easting:
Borehole Depth: 14 ft.
Ground Surface Elev.: ft.

Descriptions by: Stephen Lewitt

Boring No. OPCA-5

Client:
General Electric Company

Site:
Hill 78/Building 71 Consolidation Area
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	1.4			Brown fine Sand, some Silt, little coarse Sand, trace fine Gravel, moist.	
		(1-2')		NA	NA	1.0	1.9				
		(2-4')		NA	NA	2.0	2.0			Brown SILT, some fine Sand, trace medium-coarse Sand and fine Gravel, dry.	Hydrated bentonite seal from 0.0' to 14.0' bgs
										Moist at 4 feet.	
5	-5	(4-6')		NA	NA	2.0	1.5				
		(6-8')		NA	NA	2.0	1.9			Olive-brown CLAY and SILT, trace fine-coarse Sand, wet.	
		(8-10')		NA	NA	2.0	1.3			Same as above with trace fine Gravel, wet.	
10	-10										
		(10-12')		NA	NA	2.0	2.0				
		(12-14')		NA	NA	2.0	1.5				
15	-15									End of boring at 14.0' bgs, refusal.	

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Remarks:
PCB samples collected at 0-1', 1-6', and 6-15' intervals.

Saturated Zones

Date / Time	Elevation	Depth

Project: 20185
Script: BBL-bor2
Date: 06/04/99

Date Start/Finish: 5/26/99 - 5/26/99 **Drilling Company:** BBL **Driller's Name:** Alex Marconi **Drilling Method:** Direct Push **Bit Size:** NA **Auger Size** : NA **Rig Type:** AMS Power Probe 9600 **Spoon Size:** **Hammer Weight:** NA-lb **Height of Fall:** NA-in.	**Northing:** **Easting:** **Borehole Depth:** 15 ft. **Ground Surface Elev.:** ft. **Descriptions by:** Stephen Lewitt	**Boring No. OPCA-8** **Client:** General Electric Company **Site:** Hill 78/Building 71 Consolidation Area Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.4			Brown fine SAND and SILT, trace medium-coarse Sand, fine Gravel and organics, dry.	
		(1-2')		NA	NA	1.0	0.1			Olive-brown SILT and fine SAND, trace coarse Sand and fine Gravel, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
		(2-4')		NA	NA	2.0	0.1				
5	-5	(4-6')		NA	NA	2.0	0.2				
		(6-8')		NA	NA	2.0	0.2				
		(8-10')		NA	NA	2.0	0.1			Olive-brown SILT and fine SAND, little Clay, trace coarse Sand, fine Gravel, and cobbles dry.	
10	-10	(10-12')		NA	NA	2.0	0.3				
		(12-14')		NA	NA	2.0	0.2				
		(14-15')		NA	NA	1.0	0.1			End of boring at 15.0' bgs.	
15	-15										

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Remarks:

Appendix IX+3 (excluding herbicide/pesticide) sample at 0-1' interval. PCB samples collected at 0-1', 1-8', and 8-15' intervals.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 5/25/99 - 5/25/99
Drilling Company: BBL
Driller's Name: Alex Marconi
Drilling Method: Direct Push
Bit Size: NA **Auger Size :** NA
Rig Type: AMS Power Probe 9600
Spoon Size:
Hammer Weight: NA-lb
Height of Fall: NA-in.

Northing:
Easting:
Borehole Depth: 15 ft.
Ground Surface Elev.: ft.

Descriptions by: Stephen Lewitt

Boring No. OPCA-7

Client:
General Electric Company

Site:
Hill 78/Building 71 Consolidation Area
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.0			Brown fine SAND and SILT, trace medium-coarse Sand and fine Gravel, dry.	
		(1-2')		NA	NA	1.0	0.1			Olive-brown SILT, trace-coarse Sand, dry.	
		(2-4')		NA	NA	2.0	0.1			Brown CLAY and SILT, trace fine-medium Sand and fine Gravel, moist.	Hydrated bentonite seal from 0.0' to 15.0' bgs
5	-5	(4-6')		NA	NA	2.0	0.2			Olive-brown SILT, some fine Sand, trace medium-coarse Sand and fine Gravel, moist.	
		(6-8')		NA	NA	2.0	0.2			Olive-brown SILT, trace fine-coarse Sand and fine Gravel, moist.	
		(8-10')		NA	NA	2.0	0.3				
10	-10	(10-12')		NA	NA	0.5	0.6			Olive-gray SILT, trace fine-coarse Sand, fine Gravel and Cobbles, moist.	
		(12-14')		NA	NA	0.5	0.5				
15	-15	(14-15')		NA	NA	0.5	0.9			End of boring at 15.0' bgs.	

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Remarks:
PCB samples collected at 0-1', 1-6', and 6-15' intervals.
Duplicate sample OPCA-DUP-1 collected at 1-6' interval.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 5/26/99 - 5/26/99 **Drilling Company:** BBL **Driller's Name:** Alex Marconi **Drilling Method:** Direct Push **Bit Size:** NA **Auger Size** : NA **Rig Type:** AMS Power Probe 9600 **Spoon Size:** **Hammer Weight:** NA-lb **Height of Fall:** NA-in.	**Northing:** **Easting:** **Borehole Depth:** 15 ft. **Ground Surface Elev.:** ft. **Descriptions by:** Stephen Lewitt	**Boring No. OPCA-8** **Client:** General Electric Company **Site:** Hill 78/Building 71 Consolidation Area Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.6			Dark brown fine SAND and SILT, little Clay, trace-coarse Sand and organics, dry.	
		(1-2')		NA	NA	1.0	0.6			Brown-orange fine SAND and SILT, trace coarse Sand and fine Gravel, dry.	
		(2-4')		NA	NA	2.0	0.8			Brown fine SAND, trace coarse Sand, dry.	Hydrated bentonite seal from 0.0' to 15.0' bgs
5	-5	(4-6')		NA	NA	2.0	0.5				
		(6-8')		NA	NA	2.0	0.9			Brown fine SAND, little medium-coarse Sand, dry.	
		(8-10')		NA	NA	2.0	0.5				
10	-10	(10-12')		NA	NA	2.0	0.5				
		(12-14')		NA	NA	2.0	0.7			Brown fine SAND, little medium-coarse Sand and Clay, dry.	
15	-15	(14-15')		NA	NA	1.0	0.8			Olive-brown CLAY, trace fine Sand, Silt, and fine Gravel, dry.	

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Remarks:

PCB samples collected at 0-1', 1-6', and 8-15' intervals. Appendix IX+3 (excluding herbicides/pesticides) collected at 0-1' interval. Duplicate sample OPCA-DUP-2 collected at 0-1' interval.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 5/28/99 - 5/28/99 **Drilling Company:** BBL **Driller's Name:** Alex Marconi **Drilling Method:** Direct Push **Bit Size:** NA **Auger Size** : NA **Rig Type:** AMS Power Probe 9600 **Spoon Size:** **Hammer Weight:** NA-lb **Height of Fall:** NA-in.	**Northing:** **Easting:** **Borehole Depth:** 15 ft. **Ground Surface Elev.:** ft. **Descriptions by:** Stephen Lewitt	**Boring No. OPCA-9** **Client:** General Electric Company **Site:** Hill 78/Building 71 Consolidation Area Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	USCS Code	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation ft.											
0										**GROUND SURFACE**	
		(0-1')		NA	NA	1.0	0.3			Dark brown CLAY and SILT, trace fine-coarse Sand, fine Gravel and organics, moist.	
		(1-2')		NA	NA	1.0	0.3				
		(2-4')		NA	NA	2.0	0.2			Olive-brown SILT and CLAY, trace fine-coarse Sand and fine Gravel, moist.	Hydrated bentonite seal from 0.0' to 15.0' bgs
5	-5	(4-6')		NA	NA	1.0	0.2				
		(6-8')		NA	NA	1.0	0.4			Olive-brown SILT, some fine Sand, trace coarse Sand and fine Gravel, moist.	
		(8-10')		NA	NA	1.5	0.3			Olive-brown fine SAND and SILT, little Clay, trace fine Gravel, saturated.	
10	-10	(10-12')		NA	NA	1.5	0.3				
		(12-14')		NA	NA	2.0	0.2			Olive-brown fine SAND and SILT, saturated.	
		(14-15')		NA	NA	1.0	0.1			Olive-brown SILT and CLAY, little fine Sand, saturated.	
15	-15										

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Remarks:

PCB samples collected at 0-1', 1-6', and 6-15' intervals.
Duplicate sample OPCA-DUP-3 collected at 6-15' interval.
MS/MSD sample collected at 1-6' interval.

Saturated Zones

Date / Time	Elevation	Depth

Attachment C

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Construction Quality Assurance Plan

TECHNICAL REPORT

Construction Quality Assurance Plan - On-Plant Consolidation Areas

General Electric Company
Pittsfield, Massachusetts

June 1999

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

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Table of Contents

1. Introduction

1.1 Purpose

This *Construction Quality Assurance Plan* (CQAP) has been developed to describe the materials and procedures necessary for the construction, evaluation, and documentation during the base liner and final cover system installation at the on-plant consolidation areas located on the General Electric Company (GE) plant property in Pittsfield, Massachusetts. This CQAP is being submitted in support of the *Detailed Work Plan for On-Plant Consolidation Areas* (Detailed Work Plan) for the construction in 1999 of portions of two on-plant consolidation areas within the GE Plant Property.

1.2 Definition of Terms

The following terms and abbreviations are used throughout this CQAP. The definition of each term or abbreviation will be consistent throughout the text of this plan.

Agencies - The United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MDEP).

ASTM - American Society of Testing and Materials.

Contractor - The person or persons selected by GE to install the base liner and the final cover systems at the Building 71 Consolidation Area.

CQA - Construction Quality Assurance.

CQA Laboratory - The person or persons selected by GE to perform construction quality assurance (CQA) testing on soil and geosynthetic samples collected prior to and during the installation of the base liner and final cover systems.

Design Engineer - The person or persons responsible for the design aspects of the project. The Design Engineer's duties include reviewing and approving modifications to the base liner and final cover systems installation design. For this project, the Design Engineer is Blasland, Bouck & Lee, Inc. (BBL) headquartered in Syracuse, NY.

FML - Flexible Membrane Liner.

GCL - Geosynthetic Clay Liner.

GDC - Geosynthetic Drainage Composite.

HDPE - High Density Polyethylene.

Installer - The person or persons retained by the Contractor to install the FML, GCL, and/or GDC.

Layer - A compacted stratum of soil composed of one or more lifts placed without deviation from design grade.

Subcontractor - The person or persons retained by the Contractor to perform work associated with the installation of the base liner and final cover systems and associated structures.

Supervising Contractor - The person or persons designated by GE to represent GE on quality assurance/quality control (QA/QC) aspects of the project. Duties delegated to the Supervising Contractor will include CQA sampling, testing, determination of limits of work, and measurement of work for payment and final acceptance.

Technical Specifications - Material and performance specifications prepared for the construction materials of the base liner and final cover systems.

QA/QC - Quality Assurance/Quality Control.

1.3 Scope

Following this introductory section, Section 2 of this plan describes the qualifications of the personnel necessary to properly implement the QA/QC procedures. Section 3 discusses the requirements for communication and documentation of the work during construction and base liner and final cover systems installation. Section 4 discusses the required QA/QC procedures for the construction of the soil components of the base liner and final cover systems. Section 5 presents the QA/QC requirements associated with the installation of the geotextile portion of the base liner system, Section 6 presents the QA/QC requirements associated with the installation of the flexible membrane liner portion of the base liner and final cover systems, Section 7 presents the QA/QC requirements

associated with the installation of the GDC portion of the base liner and final cover systems, and Section 8 presents the QA/QC requirements associated with the placement of the GCL portion of the final cover system.

2. Required Personnel Qualifications

2.1 CQA Management Organization

GE has retained the services of a Supervising Contractor, who will be responsible for observing and documenting that activities associated with the installation of the base liner and final cover systems components are in general conformance with Agency-approved Detailed Work Plan.

The Supervising Contractor will provide qualified CQA personnel to serve in the following capacities:

Project Coordinator - The Project Coordinator will be responsible for overall project coordination of engineering and QA/QC activities between the involved parties, including the Agencies.

Project Manager - The Project Manager will serve as the official representative of the Supervising Contractor, and will have the ultimate technical responsibility for the work performed. The Project Manager will be responsible for overall coordination of QA/QC activities, and will report to the Project Coordinator.

Construction Technician - The Construction Technician will be an on-site representative of the Supervising Contractor, reporting to the Project Manager, and will be responsible for coordination of observation, sampling, testing, and documentation of daily construction activities.

CQA Laboratory - An independent, accredited materials-testing laboratory will be responsible for testing both soil and geosynthetic materials, as directed by the Construction Technician and as required by this CQAP.

