PHASE II COMPREHENSIVE SITE ASSESSMENT REPORT

Former Brookfield Mill Property
59-67 Mill Street
Brookfield, Massachusetts

Release Tracking Number (RTN) 2-10354

November 2007

Prepared for:
Town of Brookfield, Massachusetts

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1.0 INTRODUCTION

Metcalf & Eddy, Inc. (M&E) has been retained by the Town of Brookfield, Massachusetts to provide a Phase II Comprehensive Site Assessment in accordance with the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Contingency Plan (MCP) regulations (310 CMR 40.000) for the former Brookfield Mill property in Brookfield, Massachusetts.

The former Brookfield property was assigned Release Tracking Number (RTN) 2-10354 by MassDEP in March 1995 based on conditions discovered during a Limited Site Investigation of the property (Lycott, 1991). On January 3, 2003, a second RTN 2-14601 was assigned by MassDEP following the identification of 120-day reporting conditions identified during a Targeted Brownfields Assessment (M&E, 2002) of the former Brookfield Mill property. On February 5, 2004, a Phase I Initial Site Investigation Report, Tier Classification, and Phase II Scope of Work were submitted to MassDEP (M&E, 2004a and 2004b). The Site was classified as Tier II. At the same time, the second RTN 2-14601 was linked to the original RTN 2-10354. RTN 2-14601 is currently listed in MassDEP's site database as closed.

This Phase II Report was prepared to address RTN 2-10354 in accordance with 310 CMR 40.0480. This Phase II Report is an integral part of, and is incorporated by reference to, the attached LSP Transmittal Form (BWSC-108).

According to the MCP, a Phase II comprehensive site assessment shall collect, develop and evaluate sufficient information to support conclusions and opinions regarding the source, nature, extent and potential impacts of releases of oil and/or hazardous materials; assess the risk of harm posed by the Site to health, safety, public welfare and the environment; and assess the need to conduct remedial actions at the Site. A Method 3 risk characterization as defined by the MCP was performed to evaluate risk to human health and the environment at the Site.

The complete report is provided in several sections as follows:

- Section 2.0 - Site Location and Description
- Section 3.0 - Disposal Site History
- Section 4.0 - Phase II Investigation
- Section 5.0 - Site Hydrogeologic Conditions
- Section 6.0 - Nature and Extent of Contamination
- Section 7.0 - Environmental Fate and Transport of Site Contaminants
- Section 8.0 - Risk Characterization
- Section 9.0 - Summary and Conclusions
- Section 10.0 - Limitations
- Section 11.0 - References

2.0 SITE LOCATION AND DESCRIPTION

The former Brookfield Mill property is located on Mill Street, just north of the former Boston and Albany railroad tracks (now operated by CSX) on the southern edge of the business district of Brookfield, Massachusetts. The location is shown on Figure 1, Site Locus. A disposal site map is provided as Figures 2 and 3. These figures show pertinent Site features including the property boundary and the Phase II soil and groundwater sampling locations.

The former Brookfield Mill, a four-story wooden structure, was destroyed in a fire in August 2000. The former Brookfield Mill parcel is bordered by the Spencer Plating property to the east and the former Boston and Albany Railroad to the south. To the north, on the other side of Mill Street, is the Town of Brookfield Department of Public Works (DPW) building. These parcels are surrounded mainly by residential properties.

The “former Brookfield Mill property” refers to the parcels previously owned by Brookfield Mill and located both north and south of Mill Street (as described in the Phase I report and as shown in Appendix C of this report). “59 and 67 Mill Street” refers to the parcel located south of Mill Street and includes the former Brookfield Mill building. “54 and 56 Mill Street” refers to the parcels located north of Mill Street. They have historically been vacant except for an underground storage tank. Initial investigations performed by Lycott (1991) and M&E (2002) were due diligence assessments of the entire property but focused primarily on the mill building and the underground storage tank and piping. As described in later sections, subsequent MCP field investigations focused on the mill building at 59 and 67 Mill Street as the source of contamination, and 54 and 56 Mill Street are not considered part of the disposal site. The term “Site” refers to the contamination associated with the mill building. The Targeted Brownfield Assessment (M&E, 2002) conducted by M&E in 2002 included a review of reasonably available historical information relevant to an environmental assessment of the property, and other contamination sources were not identified.

The Site is located at a latitude and longitude of 42° 12' 32" and 72° 6' 4", respectively. The Universal Transverse Mercator coordinates are: N 4677048 E 739306.

The Site is now owned by the Town of Brookfield. It was acquired by the town on June 12, 2003 (personal communication between B. Weir of M&E and B. Lund, Chairman of the Brookfield Board of Selectmen, November 17, 2003). Prior to acquisition by the town of Brookfield, the Site was owned by the Mill Street Brookfield Realty Corporation. There are currently no on-site workers at the disposal site although the DPW facility uses portions of the former mill property for storage of sand and gravel and other materials.

The Site is presently devoid of buildings or structures. All that remains of the former four-story mill building is the foundation and some rubble and debris on the old mill footprint. It appears that after the fire, the remnants of the building either collapsed or were demolished, such that they now partially fill the basement. Fill material (sand) also appears to have been placed into the basement void (M&E, 2002).

A MassDEP Bureau of Waste Site Clean Up Site Scoring Map, generated from the MassDEP Geographic Information System, is provided in Appendix A. The Site is not located in a Zone II area, Interim Well Head Protection area, or potentially productive aquifer according to the MassDEP Site Scoring Map (September 14, 2007) of the Site and surrounding area. The Quaboag River and an area of protected open space are located within 500 feet of the Site.

Otherwise, no drinking water supplies, areas of critical environmental concern, or sole source aquifers were identified within 500 feet of the Site. The Site is also located within 500 feet of a Natural Heritage and Endangered Species Program (NHESP) wetland habitat. The NHESP and the U.S. Fish and Wildlife Service were contacted to obtain information on the species that are mapped to occur near the Site as well as any other habitats of Species of Special Concern or Threatened or Endangered Species in the vicinity of the Site (see Appendix B). The U.S. Fish and Wildlife Service responded that no federally-listed or proposed, threatened, or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area. The NHESP indicated that habitat for six state-listed rare species were identified in the vicinity of, but not necessarily within, the Site limits. On October 30, 2007, M&E performed a wildlife habitat assessment on and adjacent to the former Brookfield Mill property in order to assess the possibility that the Site would be used by the NHESP-listed rare species. It was generally concluded that it is unlikely that the Site would be used by the listed rare species, generally due to the lack of suitable habitat. The wildlife habitat assessment is documented in a memorandum included in Appendix B.

Based on year 2000 Census data, the residential population within a half-mile radius is estimated to be approximately 570. There are no Institutions (as defined in the MCP) within 500 feet of the Site.

3.0 DISPOSAL SITE HISTORY

This section presents a summary of the disposal site history including ownership and operations history, release discovery and notification, and a summary of previous investigations and response actions.

3.1 Ownership and Operations History

Prior to 1893, the former Brookfield Mill property was undeveloped. In 1893, the on-site mill building was constructed and was occupied by a leather finishing business. The mill building was subsequently occupied by various other businesses, including a paper-coating company, a shoe company, a plastic injection molding business, a charcoal filter manufacturer, and various other small businesses. Prior to the recent construction of the Brookfield DPW building on the north side of Mill Street, no buildings were ever erected on the 54-56 Mill Street parcels, apart from a storage shed shown on historical Sanborn Maps (1893, 1898, 1904, 1928, 1945, 1954). The mill building was destroyed by fire in August 2000 (M&E, 2002).

The former Brookfield Mill property is now owned by the Town of Brookfield. It was acquired by the town on June 12, 2003 (personal communication between B. Weir of M&E and B. Lund, Chairman of the Brookfield Board of Selectmen, November 17, 2003). Prior to acquisition by the Town of Brookfield, the property was owned by the Mill Street Brookfield Realty Corporation.

3.2 Release Discovery and Notification

In April 1995, the MassDEP issued a notice of responsibility (NOR) for the Brookfield Mill to the property owner at that time, Mr. Walter Allard. The NOR was based on the results of a Limited Site Investigation of the property conducted by Lycott Environmental Research Inc. in 1991, on behalf of the Country Bank for Savings (Lycott, 1991). The conditions cited in the 1995 NOR were: groundwater concentrations of total petroleum hydrocarbons (TPH) and cadmium that exceeded reportable concentrations; evidence of oil-stained soil; the location of the Site within the Zone II of a public drinking water supply well; and the existence of an unspecified rare wetland species habitat within 500 feet of the Site. The NOR applied to the Brookfield Mill parcels on the north and south sides of Mill Street. The MassDEP reached the conclusion that the Site is located within a Zone II and within 500 feet of a rare wetland species habitat, by reviewing the Bureau of Waste Site Cleanup Priority Resource Maps available at the time (1995). The current MassDEP site scoring map (September 14, 2007) does not show the Site to be within a Zone II or Interim Wellhead Protection Area, which indicates that the maps have been revised since 1995. No soil sampling was performed as part of the Limited Site Investigation.

Based on the original TPH and cadmium issues identified by Lycott, the Brookfield Mill property was assigned Release Tracking Number (RTN) 2-10354 by MassDEP. The release was classified as a Tier ID Site because the responsible party failed to file a Phase I Report and Tier Classification by April 1996.

In June 2002, a Targeted Brownfields Assessment (TBA) of the Mill Street properties (street numbers 54 through 67 Mill Street) was performed by Metcalf & Eddy under the USEPA's TBA program. The Town of Brookfield had applied for the TBA because of the town's interest in potentially acquiring the land for municipal uses. The results of soil and groundwater sampling

performed as part of the TBA indicated the presence of several metals and polycyclic aromatic hydrocarbons (PAHs) in soil samples at concentrations above their respective reportable concentrations for S-1 category soils. The June 2002 TBA field investigation is further discussed in Section 3.4.1.

On January 3, 2003, MassDEP assigned RTN 2-14601 to the 120-day reporting conditions that were identified in the initial TBA report (M&E, 2002). Separate reporting was recommended in the TBA report because the reported conditions were different from those noted by Lycott that led to the assignment of RTN 2-10354.

3.3 Oil and/or Hazardous Materials (OHM) Use and Storage History

The property originally included a coal storage shed (through 1954). Coal was replaced by fuel oil on an unknown date. A 20,000-gallon underground storage tank (UST) was located on the north side of Mill Street. The UST is thought to have held heating oil, which was pumped under the street to the mill. As part of the initial TBA conducted by M&E in May 2002, the location and size of the UST was confirmed using geophysical techniques. The results of the geophysical survey were included in the Phase I report (M&E, 2004a). The UST was not on file with the Brookfield Fire Department, and exact information regarding contents and location was not available to M&E. The UST, including the pipe leading from the UST under Mill Street to the former mill building, was removed by Peak Environmental under contract to the Town of Brookfield on June 25, 2003. No contamination was observed in the UST grave. The UST closure report by Peak Environmental was included in the Phase I report (M&E, 2004a).

In June 1998, TJF Realty (the property owner at that time) was issued notices of non-compliance related to inspections of the Brookfield Mill property by MassDEP in September 1997 and January 1998. The inspections noted illegally stored hazardous waste including 33 drums of waste oil and other EPA regulated wastes. In February 1998, TJF Realty had the drums removed under hazardous waste manifests. The Brookfield Mill building was destroyed by fire in August 2000. It is unknown how much oil or hazardous material (OHM) was being stored, if any, within the building at the time of the fire.

According to the Phase I - Limited Site Investigation by Lycott Environmental Research (Lycott, 1991), the mill building was a wooden structure with a brick foundation and a concrete-floored basement. Lycott representatives observed two floor drains in the concrete floor of the building. The Lycott representatives were told that the drains discharged directly to the environment, rather than to the on-site septic system. A concrete containment area was also present in the basement, and was filled with an oily mixture during the Lycott Site visit. It was not possible for the Lycott representatives to determine whether the containment area floor was concrete or dirt.

The Site is serviced by the Town of Brookfield water system, and all electricity and telephone wires are overhead. The mill had its own septic system that is believed to have also been used by Spencer Plating, which occupies the adjacent parcel. Sewage from the restrooms and sinks inside the mill building and from bathrooms in the building currently housing Spencer Plating was pumped into a holding tank in the mill building. It was then directed to two septic tanks west of the building, which were pumped quarterly according to a former tenant (Lycott, 1991). Brookfield town officials state that another septic system, put in place by the Massachusetts Department of Public Works during construction of the Route 148 bridge just west of the property, lies on the western edge of the mill property. In addition, the Spencer Plating facility

has installed its own septic system east of the former mill building (C. McManus, personal communication, 2001), which is not on the Site but which abuts it to the east.

3.4 Summary of Previous Investigations and Response Actions

3.4.1 June 2002 TBA Field Investigation

In June of 2002, a field investigation was performed by Metcalf & Eddy, under EPA's Targeted Brownfields Assessment program. The field investigation consisted of: a geophysical survey to identify the location of the UST north of Mill Street, a test pit investigation of the former mill building footprint with soil sampling and analysis, soil borings with surface and subsurface soil sampling and analysis, temporary groundwater well installation and development, and groundwater monitoring and sampling (M&E, 2002).

Geophysical Survey. An area of approximately 200 square feet was surveyed by Hager GeoScience, under subcontract to M&E, to more accurately locate the UST which was located north of Mill Street. The approximate UST location is shown on Figures 2 and 3 in Appendix C. Based on the survey, a structure (likely the UST) was discovered, with approximate dimensions of 20 feet long and 15 feet wide. Location of the UST was a main objective of the TBA, because it was suspected that the UST or its transmission line may have leaked. The UST, including the pipe leading from the UST under Mill Street to the former mill building, was later removed by Peak Environmental under contract to the Town of Brookfield. The removal was conducted on June 25, 2003. No contamination was observed in the UST grave.

Test Pits, Soil Borings, and Well Installation. Four test pits were dug in the footprint of the former mill building to characterize the soils and debris present in the basement of the building. The approximate locations of the pits are shown on Figure 2 in Appendix C (TP-1, TP-2, TP-3, and TP-4). Sandy loam mixed with ash and various debris (e.g. pipes, bricks, wires, small equipment pieces, a small transformer-like device, and partially burned vinyl flooring and wood) was observed in the subsurface. Six test pit soil samples were collected with analysis of each sample for volatile and extractable petroleum hydrocarbons (VPH and EPH), PCBs, total metals (EPA target analyte list), and toxicity characteristic leaching procedure (TCLP) metals.

A total of four borings (ME-1, ME-2, ME-3, and ME-4) were advanced across the former Brookfield Mill parcel and two parcels on the north side of Mill Street. ME-1, ME-2, and ME-4 were advanced on the former Brookfield Mill parcel, and ME-3 was advanced on the north side of Mill Street. Approximate locations are shown on Figure 2 and 3 in Appendix C. ME-1, ME-2, and ME-4 are also shown on Figure 3. The soil borings were advanced using a hollow stem auger and were completed as monitoring wells. At each location, surface soil samples (approximately 1 to 4 feet bgs) and/or subsurface soil samples (approximately 4 feet bgs to the end of the boring) were collected for VPH, EPH and total metals analysis.

Surface and subsurface soil analytical data for the test pits and soil borings are presented in Table 1. The results of the soil sampling indicated relatively low levels of one VPH fraction, EPH fractions, and PCBs in one or more test pit soil samples at concentrations not indicative of a release of petroleum or PCBs within the Site. Several PAHs were detected in the test pit soil samples at levels generally consistent with MassDEP published background levels for natural soils (MassDEP, 2002). Several metals were detected in soil samples above MassDEP published background levels for natural soils. TCLP metals analysis was also performed on test pit soil samples, and the TCLP regulatory level for lead was exceeded in several samples (M&E, 2004a).

Groundwater Sampling. Monitoring wells ME-1, ME-2, ME-3, and ME-4 (figures 2 and 3 in Appendix C) were sampled using the EPA low-flow method and analyzed for volatile organic compounds (VOCs), VPH, EPH, and total metals. The Lycott well MW-5 was also located, redeveloped, and sampled for metals only, due to previous detections of certain metals in a sample from this well, as reported by Lycott. Groundwater analytical data are presented in Table 3. No VPH or EPH fractions or target compounds were detected in the groundwater samples. Low levels of acetone and methyl tert-butyl ether (MTBE) were detected in some samples, but the levels were not high enough to be suggestive of a release from the former UST located north of Mill Street. Several metals were detected in the groundwater samples, but concentrations were below MCP Method 1 standards (M&E, 2004a).

3.4.2 August 2003 Supplemental TBA Field Investigation

In August and September of 2003, a supplemental field investigation was performed by Metcalf & Eddy, under EPA's Targeted Brownfields Assessment program. The supplemental field investigation consisted of: advancement of four soil borings with soil sampling, installation of eight piezometers, and two rounds of water level measurements to evaluate groundwater flow direction and velocity.

Soil Borings and Piezometer Installation. The soil borings were advanced within the footprint of the former mill building (see Figure 3 in Appendix C) to a depth of 8 to 12 feet below ground surface. Surface (0 to 4 feet) and subsurface (> 4 feet) soil samples were collected at each of the four soil boring locations and analyzed for total metals and synthetic precipitation leaching procedure (SPLP) metals. Brick, wood, burnt material, slag, and possible coal chips were observed in several of the samples. Soil analytical data are included in Table 1. Total metals results were generally consistent with the test pit results from the initial TBA field investigation. Several metals were detected above MassDEP published background concentrations for natural soils. SPLP metals analysis was performed in order to evaluate leachability under more typical environmental conditions than would be evaluated through the TCLP analysis. In the Phase I report (M&E, 2004), these results were compared to MCP Method 1 GW-3 standards and a derived standard for copper and there were no exceedances.

Eight piezometers were installed to a depth of 8 to 12 feet below ground surface. Seven were installed around the perimeter of the former building, and one (P4) was installed within the building footprint. At location P4, concrete and a perched water table were encountered at a depth of 4 feet below ground surface. The boring was advanced to 12 feet and a bentonite plug was installed to span the concrete floor, to separate the water perched above the concrete from groundwater below it. The piezometer locations are shown on Figure 3 in Appendix C. Piezometers located on the former mill property are also shown on Figure 3.

Groundwater Elevation Measurements. Water level measurements were taken on August 6, 2003 and again on September 12, 2003 in the eight piezometers installed during the supplemental TBA, and the monitoring wells that had been installed during the initial TBA. These measurements were used to determine groundwater flow direction and velocity. The groundwater flow direction was determined to be south towards the Quaboag River. Refer to Section 5.2 of this report for further discussion.

3.4.3 Phase I, Tier Classification, and Phase II Scope of Work

On January 7, 2004 a Phase I Initial Site Investigation Report, Tier Classification, and Conceptual Phase II Scope of Work were submitted to MassDEP by Metcalf & Eddy, on behalf of the Town of Brookfield. The report was prepared to address both RTN 2-14601 and 2-10534. The Phase I report concluded that the extent of contamination appeared to be limited to the former Brookfield Mill parcel on the south side of Mill Street and that metals, such as lead, beryllium, and barium were the main contaminants. Additional soil and groundwater sampling were recommended to further define the extent of soil contamination and to assess potential leaching of soil contamination to groundwater. The Site was classified as Tier II by MassDEP.

4.0 PHASE II INVESTIGATION

Phase II investigation activities were conducted in February, May, September, and November 2006 in order to further evaluate the nature and extent of contamination and collect information to perform a human health and ecological risk assessment. The Phase II activities consisted of additional soil borings and soil sampling in order to further define the extent of soil contamination and four rounds of groundwater sampling in order to assess potential leaching of soil contaminants to groundwater.

4.1 February 2006 Supplemental TBA Field Investigation

In February 2006, a supplemental field investigation was performed by Metcalf & Eddy, under EPA's Targeted Brownfields Assessment program. The field investigation consisted of additional soil borings, monitoring well installation, and groundwater sampling in order to further define the extent of soil and groundwater contamination within and outside of the former building footprint and to assess local background metals concentrations.

4.1.1 Soil Borings and Monitoring Well Installation

On February 7, 8, and 9, 2006, soil borings were advanced by Geologic-Earth Exploration using a direct push drilling rig, and soil samples were collected continuously at each location. The soil borings were logged and characterized, including any evidence of impact by oil and hazardous materials (OHM). Field observations included visual appearance and headspace screening for total volatile organic compounds using a PID. Boring logs are included as Appendix D. Soil boring locations are shown on Figures 2 and 3.

Surface soil samples (generally 0 to 3 feet below ground surface (bgs)) and subsurface soil samples (generally 4 to 8 feet bgs) were collected from 14 soil boring locations. Exact sample depths are listed below and varied depending on soil recovery from each acetate liner. Twelve borings were located around the former building footprint and two borings (MEB-13 and MEB-14) were drilled north of Mill Street as background locations. Locations identified as "MEB" are soil borings that were not completed as wells, while the designation "MEW" represents a boring that was completed as a well.

Soil samples were collected from the following depth intervals:

MEB-1:	0 to 2 feet bgs, 4 to 6 feet bgs
MEB-2:	0 to 1.5 feet bgs, 4 to 7 feet bgs
MEW-3:	0 to 2.2 feet bgs (plus field duplicate), 4 to 7.5 feet bgs
MEW-4:	0 to 2.5 feet bgs, 4 to 8 feet bgs
MEW-5:	0 to 2.7 feet bgs, 4 to 8 feet bgs
MEB-6:	0 to 3 feet bgs, 4 to 8 feet bgs
MEW-7:	1 to 1.7 feet bgs, 4 to 7.5 feet bgs
MEB-8:	1 to 3.2 feet bgs, 4 to 7.4 feet bgs
MEW-9:	0.4 to 3 feet bgs, 4 to 8 feet bgs
MEB-10:	2 to 3 feet bgs, 4 to 8 feet bgs (plus field duplicate)
MEB-11:	0.5 to 3 feet bgs, 4 to 8 feet bgs
MEB-12:	0.5 to 3 feet bgs, 4 to 8 feet bgs
MEB-13:	0 to 3 feet bgs, 4 to 8 feet bgs

MEB-14: 0 to 3 feet bgs, 4 to 8 feet bgs

No odors or elevated headspace readings were detected in any of the samples. Each sample was submitted for MCP metals analysis plus copper. The MCP metals analysis includes those metals with Method 1 Risk Standards under the MCP. Previous metals analysis conducted as part of the TBA investigations in 2002 and 2003 had included a longer reporting list (the EPA Contract Laboratory Program Target Analyte List metals), since this analysis was performed under the EPA's Contract Laboratory Program. Soil analytical results are summarized in Table 2. The soil data underwent data validation, and the data validation memorandum is presented in Appendix E.

Five temporary overburden monitoring wells were installed at the Site during the field investigation. The five new wells were installed in order to supplement existing monitoring wells and piezometers. The five newly installed wells are identified as MEW-3, MEW-4, MEW-5, MEW-7, and MEW-9 on Figures 2 and 3 and were constructed in the soil boring locations bearing the same identifications.

All five wells were constructed using one-inch schedule-40 flush joint PVC. Monitoring wells MEW-3, MEW-4, and MEW-5 were each screened below the water table at a depth of 3 to 8 feet, to ensure that groundwater and not surface water runoff was collected during the groundwater sampling event. MEW-3, MEW-4, and MEW-5 were then brought to approximately 2 feet above grade using solid PVC riser, and left as PVC stick-ups. Monitoring well MEW-7 was screened across the water table with 10-slot PVC screen from 3 to 11 feet, where refusal was met in the hole. Solid PVC riser was brought to just below surface and a 2-inch cast iron gate box was installed over the well. Monitoring well MEW-9 was constructed in the same manner as MEW-7, except that MEW-9 was screened from 2 to 12 feet. The annular space for all five new wells was packed using #2 morie type sand to a height of 0.5 to 2 feet above the screen and followed by a bentonite plug of 0.5 to 1 feet above the sand pack. See Appendix D for well construction logs.

4.1.2 Well Development and Groundwater Sampling

Well development was completed following installation of the five wells. Each well was initially purged at a relatively high rate while moving the tubing up and down to dislodge soil particles from the well screen. Then a low flow process was used to attempt to maintain depth to groundwater during purging of each well. The purge water was monitored for temperature, pH, conductivity, and turbidity. Non-aqueous phase liquids (NAPL) were not observed in any wells.

Prior to groundwater sampling, depth to groundwater was gauged in each of the new wells, and the wells were surveyed to obtain relative monitoring well/piezometer elevations. Refer to section 5.2 for a discussion of Site hydrogeology.

The new installed wells MEW-3, MEW-4, MEW-7, MEW-9 and piezometer P-3 were sampled using low-flow methods on February 16, 2006, five to six days after well development. Groundwater samples were analyzed for MCP metals plus copper. The groundwater sample from monitoring well MEW-3 was field-filtered due to elevated turbidity. Groundwater analytical results are summarized in Table 4. The groundwater data underwent data validation, and the data validation memorandum is provided in Appendix F.

4.2 May 2006 Groundwater Sampling

The second of four quarterly rounds of groundwater sampling was performed by Metcalf & Eddy on behalf of the Town of Brookfield on May 18, 2006. Groundwater samples were collected from monitoring wells MEW-3, MEW-4, MEW-7, MEW-9, and piezometer P-3 via low-flow methods and submitted for MCP metals analysis plus copper. The analytical results are summarized in Table 4, and the laboratory data report is provided in Appendix F.

4.3 September and November 2006 Groundwater Sampling and November 2006 Soil Borings

Additional field investigation was performed in September and November 2006 by Environmental Strategies & Management, Inc. on behalf of MassDEP under MassDEP's Site Assessment and Remediation Support Services (SARSS IV) contract. The field investigation was described in the SARSS IV Brownfields Site Assessment report submitted to MassDEP by Environmental Strategies & Management, Inc. and dated February 12, 2007 (ES&M, 2007).

On November 28, 2006, soil borings were performed along the southern portion of the Site as shown on Figure 3. Five soil borings (ESMB-01 through ESMB-05) were drilled by Pine and Swallow Associates using a small vibratory rig. The diameter of the probe used to complete the borings was 2.25 inches, and all borings were advanced to a depth of 8 feet. Soil boring logs are provided in Appendix G. Field screening for VOCs was performed using the MassDEP jar headspace method. No odors or elevated headspace readings were detected in any of the soil borings. Soil samples were collected from 0 to 4 feet and 4 to 8 feet below grade at each location and submitted for MCP metals analysis plus copper. The analytical results are summarized in Table 2 and the laboratory data report is provided in Appendix H.

The third and fourth of four quarterly rounds of groundwater sampling were performed by Environmental Strategies & Management, Inc. on September 28, 2006 and November 29, 2006. On each occasion, groundwater samples were collected from monitoring wells MEW-3, MEW-4, MEW-7, MEW-9, and piezometer P-3 via low-flow methods and submitted for dissolved MCP metals analysis plus copper. The analytical results are summarized in Table 4, and the laboratory data report is provided in Appendix I.

5.0 SITE HYDROGEOLOGICAL CHARACTERISTICS

This section presents a summary of information related to the geology and hydrogeology of the Site obtained from the Phase I and Phase II Site investigations.

5.1 Surficial and Bedrock Geology

Site geologic characteristics are summarized from the initial TBA field investigation (June 2002) and supplemental field investigation (August 2003) performed by M&E. A conceptual cross-section, which is provided as Figure 5 in Appendix C, illustrates the general topography, location of the former building founding, and groundwater and surface water runoff flow directions.

The Site contains the remains of a foundation and basement floor (reported to have been concrete) from the old mill building that was destroyed by fire. The basement void is currently partly filled with debris from the fire and sandy fill. The floor of the foundation is exposed on the south and east sides of the former building. The southern and eastern foundation walls have deteriorated. South of the foundation there is a drainage trench and a culvert, underlying the Boston and Albany railroad tracks, that connects the drainage to the wetlands to the south. Lycott (1991) reported that the drainage trench was installed by the railroad to reduce flooding of the tracks. The overall topography of the Site is gently sloping towards the southeast. Surface water runoff from the Site travels to the south-southeast, into the railroad drainage ditch. The topography of the Site is mostly level but drops off steeply toward the railroad tracks beyond the limits of the debris and fill which occupy much of the basement void. A further drop in surface elevation occurs where the wall of the foundation is exposed along the southern edge, facing the railroad bed. The Town of Brookfield stores sand, gravel and miscellaneous materials on portions of the property.

According to the Bedrock Map of Massachusetts (E-an Zen, et. al., 1983), the Site is underlain by an Ordovician age biotite gneiss bedrock belonging to the Partridge Formation. Confirmation, however, was not obtained during drilling, nor were there any outcrops noted.

Based on the field investigations conducted by Metcalf & Eddy and Environmental Strategies & Management, the soils in the upper 10 to15 feet consist of approximately 5 to 10 feet of fill or disturbed soils overlying fine to medium sand, silt, and little to trace amounts of gravel. Some stratification was noted in the south and southeast areas of the Site, while on the west and north sides of the Site, the soils were finer and contained more clay. Clay also comprised a horizon in one boring along the southern perimeter of the Site (ESMB-2). Geologically, the mill lies on a flood plain terrace of the Quaboag River, which is underlain by Quaternary glacial deposits of sand and gravel and possibly till. Based on borings completed by Metcalf & Eddy and Lycott, overburden is greater than 25 feet thick.

Soil boring and well installation logs for the February 2006 and November 2006 field investigations are provided in Appendices D and G, respectively.