2.2 CQA Personnel Qualifications

In general, observation, sampling, testing, and/or documentation of construction materials installation and associated procedures will be performed by a person or persons familiar with construction procedures and materials. The project personnel (including the Project Coordinator) will be under the supervision of a Professional Engineer licensed in the state of Massachusetts. Representatives of the Supervising Contractor will be familiar with the use of the equipment and methodology needed to sample and test soil and geosynthetics.

Specific qualifications for personnel with daily project involvement are as follows:

Project Manager - The Project Manager will be a professional engineer, with past experience in a position of significant responsibility for construction projects similar in magnitude and complexity to the project being undertaken. The Project Manager should be knowledgeable of the project requirements and objectives, and be familiar with the Technical Drawings and Specifications.

The Project Manager will have the following responsibilities in the implementation of the procedures in the CQAP:

- Serve as the official representative of the Supervising Contractor;
- Maintain ultimate responsibility for the implementation of the procedures in the CQAP;
- Direct and supervise the preparation, appropriate review, and modifications of Technical Drawings and Specifications and the Completion of Work Report.
- Review design documentation, including the Technical Drawings and Specifications prepared by the Design Engineer;
- Review modifications to the Technical Drawings and Specifications as they occur during construction;
- Provide certification in a Completion of Work Report that the construction has been completed in conformance with the Detailed Work Plan(s);
- Serve as the primary contact person for the Supervising Contractor. Maintain contact with GE, Design Engineer, Contractor, and Subcontractors regarding conformance with the requirements in this plan;
- Provide overall coordination of the activities of the Construction Technician;
- Provide assistance to the Construction Technician in the review and interpretation of field and laboratory testing results;
- Provide assistance to the Construction Technician in the review of shop drawings and other submittals from contractors and subcontractors;
- Perform periodic site visits to review progress and QA/QC procedures;
- Determine acceptance of the installed portion of work to permit further construction;
- Notify the Construction Technician of noted deficiencies in quality control testing results or procedures so corrective actions can be taken; and
- Review the Completion of Work Reports prior to submittal to GE.

Construction Technician - The Construction Technician should demonstrate a knowledge of base liner and/or final cover construction, earthwork, fill placement, and applicable test methods through a combination of formal

education, training, and experience. The Construction Technician should also have a demonstrated knowledge of the installation of geosynthetic materials and the performance of associated QA/QC testing methods.

The Construction Technician will have the following responsibilities in the implementation of the procedures in the CQAP:

- Oversee and coordinate QA/QC sampling and testing;
- Record on-site activities that could result in damage to earthwork or site improvements, and report these activities to the Contractor and Project Manager;
- Review daily construction reports with the Contractor;
- Prepare project status reports;
- Serve as the daily contact person for the Supervising Contractor. Maintain routine contact with GE and Contractor regarding conformance with quality control requirements;
- Review shop drawings and other submittals from the Contractor for conformance with the Technical Drawings and Specifications and take appropriate action after review;
- Review field and laboratory QA/QC testing results for conformance with the Technical Drawings and Specifications. Provide an interpretation of data to determine areas that are in conformance and non-conformance with the Technical Drawings and Specifications. Determine areas that require rework and/or repair;
- Monitor the delivery of samples to the CQA Laboratory for testing; and
- Perform regular site walk-throughs to review progress and QA/QC procedures.

3. Organization and Documentation Requirements

3.1 Organization of CQA Parties

Overall responsibility for carrying out the provisions of this CQAP will be with the Supervising Contractor. The Supervising Contractor will be responsible for documenting, in accordance with this CQAP, that the installation of the base liner and final cover systems is consistent with the Technical Drawings and Specifications. The Project Manager will maintain a complete set of the Technical Drawings and Specifications; a copy of this CQAP; and a file of completed reports, data sheets, forms, and check lists submitted to and/or originated by the Construction Technician.

The Construction Technician will report to the Project Manager. The Construction Technician will be responsible for observing the work performed by the Contractor and subcontractors, completing data sheets, forms, and check lists, and submitting to the Project Manager on a timely basis. The Construction Technician will also be responsible for the submittal of reports and other documents described throughout this CQAP to the Project Manager on a timely basis, in addition to other project-related responsibilities.

The CQA Laboratory will report to the Construction Technician. Test data and reports completed by the CQA Laboratory will be submitted directly to the Construction Technician. It will be the responsibility of the Construction Technician and Project Manager to resolve any disputes between the CQA Laboratory and the Contractor that may arise during construction.

The Contractor will discuss all matters relating to the CQAP with the Project Manager.

3.2 Documentation

The documentation of CQA activities will support a determination of whether construction activities have been carried out in accordance with the Technical Drawings and Specifications. The documentation process includes recognition of construction tasks that should be observed and documented; assignment of responsibilities for the observation, testing, and documentation of these tasks; and finally, the completion of the required reports, data sheets, forms, and check lists to provide an accurate record of the work performed during construction.

The Construction Technician will provide the Project Manager with completed and signed reports, data sheets, forms, and check lists, as described below, to document that the requirements of this CQAP have been satisfied.

3.2.1 Daily Construction Reports

The Construction Technician will complete a daily summary report of each day's construction activities. The daily construction report will contain, at a minimum, the following information:

- Date, project name, location, and the number and names of people on-site;
- Time work starts and ends, in addition to the time of work stoppages related to inclement weather or insufficient equipment or personnel;
- Data on weather conditions, including temperature, humidity, wind direction and speed, cloud cover, and precipitation;
- Contractor's work force, equipment, and materials delivered to or removed from the job site;
- Chronological description of work in progress, including notices to or requests from the Contractor and/or Installer;
- Results of testing performed on-site by CQA personnel;
- Problem/Deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this plan;
- A listing of laboratory samples collected, marked, and delivered to the CQA Laboratory;
- A record of communications with other on-site parties, outside companies, or regulatory agencies, regarding the day's construction activities; and
- A record of calibrations or standardizations performed on field testing equipment, including actions related to and results of recalibrations.

3.2.2 Problem/Deficiency Identification and Corrective Action Documentation

Daily Construction Reports prepared by the Construction Technician should 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 requirements set forth in this plan), and corrective action employed to address the problems or deficiencies. The documentation reports should 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 and corrective action documentation may include the following information:

- A description of the problem or deficiency, including reference to supplemental data or observations related to the determination of the problem or deficiency;

- Location of the problem or deficiency, including how and when the problem or deficiency was discovered. In addition, an estimate of how long the problem or deficiency existed prior to identification should be included; and
- A recommended corrective action for resolving the problem or deficiency. If the corrective action has already been implemented, then observations and documentation showing that the problem or deficiency was resolved should be included. If the problem or deficiency has not been resolved by the end of the day upon which it was discovered, then the documentation will state that the deficiency was unresolved at the end of the day.

If the problem or deficiency has not been resolved, then the Project Manager and Construction Technician will discuss the corrective actions necessary to resolve the problem or deficiency as soon as possible.

The Project Manager, working with the Construction Technician, will determine if the problem or deficiency is an indication of a situation that might require changes to the Technical Drawings and Specifications and/or the CQAP. If this situation develops, a meeting will be held with the appropriate people on site, including the Design Engineer, to determine if revisions to the Technical Drawings and Specifications and/or this CQAP should be made. Revisions to the Technical Drawings and Specifications and/or CQAP must be approved by the Design Engineer.

3.2.3 Photographic Documentation

Photographs will be taken to document observations, problems, deficiencies, and work in progress. Photographs will be in color print format and will be filed in chronological order in a permanent protective file by the Construction Technician.

The following information will be documented in the daily report or a log book for each photograph:

- Date and time;
- Location where photograph was taken; and
- Description of the subject matter.

3.2.4 Completion of Work Report

A Completion of Work Report will be assembled by the Project Manager and the Construction Technician at the end of construction. The Completion of Work Report should contain at least the following information:

- Record drawings showing the installation of each construction material as it relates to the plan views and individual details;
- Written correspondence with the Agencies and other permitting authorities;
- A summary of field observations and tests performed, laboratory samples collected, and test results reported;
- A summary of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies that were discovered;
- Documentation that acceptance criteria were met, including a comparison of documented procedure data with proposed Technical Drawings and Specifications and requirements set forth in this CQAP; and
- Certification that construction was performed in accordance with the requirements of this CQAP.

3.3 Pre-Construction Meeting

Prior to the start of construction activity, a pre-construction meeting will be held among representatives of GE, the Design Engineer, the Supervising Contractor, and the Contractor. The CQA-related topics covered at this meeting will include, but may not be limited to the following:

- Procedures and timing for each organization to receive relevant CQA documents and supporting information;
- This CQAP and its role relative to the design criteria and the Technical Drawings and Specifications;
- The responsibilities of each organization;
- Lines of authority and communication for each organization;
- The established procedures or protocol for construction deficiencies, repairs, and retesting;
- Methods of documenting and reporting construction observation data;
- Methods for distributing and storing documents and reports;
- Work area security and safety protocol;
- Procedures for the location and protection of construction materials, and for the prevention of damage of the materials from inclement weather or other adverse conditions;
- A site walk-through to review site conditions as well as staging and storage locations; and
- The Contractor's proposed construction schedule.

The pre-construction meeting will be documented by the Supervising Contractor, and minutes will be transmitted to the attending parties.

3.4 Project Progress Meetings

A progress meeting should be held at least weekly at the work area. At a minimum, the meeting will be attended by GE, the Contractor, and the Supervising Contractor. The purpose of the meetings will be to:

- Review the work activity for the week;
- Discuss the Contractor's personnel and equipment assignments for the week;
- Review the previous week's activities and accomplishments;
- Review the upcoming work schedule and overall project schedule;
- Discuss possible problems;
- Review new test data; and
- Discuss outstanding issues.

The project progress meetings meeting will be documented by the Supervising Contractor, and minutes transmitted to the attending parties.

4. Soil Fill

4.1 Description and Applicability

Soil fill consists of random, granular or cohesive material taken from on-site, approved off-site stockpiles, or borrow sources. Soil used as soil fill consists of a broad range of soils relatively free of organics, trash, or other deleterious matter. Soil fill will be used as the grading layer for the base liner system and as the FML protection layer (i.e., protection soil and topsoil) in the final cover system.

This section does not identify specific material characteristics to determine the suitability of earth materials for use as soil fill. Testing and/or material qualification requirements provided in the Technical Specification for the soil fill shall override the minimum qualifications given in this section.

4.2 Quality Control Documentation

The soil fill sources shall be evaluated to determine acceptance with the Technical Drawings and Specifications. If required, the general fill material shall be processed such that it does not contain particles exceeding the maximum size established in the project specifications. The Project Manager shall accept or reject the material based on its conformance with the Technical Specifications.

Additionally, the Contractor is required to specify the name and location of the proposed fill sources. At least one week prior to the procurement or use of fill from any source, the Contractor shall provide the Construction Technician with one sample of the proposed soil fill material. These samples will be subject to the following analyses to be performed by GE:

- Polychlorinated Biphenyls (PCBs);
- Volatile Organic Compounds (VOCs);
- Semi-VOCs;
- Metals; and
- Total petroleum hydrocarbons (TPH).

The results of the analyses will be compared to the appropriate regulatory levels. If such analyses indicate unacceptable chemical characteristics, GE will reject the use of fill materials from the proposed source(s), and the Contractor must identify and submit a sample(s) from another fill source.

If a fill source is rejected by GE, analytical testing for one additional fill source will be performed at the expense of GE. If additional fill sources (more than two sources per fill material) are rejected, additional testing will be at the expense of the Contractor.

Soil sampling results previously submitted to, and approved by, GE for the proposed sources can be submitted to GE in lieu of additional testing. However, GE reserves the right to request additional verification testing prior to source approval.

4.3 Construction Observation and Inspection

The Construction Technician shall verify the requirements of the Technical Specifications are met. The Construction Technician shall report all non-conformances to GE, the Contractor, and the Project Manager.

4.4 Defects and Repairs

If a defect (e.g., insufficient layer thickness, materials that exceed particle size requirements, etc.) is discovered in the finished soil fill layer, the Construction Technician shall determine the extent and nature of the defect. The Construction Technician shall determine the extent of the deficient area by additional testing, observations, a review of records, or other means that the Construction Technician deems appropriate.

4.4.1 Notification

After determining the extent and nature of the defect, the Construction Technician shall promptly notify GE, the Project Manager, and the Contractor.

4.4.2 Repairs and Retesting

The Contractor shall correct all deficiencies to the satisfaction of the Construction Technician. If a project specification criteria cannot be met, the Contractor shall develop and present to the Project Manager suggested solutions.

The Construction Technician shall schedule appropriate retests, if required, when the work defect has been corrected. All retests by the Construction Technician must verify that the defect has been corrected before any additional work is performed by the Contractor in the area of the deficiency.

5. Geotextile

5.1 Definition and Applicability

Geotextiles are used in cushioning and filtering applications in lining systems. This section is applicable to non-woven geotextiles made of polyester or polypropylene and used within the base liner system.

5.2 Quality Control Documentation

Prior to the installation of any geotextile, the Manufacturer or Installer shall provide the Project Manager with the following information:

1. The origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin used to manufacture the geotextile.

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

3. Reports on tests conducted by the Manufacturer to verify that resin used to manufacture the geotextile meets the Manufacturer's resin specifications.

4. Reports on quality control tests conducted by the Manufacturer to verify that the geotextile manufactured for the project meets the project specifications.

5. A list of the materials which comprise the geotextile, expressed in the following categories as percent by weight: base polymer, carbon black, other additives.

6. A specification for the geotextile which includes all properties published by the Manufacturer, measured using the appropriate test methods.

7. Written certification that minimum roll values given in the specification are guaranteed by the Manufacturer.

8. Quality control certificates, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include 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:

a. Mass per unit area (ASTM D3776).
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).

Quality control tests listed above as a, b, c, d, & e shall be performed for at least 100,000 square feet (ft^2) of geotextile produced. Only Manufacturer quality control certificates that include roll testing procedures and results of quality control tests are required for tests listed above as f, g, & h.

The Manufacturer shall identify all rolls of geotextiles with the following:

1. Manufacturer's name.
2. Product identification.
3. Roll number.
4. Roll dimensions.
5. Special instructions when required (i.e., this side up, etc.).

The Construction Technician shall review and approve in writing these documents and shall report any discrepancies with the above requirements to the Project Manager. The Construction Technician shall verify that:

1. Property values certified by the Manufacturer meet all of its guaranteed specifications.
2. Measurements of properties by the Manufacturer are properly documented and that the test methods used are acceptable.
3. Quality control certificates have been provided at the specified frequency for all rolls, and that each certificate identifies the rolls related to it.
4. Roll packages are appropriately labeled.
5. Certified minimum roll properties meet the project specifications.
6. Verify that project specifications were submitted by the Project Manager to the Installer.
7. Certification of less than 2% reclaimed polymer added.

5.3 Conformance Testing

Upon delivery of the rolls of geotextiles, the Construction Technician shall visually ensure that conformance test samples are obtained for the geotextile. These samples shall then be forwarded to the CQA Laboratory for testing to ensure conformance with the project specifications.

At a minimum, the following conformance tests shall generally be performed on geotextiles:

1. Mass per unit area.
2. Grab strength.
3. Trapezoidal tear strength.
4. Burst strength.
5. Puncture strength.
6. Filtration.
7. Permeability.

These conformance tests shall be performed in accordance with the test methods specified in the Technical Specifications.

5.3.1 Sampling Procedures

The rolls to be sampled shall be selected by the Construction Technician. Samples shall be taken across the entire width of the roll and shall not include the first complete revolution of fabric on the roll. Samples shall not be taken from any portion of a roll which has been subjected to excess pressure or stretching. Unless otherwise specified, samples shall be 3 feet long by the roll width. The Construction Technician shall mark the machine direction on the samples with an arrow. All lots of material, and the particular test sample that represents each lot, should be defined before the samples are taken.

A lot shall be defined as a group of consecutively numbered rolls from the same manufacturing line. Alternatively, a lot may be designated by the Construction Technician based on a review of all roll information including quality control documentation and manufacturing records.

Samples shall be taken at a rate of one per lot, or at a minimum of one conformance test per 100,000 ft^2 of geotextile.

5.3.2 Test Results

All conformance test results shall be reviewed and accepted or rejected by the Construction Technician prior to the deployment of the geotextile.

The Construction Technician shall examine all results from laboratory conformance testing and shall report any nonconformance to the Project Manager. The Construction Technician shall be responsible for checking that all test results meet or exceed the property values listed in the Technical Specifications. Materials and rolls which are in non-compliance shall be rejected.

If the Manufacturer has reason to believe that failing tests may be the result of the CQA Laboratory incorrectly conducting the tests, the Manufacturer 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 Manufacturer. Alternatively, the Manufacturer may have the sample retested at two different approved CQA Laboratory's at the expense of the Manufacturer. If both laboratories produce passing results, the material shall be accepted. If both laboratories do not produce passing results, then the original CQA Laboratory's test results shall be accepted. The use of these procedures for dealing with failed test results is subject to the approval of the Project Manager.

If a test result is in nonconformance, all material from the lot represented by the failing test should be considered out of specification and rejected. Alternatively, at the option of the Project Manager, 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) shall be rejected. If one or both of the additional tests fail, then the entire lot shall be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot.

5.4 Subgrade Preparation

The Contractor shall be responsible for preparing the supporting soil for geotextile placement. The Project Manager shall coordinate the work of the Contractor and the Installer so that the requirements of the Technical Specifications are met.

Before the geotextile installation begins, the Construction Technician shall verify that:

1. The surface to be lined has been rolled, compacted, or hand worked (to the requirements provided in the Technical Specifications) so as to be free of irregularities, protrusions, loose soil, and abrupt changes in grade.
2. The surface of the supporting soil does not contain stones which may be damaging to the geotextile.
3. There is no area excessively softened by high water content.

The Installer shall certify in writing that the surface on which the geotextile will be installed is acceptable. A certificate of acceptance shall be given by the Installer to the Construction Technician prior to commencement of geotextile deployment in the area under consideration. The Project Manager shall be given a copy of this certificate by the Construction Technician.

After the supporting soil has been accepted by the Installer, it is the Installer's responsibility to indicate to the Project Manager any change in the supporting soil condition that may require repair work. If the Construction Technician concurs with Installer, the Project Manager shall ensure that the supporting soil is repaired.

At any time before or during the geotextile installation, the Construction Technician shall indicate to the Project manager any locations which may not be adequately prepared for the geotextile.

5.5 Anchor Trench

The Construction Technician shall verify that the anchor trench has been constructed according to the Technical Drawings and Specifications.

Slightly rounded corners shall be provided in the trench so as to avoid sharp bends in the geomembrane. Excessive amounts of loose soil shall not be allowed to underlie the geosynthetics in the anchor trench.

The anchor trench shall be adequately drained to prevent ponding or softening of the adjacent soils while the trench is open. The anchor trench shall be backfilled and compacted as outlined in the project specifications.

Care shall be taken when backfilling the trench to prevent any damage to the geosynthetics. The Construction Technician shall observe the backfilling operation and advise the Project Manager of any problems. Any problems shall be documented by the Construction Technician in his daily report.

5.6 Geotextile Deployment

During shipment and storage, the geotextile shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting, or any other damaging or deleterious conditions. Geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings. Wrappings shall be removed shortly before deployment.

The Construction Technician shall observe rolls upon delivery at the site and any deviation from the above requirements shall be reported to the Project Manager.

The Installer shall handle all geotextiles in such a manner as to ensure they are not damaged in any way, and the following shall be complied with:

1. On slopes, the geotextiles shall be securely anchored and then rolled down the slope in such a manner as to continually keep the geotextile sheet in tension.

2. In the presence of wind, all geotextiles shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during deployment and shall remain until replaced with cover material. Project Manager will approve source of sand used (well graded clean sand).

3. Geotextiles shall be cut using a geotextile cutter (hook blade) only. If in place, special care shall be taken to protect other materials from damage, which could be caused by the cutting of the geotextiles.

4. During placement of geotextiles, care shall be taken not to entrap in or beneath the geotextile: stones; excessive dust; or moisture that could damage the geotextile or may cause clogging of drains or filters or hamper subsequent seaming.

5. A visual examination of the geotextile shall be carried out over the entire surface, after installation, to ensure that no potential harmful foreign objects are present.

6. Geotextile shall be placed and anchored in the manner and locations shown on the drawings. Any modifications to geotextile placement must be approved by the Project Manager.

7. The geotextile shall be protected at all times during construction from contamination by surface runoff and any fabric so contaminated shall be removed and replaced with uncontaminated fabric.

The Construction Technician shall note any non-compliance and report it to the Project Manager.

5.7 Seaming Procedures

Geotextiles shall be overlapped a minimum of 24 inches. In general, no horizontal seams shall be allowed on side slopes (i.e., seams shall be along, not across, the slope), except as part of a patch or splice.

5.8 Defects and Repairs

Any holes or tears in the geotextile shall be repaired with any patch made from the same geotextile sewn or heat bonded into place with a minimum of 12-inch overlap in all directions.

Care shall be taken to remove any soil or other material which may have penetrated the torn geotextile.

5.9 Geotextile Protection

FML shall be deployed over geotextile in a manner that will not damage the underlying geotextile. Deployment method must be approved by the Project Manager.

6. Flexible Membrane Liner

6.1 Description and Applicability

FMLs are low hydraulic conductivity barriers used in lining systems. The geomembrane used in the base liner and final cover systems will be a 60-mil HDPE textured FML.

6.2 Quality Control Documentation

Prior to the installation of any FML, the Manufacturer or Installer shall provide the Project Manager with the following information:

1. The origin (supplier's name and production plant) and identification (brand name and number) of the resin.

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

3. Results of tests conducted by the Manufacturer to verify that the resin used to manufacture the FML meets the project specifications for melt flow index and density.

4. A statement indicating that the amount of reclaimed polymer added to the resin during manufacturing was done with appropriate cleanliness and did not exceed 2% by weight.

5. A list of the materials which comprise the FML, expressed in the following categories as percent by weight: polyethylene, carbon black, other additives.

6. A specification for the FML which includes all properties contained in the project specifications measured using the appropriate test methods.

7. Written certification that minimum values given in the specification are guaranteed by the Manufacturer.

8. Quality control certificates, signed by a responsible party employed by the Manufacturer. Each quality control certificate shall include roll identification numbers, testing procedures, and results of quality control tests. At a minimum, results shall be given for:

a. Density (ASTM D1505).
b. Carbon black content (ASTM D1603).
c. Carbon black dispersion (ASTM D2663).
d. Thickness (ASTM D751).
e. Tensile properties (ASTM D638).
f. Tear strength (ASTM D1004).

These quality control tests shall be performed in accordance with the test methods specified in the Technical Specifications for every 40,000 ft^2 of FML produced.

The manufacturers shall provide a certification letter which will provide data for puncture, environmental stress, low temperature, and burial.

The Manufacturer shall identify all rolls of FMLs with the following:

1. Manufacturer's name.
2. Product identification.
3. Thickness.
4. Roll number.
5. Roll dimensions.

The Construction Technician shall review and approve in writing, these documents and shall report any discrepancies with the above requirements to the Project Manager. The Construction Technician shall verify that:

1. Property values certified by the Manufacturer meet all of its guaranteed specifications.

2. Measurements of properties by the Manufacturer are properly documented and that the test methods used are acceptable.

3. Quality control certificates have been provided at the specified frequency for all rolls, and that each certificate identifies the rolls related to it.

4. Rolls are appropriately labeled.

5. Certified minimum properties meet the project specifications.

6.3 Conformance Testing

Upon delivery of the rolls of FML, the Construction Technician shall ensure that conformance test samples are obtained for the FML. These samples shall then be forwarded to the CQA Laboratory for testing to ensure conformance to the project.

The following conformance tests shall be conducted:

1. Density.
2. Carbon black content.
3. Carbon black dispersion.
4. Thickness.
5. Tensile characteristics.

These conformance tests shall be performed in accordance with the test methods specified in the project specifications.

6.3.1 Sampling Procedures

The rolls to be sampled shall be selected by the Construction Technician. Samples shall be taken across the entire width of the roll and shall not include the first 3 feet. Unless otherwise specified, samples shall be 3 feet long by the roll width. The Construction Technician shall mark the machine direction on the samples with an arrow.

A lot shall be defined as a group of consecutively numbered rolls from the same manufacturing line. Alternatively, a lot may be designated by the Construction Technician based on a review of all roll information including quality control documentation and manufacturing records.

Samples shall be taken at a rate of one per lot, at a minimum, or one test per 100,000 ft^2 of FML.

6.3.2 Test Results

All conformance test results shall be reviewed, approved in writing, and the material accepted or rejected by the Construction Technician prior to the deployment of the FML.

The Construction Technician shall examine all results from laboratory conformance testing and shall report any nonconformance to the Project Manager. The Construction Technician shall be responsible for checking that all test results meet or exceed the property values listed in the project specifications.

If the Manufacturer has reason to believe that failing tests may be the result of the CQA Laboratory incorrectly conducting the tests, the Manufacturer may request that the sample in question be retested by the CQA Laboratory with a technical representati /e of the Manufacturer present during the testing. This retesting shall be done at the expense of the Manufacturer. The Manufacturer may have the same sample retested at two different approved CQA Laboratories. If both laboratories produce passing results, the material shall be accepted. If both laboratories do not produce passing results, then the original CQA Laboratory's test results shall be accepted. The use of these procedures for dealing with failed test results is subject to the approval of the Project Manager.

If a test result is in nonconformance, all material from the lot represented by the failing test should be considered out of specification and rejected. Alternatively, at the option of the Project Manager, 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) shall be rejected. If one or both of the additional tests fail, then the entire lot shall be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot.