5.2 Hydrogeology

Water level measurements were made just prior to groundwater sampling in February 2006. Groundwater depths at wells MEW-3, MEW-4, MEW-7, and MEW-9 were measured between 0.8 and 6.7 feet bgs. Figure 4 illustrates groundwater elevation contours based on those water

level measurements. As shown on Figure 4, groundwater flow is generally to the south, towards the Quaboag River. The gradient was calculated at 0.06 - 0.08 (6-8%). Assuming a hydraulic conductivity of 3 ft/day (equal to 10^{-3} cm/s: consistent with sand containing silt), a porosity of 0.30 (30%) and a 0.06 - 0.08 (6-8%) gradient, the groundwater velocity is estimated to be 0.6 - 0.8 feet per day (assuming effective porosity equal to porosity and saturated conditions).

Appendix C contains a schematic cross-section through the former building footprint, showing the ground surface, approximate water table elevation, and the estimated extent of building walls and floors, demolition debris, and fill. The buried wall and floor serve as a partial barrier to groundwater flow through the demolition area. It is believed that regional groundwater flow mostly passes under this area (below the floor that is at least partially intact).

6.0 NATURE AND EXTENT OF CONTAMINATION

The analytical results from samples collected and field observations made during the Phase II field investigations were used to supplement information about the nature and extent of soil and groundwater contamination reported in the Phase I Initial Site Investigation report. The Phase II investigation focused on defining the horizontal and vertical extent of contamination beyond the footprint of the former Brookfield Mill building and assessing potential leaching of soil contamination to groundwater. The most likely sources of contamination at the Site are building debris and ash from the mill fire. It is also possible that past disposal practices of former businesses located at the Site may have contributed to elevated metals concentrations. Additionally, some metals may be naturally occurring.

6.1 Surface and Subsurface Soil

Surface and subsurface soil sampling documented in the Phase I report (M&E, 2004a) included test pits and soil borings located primarily within the footprint of the former mill building. The soil analytical results are summarized in Table 1. The results indicated relatively low levels of one VPH fraction, EPH fractions, and PCBs in one or more test pit soil samples at concentrations not indicative of a release of petroleum or PCBs within the Site. Several PAHs were detected in the test pit soil samples at levels generally consistent with MassDEP published background levels for natural soils (MassDEP, 2002). Several metals were detected in soil samples from soil borings and test pits above MassDEP published background levels for natural soils. TCLP metals analysis was also performed on test pit soil samples, and the TCLP regulatory level for lead was exceeded in several samples. SPLP metals analysis was subsequently performed on soil samples from soil borings in order to evaluate leachability under more typical environmental conditions than would be evaluated through the TCLP analysis. In the Phase I report (M&E, 2004a), these results were compared to MCP Method 1 GW-3 standards and a derived standard for copper and there were no exceedances. Based on the Phase I results, metals are the primary contaminant of concern at the Site.

During Phase II investigations by Metcalf & Eddy and Environmental Strategies & Management, additional soil sampling was conducted to further define the extent of metals contamination in Site soils. The soil analytical results are summarized in Table 2. Several metals were detected in each surface soil (generally 0 to 3 feet or 0 to 4 feet bgs) and subsurface soil (generally 4 to 8 feet bgs) sample. Surface and subsurface soil samples collected to the west of the former building footprint (MEB-11 and MEB-12) showed metals concentrations that were below or consistent with MassDEP published background levels for natural soils. Additionally, in surface soils to the north, south, and southeast of former building footprint, metals concentrations in borings MEB-8, MEW-9, MEB-10, MEW-4, ESMB-4, and ESMB-1 were below or consistent with background levels. In subsurface soils to the north and south of the former building footprint, metals concentrations in borings MEB-8, MEW-9, MEB-10, and MEW-4 were below or consistent with background levels. These results indicate that metals contamination associated with the former building likely does not extend beyond the former building footprint to the west and northwest.

Two borings (MEB-13 and MEB-14) were drilled at locations north of Mill Street and were intended to represent background conditions for native soils. For the most part, the metals concentrations in the background soil samples were similar to the results for the borings drilled

around the former building footprint and consistent with MassDEP background levels for natural soils. Concentrations of barium and vanadium in the surface and subsurface soil samples from each background location exceeded the MassDEP background levels. Additionally, chromium in the subsurface soil sample from one of the borings slightly exceeded the MassDEP background level. These results indicate that barium, vanadium, and chromium concentrations in the area of the Site may be naturally elevated.

Metals detected above MassDEP background levels for natural soils and above concentrations in the borings intended to represent local background conditions, include barium, chromium, copper, lead, vanadium, and zinc. These metals were detected in one or more surface and subsurface soil samples along the northern (MEW-7) and southern (ESMB-1, ESMB-3, MEW-3, MEW-5, MEB-6) perimeters of the former building footprint.

Given the presence of the paved road (Mill Street) just north of the former building footprint and the general flow of groundwater and surface runoff toward the south, it not expected that soils to the north and beneath the road would be impacted by the Site. Therefore, the disposal site boundary is expected to correspond to the edge of pavement on northern side.

Similarly, to the south of the former building footprint, the soil contamination is expected to be limited by the drainage trench and railroad track embankment to the south. It is expected that the drainage trench would act as a sink for eroded soil, limiting transport of contaminated soils further south to the Quaboag River and the NHESP wetlands habitat.

To the east, the limit of soil contamination is more uncertain but is generally expected to correspond to the property boundary because soils beyond that boundary are not expected to have been disturbed as a result of the building fire.

Vertical extent of soil contamination is expected to be limited to the depth of fill and disturbed soils which ranges from 5 to 10 feet in depth based on field investigation (see section 5.1). Given the limited mobility of metals in soil and the likely horizontal or upward direction of groundwater flow towards the wetlands and Quaboag River, natural soils at depth are not expected to be impacted by contamination from the Site.

6.2 Groundwater

Groundwater sampling documented in the Phase I report (M&E, 2004a) included groundwater data from three wells on the former mill property and two wells located north of Mill Street, one of which was located near a former UST. No VPH or EPH fractions or target compounds were detected in the groundwater samples. Low levels of acetone and methyl tert-butyl ether (MTBE) were detected in some samples, but the levels were not high enough to be suggestive of a release from the former UST located north of Mill Street. Several metals were detected in the groundwater samples, but concentrations were below MCP Method 1 standards (M&E, 2004).

In February, May, September, and November 2006, four rounds of groundwater sampling, with analysis for MCP metals plus copper, were conducted on the former mill property in order to assess the potential leaching of soil contamination to groundwater. During each round, groundwater samples were collected from monitoring wells MEW-3, MEW-4, MEW-7, MEW-9, and P-3. The 2006 groundwater analytical data are summarized in Table 4. Lead and zinc were detected in groundwater samples from each well during at least one of the four monitoring rounds. The highest lead concentration (18 ug/L) was detected in monitoring well MEW-3

(along the southern perimeter of the former building footprint) during the September monitoring round. The highest zinc concentrations (202 ug/L and 188 ug/L [field dup.]) were detected in MEW-3 during the May monitoring round.

Based on the data collected to date, there is some uncertainty in the extent of groundwater contamination that may extend to the south of the former building footprint and into the wetland area. It is also possible that groundwater from the Site may discharge to surface water in the wetland. It is certain that impacts from groundwater at the Site would not extend beyond the wetland area and into the Quaboag River given the relatively low lead and zinc concentrations and the high amount of dilution that would occur as groundwater discharges to the river.

6.3 Site Definition

For the purposes of this report, the Site is defined as an area encompassing the former building footprint and bounded by Mill Street to the north, soil borings MEB-11 and MEB-12 to the west, the drainage trench to the south, and the property boundary to the east. However, as discussed in section 6.2, there is some uncertainty in the extent of groundwater impacts to the south, within the wetland area. Figure 3 shows the estimated areal extent of Site contamination.

7.0 ENVIRONMENTAL FATE AND TRANSPORT OF SITE CONTAMINANTS

Evaluation of the environmental fate and transport of Site contaminants provides information on the source of contaminants, the extent to which they have migrated, and the expected fate of future migration. The section identifies the site contaminants; describes the environmental fate and transport characteristics of the contaminants including both physical and chemical properties; and summarizes the site-specific, predominant potential migration pathways for Site contaminants including observed contaminant migration trends.

7.1 Site Contaminants

Metals are the primarily contaminants identified in Site soil and groundwater.

7.2 Physical and Chemical Characteristics of Site Contaminants

An understanding of the physical and chemical properties of a contaminant helps predict how the contaminant will move (or partition) from one media into another media (i.e., soils into air, soils into groundwater, or groundwater into air).

Assessing the mobility of metals in environmental media is complicated because of the many organic and inorganic complexes and salts they form. In addition, metals undergo a variety of processes in soils and water, which include hydrolysis, reduction, oxidation, and adsorption (i.e., ion exchange, specific adsorption). These reactions are highly dependent on factors such as pH, salinity, ionic strength, particle-surface reactions, and the presence of anions and natural organic acids (humics and fulvics). Many of the metals detected at the Site are expected to be relatively insoluble, either in metallic form or as inorganic complexes and salts, but may become soluble in the presence of organic acids and reducing conditions. An exception is mercury, which is not very soluble in water but will readily volatilize from water to air. Adsorption of metals through cation exchange, specific adsorption, co-precipitation, or organic complexation by soils and sediments is the dominant fate mechanism in natural systems. Metals vary in the extent to which they are adsorbed by these mechanisms, and the adsorbents range in selectivity for metals. For example, the selectivity of peat for divalent metals is as follows [Alloway, 1990]:

Lead > copper > cadmium = zinc > calcium

Cations, such as barium and manganese, are mobile in natural environments. These cations are easily leached from salts and minerals to water systems due to weathering processes. In water, these cations are dissociated to ionic forms, which tend to remain mobile unless affected by changes in pH or other interactions, such as retention by soils through cation exchange reactions.

Metals occur naturally in soil, groundwater, and surface water systems as a result of weathering of rocks and soils and decay of plants. However, concentrations are often elevated in industrial settings. Common sources of heavy metals are atmospheric pollution from motor vehicles, fuel combustion products (e.g., ash, slag), industrial sludge, and wastewater [Alloway, 1990]. Conclusions regarding the migration of metals are difficult to make due to the numerous reactions and complex geochemistry discussed above.

7.3 Migration Pathways

Past, present and future migration pathways are evaluated at the Site to identify media that received, are receiving or may receive Site-related contaminants. In addition, migration pathways are evaluated to predict potential human and ecological exposures. Human and ecological exposure pathways describe the course a chemical takes from the source to the potentially exposed human or ecological receptor. Evidence of and potential for contaminant migration at the Site are discussed in this section. The contaminants and their migration pathways are further discussed in the Risk Characterization (Appendix J).

The predominant chemical group detected at the Site was metals. Metals were detected at the Site in surface and subsurface soils and groundwater. Contaminant releases to these media at the Site may allow for the migration of contaminants in air, soil, surface water, and groundwater.

7.3.1 Migration of Contaminants in Air

There are no buildings on the Site, so volatilization to indoor air is not a consideration under current conditions. The Site remains vacant and is not currently used by the town for any purpose other than storing sand, gravel, and other materials. Hence there are no routine activities on Site that could potentially generate dust, other than possible occasional dust generation as materials are placed or retrieved.

Future construction work, which results in soil being excavated, may result in the transfer of contaminated subsurface soil to air in the form of fugitive dust and particulate deposition.

7.3.2 Migration of Contaminants in Soil

Several metals are present above background in surface and subsurface soils at the Site. There is potential for contaminant migration in soils. Contaminated soils near the surface could become exposed and be dispersed to other areas via wind and/or water erosion or human activities.

7.3.3 Migration of Contaminants in Groundwater

Metals are the primary contaminants detected in on-Site monitoring wells. Results from SPLP analyses did not indicate the potential for significant leaching of metals contamination from soil to groundwater. It is expected that any migration of groundwater contaminants would be to the south and into wetland and Quaboag River surface water (see Section 7.3.5).

7.3.4 Migration of Contaminants via Drains and Subsurface Utilities

There is no potential for migration of contaminants via drains and subsurface utilities.

7.3.5 Migration of Contaminants in Surface Water and Sediment

The Quaboag River and wetlands are located downgradient and within 500 feet of the Site. Migration of contaminants to surface water and sediment in the Quaboag River via groundwater

is not likely to be significant given the relatively low metals concentrations in groundwater and the significant amount of dilution that would occur in the Quaboag River. However, contaminated groundwater may migrate to surface water within the adjacent wetlands with less dilution. Deposition of contaminated soils to sediments in the Quaboag River and the adjoining wetlands could occur via wind and/or water erosion. However, the drainage trench and railroad track embankment immediately south of the Site are likely to act as a sink for eroded soil, limiting its transport further south towards the Quaboag River and the NHESP wetlands habitat.

8.0 RISK CHARACTERIZATION

A MCP Method 3 Human Health Risk Characterization has been conducted for baseline conditions at the Site in accordance with the requirements of 310 CMR 40.0990 and is included as Appendix J to this report.

The risk characterization was conducted using applicable soil and groundwater analytical sampling data. Airborne particulate data were derived from soil data using default MassDEP PM_{10} values for the adolescent trespasser, town worker, construction worker, on-site worker, and residential (adult and child) exposure scenarios. Surface water exposure point concentrations for the downgradient wetland were derived from groundwater data using a default 10-fold dilution factor. Indoor and outdoor atmospheric data were derived from soil data using vapor migration and air dispersion/dilution models. A summary of the conclusions is provided below.

The risk characterization concluded that under current Site activities and uses, potential exposures to chemicals of potential concern (COPCs) in soil pose no significant risk of harm to current town workers or trespassers, and COPCs in surface water pose no significant risk of harm to current adolescent recreational users. There are no current direct exposure pathways completed for groundwater.

Under future foreseeable Site activities and uses, potential exposures to COPCs in groundwater and surface water pose no significant risk of harm to future construction workers and future recreational users, respectively. In addition, potential exposures to COPCs in soil pose no significant risk of harm to future trespassers, on-site workers, construction workers, or adult residents across the Site. The evaluation of future indoor and outdoor air pathways also indicates no significant risk of harm to future on-site workers, construction workers, or residents. Significant risk of harm is posed to future child residents, exposed to soil throughout the Site, primarily attributable to the presence of lead in soil. The evaluation also indicates a future risk of harm to child recreational users exposed to soil should the site be developed as a park.

Risk of harm to safety is significant under both current and future foreseeable site conditions due to the presence of visible physical hazards (e.g., unstable slopes, glass, rusted waste). No chemical hazards (e.g., corrosive, flammable/ignitable, reactive materials) are present at the Site.

There is currently no condition of unilateral restrictions on the uses of the abutting property, negative impacts on residences hydraulically downgradient of the site, or reports of significant degradation of public or private drinking water resources as a result of the COPC release. In addition, maximum COPC soil and groundwater concentrations do not exceed their respective UCLs.