6.4 FML Deployment

6.4.1 Panel Nomenclature

A field panel is defined as a unit of FML which is to be seamed in the field, i.e., a field panel is a roll or a portion of a roll cut in the field.

It shall be the responsibility of the Construction Technician to ensure that each field panel is given an identification code (number or letter-number) consistent with the layout plan. This identification code shall be agreed upon by the Project Manager, the Installer and the Construction Technician. This field panel identification code shall be as simple and logical as possible. In general, it is not appropriate to identify panels using roll numbers since roll numbers established in the manufacturing plant are usually cumbersome and are not related to location in the field. The Construction Technician shall establish a table or chart showing correspondence between roll numbers and field panel identification codes. The field panel identification code shall be used for all quality assurance records.

The Construction Technician shall verify that field panels are installed at the approximate locations indicated on the Installer's layout plan, as approved by the Project Manager.

6.4.2 Panel Deployment Procedure

The Construction Technician shall review the panel deployment progress of the Installer (keeping in mind issues relating to wind, rain, subgrade, and other site-specific conditions) and advise the Project Manager on its compliance with the approved panel layout drawing and its suitability to the actual field conditions. Once approved, only the Project Manager can authorize changes to the panel deployment procedure. The Construction Technician shall verify that the condition of the supporting soil does not change detrimentally during installation.
The Construction Technician shall record the identification code, location, and date of installation of each field panel.

Temporary weights will be used during FML installation to guard against wind damage. Temporary weights may consist of sand bags, tires, or other means approved by the Project Manager. The selected method will not damage the FML or other materials.

6.4.3 Deployment Weather Conditions

FML deployment shall not be undertaken if weather conditions will preclude material seaming following deployment.

The Construction Technician shall verify that the above conditions are fulfilled. Ambient temperature shall be measured by the Construction Technician in the area in which the panels are to be deployed. The Construction Technician shall inform the Project Manager of any weather related problems which may not allow FML placement to proceed.

6.4.4 Method of Deployment

Before the FML is handled on site, the Construction Technician shall verify that handling equipment to be used on site is adequate and does not pose risk of damage to the FML. During handling, the Construction Technician shall observe and verify that the Installer's personnel handle the FML with care.

The Construction Technician shall verify the following:

1. Any equipment on the liner used does not damage the FML by handling, excessive heat, leakage of hydrocarbons, or other means.

2. The prepared surface underlying the FML has not deteriorated since previous acceptance, and is still acceptable immediately prior to the placement of FML.

3. All personnel do not smoke or wear damaging shoes while working on the FML, or engage in other activities which could damage the FML.

4. 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.

5. The method used to place the panels minimizes wrinkles (especially differential wrinkles between adjacent panels).

6. Adequate temporary loading and/or anchoring (e.g., sand bags, tires), not likely to damage the FML, has been 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.

7. Direct contact with the FML is minimized, and the FML is protected by geotextiles, extra FML, or other suitable materials, in areas where excessive traffic may be expected.

The Construction Technician shall inform the Project Manager if the above conditions are not fulfilled.

6.4.5 Damage and Defects

Upon delivery to the site, the Construction Technician shall conduct a surface observation of all rolls for defects and for damage. This inspection shall be conducted without unrolling rolls unless defects or damages are found or suspected. The Construction Technician shall advise the Project Manager, in writing, of any rolls or portions of rolls which should be rejected and removed from the site because they have unrepairable flaws.

The Construction Technician shall inspect each panel, after placement and prior to seaming, for damage and/or defects. The Construction Technician shall advise the project Manager which panels, or portions of panels, should be rejected, repaired, or accepted. Damaged panels, or portions of damaged panels, which have been rejected shall be marked and their removal from the work area recorded by the Construction Technician.

6.4.6 Writing on the Liner

To avoid confusion, the Installer and the Construction Technician shall each use different colored markers that are readily visible for writing on the FML. The markers used must be semi-permanent and compatible with the FML. The Installer shall use a white marker to write on the FML. The Construction Technician shall use a yellow marker.

6.5 Field Seaming

6.5.1 Seam Layout

Before installation begins, the Installer shall provide the Project Manager with a panel layout drawing, i.e., a drawing of the area to be lined showing all expected seams. The Construction Technician shall review the panel layout drawing and verify that it is consistent with accepted state-of-practice. No panels may be seamed without the written approval of the panel layout drawing by the Project Manager. In addition, panels not specifically shown on the panel layout drawing may not be used without the Project Manager's prior approval.

In general, seams should be oriented parallel to the line of maximum slope, i.e., oriented along, not across, the slope. In corners and odd-shaped geometric locations, the number of seams should be minimized. No horizontal seam should be less than 5 feet from the toe of the slope, or areas of potential stress concentrations, unless otherwise authorized by the Project Manager.

A seam numbering system compatible with the panel numbering system shall be used by the Construction Technician.

6.5.2 Accepted Seaming Methods

Approved processes for field seaming are extrusion welding and fusion welding. Proposed alternate processes shall be documented and submitted by the Installer to the Project Manager for approval. Only apparatus which have been specifically approved by make and model shall be used. The Project Manager shall submit all documentation regarding seaming methods to be used to the Installer for review.

6.5.2.1 Extrusion Process

The Construction Technician shall log ambient, seaming equipment, and FML surface temperatures at appropriate intervals and report any noncompliances to the Project Manager.

The Construction Technician shall verify that:

1. The Installer maintains on-site the number of spare operable seaming equipment (and parts) decided upon at the pre-construction meeting.
2. Equipment used for seaming is not likely to damage the FML.
3. Prior to beginning a seam, the extruder is purged until all heat-degraded extradite has been removed from the barrel.
4. Clean and dry welding rods or extradite pellets are used.
5. The electric generator is placed on a smooth base such that no damage occurs to the FML.
6. Grinding shall be completed no more than 1 hour prior to seaming.
7. A smooth insulating plate or fabric is placed beneath the hot welding apparatus after usage such that no damage occurs.
8. The FML is protected from damage in heavy traffic areas.
9. Exposed grinding marks adjacent to an extrusion weld shall be minimized. In no instance shall exposed grinding marks extend more that ¼ inch from the finished seamed area.
10. In general, the FML panels are aligned to have a nominal overlay of 3 inches for extrusion welding. In any event, the final overlap shall be sufficient to allow peel tests to be performed on the seam.
11. No solvent or adhesive is used.

12. The procedure used to temporarily bond adjacent panels together does not damage the FML; in particular, the temperature of hot air at the nozzle of any temporary welding apparatus is controlled such that the FML is not damaged.

6.5.2.2 Fusion Process

The Construction Technician shall log ambient, seaming equipment, and FML surface temperatures at appropriate intervals and report any noncompliances to the Project Manager.

The Construction Technician shall also verify that:

1. The Installer maintains on-site the number of spare operable seaming equipment (and parts) decided upon at the pre-construction meeting.
2. Equipment used for seaming is not likely to damage the FML.
3. For cross seams, the edge of the cross seam is ground to an incline prior to welding.
4. The electric generator is placed on a smooth base such that no damage occurs to the FML.
5. A smooth insulating plate or fabric is placed beneath the hot welding apparatus after usage such that no damage occurs.
6. The FML is protected from damage in heavy traffic areas.
7. A movable protective layer is used as required by the Installer directly below each overlap of FML that is to be seamed to prevent buildup of moisture between the sheets and prevent debris from collecting around the pressure rollers.
8. In general, the FML panels are aligned to have a nominal overlap of 5 inches for fusion welding. In any event, the final overlap shall be sufficient to allow peel tests to be performed on the seam.
9. No solvent or adhesive is used.

6.5.3 Seam Preparation

The Construction Technician shall verify that prior to seaming, the seam area is clean and free of moisture, dust, dirt, debris or foreign material of any kind. If seam overlap grinding is required, the Construction Technician must ensure that the process is completed according to the Manufacturer's instructions within one hour of the seaming operation, and in a way that does not damage the FML. The Construction Technician shall also verify that seams are aligned with the fewest possible number of wrinkles and "fishmouths".

6.5.4 Trial Seams

Trial seams shall be made on fragment pieces of FML to verify that conditions are adequate for production seaming. Such trial seams shall be made at the beginning of each seaming period, and at least once each five hours, for each production seaming apparatus used that day. Each seamer shall make at least one trial seam each day. Trial seams shall be made under the same conditions as actual seams.

The trial seam sample shall be at least 3 foot long by 1 foot wide (after seaming) with the seam centered lengthwise.

Two specimens shall be cut from the sample with a 1 inch wide die. The specimens shall be cut by the installer at locations selected randomly along the trial seam sample by the Construction Technician. The specimens shall be tested in peel using a field tensiometer. The tensiometer shall be capable of maintaining a constant jaw separation rate of two inches per minute. If a specimen fails, the entire operation shall be repeated. If the additional specimen fails, the seaming apparatus and seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial welds are achieved. The Construction Technician shall observe all trial seam procedures.

The remainder of the successful trial seam sample shall be cut into three pieces, one to be retained in the Project Manager's archives, one to be given to the Installer, and one to be retained by the Construction Technician for possible laboratory testing. Each portion of the sample shall be assigned a number and marked accordingly by the Construction Technician, who shall also log the date, hour, ambient temperature, number of seaming unit, name of seamer, and pass or fail description.

If agreed upon between the Project Manager and the Construction Technician, and documented by the Construction Technician in his daily report, the remaining portion of the trial seam sample can be subjected to destructive testing. If a trial seam sample fails a test conducted by the CQA Laboratory, then a destructive seam test sample shall be taken from each of the seams completed by the seamer during the shift related to the subject trial seam. These samples shall be forwarded to the CQA Laboratory and, if they fail the tests, the procedure indicated in Section 6.7.7 shall apply. The conditions of this paragraph shall be considered satisfied for a given seam if a destructive seam test sample has already been taken.

6.5.5 General Seaming Procedures

During general seaming, the Construction Technician shall be cognizant of the following:

1. If required, a firm substrate shall be provided by using a flat board, a conveyor belt, or similar hard surface directly under the seam overlap to achieve proper support.
2. Fishmouths or wrinkles at the seam overlaps shall be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut fishmouths or wrinkles shall be seamed and any portion where the overlap is inadequate shall then be patched with an oval or round patch of the same FML extending a minimum of 6 inches beyond the cut in all directions.
3. If seaming operations are carried out at night, adequate illumination shall be provided.
4. Seaming shall extend to the outside edge of panels placed in the anchor trench.
5. All cross seam tees should be extrusion welded to a minimum distance of 4 inches on each side of the tee.
6. No field seaming shall take place without the Master Seamer being present.

The Construction Technician shall verify that the above seaming procedures are followed, and shall inform the Project Manager of any nonconformance.

6.5.6 Seaming Weather Conditions

6.5.6.1 Normal Weather Conditions

The normal required weather conditions for seaming are as follows:

1. Ambient temperature between 32°F and 104°F or sheet temperature less than 122°F unless otherwise authorized by GE.
2. Dry condition, i.e., no precipitation or other excessive moisture, such as fog or dew.
3. No excessive winds (winds exceeding 20 mph).

The Construction Technician shall verify that these weather conditions are fulfilled and notify the Project Manager if they are not. Ambient temperature shall be measured by the Construction Technician in the area in which the panels are to be placed. The Project Manager will then decide if the installation is to be stopped or special procedures are to be used.

6.5.6.2 Cold Weather Conditions

To ensure a quality installation, if seaming is conducted when the ambient temperature is below 32°F, the following conditions shall be met:

1. FML surface temperatures shall be determined by the Construction Technician at intervals of at least once per 100 feet of seam length to determine if preheating is required. For extrusion welding, preheating is required if the surface temperature of the FML is below 32°F.

2. Preheating may be waived by the Project Manager based on a recommendation from the Construction Technician, if the Installer demonstrates to the Construction Technician's satisfaction that welds of equivalent quality may be obtained without preheating at the expected temperature of installation.

3. If preheating is required, the Construction Technician shall inspect all areas of FML that have been preheated by a hot air device prior to seaming, to ensure that they have not been overheated.

4. Care shall be taken to confirm that the surface temperatures are not lowered below the minimum surface temperatures specified for welding due to winds or other adverse conditions. It may be necessary to provide wind protection for the seam area.

5. All preheating devices shall be approved prior to use by the Project Manager.

6. Additional destructive tests shall be taken at an interval between 500 feet and 250 feet of seam length, at the discretion of the Construction Technician.

7. Sheet grinding may be performed before preheating, if applicable.

8. Trial seaming shall be conducted under the same ambient temperature and preheating conditions as the actual seams. Under cold weather conditions, new trial seams shall be conducted if the ambient temperature drops by more than 10° F from the initial trial seam test conditions. Such new seams shall be conducted upon completion of seams in progress during temperature drop.

6.5.6.3 Warm Weather Conditions

At sheet temperatures above 122°F or ambient temperature above 104°F, no seaming of the FML shall be permitted unless the Installer can demonstrate to the satisfaction of the Project Manager that FML seam quality is not compromised.

Trial seaming shall be conducted under the same ambient temperature conditions as the actual seams.

At the option of the Construction Technician, additional destructive tests may be required for any suspect areas.

6.6 Nondestructive Seam Testing

6.6.1 Concept

The Installer shall nondestructively test all field seams over their full length using a vacuum test unit, air pressure test (for double fusion seams only), or other approved method (which shall be selected by the Contractor and approved by the Construction Technician prior to its use). Vacuum testing and air pressure testing are described in Sections 6.6.2 and 6.6.3, respectively. The purpose of nondestructive tests is to check the continuity of the seams. It does not provide quantitative information on seam strength. Nondestructive testing shall be carried out as the seaming work progresses, not at the completion of all field seaming.

For all seams, the Construction Technician shall:

1. Observe nondestructive testing procedures.
2. Record location, data, name of tester, and outcome of all testing.
3. Visually inspect all tests.
4. Inform the Installer and Project Manager of any required repairs.

Any seams that cannot be nondestructive tested shall be cap-stripped with the same FML. The cap-stripping operations shall be observed by the Construction Technician and Installer for uniformity and completeness.

The spark test method may be used for nondestructive testing of extrusion welds associated with HDPE pipe boots.

6.6.2 Vacuum Testing

The following procedures are applicable to vacuum testing:

1. The equipment shall consist of the following:

    a. A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, a porthole or valve assembly, and a vacuum gauge.
    b. A pump assembly equipped with a pressure controller and pipe connections.
    c. A rubber pressure/vacuum hose with fittings and connections.
    d. A soapy solution.
    e. A bucket and wide paint brush, or other means of applying the soapy solution.

2. The following procedures shall be followed:

    a. Energize the vacuum pump and reduce the applied pressure to approximately 5 psi gauge.
    b. Wet a strip of geomembrane approximately 12 inches by 48 inches with the soapy solution.
    c. Place the box over the wetted area.
    d. Close the bleed valve and open the vacuum valve.
    e. Ensure that a leak-tight seal is created.
    f. For a period of approximately 10 seconds, apply vacuum and examine the FML through the viewing window for the presence of soap bubbles.
    g. If no bubble appears after 10 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inch overlap, and repeat the process.
    h. All areas where soap bubbles appear shall be marked and repaired.

6.6.3 Air Pressure Testing

The following procedures are applicable to double fusion welding which produces a double seam with an enclosed space.

1. The equipment shall consist of the following:

a. An air pump (manual or motor driven), equipped with pressure gauge capable of generating and sustaining a pressure between 24 and 35 psi and mounted on a cushion to protect the FML.
b. A rubber hose with fittings and connections.
c. A sharp hollow needle, or other approved pressure feed device.

2. The following procedures shall be followed:

a. Seal both ends of the seam to be tested.
b. Insert needle or other approved pressure feed device the air channel created by the fusion weld.
c. Insert a protective cushion between the air pump and the FML.
d. Pressure the air channel to a pressure of approximately 25 psi. Close valve, allow for pressure to stabilize, and sustain pressure for at least 3 minutes.
e. If loss of pressure exceeds the maximum permissible pressure differential as outlined in the project specifications or does not stabilize, locate faulty area and repair.
f. Cut opposite end of tested seam area once testing is completed to verify continuity of the air channel. If air does not escape, locate blockage and retest unpressurized area. Seal the cut end of the air channel.
g. Remove the needle or other approved pressure feed device and seal the hole in the FML.

6.6.4 Test Failure Procedures

The Installer shall complete any required repairs in accordance with Section 6.8. For repairs, the Construction Technician shall:

1. Observe the repair and testing of the repair.
2. Mark on the FML that the repair has been made.
3. Document the repair procedures and test results.

6.7 Destructive Seam Testing

6.7.1 Concept

Destructive seam tests shall be performed at selected locations. The purpose of these tests is to evaluate seam strength. Seam strength testing shall be done as the seaming work progresses, not at the completion of all field seaming.

6.7.2 Location and Frequency

The Construction Technician shall select locations where seam samples will be cut out for laboratory testing. Those locations shall be established as follows:

1. A minimum frequency of one test location per 500 feet of seam length performed by each welder. This minimum frequency is to be determined as an average taken throughout the entire site.

2. Test locations shall be determined during seaming at the Construction Technician's discretion. Selection of such locations may be prompted by suspicion of overheating, contamination, offset welds, or any other potential cause of imperfect welding.

The Installer shall not be informed in advance of the locations where the seam samples will be taken.

6.7.3 Sampling Procedures

Samples shall be cut by the Installer at locations selected by the Construction Technician as the seaming progresses so that laboratory test results are available before the FML is covered by another material. The Construction Technician shall:

1. Observe sample cutting.
2. Assign a number to each sample, and mark it accordingly.
3. Record sample location on panel layout drawing.
4. Record reason for taking the sample at this location (e.g., statistical routine, suspicious feature of the FML, etc.).

5. Examine samples for holes, grooves, melt through, wavering welds, unusual weld width, and any other unusual characteristics.

All holes in the FML resulting from destructive seam sampling shall be immediately repaired. The continuity of the new seams in the repaired area shall be tested.

6.7.4 Sample Dimensions

At each sampling location, two types of samples shall be taken by the Installer. First, two samples for field testing should be taken. Each of these samples shall be cut with a 1 inch wide die, with the seam centered parallel to the width. The distance between these two samples shall be 56 inches. If both samples pass the field test described in Section 6.7.5, a sample for laboratory testing shall be taken.

The sample for laboratory testing shall be located between the samples for field testing. The sample for laboratory testing shall be 12 inches wide by 56 inches long with the seam centered lengthwise. The sample shall be cut into three parts and distributed as follows:

1. One portion to the Installer for optional laboratory testing, 12 inches by 18 inches;
2. One portion for CQA Laboratory testing, 12 inches by 18 inches; and
3. One portion to the Project Manager for archive storage, 12 inches by 18 inches.

Final determination of the sample sizes shall be made at the pre-construction meeting.

6.7.5 Field Testing

Two, 1 inch wide strips shall be tested in the field using a tensiometer for peel adhesion and shall not fail according to the criteria in the project specifications. The tensiometer shall be capable of maintaining a constant jaw separation rate of two inches per minute. If the test passes in accordance with this section, the sample qualifies for testing in the laboratory. If it fails, the seam should be repaired. Final judgement regarding seam acceptability, based on the failure criteria, rests with the Project Manager.

The Construction Technician shall witness all field tests and mark all samples and portions with their number. The Construction Technician shall also log the date and time, ambient temperature, number of seaming unit, name of

seamer, welding apparatus temperatures and pressures, and pass or fail description, and attach a copy to each sample portion.

6.7.6 Laboratory Testing

Destructive test samples shall be packaged and shipped, if necessary, under the responsibility of the Construction Technician in a manner which will not damage the test sample. The sample shall be shipped as soon as possible to expedite laboratory testing. The Project Manager will be responsible for storing the archive samples. Test samples shall be tested by the CQA Laboratory.

Testing shall include "Seam Shear Strength" and "Peel Adhesion". These terms along with minimum acceptable values shall be defined in the project specifications. At least five specimens shall be tested in each shear and peel. Specimens shall be selected alternately by tests from the samples (i.e., peel, shear, peel, shear, and so on). A passing test shall meet the minimum acceptable values in at least four of the five specimens tested for each method.

The CQA Laboratory shall provide verbal test results no more than 24 hours after they receive the samples. The Construction Technician shall review laboratory test results as soon as they become available, and make appropriate recommendations to the Project Manager.

6.7.7 Destructive Test Failure Procedures

The following procedures shall apply when a sample fails a destructive test, whether that test is conducted by the CQA Laboratory, or by field tensiometer. The Installer has two options:

1. The Installer can repair the seam between any two passing destructive test locations.

2. The Installer can trace the welding path to an intermediate location 10 feet minimum from the point of the failed test in each direction and take a sample with a 1 inch wide die for an additional field test at each location. If these additional samples pass the test, then full laboratory samples are taken. If these additional laboratory samples pass the tests, then the seam is repaired between these locations. If either sample fails, then the process is repeated to establish the zone in which the seam should be repaired.

All acceptable repaired seams shall be bound by two locations from which samples passing laboratory destructive tests have been taken. Passing laboratory destructive tests taken may be used as a boundary for the failing seam. Repairs shall be made in accordance with Section 6.8.

The Construction Technician shall document all actions taken in conjunction with destructive test failures. No installation of material above the FML shall be done until destructive testing for that section is completed and accepted by the Construction Technician.

6.8 Defects and Repairs

6.8.1 Identification

All seams and non-seam areas of the FML shall be examined by the Construction Technician for identification of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Because light reflected by the FML helps to detect defects, the surface of the FML shall be clean at the time of examination. The FML surface shall be cleaned by the Installer if the Construction Technician determines that the amount of dust or mud inhibits examination.

6.8.2 Evaluation

Each suspect location both in seam and non-seam areas shall be nondestructively tested. Each location which fails the nondestructive testing shall be marked by the Construction Technician and repaired by the Installer. All defects found during testing shall be numbered and marked immediately after detection. Work shall not proceed with any materials which will cover locations which have been repaired until appropriate nondestructive and laboratory test results (as necessary) with passing values are available.

6.8.3 Repair Procedures

Any portion of the FML exhibiting a flaw, or failing a destructive or nondestructive test, shall be repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure shall be agreed upon between the Project Manager, the Installer, and the Construction Technician.

1. The repair procedures available include:

a. Patching, used to repair large holes, tears, undispersed raw materials, and contamination by foreign matter.
b. Bead weld, used to repair small tears, pinholes, or other minor, localized flaws.
c. Capping, used to repair large lengths of failed seams.
d. Extrusion welding the flap shall not be allowed.
e. Removing bad seam and replacing with a strip of new material welded into place.

2. For any repair method, the following provisions shall be satisfied:

a. Surfaces of the FML which are to be repaired using extrusion methods shall be ground no more than one hour prior to the repair.
b. All surfaces shall be clean and dry at the time of the repair.
c. All seaming equipment used in repairing procedures shall meet the requirements of the project.
d. Patches or caps shall be of the same FML thickness, type, and extend at least 6 inches beyond the edge of the defect. All corners of patches shall be rounded with a radius of approximately 3 inches.

6.8.4 Repair Verifications

The Construction Technician shall observe all nondestructive testing of repairs and shall record the number of each repair, date, and test outcome. Each repair shall be nondestructively tested. Repairs which pass the nondestructive test shall be taken as an indication of an adequate repair. Long repairs may require destructive testing at the discretion of the Construction Technician. Failed tests indicate that the repair shall be redone and retested until a passing test results.

6.8.5 Large Wrinkles

When seaming of the FML is completed, and prior to placing overlying materials, the Construction Technician shall indicate to the Project Manager which wrinkles should be cut and reseamed by the Installer. Also, the Construction Technician shall indicate to the Project Manager which areas are in tension (bridging or "trampoline effect") should be cut and repaired by the Installer. The number of wrinkles and "trampolines" to be repaired should be kept to an absolute minimum. Therefore, wrinkles and trampolines should be located during the coldest part of the installation period, while keeping in mind the forecasted weather to which the uncovered FML may be exposed. Wrinkles are considered to be large when the FML can be folded over on to itself. This is generally the case for a wrinkle that

extends 12 inches from the subgrade. Trampolines are considered for repair when the FML is 9 inches above the subgrade. Seams produced while repairing wrinkles or trampolines shall be tested as outlined above.

When placing overlying material on the FML, every effort must be made to minimize wrinkle development. If possible, cover should be placed during the coolest weather available. In addition, small wrinkles should be isolated and covered as quickly as possible to prevent their growth. The placement of cover materials shall be observed by the Construction Technician to ensure that wrinkle formation is minimized.

6.9 FML Protection

No installation of materials above the FML shall proceed until all FML testing has been completed for that segment. The QA of the adjacent materials themselves are covered in separate sections of this plan.

7. Geosynthetic Drainage Composite

7.1 General

GDCs are materials used as drainage and filter media in lining systems. This section is applicable to GDCs made of non-woven geotextiles (polyester or polypropylene) bonded to both sides of an HDPE geonet.

7.2 Manufacturing and Delivery

This subsection describes the quality control measures applicable to the GDC components manufacture, the GDC components compositing, and GDC delivery to the site prior to installation.

7.2.1 Material Specifications

The GDC used in the base liner and final cover systems will be a double sided GDC. The GDC will be constructed by thermally bonding a single piece of non-woven geotextile to both sides of an HDPE drainage net.

7.2.2 Quality Control Requirements

Prior to the installation of any GDC, the GDC Manufacturer or Installer shall provide the Project Manager with the following information:

1. The origin (supplier's name and production plant) and identification (brand name and number) of the geotextile and geonet used to fabricate the GDC.