Using a Stage I Environmental Screening, risk of harm to the environment was assessed for two independent ecological units: terrestrial and wetland exposure areas. Although PCBs were present in soil samples, given the small size (<1.0 acres) of the Site, the Site appears to qualify for exclusion from assessment of risk of harm to terrestrial life. However, the modeled surface water concentration of lead exceeds its Lowest Ambient Water Quality Criteria (LAWQC). Therefore, there is evidence that COPC concentrations in surface water, via groundwater discharge, may pose a risk of harm to aquatic habitat in the wetland area.

Based on these findings, Site conditions are considered to pose significant risk of harm to human health, safety, and the environment under current and/or future foreseeable Site activities and uses. To address this risk of harm to human health under future foreseeable Site activities and uses and to achieve a condition of no significant risk, implementation of an Activity and Use Limitation (AUL) pursuant to 310 CMR 40.1012 is recommended. Further study and/or remedial actions are recommended to address the risk of harm to safety and the environment.

9.0 SUMMARY AND CONCLUSIONS

On behalf of the Town of Brookfield, M&E has prepared this Phase II Comprehensive Site Assessment, including a Method 3 Risk Characterization, to address contamination present at the former Brookfield Mill property.

Conceptual Site Model. The most likely sources of contamination at the Site are building debris and ash from the mill fire. The former UST located north of Mill Street and its associated piping have been ruled out as a potential source. Metals are the main contaminant of concern. PAHs may have also been released, however concentrations are generally consistent with MassDEP published background levels for natural soils. It is possible that past disposal practices of former businesses located at the Site may have contributed to elevated metals concentrations. Additionally, some metals may be naturally occurring.

The extent of soil contamination is limited to the immediate area of the former mill building. Specifically, the Site is defined as an area encompassing the former building footprint and bounded by Mill Street to the north, soil borings MEB-11 and MEB-12 to the west, the drainage trench to the south, and the property boundary to the east. It is possible that groundwater impacts extend south of the drainage trench and into the wetlands to the south. Additionally, impacted groundwater may discharge to surface water within the wetland.

Primary migration routes likely included potential dispersion of surface soils via wind and/or water erosion or from human activities. Leaching and migration of metals in the dissolved form in groundwater is likely limited, given their likely low solubility and mobility; however, as indicated above, it is possible that groundwater in the wetlands may be impacted. It is certain that impacts from groundwater at the Site would not extend beyond the wetland area and into the Quaboag River given the relatively low metals concentrations detected in groundwater and the high amount of dilution that would occur as groundwater discharges to the river.

Risk Characterization Conclusions. The risk characterization concluded that Site conditions are considered to pose significant risk of harm to human health, safety, and the environment under current and/or future foreseeable Site activities and uses. Significant risk of harm is posed to potential future child residents and child recreational users exposed to soil should the Site be developed as a park. Risk of harm to safety is significant under both current and future foreseeable Site conditions due to the presence of visible physical hazards (e.g., unstable slopes, glass, rusted waste). Additionally, there is evidence that lead concentrations in surface water, via groundwater discharge, may pose a risk of harm to aquatic habitat in the wetland area to the south of the former mill property.

To address this risk of harm to human health under future foreseeable Site activities and uses and to achieve a condition of no significant risk, implementation of an Activity and Use Limitation (AUL) pursuant to 310 CMR 40.1012 is recommended. Further study and/or remedial actions are recommended to address the risk of harm to safety and the environment. As a result, a permanent solution has not been achieved at this time.

10.0 LIMITATIONS

The conclusions summarized herein were formed upon the observations stated within this report at the time these services were conducted. This report was prepared for the sole and exclusive use of the Client to be used in an environmental evaluation of the subject site. No other party is entitled to rely in any way on the conclusions, observations, specifications, or data contained herein without the express written consent of Metcalf & Eddy, Inc. Any use of this report by anyone other than the Client, or any use of this report by the Client or others for any other purpose than the stated purpose set forth above, without the express written consent of Metcalf & Eddy, Inc. shall be at the user's sole risk, and Metcalf & Eddy, Inc. shall not have any liability or responsibility thereof.

This report is subject to the Statement of Limitations provided as Appendix K of this report, and is incorporated herein by reference.

11.0 REFERENCES

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TABLES

Table 1. Surface and Subsurface Soil Analytical Data -- June 2002 and August 2003
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	ME-1A	ME-1B	ME-2A	ME-2B	ME-3B	ME-4A	ME-4B	TP-1-A	TP-2-A	TP-2-B	KTP-2-B	TP-3-A	TP-3-B	TP-4-B	DEP Background for Natural Soils **
APPROXIMATE SAMPLE DEPTH (ft bgs)	0-4	4-12	3	4-12	4-12	0-4	4-14	0-4	0-4	4-7	4-7	0-4	4-9	0-7.5	
M&E SAMPLE ID	ME-1A-0-4	ME-1B-4-12	ME-2A-3	ME-2B-4-12	ME-3B-4-12	ME-4A-0-4	ME-4B-4-14	TP-1-A	TP-2-A	TP-2-B	KTP-2-B	TP-3-A	TP-3-B	TP-4-B	
DATE SAMPLED	6/11/02	6/11/02	6/11/02	6/11/02	6/12/02	6/12/02	6/12/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	
COMMENTS								VPH, 2-4 ft	VPH, 3-3.5 ft	VPH, 6.5-7	FD	VPH, 3-3.5	VPH, 7 ft	VPH, 5.5 ft	
VPH - MADEP - VPH-98-1 (ug/kg)															
C_9-C_{12} Aliphatics	5,600 U	5,900 U	6,800 U	5,800 U	6,200 U	6,000 U	6,300 U	5,500 U	6,300 U	6,500 UJ	6,800 UJ	4,600 U	6,000 U	12,000 J	--
EPH - MADEP-EPH-98-1 (ug/kg)			Not Analyzed												
C_9-C_{18} Aliphatics	4,300	3,500 U		3,400 U	3,300 U	3,200 U	3,500 U	3,300 U	4,200	5,500	3,700 U	3,400 U	3,400 U	53,000	--
C_{19}-C_{36} Aliphatics	65,000	4,600 U		4,500 U	4,400 U	12,000	4,700 U	47,000	98,000	190,000	150,000	86,000	24,000	530,000	--
C_{11}-C_{22} Aromatics	9,400 U	9,800 U		9,600 U	9,400 U	9,200 U	10,000 U	9,200 U	25,000	38,000	28,000	22,000	12,000	85,000	--
Benzo(a)anthracene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	570 U	680	620 U	560 U	570 U	770 U	2,000
Benzo(a)pyrene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	570 U	690	620 U	560 U	570 U	770 U	2,000
Benzo(b)fluoranthene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	920	1,300	1,200	1,100	960	770 U	2,000
Dibenzo(a,h)anthracene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	**600**	**860**	**780**	**710**	570 U	770 U	500
Fluoranthene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	590	1,600	1,200	1,100	570 U	770 U	4,000
Indeno(1,2,3-cd)pyrene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	600	860	780	710	570 U	770 U	1,000
Phenanthrene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	570 U	1,700	1,300	1,100	570 U	770 U	3,000
Pyrene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	650	1,500	1,200	1,100	570 U	770 U	4,000
2-Methylnaphthalene	550 U	580 U		570 U	550 U	540 U	590 U	540 U	570 U	630 U	620 U	560 U	570 U	**850**	500
PCBs - SW-846, Method 8082 (ug/kg)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed								
Aroclor-1260								55 U	140	150	120	110	58 U	78 U	
RAS INORGANICS - Total Metals (mg/Kg)			Not Analyzed												
Aluminum	**10,100 J**	5,870 J		7,500 J	**11,400 J**	9,080 J	7,190 J	**10,600 J**	8,900 J	**26,200 J**	9,450 J	9,100 J	8,090 J	**10,900 J**	10,000
Antimony	2.1 UJ	0.88 UJ		0.87 UJ	0.86 UJ	0.84 UJ	0.92 UJ	0.85 UJ	1.0 UJ	5.1 UJ	4.0 UJ	0.86 UJ	0.88 UJ	3.7 UJ	1
Arsenic	6.8	1.3 J		1.7	1.4	4.0	1.4 J	2.0	8.6	7.1	6.5	6.6	4.2	5.9	20
Barium	**228**	42.8		**69.6**	**72.0**	43.7	49.2	**143**	**317**	**3,250**	**2,350**	**85.6**	**287**	**2,230**	50
Beryllium	**1.4**	0.25 U		0.18 U	0.12 UJ	0.21 U	**0.50**	0.27 U	0.27 U	0.19 U	0.28 U	0.21 U	0.25 U	0.19 U	0.4
Cadmium	0.11 U	0.12 U		0.11 U	0.53	0.11 U	0.12 U	0.11 U	0.51	0.70	0.46	0.41	0.12 U	1.7	2
Calcium	12,700 J	1,780 J		1,410 J	650 J	442 J	442 J	2,540 J	2,650 J	6,970 J	8,760 J	2,940 J	8,730 J	22,700 J	--
Chromium	22.8 J	13.5 J		19.2 J	24.9 J	14.3 J	15.6 J	16.2 J	17.0 J	25.5 J	20.4 J	**33.1 J**	11.0 J	19.4 J	30
Cobalt	**12.2 J**	**8.4**		**10.3**	**23.9**	**4.6**	**33.3**	**5.2**	**4.7**	**7.7 J**	**7.1 J**	**4.3**	3.3	**6.9 J**	4
Copper	**4,520 J**	17.8 J		20.9 J	21.0 J	19.8 J	12.3 J	19.6 J	**106 J**	**6,380 J**	**308 J**	**95.6 J**	**41.2 J**	**1,680 J**	40
Iron	**27,600**	12,300		17,300	14,000	13,400	**25,800**	15,100	15,100	**34,800**	**34,500**	16,000	13,000	**63,900**	20,000
Lead	100 J	2.6 J		3.6 J	3.0 J	19.1 J	3.4 J	**277 J**	**277 J**	**546 J**	**362 J**	**190 J**	51.0 J	**1,250 J**	100
Magnesium	3,660	2,160		3,280	3,880	2,120	2,340	2,850	2,240	2,540	3,960	2,070	1,490	3,480	5,000
Manganese	209	63.8		112	103	159	284	209	161	**400**	**334**	157	148	**343**	300
Mercury	0.06 U	0.06 U		0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.09 J	0.12 J	0.08 U	0.11 J	0.10 J	0.09 J	0.3
Nickel	16.5 J	14.7 J		19.3 J	**51.9 J**	7.1 J	13.3 J	7.2 J	9.3 J	**56.5 J**	18.9 J	8.6 J	6.1 J	**28.5 J**	20
Potassium	3,160	2,210		3,390	4,190	1,260	2,380	2,740	1,790	1,470	1,270	1,440	888	1,140	--
Selenium	0.50 U	**0.63 J**		0.50 U	0.50 U	**0.77 J**	0.53 U	0.49 U	**1.3**	0.56 U	**0.89 J**	**0.53 J**	0.51 U	**0.89 J**	0.5
Silver	**1.2**	0.25 U		0.25 U	0.25 U	0.24 U	0.27 U	0.25 U	0.25 U	**3.8**	0.34 J	0.25 U	0.25 U	**1.1**	0.6
Sodium	829 J	439		543	454	483	568	539	645	2,630 J	1,690 J	575	554	2,900	--
Thallium	0.80 U	0.81 U		0.80 U	0.79 U	0.77 U	**1.1 J**	0.78 U	0.79 U	0.89 U	1.1 U	0.79 U	0.81 U	**1.3 J**	0.6
Vanadium	29.0	19.0		27.8	29.7	18.9	22.5	27.9	26.4	21.7	17.2	29.9	16.2	16.5	30
Zinc	224 J	24.9 J		33.7 J	58.1 J	35.2 J	33.8 J	82.8 J	**143 J**	**1,690 J**	**788 J**	**104 J**	**171 J**	**1,600 J**	100
TCLP Metals (ug/L, in TCLP extract of soil)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed								
Arsenic								0.55 U	2.0 J	1.4 J	1.3 J	2.4 J	1.2 J	2.0 J	
Barium								1,500	2,100	3,900	3,700	950	1,600	210	
Cadmium								45 J	22 J	18 J	15 J	8.6 J	2.8 J	53 J	
Chromium								13 UJ	21 UJ	32 U	28 U	17 UJ	21 UJ	43 U	
Lead								2,300	940	7,800	6,200	860	1,300	18,000	
Mercury								0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	
Selenium								6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	
Silver								0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	

Table 1. Surface and Subsurface Soil Analytical Data -- June 2002 and August 2003
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	ME-1A	ME-1B	ME-2A	ME-2B	ME-3B	ME-4A	ME-4B	TP-1-A	TP-2-A	TP-2-B	KTP-2-B	TP-3-A	TP-3-B	TP-4-B	DEP Background for Natural Soils **
APPROXIMATE SAMPLE DEPTH (ft bgs)	0-4	4-12	3	4-12	4-12	0-4	4-14	0-4	0-4	4-7	4-7	0-4	4-9	0-7.5	
M&E SAMPLE ID	ME-1A-0-4	ME-1B-4-12	ME-2A-3	ME-2B-4-12	ME-3B-4-12	ME-4A-0-4	ME-4B-4-14	TP-1-A	TP-2-A	TP-2-B	KTP-2-B	TP-3-A	TP-3-B	TP-4-B	
DATE SAMPLED	6/11/02	6/11/02	6/11/02	6/11/02	6/12/02	6/12/02	6/12/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	6/10/02	
COMMENTS								VPH, 2-4 ft	VPH, 3-3.5 ft	VPH, 6.5-7	FD	VPH, 3-3.5	VPH, 7 ft	VPH, 5.5 ft	
SPLP Metals (ug/L, in SPLP extract of soil)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	
Antimony															
Arsenic															
Barium															
Beryllium															
Cadmium															
Chromium															
Copper															
Lead															
Mercury															
Nickel															
Selenium															
Silver															
Thallium															
Vanadium															
Zinc															
LAB SAMPLE ID															
Volatile Organic Compounds	81142002	81142004	N/A	81142003	81142004	81142001	81142004	81142002	81142004	N/A	81142003	81142004	81142001	81142004	
VPH, EPH	ME-1A-0-4	ME-1B-4-12	ME-2A-3	ME-2B-4-12	ME-3B-4-12	ME-4A-0-4	ME-4B-4-14	ME-1A-0-4	ME-1B-4-12	ME-2A-3	ME-2B-4-12	ME-3B-4-12	ME-4A-0-4	ME-4B-4-14	
SPLP METALS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
RAS - Total Metals	MALR20	MALR24	N/A	MALR25	MALR26	MALR23	MALR27	MALR20	MALR24	N/A	MALR25	MALR26	MALR23	MALR27	