2. Copies of dated quality control certificates issued by the geotextile and geonet supplier. These certificates shall contain the results of the quality control tests performed on the GDC components outlined in the Technical Specifications.

3. A specification for the GDC which includes all properties published by the Manufacturer measured using the appropriate test methods.

4. Written certification that minimum values given in the Technical Specifications are guaranteed by the Manufacturer.

5. Quality control certificates for the GDC, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include roll identification numbers, testing procedures and results of quality control tests. At a minimum, results shall be given for:

- Mass per unit area (ASTM D3776).
- Thickness (ASTM D1777).
- Geotextile-geonet adhesion (ASTM D413).
- Transmissivity Testing (ASTM D4716).

Quality control tests shall be performed for at least every 40,000 ft^2 and transmissivity testing for at least every 100,000 ft^2 of GDC produced.

The Manufacturer shall identify all rolls of GDC with the following:

- Manufacturer's name;
- Product identification;
- Roll number; and
- Roll dimensions.

The Construction Technician should review these documents and report any discrepancies with the above requirements to the Project Manager. The Construction Technician should verify that:

- Property values certified by the Manufacturer meet all of its guaranteed specifications;
- Measurements of properties by the Manufacturer are properly documented and that the test methods used are acceptable;
- Quality control certificates have been provided at the specified frequency for all rolls, and that each certificate identifies the rolls related to it;
- Roll packages are appropriately labeled;
- Certified minimum roll properties meet the Technical Specifications; and
- Technical Specifications were submitted by the Contractor to the Installer.

7.2.3 Manufacturer's Certification

The GDC Manufacturer will provide certification, based on tests performed by either the GDC Manufacturer's laboratory or another outside laboratory contracted by the GDC Manufacturer, that the GDC supplied comply with this CQAP and the Technical Drawings and Specifications. Additionally, the GDC Manufacturer will provide certification that the Manufacturer's Quality Control Plan was fully implemented for the GDC material supplied under this plan.

7.2.4 Delivery, Handling, and Storage of the GDC

After the GDC has been manufactured, the GDC rolls will be shipped to the GE Plant Property. GDC rolls will be wrapped in relatively opaque and water tight plastic to prevent damage during shipping and storage. GDC 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.

Each GDC panel roll will be marked by the GDC Manufacturer with the following information (on a durable gummed label, or equivalent):

- Name of manufacturer;
- Product type and identification number (if any);
- Panel length and width;
- Nominal product thickness; and
- Identification number.

The following practices will be used, as a minimum, in receiving and storing GDC rolls in the designated storage area at the job site:

- Damage to contents will be prevented during unloading or transfer of the rolls from one location to another;
- GDC rolls will be stored to ensure that they are adequately protected from the following:

    a. Equipment damage;
    b. Strong oxidizing chemicals, acids, or bases;
    c. Flames, including welding sparks;

d. Temperatures in excess of 160°F; and

e. Soiling;

The Construction Technician should observe and document, throughout the pre-installation, installation, and post-installation periods, that the Installer is providing adequate handling equipment for moving GDC rolls and that the equipment and the handling methods used do not pose unnecessary risk of damage. The Installer will be responsible for the means and methods to implement the work.

The Installer will be responsible for ensuring that all materials installed meet specifications (i.e., that the roll marking label information indicates the required specifications and properly represent materials). The Construction Technician should maintain a log of GDC roll deliveries.

7.3 GDC Conformance Testing Requirements

This subsection describes the test methods, including sampling procedures and frequencies, and the role of the CQA Laboratory in testing the GDC rolls samples.

7.3.1 Test Methods

Upon delivery of the rolls of GDC, the Construction Technician should observe that conformance test samples are obtained for the GDC. These samples should then be forwarded to the CQA Laboratory for testing to monitor conformance with the project specifications.

At a minimum, the following conformance tests should generally be performed on GDC as a unit:

- Mass per unit area (ASTM D-3776);
- Thickness (ASTM D-1777);
- Geotextile-geonet adhesion (ASTM D-413); and
- Transmissivity (ASTM D-4716).

The rolls to be sampled should be selected by the Construction Technician. Samples should not be taken from any portion of a roll which has been damaged. Unless otherwise specified, samples shall be 3 feet long by the roll width.

The Construction Technician should mark the machine direction on the samples with an arrow. Lots of material and the particular test sample that represents each lot should be defined before the samples are taken.

A lot shall be defined as a group of consecutively numbered rolls from the same manufacturing line. Alternatively, a lot may be designated by the Construction Technician based on a review of all roll information including quality control documentation and manufacturing records.

- Samples should be taken at a rate of one per lot, or at a minimum of one conformance test per 100,000 ft^2 of GDC.

7.3.2 Role of the CQA Laboratory

The CQA Laboratory will be responsible for performing the tests on samples submitted to them. The results of the tests performed will be reported to the Project Manager.

Retesting of GDC rolls for quality assurance purposes, because of failure to meet any or all of the acceptance specifications can be authorized only by the Project Manager.

The GDC Manufacturer and/or Installer may perform their own tests according to the methods and procedures defined in Section 7.3.1; however, the results will be applicable only to their own quality control needs. These results will not be substituted for the quality assurance testing described herein.

7.3.3 Procedures for Determining GDC Test Failures

All conformance test results should be reviewed and material accepted or rejected by the Construction Technician prior to the deployment of the GDC.

The Construction Technician should review results from laboratory conformance testing and report non-conformance to the Project Manager. The Construction Technician is responsible for checking that test results meet or exceed the property values listed in the Technical Specifications.

The following procedure should be used in interpreting results:

1. If the test values meet the requirement stated in the Technical Specifications, then the roll and the lot will be accepted for use at the job site. If the sample represents all rolls from an entire shipment, then the entire shipment will also be considered accepted.

2. If the results do not meet the Technical Specifications, then the roll and the lot may be retested using specimens either from the original roll sample, or from another sample collected by the Construction Technician. For retesting, two additional tests will be performed for the failed test procedure (each additional test will consist of multiple-specimen tests if multiple specimens are called for in the test procedure). If both of the retests are acceptable, then the roll and lot will be considered to have passed this particular acceptance test; if either of the two additional tests fail, then the roll and batch will be considered unsuitable without further recourse. The Construction Technician may obtain samples from other rolls in the lot. On the basis of testing these samples, the Construction Technician may choose to accept a portion of the lot while rejecting the remainder.

If retesting does not result in passing test results as defined in the preceding paragraph, or if there are other nonconformities with the material specifications, then the Installer will withdraw the rolls from use at the Installer's sole expense. The Installer will be responsible for the sole expense of removing the GDC from the site and providing acceptable replacement materials.

7.4 GDC Installation

This subsection includes discussions of placement of the GDC and defects and repairs to the GDC.

Parties involved in the installation of the GDC will be familiar with GDCs and will emphasize protection of the GDC, and the underlying FML, from damage during construction activities.

7.4.1 Subgrade Preparation

The GDC will be placed directly over the FML. Prior to installing the GDC, the Installer will confirm with Construction Technician that the FML to be covered has been installed and fully tested according to this CQAP and the Technical Specifications.

The Construction Technician shall verify that the GDC is free of dirt and dust prior to installation. The Construction Technician shall identify any dirty rolls and report them to the Project Manager. If the GDC is judged to be dirty or

dusty, it shall be washed by the Installer prior to installation. Washing operation should be observed by the Construction Technician and improper washing operations should be reported to the Project Manager.

7.4.2 GDC Placement

The Installer shall handle all GDC rolls in such a manner as to ensure they are not damaged in any way, and the following shall be complied with:

1. When deployed, the geonet component of the GDC will be in direct contact with the underlying FML.

2. On slopes, the GDC shall be securely anchored and then rolled down the slope in such a manner as to continually keep the GDC sheet in tension. If necessary, the GDC shall be positioned by hand after being unrolled to minimize wrinkles.

3. In the presence of wind, all GDCs shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during deployment and shall remain until replaced with cover material.

4. Unless otherwise specified, GDC shall not be welded to the FML.

5. GDCs shall be cut using a hook blade or other tool approved by the Construction Technician. Special care shall be taken to protect underlying FML damage which could be caused by the cutting of the GDC. Care should be taken not to leave the tools on the GDC.

6. The Installer shall take all necessary precautions to prevent damage to the underlying FML during placement of the GDC.

7. During placement of GDC, care shall be taken not to entrap in or beneath the GDC, stones, or dirt that could damage the FML, cause clogging of drains or filters, or hamper subsequent seaming. If dirt or excess dust is entrapped in the geonet, it should be washed clean.

8. A visual examination of the geotextile portion of the GDC shall be carried out over the entire surface, after installation, to ensure that no potentially harmful foreign objects are present.

The Construction Technician should note noncompliance and report it to the Project Manager.

7.4.3 Seaming Procedures

In general, no horizontal seams, with the exception of butt-seams, will be allowed on slopes greater than 5-horizontal to 1-vertical.

A butt-seam is defined as the seam created by joining the two panels of GDC end-to-end.

7.4.3.1 Geonet Seams

At a minimum, the following shall be met:

1. Adjacent geonet shall be overlapped by at least 4 inches.
2. The geonet overlaps shall be tied with plastic fasteners. Tying devices shall be white or yellow for easy inspection. Metallic devices are not allowed.
3. Tying shall be every 5 feet along the slope, every 6 inches on butt-seams, and every 6 inches in the anchor trench.

The Construction Technician should note noncompliance and report it to the Project Manager.

7.4.3.2 Geotextiles Seaming

Geotextiles shall be overlapped a minimum of 3 inches prior to seaming. All geotextiles shall be continuously sewn. Spot sewing is not allowed. Securing pins will not be used in geotextile installation.

Sewing shall be done using polymeric thread with chemical and ultraviolet light resistance properties equal to or exceeding those of the geotextile. A sewing thread color that contrasts the color of the geotextile being sewn shall be used, to allow for ease of inspection. Sewing shall be done using machinery and stitch types specified in the Technical Specifications or as approved in writing by the Project Manager.

7.4.4 Defects and Repairs

Any portion of the GDC exhibiting a flaw shall be repaired. Prior to acceptance of the GDC, the Installer shall locate and repair all damaged areas as directed by the Construction Technician. The Construction Technician should observe any repair and report noncompliance with the following requirements in writing to the Project Manager.

7.4.4.1 Small Defects

If in the Construction Technician's judgement, the defect is determined to be small, typically smaller than 3 feet by 3 feet, the GDC shall be repaired as follows:

1. If the geonet is judged to be undamaged, but the geotextile is damaged, a patch of geotextile shall be placed. The geotextile patch shall be heat leistered in place with a minimum of 12-inch overlap in all directions.

2. If the geonet is judged to be damaged, the damaged geonet shall be removed. A section of GDC shall be cut to replace the removed section. The GDC shall be tied to the existing GDC with a minimum of 12-inch overlap in all directions using plastic fasteners placed at least every 6 inches.

Care shall be taken to remove any soil or other material which may have penetrated the torn geotextile.

7.4.4.2 Large Defects

If in the Construction Technician's judgement, the defect is determined to be large, typically larger than 3 feet by 3 feet, the GDC shall be replaced.

7.4.5 GDC Layer Acceptance

The Installer and the Manufacturer shall retain all ownership and responsibility for the GDC in the base liner and final cover systems until acceptance by GE.

The GDC layer of the systems shall be accepted by GE when:

- The installation is finished;

- Verification of the adequacy of all seams and repairs is complete; and
- All documentation of installation is complete.

The Supervising Contractor shall certify that installation has proceeded in general accordance with this section of the CQAP.

7.5 Anchor Trench

The anchor trench for the FML and GDC will be excavated by the Contractor to the lines and grades shown on the Technical Drawings.

The anchor trench will be backfilled and compacted by the Contractor. Care will be taken when backfilling the trench to prevent any damage to the geosynthetics placed in the trench prior to backfilling. The anchor trench will be adequately drained to prevent ponding or softening of the adjacent soil while the trench is open.

The Construction Technician should observe the backfilling and compacting operations and advise the Contractor of the adequacy of the soil installation. The Construction Technician should also advise the Project Manager of problems (if any).

8. Geosynthetic Clay Liner

8.1 General

A GCL is a composite barrier material which consists of a dry bentonite clay soil supported between two geotextiles. This section is applicable to the GCL used in the final cover system.

8.2 Manufacturing and Delivery

This subsection describes the quality control measures applicable to the GCL components manufacture, and delivery to the site prior to installation.

8.2.1 Material Specifications

The GCL used in the final cover system will be comprised of a layer of sodium bentonite supported within two geotextiles. The GCL will be held together by needle punching of the geotextiles.

8.2.2 Quality Control Requirements

Prior to the installation of any GCL, the GCL Manufacturer or Installer shall provide the Project Manager with the following information:

1. Manufacturer's data for the GCL including physical properties and roll size.
2. GCL material sample.
3. Manufacture's QA/QC program.
4. Certified results of all quality control testing.

Quality control tests shall be performed for at least every 100,000 ft^2 of GCL produced.