Table 1. Surface and Subsurface Soil Analytical Data -- June 2002 and August 2003
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	SB-1S	SB-1D	SB-2S	SB-2D	SB-3S	SB-3D	SB-4S	SB-4D	SBK-4D	
APPROXIMATE SAMPLE DEPTH (ft bgs)	0-4	4-10.5	0-4	4-12	0-4	4-12	0-4	4-8	4-8	DEP Background for Natural Soils
M&E SAMPLE ID	SB-1S	SB-1D	SB-2S	SB-2D	SB-3S	SB-3D	SB-4S	SB-4D	SBK-4D	
DATE SAMPLED	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	
COMMENTS									FD	**
VPH - MADEP - VPH-98-1 (ug/kg)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	
C_9-C_{12} Aliphatics										--
EPH - MADEP-EPH-98-1 (ug/kg)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	
C_9-C_{18} Aliphatics										--
C_{19}-C_{36} Aliphatics										--
C_{11}-C_{22} Aromatics										--
Benzo(a)anthracene										2,000
Benzo(a)pyrene										2,000
Benzo(b)fluoranthene										2,000
Dibenzo(a,h)anthracene										500
Fluoranthene										4,000
Indeno(1,2,3-cd)pyrene										1,000
Phenanthrene										3,000
Pyrene										4,000
2-Methylnaphthalene										500
PCBs - SW-846, Method 8082 (ug/kg)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	
Aroclor-1260										
RAS INORGANICS - Total Metals (mg/Kg)										
Aluminum	4,170	**11,000**	9,970	**10,800**	**11,700**	**12,200**	9,070	8,530	8,340	10,000
Antimony	0.57 UJ	0.60 UJ	0.64 UJ	0.59 UJ	0.64 UJ	0.60 UJ	0.68 UJ	**1.8 J**	**2.8 J**	1
Arsenic	1.0 UJ	2.7 UJ	5.4	2.8 UJ	4.5	4.1	2.4 UJ	8.0 J	5.4 J	20
Barium	13.8 J	**106 J**	**166 J**	**132 J**	**236 J**	**141 J**	**766 J**	**1,140 J**	**1,220 J**	50
Beryllium	0.11	0.34	0.34	0.34	0.39	0.40	0.28	0.29	0.23	0.4
Cadmium	0.10 U	0.11 U	0.11 U	0.10 U	0.45	0.11 U	0.21 J	0.53	1.0	2
Calcium	277	1,780	3,900	1,090	6,290	3,290	29,900	9,740	10,100	--
Chromium	3.3	21.3	18.3	17.1	21.3	19.6	16.5	17.0	16.4	30
Cobalt	1.3	3.4	3.2	3.7	3.0	**4.8**	2.5	**5.3 J**	3.5 J	4
Copper	3.0 J	17.6 J	38.7 J	21.7 J	**56.7 J**	**42.8 J**	**247 J**	**1,210 J**	**1,260 J**	40
Iron	4,200 J	15,100 J	17,300 J	19,100 J	19,100 J	18,900 J	17,700 J	**34,600 J**	**25,400 J**	20,000
Lead	3.5 J	13.2 J	84.6 J	7.8 J	**250 J**	**141 J**	**524 J**	**468 J**	**686 J**	100
Magnesium	270	3,140	2,400	2,920	2,690	3,030	3,450	1,980	1,760	5,000
Manganese	30.9	228	152	282	191	**308**	205	256	214	300
Mercury	0.042 UJ	0.049 UJ	0.084 J	0.048 UJ	**0.35 J**	**2.2 J**	0.15 J	0.15 J	**0.32 J**	0.3
Nickel	2.3	8.1	8.1	7.4	8.1	8.1	10.0	18.4	14.1	20
Potassium	217	2,640	1,800	2,670	1,800	2,650	2,570	1,120	902	--
Selenium	0.65 U	0.68 U	0.73 U	0.67 U	0.74 U	0.68 U	0.77 U	0.78 UJ	0.76 UJ	0.5
Silver	0.26 U	0.28 U	0.30 U	0.27 U	**0.96**	0.28 U	0.31 U	0.32 U	**2.6**	0.6
Sodium	69.2 U	121 J	78.6 J	134 J	78.8 J	223	264	141 J	126 J	--
Thallium	0.70 U	0.73 UJ	0.77 U	0.71 U	0.78 U	0.72 U	0.82 U	0.83 U	0.80 U	0.6
Vanadium	6.3	27.6	26.4	27.8	28.4	**30.8**	23.0	21.8	16.8	30
Zinc	6.8 J	38.1 J	148 J	39.4 J	**204 J**	66.3 J	**420 J**	**670 J**	**782 J**	100
TCLP Metals (ug/L, in TCLP extract of soil)	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	
Arsenic										
Barium										
Cadmium										
Chromium										
Lead										
Mercury										
Selenium										
Silver										

Table 1. Surface and Subsurface Soil Analytical Data -- June 2002 and August 2003
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	SB-1S	SB-1D	SB-2S	SB-2D	SB-3S	SB-3D	SB-4S	SB-4D	SBK-4D	DEP Background for Natural Soils **
APPROXIMATE SAMPLE DEPTH (ft bgs)	0-4	4-10.5	0-4	4-12	0-4	4-12	0-4	4-8	4-8	
M&E SAMPLE ID	SB-1S	SB-1D	SB-2S	SB-2D	SB-3S	SB-3D	SB-4S	SB-4D	SBK-4D	
DATE SAMPLED	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	08/05/03	
COMMENTS									FD	
SPLP Metals (ug/L, in SPLP extract of soil)										
Antimony	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.1 J	3.0 U	
Arsenic	3.6 J	3.0 U	3.0 J	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.2 J	
Barium	124	134	168	136	101	141	62.0	175	178	
Beryllium	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
Cadmium	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	
Chromium	1.4	0.83 J	1.0 J	0.60 U	1.3	0.60 U	1.2	0.60 U	0.60 U	
Copper	15.3	4.0 U	4.0 U	4.0 U	4.8 J	4.0 U	4.0 U	17.2	10.1	
Lead	29.1	4.0 U	4.8 J	4.0 U	8.3	5.1 J	4.0 U	9.4	18.6	
Mercury	0.14 U	0.14 U	0.13 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U	0.16 U	
Nickel	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	1.1 J	0.80 U	
Selenium	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	
Silver	3.4 UJ	3.9 UJ	2.4 UJ	2.9 UJ	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	
Thallium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	
Vanadium	2.8	1.3 J	1.5	0.70 U	2.0	0.70 U	3.9	0.70 U	0.70 U	
Zinc	12.7 J	8.7 J	21.7	7.8 J	18.6	7.0 U	7.0 U	24.2	20.1	
LAB SAMPLE ID										
Volatile Organic Compounds	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
VPH, EPH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
SPLP METALS	SB-1S	SB-1D	SB-2S	SB-2D	SB-3S	SB-3D	SB-4S	SB-4D	SBK-4D	
RAS - Total Metals	MA1358	MA1357	MA1360	MA1359	MA1362	MA1361	MA1364	MA1363	MA1365	

Notes:
EPH - Extractable Petroleum Hydrocarbons
ft bgs - feet below ground surface
FD - field duplicate sample
J - Quantitation is approximate due to limitations identified in the quality control review
MCP - Massachusetts Contingency Plan
PCBs - Polychlorinated Biphenyls
RAS - Routine Analytical Services
SPLP - Synthetic Precipitation Leaching Procedure
TCLP - Toxicity Characteristic Leaching Procedure
U - Analyte was not detected at the stated sample-specific detection limit.
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review
VPH - Volatile Petroleum Hydrocarbons

** - Background Levels - MADEP Technical Updatee, May 2002. Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil.

Bold results indicate exceedances of the Background Levels for Natural Soils

Table 2. Surface and Subsurface Soil Analytical Data -- February and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	DEP Background for Natural Soils *	MEB-1		MEB-1		MEB-2		MEB-2		MEW-3				MEW-3		MEW-4		MEW-4		MEW-5		MEW-5		MEB-6	
APPROXIMATE SAMPLE DEPTH (ft bgs)		0-2		4-6		0-1.5		4-7		0-2.2				4-7.5		0-2.5		4-8		0-2.7		4-8		0-3	
M&E SAMPLE ID		MEB-1-0-2		MEB-1-4-6		MEB-2-0-1.5		MEB-2-4-7		MEW-3-0-2.2		MEK-3-0-2.2		MEW-3-4-7.5		MEW-4-0-2.5		MEW-4-4-8		MEW-5-0-2.7		MEW-5-4-8		MEB-6-0-3	
DATE SAMPLED		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06		02/07/06	
COMMENTS												FD													
METALS (mg/kg)																									
Antimony	1	1.2	U	0.99	U	1.1	U	1.1	U	0.94	U	1.1	U	0.88	U	0.99	U	1.1	U	1.1	U	1.0	U	1.0	U
Arsenic	20	5.7		1.7		4.3		3.1		4.2		3.9		1.2		4.0		2.1		5.6		1.6		5.5	
Barium	50	**96.3**	**J**	**76.6**	**J**	**54.6**	**J**	**54.2**	**J**	**91.6**	**J**	**130**	**J**	43.5	J	46.2	J	46.6	J	**92.9**	**J**	**164**	**J**	**61.5**	**J**
Beryllium	0.4	0.29	UJ	0.25	UJ	0.26	UJ	0.27	UJ	0.23	UJ	0.28	UJ	0.22	UJ	0.25	UJ	0.26	UJ	0.26	UJ	0.25	UJ	0.25	UJ
Cadmium	2	0.70	J	0.71	J	1.6	J	0.60	J	0.92	J	0.85	J	1.5	J	0.36	J	0.28	J	1.1	J	1.4	J	0.97	J
Chromium	30	16.6		18.1		26.2		26.3		15.8		17.3		16.2		13.4		16.1		18.2		**43.2**		14.6	
Copper	40	24.3		15.4		**166**		**84.2**		32.4		33.6		14.9		22.4		15.4		**49.1**		28.0		33.8	
Lead	100	16.2	J	3.4	J	89.1	J	75.4	J	**507**	**J**	**917**	**J**	31.7	J	90.6	J	64.9	J	**340**	**J**	14.2	J	**238**	**J**
Mercury	0.3	0.044	J	0.034	UJ	0.070	J	0.060	J	0.076	J	0.038	J	0.031	UJ	0.047	J	0.031	UJ	0.24	J	0.038	UJ	**0.40**	**J**
Nickel	20	9.0	J	9.9	J	9.1	J	6.6	J	6.0	J	6.4	J	6.6	J	6.8	J	9.6	J	6.8	J	**20.4**	**J**	6.0	J
Selenium	0.5	1.7	U	1.5	U	1.6	U	1.6	U	1.4	U	1.7	U	1.3	U	1.5	U	1.6	U	1.6	U	1.5	U	1.5	U
Silver	0.6	1.7	U	1.5	U	1.6	U	1.6	U	1.4	U	1.7	U	1.3	U	1.5	U	1.6	U	1.6	U	1.5	U	1.5	U
Thallium	0.6	1.2	UJ	0.99	UJ	1.1	UJ	1.1	UJ	0.94	UJ	1.1	UJ	0.88	UJ	0.99	UJ	1.1	UJ	1.1	UJ	1.0	UJ	1.0	UJ
Vanadium	30	24.9	J	24.8	J	17.6	J	26.5	J	22.2	J	22.6	J	22.7	J	19.4	J	21.2	J	26.8	J	**69.5**	**J**	21.2	J
Zinc	100	39.8	J	25.2	J	**110**	**J**	87.4	J	**213**	**J**	**210**	**J**	**277**	**J**	99.4	J	47.3	J	**176**	**J**	**109**	**J**	94.2	J

Table 2. Surface and Subsurface Soil Analytical Data -- February and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME APPROXIMATE SAMPLE DEPTH (ft bgs) M&E SAMPLE ID DATE SAMPLED COMMENTS	**DEP Background for Natural Soils ***	**MEB-6 4-8 MEB-6-4-8 02/07/06**		**MEW-7 1-1.7 MEW-7-1-1.7 02/07/06**		**MEW-7 4-7.5 MEW-7-4-7.5 02/07/06**		**MEB-8 1-3.2 MEB-8-1-3.2 02/08/06**		**MEB-8 4-7.4 MEB-8-4-7.4 02/08/06**		**MEW-9 0.5-3 MEW-9-0.5-3 02/08/06**		**MEW-9 4-8 MEW-9-4-8 02/08/06**		**MEB-10 2-3 MEB-10-2-3 02/08/06**		**MEB-10 4-8 MEB-10-4-8 02/08/06**		**MEB-10 4-8 MEK-10-4-8 02/08/06 FD**		**MEB-11 0.5-3 MEB-11-0.5-3 02/08/06**		**MEB-11 4-8 MEB-11-4-8 02/08/06**	
METALS (mg/kg)																									
Antimony	1	0.99	U	0.95	U	0.98	U	0.97	U	0.95	U	1.1	U	0.89	U	0.95	U	1.1	UJ	1.1	UJ	1.0	UJ	1.0	UJ
Arsenic	20	4.2		0.95	U	2.7		3.3		4.8		3.2		2.8		3.3		1.5		1.6		3.2		3.4	
Barium	50	**76.5**	**J**	**61.9**	**J**	**89.6**	**J**	42.6	J	**53.9**	**J**	43.8	J	**53.1**	**J**	34.5	J	29.0	J	33.9	J	**61.3**	**J**	46.2	J
Beryllium	0.4	0.25	UJ	0.24	UJ	0.24	UJ	0.24	UJ	0.24	UJ	0.27	UJ	0.22	UJ	0.24	UJ	0.27	U	0.26	U	0.25	U	0.26	U
Cadmium	2	1.6	J	0.56	J	0.65	J	0.28	J	0.45	J	0.27	UJ	0.40	J	0.29	J	0.27	U	0.26	U	0.25	U	0.26	U
Chromium	30	20.2		27.9		24.9		12.3		17.6		13.3		19.2		13.0		10.7	J	12.5	J	12.7	J	14.5	J
Copper	40	**43.8**		8.6		16.7		12.5		15.8		11.5		13.7		7.5		6.3		6.9		10.6		9.6	
Lead	100	27.3	J	4.4	J	4.8	J	17.3	J	6.3	J	20.1	J	3.7	J	8.4	J	2.2	J	2.3	J	24.5	J	5.9	J
Mercury	0.3	**0.36**	**J**	0.034	UJ	0.037	UJ	0.034	UJ	0.035	UJ	0.034	UJ	0.030	UJ	0.053	J	0.033	U	0.039	U	0.035	U	0.032	U
Nickel	20	7.2	J	6.9	J	6.7	J	5.6	J	6.9	J	5.2	J	5.6	J	5.5	J	5.8	J	6.8	J	5.2	J	6.1	J
Selenium	0.5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.6	U	1.3	U	1.4	U	1.6	UJ	1.6	UJ	1.5	UJ	1.5	UJ
Silver	0.6	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.6	U	1.3	U	1.4	U	1.6	U	1.6	U	1.5	U	1.5	U
Thallium	0.6	0.99	UJ	0.95	UJ	0.98	UJ	0.97	UJ	0.95	UJ	1.1	UJ	0.89	UJ	0.95	UJ	1.1	UJ	1.1	UJ	1.0	UJ	1.0	UJ
Vanadium	30	26.2	J	**43.2**	**J**	**37.5**	**J**	17.8	J	25.4	J	19.4	J	25.4	J	19.2	J	12.5	J	14.6	J	15.9	J	19.6	J
Zinc	100	51.1	J	42.1	J	32.3	J	49.4	J	32.6	J	41.5	J	27.2	J	54.9	J	21.3	J	24.2	J	33.7	J	25.8	J