The Manufacturer shall identify all rolls of GCL with the following:

- Manufacture's Name;
- Product Identification;

- Lot/Batch Number;
- Roll Number; and
- Roll Dimensions.

The Construction Technician should review these documents and report any discrepancies with the above requirements to the Project Manager. The Construction Technician should verify that:

- Field delivered material meets the specification values according to the manufacturer's specification sheet;
- Measurements of properties by the Manufacturer are properly documented and that the test methods used are acceptable;
- Quality control certificates have been provided and that each certificate identifies the rolls related to it;
- Roll packages are appropriately labeled;
- Certified minimum roll properties meet the Technical Specifications; and
- Technical Specifications were submitted by the Contractor to the Installer.

8.2.3 Manufacturer's Certification

The GCL Manufacturer will provide certification, based on tests performed by either the GCL Manufacturer's laboratory or another outside laboratory contracted by the GCL Manufacturer, that the GCL supplied under this plan complies with this CQAP and the Technical Specifications. Additionally, the GCL Manufacturer will provide certification that the Manufacturer's Quality Control Plan was fully implemented for the GCL material supplied under this plan.

8.2.4 Delivery, Handling, and Storage of the GCL

After the GCL has been manufactured, the GCL rolls will be shipped to the GE Plant Property. GCL will be packaged and shipped by appropriate means so as to prevent damage. Materials will be delivered only after the required submittals have been received and reviewed by GE and/or GE's Representative. GCL 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.

Each GCL panel roll will be marked by the GCL Manufacturer with the following information (on a durable gummed label, or equivalent):

- Name of manufacturer;
- Product identification number (if any);
- Lot/Batch Number;
- Roll Number; and
- Roll Dimensions.

The GCL will be stored in an area which prevents damage to the product or packaging, and will be kept clean and free from dirt, dust, mud and any other debris. The GCL will not be allowed to come into contact with any liquid or moisture. Any GCL found to be wet or damaged will be replaced with new material at the Contractor's expense.

The Construction Technician should observe and document, throughout the pre-installation, installation, and post-installation periods, that the Installer is providing adequate handling equipment for moving GCL rolls and that the equipment and the handling methods used do not pose unnecessary risk of damage. The Installer will be responsible for the means and methods to implement the work.

The Installer will be responsible for ensuring that all materials installed meet specifications (i.e., that the roll marking label information indicates the required specifications and properly represent materials). The Construction Technician should maintain a log of GCL roll deliveries.

8.3 Test Methods

The Construction Technician should observe that test samples are obtained for the GCL upon delivery. These samples should then be forwarded to the CQA Laboratory for testing to monitor with the project specifications.

The GCL should have, at a minimum, the following properties:

Property	Test Method	Test Value
Grab Strength (lbs.)	ASTM D-4632	90
Permeability (cm/sec)	ASTM D-5084	$5x10^{-9}$

8.4 GCL Installation

8.4.1 Preparation

The GCL will be placed directly on top of the "select" consolidated materials. The Construction Technician will verify that the GCL is free of tears, flaws, and areas that have contacted liquid. The Contractor will be responsible for replacing any damaged GCL prior to installation.

8.4.2 GCL Placement

The Installer will handle all GCL rolls in such a manner as to ensure that they are not damaged in any way, and the following will be complied with:

1. GCL is installed at locations shown on the Technical Drawings.
2. Adjacent rolls are overlapped approximately 6 to 9 inches and seamed with bentonite as recommended by the manufacturer.
3. All GCL are covered and protected at the end of each day to prevent contact with moisture.
4. All Manufacturer's recommended installation and protection procedures are adhered to.
5. GCL placement is not permitted during precipitation events.
6. The GCL is unrolled downslope keeping the material in slight tension to minimize wrinkles and folds.
7. Adequate loading is placed to prevent uplift by wind.
8. Holes or tears in the GCL are repaired in accordance with the manufacturer's recommendations.
9. The Contractor is responsible for maintaining the integrity of the GCL during installation and placement of the FML.

8.4.3 GCL Layer Acceptance

The Installer and the Manufacturer shall retain all ownership and responsibility for the GCL in the final cover system until acceptance by GE.

The GCL layer of the final cover system will be accepted by GE when:

- The installation is finished; and

- All documentation of installation is complete.

The Supervising Contractor will certify that installation has proceeded in general accordance with this section of the CQAP.

Attachment D

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Emergency Preparedness and Contingency Plan

TECHNICAL REPORT

Emergency Preparedness and Contingency Plan - On-Plant Consolidation Areas

General Electric Company
Pittsfield, Massachusetts

June 1999

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Table of Contents

1. Introduction

1.1 General

This *Emergency Preparedness and Contingency Plan* (Plan) presents procedures which will be followed by personnel performing consolidation operations at the on-plant consolidation areas at the General Electric Company (GE) Plant in Pittsfield, Massachusetts. This Plan is divided into the following sections:

Section 1 - General Information;
Section 2 - Emergency Phone Numbers and Equipment;
Section 3 - Preventive Measures and Contingency Actions;
Section 4 - Evacuation Procedures; and
Section 5 - Recordkeeping.

1.2 Purpose

This Plan serves as a predetermined course of action to be implemented upon the identification of specific problems or concerns, and has been designed to minimize potential risks or hazards to worker and public health and the environment from any unplanned sudden or non-sudden events related to the consolidation operations. Although the consolidation areas have been designed with state-of-the-art environmental controls, operational problems that may be experienced from day to day, as well as extraordinary "worst case" problems that may develop, must be prepared for. These situations may include fires and/or explosions, spills or release of materials, and severe weather conditions. The emergency response actions that will be implemented in those situations are identified in this Plan. The Plan also identifies many precautions that will be utilized to minimize spills and impacts to the environment. The appropriate equipment and procedures that will be used for cleanup in the event of a spill or release are also included in this Plan.

All on-site personnel contracted to GE to perform the consolidation activities will be given copies of this Plan.

2. Emergency Phone Numbers and Equipment

2.1 General

Emergency situations can be categorized into three general classifications: fire and/or explosion; releases to the atmosphere and/or soil or surface waters; and severe weather conditions. First and foremost, the initial response to any emergency will be to protect human health and safety and then the environment. Secondary response to the emergency includes identification, containment, treatment, and disposal.

Prior to any consolidation activities being performed, contact will be made with local fire departments to inform them of hazards associated with the project. A determination will be made as to who will take command in emergency situations.

In the event the situation is beyond the capabilities of site personnel, assistance will be contacted. Below is a list of emergency telephone numbers:

Emergency Telephone Numbers:

- GE Plant Protection ..... 494-3761 or 494-5959
- GE Ambulance ..... 494-4900 or 448-4900
- GE Fire or Spill 494-4545
- GE Area Medical ..... 494-4900 or 448-7346
- GE Project Coordinator (John Novotny) 494-3177
- Local Ambulance 911
- Fire Department 911
- Police Department 911
- Area Hospital (Berkshire Medical Center) ..... 911 or (413) 447-2834

  Directions to Hospital:

  Travel north on New York Avenue to Dalton Avenue.

  Take right onto Dalton Avenue traveling west.

  Follow signs to Berkshire Medical Center.

- Poison Control Center ..... (800) 336-6997

- USEPA National Response Center ..... (800) 438-2427
- MASS Spill Hot Line ..... (617) 556-1133
- MASS 24-Hour Hot Line ..... (888) 403-1133

2.2 Emergency Equipment

Emergency equipment will be provided for the protection of all personnel. Site operating personnel will be responsible for ensuring that all emergency equipment is functioning properly and is readily available for use.

Emergency and spill or containment equipment located on-site will include:

- Portable fire extinguishers in compliance with the National Fire Code Standards;
- Brooms and shovels for cleanup of small-quantity soil spills;
- Dozers and front-end loaders for cleanup of large-quantity soil spills;
- Absorbent materials for cleanup of liquid spills;
- Wrenches and tools for tightening fittings and valves; and
- Leakproof containers for storage and disposal of contaminated materials not placed in the Consolidation areas.

Fire extinguishers will be stationed at the following locations:

- One in the site operations trailer; and
- One in each piece of on-site equipment.

There will be occasions when pertinent equipment becomes disabled for extended periods. Back-up equipment will be utilized when this occurs. If back-up equipment is not available, the equipment will be leased to properly operate the consolidation areas.

3. Preventive Measures and Contingency Actions

3.1 General

This Section identifies precautions that will be utilized to minimize fires and/or explosions, spills or releases of materials, and other impacts to the environment. In the event of a fire or explosion, spill or release, or severe weather conditions, this section also provides contingency measures to be performed by site personnel.

3.2 Prevention Methods

All possible precautions shall be taken when performing consolidation activities to minimize the impacts to soil, water, air, structures, equipment or materials that would result from a fire and/or explosion, or from a spill or release. This includes the following:

- Implementation of silt fencing and/or hay bales, as necessary, around the perimeter of the work area to contain the spill and to minimize the exposed area that would be impacted in the event of a spill or release;
- Use of contained, lined vehicles for transportation from the response action area to the consolidation area;
- Minimizing material transport over water courses;
- Minimizing the time handling consolidation materials (i.e., minimize "double handling");
- Minimizing dust resulting from the transport, handling, and/or placement of consolidation materials (including soil covers) with the use of dust suppression methods (e.g., watering);
- Installing daily covers at the end of each working day, and interim covers when consolidation activities cease for the year, or when final design grades are achieved, but the area is not large enough to warrant the installation of a final cover;
- Making fire fighting, and spill containment and cleanup materials readily available for use if necessary; and
- Air monitoring during all soil and consolidation materials handling activities.

Additionally, Material Safety Data Sheets (MSDSs) for substances stored on-site during the consolidation activities will be made readily available to site personnel These substances may include:

- Automotive gasolines;
- Diesel fuels;
- Select Motor Oils;

- Propane; and
- Various cleaning products.

These materials will be kept in the containers provided by the supplier or manufacturer, and securely stored.

3.3 Site Communication

There will always be at least two employees on-site during active consolidation activities. If an emergency situation develops, the first employee who becomes aware of the situation will contact the Site Supervisor(s), who will then contact the GE Project Coordinator and the site Health and Safety Officer (HSO). Upon being advised of the emergency situation, the GE Project Coordinator and HSO will assess the nature of the emergency to determine the proper course of action.

3.4 Conditions for Contingency Actions

Some of the conditions under which contingency actions will be implemented are:

- Identification of a localized and containable fire;
- Occurrence of a spill or material release;
- Severe weather conditions; or
- Physical or chemical injury to a worker.

3.5 Assessing the Risk

First and foremost, the HSO's initial reaction to any emergency will be to protect human health and safety and then the environment. Secondly, he/she will assess the nature of the emergency, the steps required to contain and treat the emergency, and any requirements for disposal that may result from containing and treating the situation.

The HSO will assess possible hazards to human health and the environment that may result from any emergency situation. This assessment will take into consideration both direct and indirect effects of the incident (e.g., the effects of toxic, irritating, or asphyxiating gases that are generated).

3.5.1 Fire and/or Explosion

Contingency actions will immediately be implemented upon notification that any of the following events has occurred:

- A fire causes, or could cause, the release of toxic fumes;
- The fire spreads and could possibly ignite nearby fuel oil or could cause heat-induced explosions;
- The fire could possibly spread to off-site areas;
- Use of water or water and chemical fire suppressants could result in uncontrollable contaminated runoff;
- A danger exists that an explosion could occur causing a safety or health hazard;
- A danger exists that an explosion could ignite other hazardous waste at the Consolidation area;
- A danger exists that an explosion could result in release of toxic material; or
- An explosion has occurred.

3.5.2 Spills or Material Release

The primary potential for spills occurring during consolidation activities involve soils impacted by polychlorinated biphenyls (PCBs) and liquid spills involving fuel, lubricating oils, etc. The following spills or material releases, whether detected as having occurred or being imminent, will be cause for contingency actions:

- A spill that could result in release of flammable liquids or vapors, thus causing a fire or gas explosion hazard;
- A spill that could cause the release of toxic vapors or fumes into the atmosphere;
- A spill that can be contained on-site but a potential exists for ground water or surface water impact; or
- A spill that cannot be contained on-site resulting in a potential for off-site soil contamination and/or ground water or surface water impact.

Upon implementation of any contingency actions, the HSO will immediately assess the magnitude based on:

- MSDSs for the material spilled or released;
- Source of the release or spillage of hazardous material;
- An estimate of the quantity released and the rate at which it is being released;
- The direction in which the spill or air release is moving;

- Personnel who may be or may have been in contact with material, or air release, and possible injury or sickness as a result;
- Potential for fire and/or explosion resulting from the situation; and
- Estimates of area under influence of release.

If the accident is determined to lie within the on-site emergency response capabilities, the HSO will immediately activate the necessary corrective actions. If the HSO believes the incident might be beyond the capabilities of the operating crew, he/she will immediately notify the appropriate off-site response teams and governmental agencies.