Table 2. Surface and Subsurface Soil Analytical Data -- February and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME APPROXIMATE SAMPLE DEPTH (ft bgs) M&E SAMPLE ID DATE SAMPLED COMMENTS	**DEP Background for Natural Soils ***	**MEB-12 0.5-3 MEB-12-0.5-3 02/08/06**		**MEB-12 4-8 MEB-12-4-8 02/08/06**		**MEB-13 0-3 MEB-13-0-3 02/08/06**		**MEB-13 4-8 MEB-13-4-8 02/08/06**		**MEB-14 0-3 MEB-14-0-3 02/08/06**		**MEB-14 4-8 MEB-14-4-8 02/08/06**		**ESMB-1 0-4 ESMB-01 0-4 11/28/06**		**ESMB-1 4-8 ESMB-01 4-8 11/28/06**		**ESMB-2 0-4 ESMB-02 0-4 11/28/06**		**ESMB-2 4-8 ESMB-02 4-8 11/28/06**		**ESMB-3 0-4 ESMB-03 0-4 11/28/06**	
METALS (mg/kg)																							
Antimony	1	0.88	UJ	0.90	UJ	0.97	UJ	0.97	UJ	1.0	UJ	1.0	UJ	1.1	U	2.6		1.1	U	1.1	U	1.2	U
Arsenic	20	2.8		2.0		2.2		0.97	U	3.3		1.9		3.4	U	8.9		4.8		3.4	U	4.2	
Barium	50	28.4	J	**56.2**	**J**	**66.5**	**J**	**101**	**J**	**57.7**	**J**	**105**	**J**	44		**150**		**64**		**71**		**800**	
Beryllium	0.4	0.22	U	0.22	U	0.24	U	0.24	U	0.26	U	0.26	U	0.34	U	0.38	U	0.34	U	0.34	U	0.36	U
Cadmium	2	0.22	U	0.23		0.49		0.69		0.40		0.51		0.56	U	1.3		0.57	U	0.57	U	0.59	U
Chromium	30	9.4	J	14.3	J	25.3	J	**31.4**	**J**	21.7	J	25.9	J	23		16		22		18		14	
Copper	40	8.5		10.9		13.3		16.5		13.5		14.7		23	U	**78**		23	U	23	U	24	U
Lead	100	4.6	J	3.7	J	7.8	J	4.1	J	6.3	J	4.8	J	18		**220**		12		11	U	23	
Mercury	0.3	0.032	U	0.031	U	0.036	U	0.031	U	0.036	U	0.032	U	0.039	U	0.079		**0.49**		0.039	U	**0.36**	
Nickel	20	4.6	J	5.3	J	6.6	J	9.8	J	6.4	J	7.5	J	11	U	13	U	11	U	**23**		12	U
Selenium	0.5	1.3	UJ	1.3	UJ	1.5	UJ	1.5	UJ	1.6	UJ	1.5	UJ	22	U	13	U	11	U	11	U	12	U
Silver	0.6	1.3	U	1.3	U	1.5	U	1.5	U	1.6	U	1.5	U	5.6	U	6.3	U	5.7	U	5.7	U	5.9	U
Thallium	0.6	0.88	UJ	0.90	UJ	0.97	UJ	0.97	UJ	1.0	UJ	1.0	UJ	5.6	U	6.3	U	5.7	U	5.7	U	5.9	U
Vanadium	30	12.8	J	20.2	J	**34.3**	**J**	**47.4**	**J**	**30.1**	**J**	**40.9**	**J**	19		25		**37**		35	U	22	
Zinc	100	16.5	J	19.9	J	31.6	J	39.5	J	26.3	J	37.2	J	56	U	**580**		57	U	57	U	**110**	

Table 2. Surface and Subsurface Soil Analytical Data -- February and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME APPROXIMATE SAMPLE DEPTH (ft bgs) M&E SAMPLE ID DATE SAMPLED COMMENTS	**DEP Background for Natural Soils ***	**ESMB-3 4-8 ESMB-03 4-8 11/28/06**		**ESMB-4 0-4 ESMB-04 0-4 11/28/06**		**ESMB-4 4-8 ESMB-04 4-8 11/28/06**		**ESMB-5 0-4 ESMB-05 0-4 11/28/06**		**ESMB-5 4-8 ESMB-05 4-8 11/28/06**	
METALS (mg/kg)											
Antimony	1	1.1	U	1.2	U	1.2	U	**2.2**		1.1	U
Arsenic	20	3.3	U	3.6	U	3.5	U	7.3		3.4	U
Barium	50	**81**		40		**55**		**780**		**62**	
Beryllium	0.4	0.33	U	0.36	U	0.35	U	0.38	U	0.34	U
Cadmium	2	0.56	U	0.60	U	0.58	U	1.60		0.57	U
Chromium	30	27		15		18		**71**		22	
Copper	40	29		24	U	23	U	**78**		23	U
Lead	100	11	U	15		12	U	**1300**		11	U
Mercury	0.3	0.036	U	0.29		0.037	U	0.12		0.039	U
Nickel	20	**47**		12	U	12	U	13	U	13	
Selenium	0.5	11	U	12	U	12	U	13	U	11	U
Silver	0.6	5.6	U	6.0	U	5.8	U	6.4	U	5.7	U
Thallium	0.6	5.6	U	6.0	U	5.8	U	6.4	U	5.7	U
Vanadium	30	**48**		22		29		26		**36**	
Zinc	100	57		60	U	**460**		**860**		57	U

Notes:
* Background Levels - MassDEP Technical Update, May 2002. Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil.
ft bgs - feet below ground surface
FD - field duplicate sample
J - Quantitation is approximate due to limitations identified in the quality control review.
MCP - Massachusetts Contingency Plan
mg/kg - milligram per kilogram
U - Analyte was not detected at the stated sample-specific detection limit.
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review.

Bold results indicate exceedances of Background Levels for Natural Soils.

Table 3. Groundwater Analytical Data - June 2002
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	ME-1	ME-2		ME-3	ME-4	MW-5
WELL SCREEN INTERVAL (ft bgs)	2-12	2-12		4-14	5-15	5-25*
M&E SAMPLE ID	ME-1	ME-2	KME-2	ME-3	ME-4	ME-5
DATE SAMPLED	6/18/02	6/18/02	6/18/02	6/18/02	6/19/02	6/18/02
COMMENTS			FD			Lycott
PARAMETER/ANALYTE						
VOLATILE PETROLEUM HYDROCARBONS - MADEP-VPH-98-1 (µg/l)						Not Analyzed
None Detected (all analytes; all samples analyzed)						
VOLATILE ORGANIC COMPOUNDS - RAS (µg/l)						Not Analyzed
Acetone	5.0 UJ	10 J	9.1 J	50 J	5.0 UJ	
Methyl-t-butyl ether (MTBE)	1.1 J	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	
EXTRACTABLE PETROLEUM HYDROCARBONS - MADEP-EPH-98-1, AND TARGET PAHs BY GC/MS-SIM (µg/l)						Not Analyzed
None Detected (all analytes; all samples analyzed)						
METALS - RAS (µg/l)						
Aluminum	101 U	616	574	38.1 U	19.4 U	49.4 U
Antimony	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U
Arsenic	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Barium	64.5	84.3	85.5	20.3	20.7	9.3
Beryllium	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Cadmium	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Calcium	134,000	21,500	21,700	9,220	14,100 J	16,600
Chromium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Cobalt	5.6 U	5.6 U	5.6 U	5.6 U	15.5	5.6 U
Copper	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
Iron	107 U	619	614	416	7.0 U	98.5 U
Lead	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Magnesium	17,200	3,340	3,360	2,660	4,480	4,130
Manganese	140	381	382	672	189	24.1
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	10.2 U	10.2 U	10.2 U	10.2 U	10.2 U	10.2 U
Potassium	28,800	4,630	4,350	3,720	2,320	1,950
Selenium	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Silver	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Sodium	138,000	122,000	123,000	7,230	29,100	10,900
Thallium	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Vanadium	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Zinc	3.6 U	3.6 U	6.0 J	5.6 J	3.6 U	3.6 U
LAB SAMPLE ID						
Volatile Petroleum Hydrocarbons	ME-1	ME-2	KME-2	ME-3	ME-4	Not Analyzed
Volatile Organic Compounds	A0BW5	A0BW6	A0BW7	A0BW8	A0BX0	Not Analyzed
Extractable Petroleum Hydrocarbons	ME-1	ME-2	KME-2	ME-3	ME-4	Not Analyzed
Inorganics (Metals Only)	MA02D6	MA02D7	MA02D8	MA02D9	MA02E1	MA02E0

Notes:
ft bgs - feet below ground surface
FD - field duplicate sample
J - Quantitation is approximate due to limitations identified in the quality control review.
MCP - Massachusetts Contingency Plan
U - Analyte was not detected at the stated sample-specific detection limit.
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review

* - Well screen interval is estimated based on down hole measurements, but could not be positively identified.

Table 3. Groundwater Analytical Data - June 2002
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	ME-1	ME-2		ME-3	ME-4	MW-5
WELL SCREEN INTERVAL (ft bgs)	2-12	2-12		4-14	5-15	5-25*
M&E SAMPLE ID	ME-1	ME-2	KME-2	ME-3	ME-4	ME-5
DATE SAMPLED	6/18/02	6/18/02	6/18/02	6/18/02	6/19/02	6/18/02
COMMENTS			FD			Lycott
PARAMETER/ANALYTE						
VOLATILE PETROLEUM HYDROCARBONS - MADEP-VPH-98-1 (µg/l)						Not Analyzed
None Detected (all analytes; all samples analyzed)						
VOLATILE ORGANIC COMPOUNDS - RAS (µg/l)						Not Analyzed
Acetone	5.0 UJ	10 J	9.1 J	50 J	5.0 UJ	
Methyl-t-butyl ether (MTBE)	1.1 J	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	
EXTRACTABLE PETROLEUM HYDROCARBONS - MADEP-EPH-98-1, AND TARGET PAHs BY GC/MS-SIM (µg/l)						Not Analyzed
None Detected (all analytes; all samples analyzed)						
METALS - RAS (µg/l)						
Aluminum	101 U	616	574	38.1 U	19.4 U	49.4 U
Antimony	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U
Arsenic	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Barium	64.5	84.3	85.5	20.3	20.7	9.3
Beryllium	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Cadmium	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Calcium	134,000	21,500	21,700	9,220	14,100 J	16,600
Chromium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Cobalt	5.6 U	5.6 U	5.6 U	5.6 U	15.5	5.6 U
Copper	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
Iron	107 U	619	614	416	7.0 U	98.5 U
Lead	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Magnesium	17,200	3,340	3,360	2,660	4,480	4,130
Manganese	140	381	382	672	189	24.1
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	10.2 U	10.2 U	10.2 U	10.2 U	10.2 U	10.2 U
Potassium	28,800	4,630	4,350	3,720	2,320	1,950
Selenium	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Silver	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Sodium	138,000	122,000	123,000	7,230	29,100	10,900
Thallium	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Vanadium	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Zinc	3.6 U	3.6 U	6.0 J	5.6 J	3.6 U	3.6 U
LAB SAMPLE ID						
Volatile Petroleum Hydrocarbons	ME-1	ME-2	KME-2	ME-3	ME-4	Not Analyzed
Volatile Organic Compounds	A0BW5	A0BW6	A0BW7	A0BW8	A0BX0	Not Analyzed
Extractable Petroleum Hydrocarbons	ME-1	ME-2	KME-2	ME-3	ME-4	Not Analyzed
Inorganics (Metals Only)	MA02D6	MA02D7	MA02D8	MA02D9	MA02E1	MA02E0

Notes:
ft bgs - feet below ground surface
FD - field duplicate sample
J - Quantitation is approximate due to limitations identified in the quality control review.
MCP - Massachusetts Contingency Plan
U - Analyte was not detected at the stated sample-specific detection limit.
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review

* - Well screen interval is estimated based on down hole measurements, but could not be positively identified.

Table 4. Groundwater Analytical Data -- Feburary, May, September, and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME	MEW-3		MEW-3		MEW-3		MEW-3		MEW-3		MEW-4		MEW-4		MEW-4		MEW-4		MEW-4		MEW-7		MEW-7		MEW-7	
WELL SCREENED INTERVAL (ft bgs)	3-8		3-8				3-8		3-8		3-8				3-8		3-8		3-8		3-11		3-11		3-11	
M&E SAMPLE ID	MEW-3		MEW-3		MEW-3CS		MEW-3		MEW-3		MEW-4		MEW-4CS		MEW-4		MEW-4		MEW-4		MEW-7		MEW-7		MEW-7	
DATE SAMPLED	2/16/06		5/18/06		5/18/06		9/28/06		11/29/06		2/16/06		2/16/06		5/18/06		9/28/06		11/29/06		2/16/06		5/18/06		9/28/06	
TOTAL OR DISSOLVED	Dissolved		Total		Total		Dissolved		Dissolved		Total		Total		Total		Dissolved		Dissolved		Total		Total		Dissolved	
COMMENTS													FD of MEW-4													
METALS (ug/L)																										
Antimony	20	UJ	20	U	20	U	6	U	6	U	20	UJ	20	UJ	20	U	6	U	6	U	20	UJ	20	U	6	
Arsenic	20	U	20	U	20	U	5	U	5	U	20	U	20	U	20	U	5	U	5	U	20	U	20	U	5	
Barium	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	
Beryllium	5.0	U	5.0	U	5.0	U	4.0	U	4.0	U	5.0	U	5.0	U	5.0	U	4.0	U	4.0	U	5.0	U	5.0	U	4.0	
Cadmium	5.0	U	5.0	U	5.0	U	4.0	U	4.0	U	5.0	U	5.0	U	5.0	U	4.0	U	4.0	U	5.0	U	5.0	U	4.0	
Chromium	20	U	20	U	20	U	10	U	10	U	20	U	20	U	20	U	10	U	10	U	20	U	20	U	10	
Copper	30	U	30	U	30	U	25	U	25	U	30	U	30	U	30	U	25	U	25	U	30	U	30	U	25	
Lead	10	U	10	U	17.3		18		6		10	U	10	U	10	U	14		11		10	U	10	U	9	
Mercury	0.28	U	0.28	U	0.28	U	0.2	U	0.2	U	0.26	U	0.26	U	0.28	U	0.2	U	0.2	U	0.28	U	0.28	U	0.2	
Nickel	50	U	50	U	50	U	40	U	40	U	50	U	50	U	50	U	40	U	40	U	50	U	50	U	40	
Selenium	30	UJ	30	U	30	U	50	U	50	U	30	UJ	30	UJ	30	U	50	U	50	U	30	UJ	30	U	50	
Silver	30	UJ	30	U	30	U	7	U	7	U	30	UJ	30	UJ	30	U	7	U	7	U	30	UJ	30	U	7	
Thallium	20	U	20	U	20	U	2	U	2	U	20	U	20	U	20	U	2	U	2	U	20	U	20	U	2	
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	
Zinc	144	J	202		188		200	U	200	U	66	UJ	66	UJ	73.2		200	U	200	U	66	UJ	71.9		200	

Table 4. Groundwater Analytical Data -- Feburary, May, September, and November 2006
Mill Street Property, Brookfield, Massachusetts

LOCATION NAME		MEW-7		MEW-9		MEW-9		MEW-9		MEW-9		MEW-9		P-3		P-3		P-3		P-3	
WELL SCREENED INTERVAL (ft bgs)		3-11		2-12		2-12		2-12				2-12		2-12		2-12		2-12		2-12	
M&E SAMPLE ID		MEW-7		MEW-9		MEW-9		MEW-9		DUP-1		MEW-9		P-3		P-3		P-3		P-3	
DATE SAMPLED		11/29/06		2/16/06		5/18/06		9/28/06		9/28/06		11/29/06		2/16/06		5/18/06		9/28/06		11/29/06	
TOTAL OR DISSOLVED		Dissolved		Total		Total		Dissolved		Dissolved		Dissolved		Total		Total		Dissolved		Dissolved	
COMMENTS										FD of MEW-9											
METALS (ug/L)																					
Antimony	U	6	U	20	UJ	20	U	6	U	6	U	6	U	20	UJ	20	U	6	U	6	U
Arsenic	U	5	U	20	U	20	U	5	U	5	U	5	U	20	U	20	U	5	U	5	U
Barium	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U
Beryllium	U	4.0	U	5.0	U	5.0	U	4.0	U	4.0	U	4.0	U	5.0	U	5.0	U	4.0	U	4.0	U
Cadmium	U	4.0	U	5.0	U	5.0	U	4.0	U	4.0	U	4.0	U	5.0	U	5.0	U	4.0	U	4.0	U
Chromium	U	10	U	20	U	20	U	10	U	10	U	10	U	20	U	20	U	10	U	10	U
Copper	U	25	U	30	U	30	U	25	U	25	U	25	U	30	U	30	U	25	U	25	U
Lead		16		10	U	10	U	11		11		5	U	10	U	10	U	14		10	
Mercury	U	0.2	U	0.28	U	0.28	U	0.2	U	0.2	U	0.2	U	0.26	U	0.28	U	0.2	U	0.2	U
Nickel	U	40	U	50	U	50	U	40	U	40	U	40	U	50	U	50	U	40	U	40	U
Selenium	U	50	U	30	UJ	30	U	50	U	50	U	50	U	30	UJ	30	U	50	U	50	U
Silver	U	7	U	30	UJ	30	U	7	U	7	U	7	U	30	UJ	30	U	7	U	7	U
Thallium	U	2	U	20	U	20	U	2	U	2	U	2	U	20	U	20	U	2	U	2	U
Vanadium	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U
Zinc	U	200	U	66	UJ	69.6		200	U	200	U	200	U	66	UJ	53.2		200	U	200	U

Notes:
ft bgs - feet below ground surface
FD - field duplicate sample
J - Quantitation is approximate due to limitations identified in the quality control review.
MCP - Massachusetts Contingency Plan
U - Analyte was not detected at the stated sample-specific detection limit.
ug/L - microgram per liter
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review.

FIGURES

Due to their size, pages 42 and 43 of this report are in separate files. See:

- **Phase II Comprehensive Rpt Nov 2007-Part1_PAGE_42.pdf**
- **Phase II Comprehensive Rpt Nov 2007-Part1_PAGE_43.pdf**

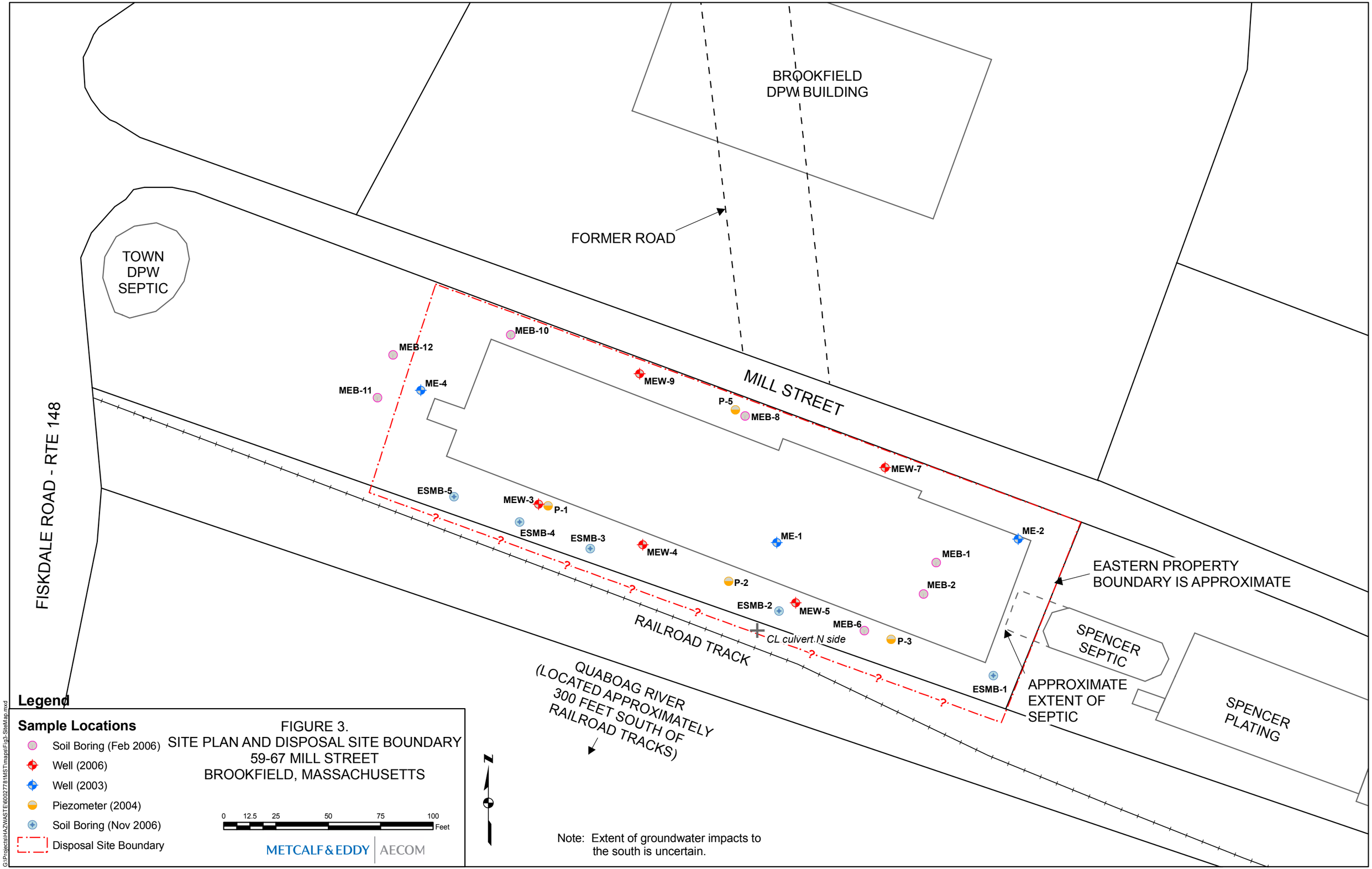


FIGURE 3.
SITE PLAN AND DISPOSAL SITE BOUNDARY
59-67 MILL STREET
BROOKFIELD, MASSACHUSETTS

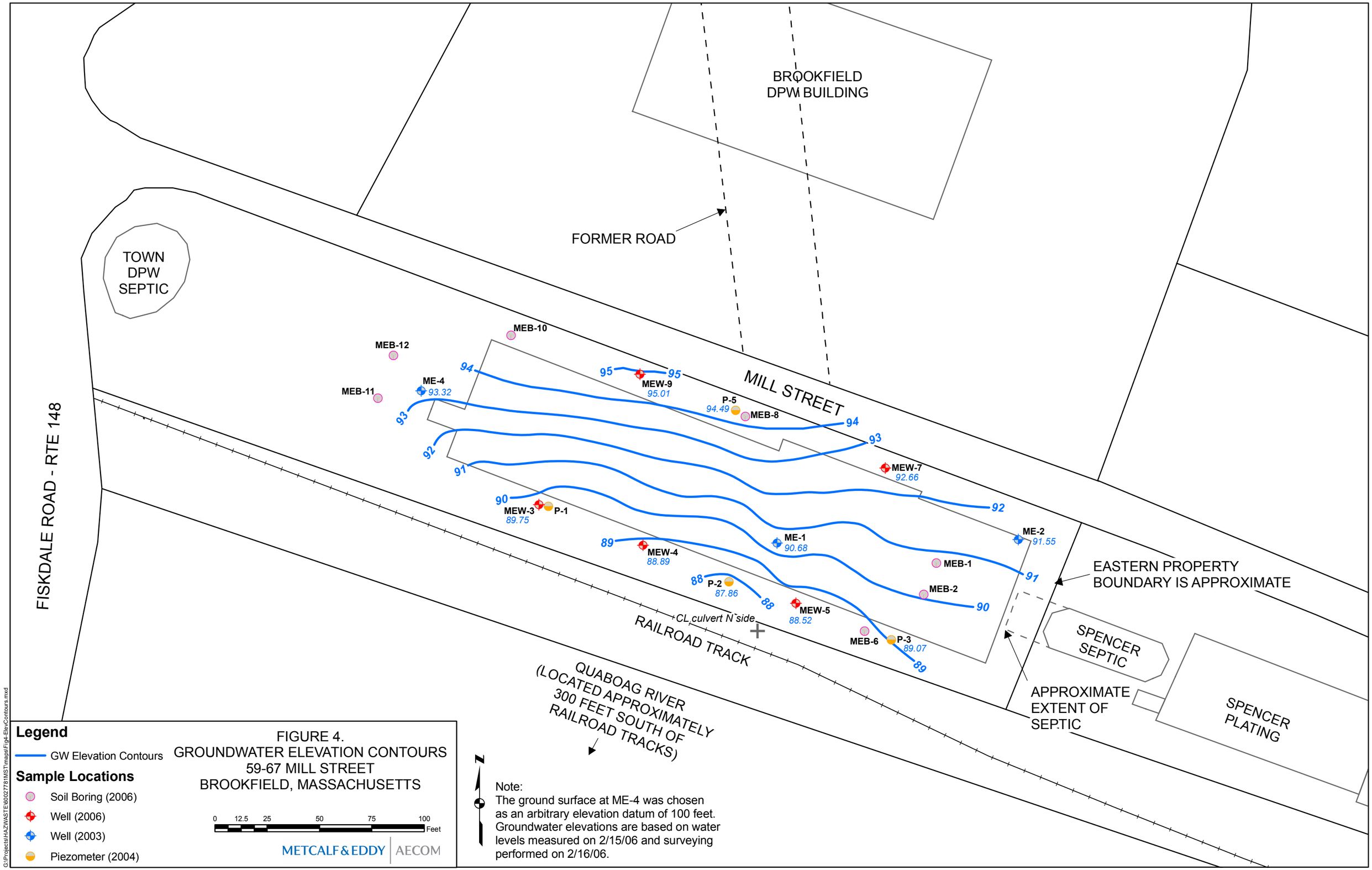


FIGURE 4.
GROUNDWATER ELEVATION CONTOURS
59-67 MILL STREET
BROOKFIELD, MASSACHUSETTS

APPENDIX A

MassDEP Site Scoring Map

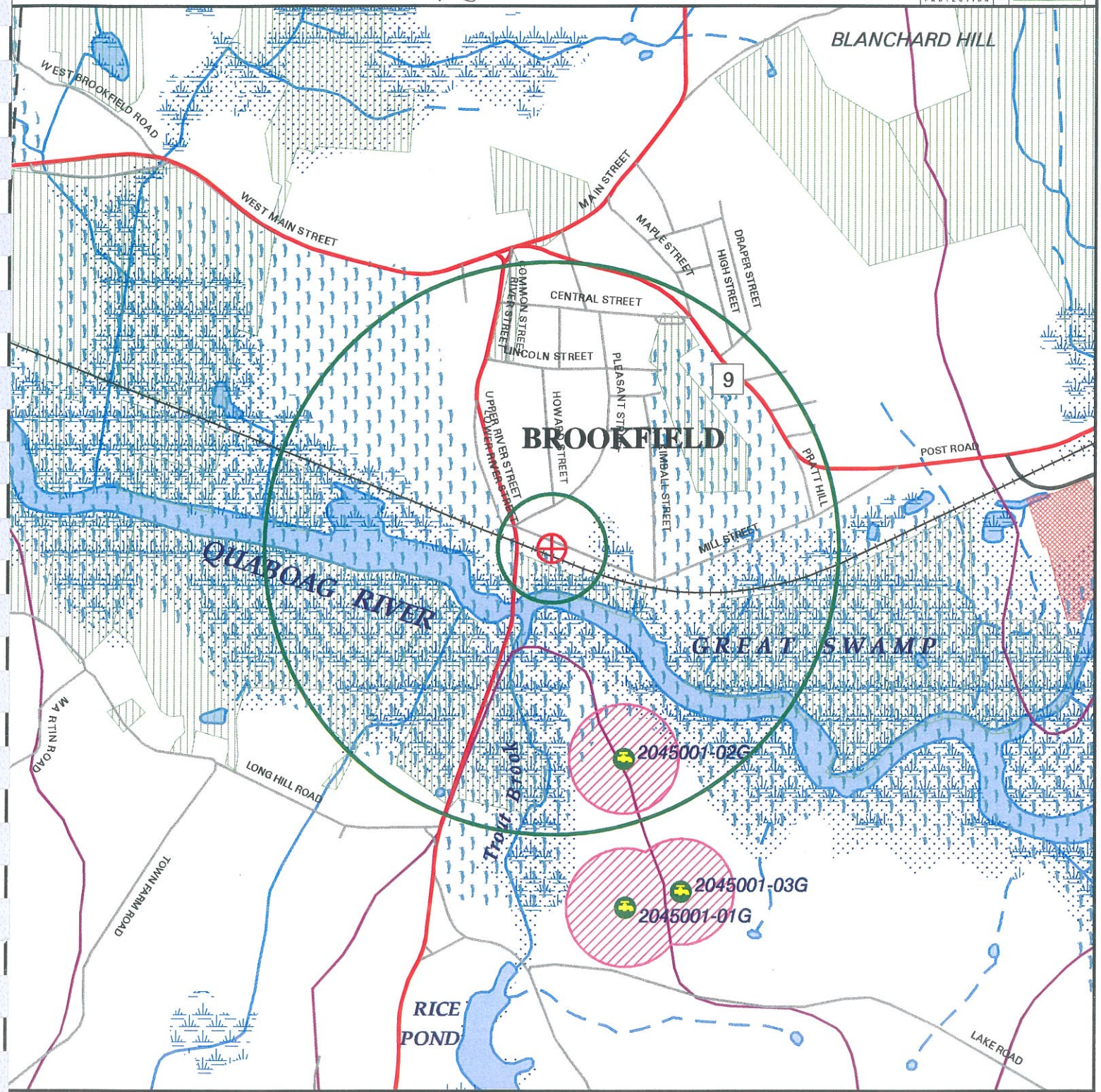
MA DEP - Bureau of Waste Site Cleanup

Site Scoring Map: 500 feet & 0.5 Mile Radii

SITE NAME:
Former Brookfield Mill
Mill Street
Brookfield, MA 01506
421232n 720604ew

The information shown on this map is the best available at the date of printing. Please refer to the data source descriptions document.