In the event of an emergency spill or release, all personnel not involved with emergency response activity will immediately evacuate the area around the release. The spill or release area will be roped or otherwise blocked off.

3.5.3 Severe Weather Conditions

The following severe weather conditions, whether occurring or imminent, will trigger performance of contingency actions:

- A tornado has been sighted in the area;
- A tornado warning is in effect for the area;
- A lightning and/or thunder storm is underway in the area; or
- A snow storm with low visibility.

3.6 Contingency Actions for Fires and Explosions

When fire or explosion appear imminent or have occurred, all normal work activities will cease. The HSO will perform a risk assessment of the severity of the situation and decide whether the emergency event will or will not be readily controllable with existing portable fire extinguishers or available site equipment and materials. Fire fighting will not be done at the risk to operating personnel. Local fire departments will be contacted in fire/explosion situations.

If the fire can be handled by site personnel without undue risk to their well-being, fire extinguishers and/or water will be used to contain the fire. After the fire has been extinguished, the HSO will assess the damage done by the fire and determine corrective actions necessary to clean up the area and contain runoff.

If the situation appears uncontrollable and the HSO believes that human life or health is threatened, the site will be evacuated. The HSO will consult with the local fire fighter at the scene to alert personnel when all danger has passed. The fire department will determine when all danger has passed and personnel can safely return to the site.

All equipment used in the emergency will be cleaned and refurbished as soon as possible after the emergency has passed so that it will be ready for use in the event of any future emergency.

3.7 Contingency Actions for Spills or Material Releases

Should PCB-impacted soils contact areas outside of the consolidation area, the material will be relocated using a front-end loader to the consolidation area and the need for further actions (e.g., sampling, additional soil removal, etc.) will be assessed.

Should a spill occur involving liquids during the consolidation activities (i.e., fuel, lubricating oils, etc.), the following procedures will be implemented:

- The spill will be contained with berms formed with soil and/or dry absorbent;
- Dry absorbent will be applied to the spill in a quantity sufficient to fully contain the spill;
- Absorbent will be shoveled into 55-gallon drums;
- Spilled materials and associated wastes will be disposed of according to their regulatory classifications; and
- Appropriate spill clean up verification will be performed to the satisfaction of the Agencies for all spills at the Consolidation areas. The type of verification sampling will be determined by the Project Coordinator and the Agencies.

If a spill/release results from failure of the Consolidation area base liner system, the following procedures will be implemented to contain the leachate:

- The leachate will be contained with berms formed with soil and/or dry absorbent;

- Dry absorbent will be applied to the leachate in a quantity sufficient to fully contain the spill/release;
- Spilled materials and all impacted materials will be relocated to the appropriate consolidation area using the appropriate equipment (e.g., front-end loader); and
- The area of the liner resulting in failure will be located and repaired;

3.7.1 Spill and/or Containment Materials and Equipment

Soil spills will be removed with the appropriate equipment and disposed of at the consolidation area. Liquid spills (other than leachate), as well as impacted media will be disposed of at an appropriate licenced disposal facility. The following spill or containment equipment will be available on site for use in the event of a spill.

- Soil (for the construction of containment berms)
- Loose dry absorbent;
- Shovels;
- Brooms;
- Dozer;
- Front-end loader;
- Wrenches and tools for tightening fittings and valves; and
- Water-tight sealable containers.

Also, in the event of a spill, site personnel will wear appropriate personal protective equipment.

3.8 Severe Weather Conditions

This section addresses the contingency actions to be performed during severe weather conditions, including heavy rains, tornadoes, electrical storms, and

3.8.1 Heavy Rains

During rainy periods, the consolidation areas are subjected to the possibility of soil erosion. This problem will be alleviated by the use of surface runoff controls (e.g., drainage swales, berms, silt fences and hay bales) to direct

drainage away from active or sensitive areas. Consolidation materials which are visibly exposed as a result of heavy rains will be immediately covered with plastic sheeting.

3.8.2 Tornados and Electric Storms

When a tornado warning has been issued, or has been sighted in the area, or when an electric storm occurs, the Site Supervisor will immediately institute emergency shutdown procedures, and all personnel will take shelter. Workers will take necessary precautions during lightning storms to protect themselves from lightning strikes. If possible, workers will stay indoors or in a car. If someone is hit by lightning, immediate medical attention will be sought, and CPR will be initiated if breathing and/or circulation has stopped.

When the storm has passed, the Site Supervisor will inspect all on-site equipment to ensure its readiness for operation. If the inspection indicates a fire, explosion or release has occurred as the result of a severe weather condition, the procedures for those events will be followed.

3.8.3 Snowfall and Freezing Conditions

Consolidation activities are expected to continue through the winter months, and therefore the possibility of performing operations in heavy snowfall and freezing conditions must be accounted for. Snow removal from access roads and operation areas, as necessary, will be accomplished with a dozer and/or front-end loader. During snow removal operations, snowbanks will be arranged in a manner that provides adequate snowmelt drainage away from the consolidation areas and roadways.

3.9 Injury to Workers

Regardless of the nature and degree of the injury, the GE Project Coordinator will be apprised of all injuries requiring First Aid of any kind. Minor injuries sustained by workers will be treated on-site using materials from First Aid kits. Whenever possible, such treatment will be administered by trained personnel in the personnel decontamination area or other "clean" zones. Examples of minor injuries include small scrapes and blisters. Minor injuries such as these will not trigger implementation of contingency actions.

Major injuries sustained by workers will require professional medical attention at a hospital. The HSO will immediately follow procedures in this Plan and summon an ambulance to transport the injured worker to the hospital. The hospital and ambulance will be advised of:

- The nature of the injury;
- Whether the injured worker will be decontaminated prior to transport;
- When and where the injury was sustained; and
- The present condition of the injured worker (e.g., conscious, breathing).

Emergency decontamination procedures will be implemented, if possible. The injured person will, at a minimum, be wrapped in a blanket to prevent spreading of contamination to the transport vehicle. An employee will accompany the injured worker to the hospital and will bring copies of applicable MSDSs.

3.9.1 Physical

First Aid will be administered to physical injuries. If the injury is major, off-site medical attention will be required.

3.9.2 Chemical

If the injury involves chemical exposure, the following situations will require First Aid procedures as listed:

1. Eye exposure - thoroughly rinse at the eye wash station or portable eye wash unit using water and/or eye wash solution. Obtain medical attention immediately.
2. Dermal exposure - rinse affected area immediately using clean water. Obtain medical attention, if necessary.
3. Ingestion - refer to MSDS and administer emetic, if required. Obtain medical attention immediately.
4. Inhalation - move to fresh air. If breathing has stopped, perform CPR. Obtain medical attention immediately.

3.9.3 Biological

If there is contact with poisonous plants, the following procedures will be implemented:

- Wash affected area immediately with soap and water;

- Remove clothing and wash;
- Apply ointment to affected area to reduce itching; and
- For severe inflammation and itching, contact a physician.

In case of a poisonous snake, animal or insect bite, the following will be performed:

- Keep the victim lying down and calm;
- If possible, identify animal that inflicted wound;
- Apply a constricting bandage 2 inches above the wound on the side leading blood towards the heart;
- Sterilize the surrounding wound area with an antiseptic;
- Obtain medical attention immediately; and
- In the case of removal of ticks, they will be removed with tweezers. If satisfactory removal can not be accomplished at the site, medical attention will be sought.

3.10 Controlling Dust

Dust from access roads and unvegetated areas may be a problem during operation of the Consolidation areas, particularly during dry and windy weather. Dust control will be accomplished by wetting the site roads and active areas as needed. To further control dust, Consolidation areas that are filled to final grade, or areas that will not receive additional material within three months will be seeded with a quickly germinating rye grass.

3.11 Noise

Elevated noise levels at the Consolidation areas (if any) will be due to the consolidation operations and truck traffic on site access roads. All construction equipment used at the site will have muffler systems designed to minimize noise. Such equipment will be maintained in proper working condition by the construction staff. All transfer vehicles associated with hauling the consolidation materials to the Consolidation areas will be properly equipped and maintained with exhaust systems meeting Massachusetts and Federal Department of Transportation guidelines. Vehicles arriving at the Consolidation area with excessively loud exhaust systems will be instructed to repair the situation. Failure to do so on a timely basis will be grounds for denying access to the Consolidation area.

3.12 Equipment and Materials Cleaning

Material and equipment cleaning will be utilized to prevent the transport of PCBs or other potential site materials that may be present on any equipment or materials used for consolidation activities. The specific materials and equipment cleaning procedures to be utilized include the following.

- A materials and equipment cleaning area will be constructed and will generally consist of an impermeable barrier that is sloped to a collection sump.
- Each piece of equipment will be visually inspected prior to leaving the consolidation area. Accumulations of soil or sediment on the vehicle tires or other exterior surfaces will be removed manually or, if necessary, by using a high-pressure water spray in the equipment cleaning area.
- Equipment and materials that have been used to handle consolidation materials will be cleaned in the equipment cleaning area before it enters non-work areas, handles "clean" materials (e.g., cover soils, etc.), or leaves the site. Equipment cleaning will likely be performed utilizing a high-pressure water spray.
- Liquid materials (and other residual material collected during equipment decontamination) will be collected, containerized, and properly disposed of.

4. Evacuation Procedures

4.1 General

The decision to evacuate the site in the event of life threatening situations must be made quickly by the Site Supervisor and/or HSO. This decision will be based on:

- The location and extent of the fire/explosion, spill/release, and/or the severity of the weather condition;
- The materials involved in the fire/explosion, and/or spill/release;
- Proximity of other materials to the fire/explosion, and/or spill/release; and
- Prevailing wind and weather conditions.

Evacuation procedures will be implemented when human health is in danger. If the HSO determines that a site incident requires evacuation of all on-site personnel, he/she will follow the below evacuation procedures.

- Evacuation routes will be in the predominantly upwind direction of the Exclusion Zone;
- Evacuation routes will be through the Decontamination Area in order to decontaminate, if time allows, and to account for site personnel;
- Alternate routes will be established in case the primary route is blocked by fire, spill, etc. Alternate routes will not cross or overlap the primary routes;
- Mobility constraints of personnel wearing protective clothing and equipment will be considered; and
- All site personnel will be clearly aware of evacuation routes.

5. Recordkeeping

5.1 General

Records of the following activities will be made and kept at the on-site field office as well as with the GE Project Coordinator. The following records will be maintained for the length of time noted in the appropriate regulation:

- Accidents or incidents reportable under OSHA 29 CFR § 1904;
- Illnesses of site personnel;
- Occurrences of spills or material releases and related actions;
- Incidents resulting in evacuation;
- Incidents resulting in implementation of any aspect of the this Plan;
- Training records documenting date, attendance, and topics covered;
- Daily safety logs; and
- Weekly safety meeting reports.

5.2 Construction Equipment

Maintenance schedules and decontamination records will be maintained for all site construction equipment used during the consolidation activities.

5.3 Site Personnel Illnesses

Exposure to contaminants will be minimized by the use of appropriate personal protective equipment by site personnel, and implementation of health and safety precautions and procedures. Any personnel exhibiting symptoms associated with exposure to contaminants will immediately report them to the Site Supervisor. The occurrence of any of these symptoms by site personnel will be recorded. Upon investigation of the personal protective gear being employed, the GE Project Coordinator and HSO will assess the need for additional protective measures.

5.4 Accidents or OSHA-Reportable Incidents

Recordkeeping and reporting of injuries and illnesses will adhere to the requirements of OSHA 29 CFR § 1904. The Site Supervisor shall maintain a record of all recordable occupational injuries and illnesses throughout the project. Entries shall be recorded within 6 working days of the incident.

5.5 Site Inspections

Any site inspection (e.g., Agency, OSHA, etc.) results will be maintained on-site.

5.6 Spills or Material Releases

All spills or material releases will be recorded to indicate the date and time of the incident, the estimated volume of the spill or material release, and the source of the spill or material release. Also included will be the methods and materials employed to clean up the condition and disposal procedures for the released materials. Occurrences of any spills or material releases during the project will be reported to the appropriate agency(ies).

5.7 Contingencies

Any incidents that result in implementation of any contingency actions described in this plan will be reported immediately to GE and the appropriate agencies. Notification will include the nature of the incident that triggered implementation of the contingency action, the date and time at which the activity was implemented, and the results of the implementation.

5.8 Evacuations

Any incident that requires evacuation will be immediately reported to GE and the appropriate agency(ies). GE and the agency(ies) will be notified regarding the nature of the incident that triggered the evacuation, and the extent to which evacuation was conducted (e.g., only site personnel, or project and surroundings). The date and time at which the evacuation was implemented and the duration for which the site was abandoned will also be incorporated into the report. At a minimum, the following will be included in the report:

- Chronological history and facts of the incident;
- Titles and names of personnel involved;
- Actions and decisions made by whom, when, and the results;
- Types of samples and test results taken; and
- Possible exposure to site personnel.


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