MASS GIS — Office of Geographic and Environmental Information
Massachusetts Executive Office of Energy & Environmental Affairs



Roads: Limited Access, Divided, Major Road, Connector, Street, Track, Trail
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct
Basins: Major, Sub; Streams: Perennial, Intermittent, Man Made Shore, Dams
Potentially Productive Aquifers: Medium,High Yield
Non-Potential Drinking Water Source Area: Medium,High Yield

EPA Sole Source Aquifer; FEMA 100-year floodplain
Public Water Supplies: Ground,Surface,Non Community
Approved Zone2; IWPA; Surface Water Supply Zone A
Hydrography: Water Features,Public Surface Water Supply
Wetlands: Fresh,Salt,NHESP Wetlands Habitat
Protected Open Space; ACEC
DEP Permitted Solid Waste Facilities; Certified Vernal Pools

N W E S

SCALE 1:15000

0 1/2 MILES
0 1/2 1 KILOMETERS

September 14, 2007

APPENDIX B

Endangered Species Correspondence and Site Walk-Over Memorandum

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

10/24/2007

Cindy Castleberry
Metcalf & Eddy, Inc.
701 Edgewater Drive
Wakefield MA 01880

RE: Project Location: 59-67 MILL STREET
Town: BROOKFIELD
NHESP Tracking No.: 03-13805

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat 12* (PH 12) and *Estimated Habitat 817* (EH 817) as indicated in the *Massachusetts Natural Heritage Atlas* (12th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Botaurus lentiginosus	American Bittern	Bird	Endangered
Scirpus longii	Long's Bulrush	Plant	Threatened
Podilymbus podiceps	Pied-Billed Grebe	Bird	Endangered
Cistothorus platensis	Sedge Wren	Bird	Endangered
Notropis bifrenatus	Bridle Shiner	Fish	Special Concern
Ambystoma laterale	Blue-Spotted Salamander	Amphibian	Special Concern

The species listed above is/are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website (www.nhesp.org).

Please note that projects and activities located within Priority and/or Estimated Habitat **must** be reviewed by the NHESP for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

Wetlands Protection Act (310 CMR 10.00)

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the NHESP so that it is received at the same time as the local conservation commission. If the NHESP determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, than the proposed project may not be permitted (310 CMR 10.37,

10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the NHESP to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

A streamlined joint MESA/WPA review process is now available. When filing a Notice of Intent (NOI), the applicant may now file concurrently under the MESA on the same NOI form and qualify for a 30-day streamlined joint review. For a copy of the revised NOI form, please visit the MA Department of Environmental Protection's website: http://www.mass.gov/dep/water/approvals/wpaform3.doc.

MA Endangered Species Act (M.G.L. c. 131A)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be sent to NHESP Environmental Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). For a MESA filing checklist and additional information please see our website: www.nhesp.org ("Regulatory Review" tab).

We recommend that rare species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to rare species and their habitats is likely to expedite endangered species regulatory review.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Amy Coman, Endangered Species Review Assistant, at (860) 389-6364.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

October 24, 2007

Reference:	Project	Location
	Site assessment	Brookfield, MA

Thomas Touchet
Metcalf & Eddy, Inc.
701 Edgewater Drive
Wakefield, MA 01880-5371

Dear Mr. Touchet:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

In order to curtail the need to contact this office in the future for updated lists of federally-listed or proposed threatened or endangered species and critical habitats, please visit the Endangered Species Consultation page on the New England Field Office's website:

www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm

In addition, there is a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no habitat exists, then no federally-listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Anthony P. Tur
Endangered Species Specialist
New England Field Office

Metcalf & Eddy
701 Edgewater Drive, Wakefield, Massachusetts 01880-5371
T 781.246.5200 F 781.245.6293 www.m-e.aecom.com

Memorandum

Date: October 30, 2007

To: Nathan Henderson (M&E)
Cindy Castleberry (M&E)

From: Tom Touchet

Subject: **Wildlife Habitat Assessment for Brookfield MCP Project – Brookfield, MA**

Distribution: File

On Tuesday, September 25, 2007, Cindy Castleberry and I traveled to Brookfield, Massachusetts to perform a wildlife habitat assessment on and adjacent to the Brookfield MCP site. The assessment included recording observations of representative vegetative species, potential wildlife food sources, nesting habitat, tree cavities and coarse woody debris/snags, denning habitat, substrate characteristics, amount of disturbance, etc.

Upland On-Site Habitat Characterization

The site is located at 59-67 Mill Street in Brookfield, Massachusetts. The main portion of the project site is essentially rectangular in shape with dimensions of approximately 70 feet wide by approximately 340 feet long. The site lies parallel and directly adjacent to the south side of Mill Street, opposite the Brookfield DPW building and property. In general, the project site is highly disturbed as evidenced by sporadic piles of partially buried metal and construction debris (bricks, concrete, etc.) as well as dumped piles of sand, rock, and wood chips. A concrete slab and remnants of the old mill foundation were observed beneath portions of the site. No mature tree canopy is present at the site. Sporadic vegetation generally consisted of weedy herbaceous species and small woody shrubs. Representative herbaceous species included goldenrods (*Solidago* spp.), common mugwort *(Artemisia vulgaris)*, thistles (*Cirsium* sp.), annual ragweed (*Ambrosia artemisiifolia*), spotted knapweed *(Centaurea maculosa)*, common mullein *(Verbascum thapsus)*, little bluestem *(Schizachyrium scoparius)*, Queen Anne's lace *(Daucus carota)*, and pokeweed *(Phytolacca americana)*. Shrubs included quaking aspen *(Populus tremuloides)*, American elm *(Ulmus americana)*, and Eastern cottonwood *(Populus deltoides)*.

While the bases of loose piles of sand and stone may provide burrowing habitat for small mammals, the persistence of this habitat is low due to the transient nature of the piles and apparent frequency of disturbance at the site. No snags, tree cavities, or valuable coarse

woody debris are present for wildlife usage on site and the vegetative species present provide relatively low levels of food for wildlife. No wetlands or vernal pools are present on the site.

Figure 1. Representative View of the Project Site Looking Southeast

Figure 2. Representative View of the Project Site Looking Southwest

Adjacent Habitat
The Brookfield DPW yard lies directly across the street from the site to the north. Due to the nature of land use on this property (building, pavement, mowed grass), wildlife habitat is generally of low value.

Immediately to the south and parallel to the site is an existing railroad corridor. A narrow wetland swale lies along the north side of the railbed and is comprised of wetland species including: wide-leaf cattail *(Typha latifolia)*, purple loosestrife *(Lythrum salicaria)*, and horsetails (*Equisetum* sp.). to the north of this swale, just south of the project site lies a shrub buffer consisting of silky dogwood *(Cornus amomum)*, staghorn sumac *(Rhus typhina)*, and several other shrub species. This buffer provides some food for wildlife (dogwood berries, etc.) and potential nesting habitat for bird species, although proximity to the active railway may discourage some nesting activity.

Figure 3. Wetland Swale and Shrub Buffer Associated with the North Side of the Railway (looking west)

South of the railway toward the Quaboag River, the vegetative community follows a general gradient from upland shrub edge, fringe of forested wetland, to emergent marsh adjacent to the river. The highest quality wildlife habitat can be found in this area south of the railway. The shrub edge is comprised of a mix of shrubs and herbs with: grey birch (*Betula populifolia*), silky dogwood, autumn olive *(Elaeagnus umbellate)*, staghorn sumac, Asiatic bittersweet *(Celastrus orbiculatus)* and sporadic Japanese knotweed (*Polygonum cuspidatum*). The forested wetland canopy includes American elm, green ash *(Fraxinus pennsylvanica)*, and red maple *(Acer rubrum)*. Dead snags with potential nesting cavities were observed. These snags also provide resting habitat for various avian species.

South of this forested wetland border lies a palustrine emergent wetland associated with Quaboag River. Emergent species include: wide-leaf cattail, smartweed *(Polygonum spp.)*, woolgrass *(Scirpus cyperinus)*, American burreed *(Sparganium americanum)*, broadleaf arrowhead *(Sagittaria latifolia)*, buttonbush *(Cephalanthus occidentalis)*, and lilies (*Nuphar* spp.). This emergent wetland also provides habitat for various amphibians. Green frog *(Rana clamitans)* were observed in shallow portions of the wetland/river boundary.

Figure 4. View of Emergent Wetland Associated with Quaboag River (looking east)

NHESP Correspondence

The entire project area and adjacent lands are mapped as containing Estimated (WH 5035) and Priority Habitat (PH 826) of Rare Species by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). In response to an information request letter made in December 2003 by M&E to NHESP regarding rare species in the vicinity of the project area, the NHESP responded on March 9, 2004. NHESP listed the following four species as occurring within the vicinity of the project area: Triangle floater mussel *(Alasmidonta undulata)*, species of special concern; American Bittern *(Botaurus lentignosus)*, an endangered bird species; spotted turtle (*Clemmys guttata*), a species of special concern; and Long's Bulrush *(Scirpus longii)*, a threatened plant species.

As a mussel species, Triangle floater mussels would only occur within the river and would not be found in the immediate vicinity of the project site. While no American Bittern were observed the day of the field visit, the emergent wetland, particularly with its abundance of frogs, would likely provide valuable habitat for this species. However, given the secretive nature of this species and distance, lack of suitable habitat, and frequent disturbance of the project site, it is unlikely that the project site would provide valuable wildlife habitat for the American Bittern. Spotted turtle were not observed the day of the field visit, although the emergent wetland and adjacent forested wetland habitat would likely provide valuable habitat for this species. However, spotted turtle has since been de-listed as a Species of Special Concern by the NHESP and is no longer subject to protection under State law. No Long's Bulrush were observed during the field visit, although it is possible it may be found in the emergent wetland.

Since it is a wetland species, it is extremely unlikely it would be found on or impacted by activity on the project site.

A follow-up letter was sent to NHESP in October 2007 to determine if any changes had occurred since the last inquiry to NHESP in 2004. On October 24, 2007, the NHESP provided a response letter indicating that the project area was now located within Priority Habitat 12 (PH 12) and Estimated Habitat 817 (EH 817) as indicated in the *Massachusetts Natural Heritage Atlas* (12th Edition). Three bird, one plant, one fish, and one amphibian species are now listed for the area. Only the American Bittern and Long's Bulrush remained from the 2004 inquiry list. Additional species now include: Pied-billed grebe (*Podilymbus podiceps)*, an endangered bird species; sedge wren (*Cistothorus platensis)*, an endangered bird species; bridle shiner *(Notropis bifrenatus)*, a fish species of special concern; and Blue-spotted salamander *(Ambystoma laterale)*, an amphibian species of special concern. As discussed above, it is unlikely that the American bittern or Long's bulrush would be found on the project site due to the upland nature of the site and history of site disturbance.

The pied-billed grebe typically uses habitat dominated by cattails, reeds, and other vegetation which can provide cover and nesting materials and may be found near rivers, estuaries, or tidal creeks. The Quaboag River and adjacent wetlands may provide usable habitat for the pied-billed grebe, however the project site does not contain suitable nesting or feeding habitat and the grebe is therefore unlikely to be found on the project site.

The sedge wren occupies drier transitional edges of freshwater marshes, bogs and wet meadows. The upper periphery of emergent wetlands adjacent to the Quaboag River may provide some nesting habitat for the sedge wren. However, it is unlikely that the sedge wren would be found on the project site due to a lack of suitable vegetation, distance from the wetland, and the shy and elusive nature of the species.

Bridle shiners are small minnows that occupy clear water in slack areas of streams and rivers. They are often associated with moderate levels of submerged aquatic vegetation and open areas where they can school. While the Quaboag River may provide habitat for bridle shiners, the project site contains no aquatic habitat.

The blue-spotted salamander requires moist, moderately shaded habitats, favoring northern hardwood/hemlock forests with depressions available for seasonal flooding. Temporarily ponded areas such as vernal pools, especially if containing numerous dead and decaying leaves for cover and overhanging bushes or grass for egg deposition, often provide valuable habitat. While no hardwood/hemlock forests or vernal pools are located close to the site, drainage ditches such as the ditches found adjacent to the railbed may provide some habitat for the blue-spotted salamander reproduction. Adult salamanders spend most of the year beneath leaf litter or underground to a depth of one meter, usually within 500 meters of their breeding pool. As indicated by NHESP in their rare species fact sheet, "there are two critical components in the life history of this species: vernal pool habitat required for reproduction and upland forest habitat required for foraging, hibernation, and other terrestrial and fossorial activities". Since the project site does not contain forested habitat, has undergone various degrees of disturbance, and generally contains dry soils during much of the year, it is unlikely that blue-spotted salamanders would occur on the project site. However, there is a small possibility of encountering transient salamanders during the breeding period, such as during a wet Spring night.

US Fish and Wildlife Service Correspondence

As part of a recent inquiry to the US Fish and Wildlife Service regarding the presence of federally-listed rare, threatened, or endangered species on or in the vicinity of the project site, a request letter was sent to USFWS on September 24, 2007. In a response letter from the USFWS dated October 24, 2007, no federally-listed or proposed, threatened, or endangered species or critical habitat under the jurisdiction of the U.S Fish and Wildlife Service are known to occur in the project area.

APPENDIX C

Figures from Phase I Report (M&E, 2004a)