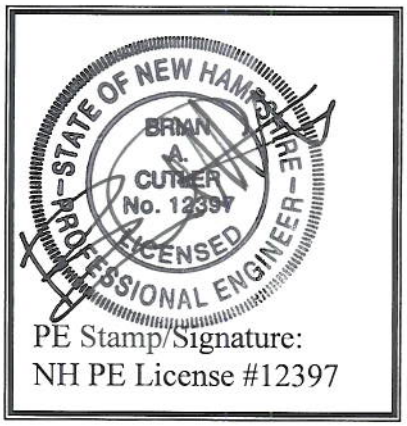
ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

EPA Brownfields Cleanup Grant
Agreement #97180201

Former Woods Woolen Mill Site
DES Site#199909015
25 West Mill Street (Lot 28)
Hillsborough, New Hampshire 03244

August 2008



Prepared for

Town of Hillsborough
Planning Department
29 School Street
Hillsborough, New Hampshire, 03244

Bettina Eames

Digitally signed by Bettina Eames
DN: cn=Bettina Eames, o=Loureiro Engineering Associates, Inc., ou=NH Office, email=beeames@loureiro.com, c=US
Date: 2008.08.29 15:09:27 -04'00'

Prepared by

LOUREIRO ENGINEERING ASSOCIATES, INC.
10 Twin Bridge Road, Unit 1-A
Merrimack, New Hampshire, 03054

An Employee Owned Company

Comm. No. 40HM802.006

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PE Stamp/Signature:
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ACRONYMS

ABCA	Analysis of Brownfields Cleanup Alternatives
ACM	Asbestos-Containing Material
ACBM	Asbestos-Containing Building Material
ADS	Asbestos Disposal Site
AOCs	Areas of Concern
ARD	Air Resources Division
AUR	Activity and Use Restriction
CRP	Community Relations Plan
DRED	Department of Economic and Recreation Development
ESA	Environmental Site Assessment
FAM	Financial Assurance Mechanism
FEMA	Federal Emergency Mapped Area
FIRM	Flood Insurance Rate Maps
LBP	Lead-Based Paint
LEA	Loureiro Engineering Associates, Inc
NFA	No Further Action
NHDES	New Hampshire Department of Environmental Services
NHDOT	Department of Transportation
PE	Professional Engineer
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RECs	Recognized Environmental Conditions
ROW	Right of Way
1,1,1-TCA	1,1,1-Trichloroethane
TCLP	Toxicity Characteristic Leaching Procedure
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
WMD	Waste Management Division

1. INTRODUCTION

1.1 Purpose and Scope

Loureiro Engineering Associates, Inc. (LEA) has prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) for the Former Woods Woolen Mill Site ("the Site") located on West Mill Street in Hillsborough, New Hampshire. This ABCA has been prepared in general accordance with the EPA Brownfield cleanup grant agreement (Grant No. 97180201-0) which was awarded to the Town of Hillsborough on September 30, 2007. In accordance with this agreement, an ABCA is required to evaluate potential remedial options for interim cleanup of the Site and under the state of New Hampshire Voluntary Cleanup Program (VCP). Interim cleanup of the Site is needed to complete additional comprehensive assessment and final cleanup of the Site. Future development of the Site is as a passive use recreational public park. The requirements of the ABCA, which are addressed in this report, include:

- Site Description, Background and History
- Public Health and Safety Concerns/Risk Drivers
- Cleanup Rationale/Future Planned Use
- Identification of Interim Cleanup Objectives
- Analysis of Cleanup Alternatives for Interim Cleanup
- Rationale and Implementation for Selected Cleanup Alternative

This ABCA has also been written to satisfy the New Hampshire Department of Environmental Services (NHDES) Waste Management Division (WMD) requirements for a Remedial Action Plan (RAP) as specified in the New Hampshire Code of Administrative Rules Env-Or 600 – *Contaminated Site Management.* Because the Site is considered a hazardous waste site under the NHDES-WMD, criteria for a RAP have been also included herein.

1.2 Applicability and Limitations

This ABCA has been prepared to address proposed interim cleanup activities at the Site only and is not intended to be applied or applicable for decision making as related to future final cleanup for the Site.

1.3 PE Signature and Stamp

As required under Env-Or 606.10(c), this ABCA has been reviewed and certified by Brain A. Cutler, PE, LEP, Senior Vice President of LEA and is a New Hampshire licensed Professional Engineer (PE License #12397).

2. SITE DESCRIPTION

2.1 Location and Description

The Site is located on 23/25 West Mill Street along on the south side of the Contoocook River within walking distance of Hillsborough Village. The Site consists of two separate, non-contiguous parcels or lots bisected by a former railroad right-of-way (ROW) as described below:

Lot 28, Tax Map 25 (23 West Mill Street) - This lot consists of approximately 2.0±acres of town-owned land and is situated on the west side of the Site between the Contoocook River and the ROW. This lot contains four structures: Warehouse Building #3, Warehouse Building #2, the Boiler House and the former mill foundation.

Lot 29, Tax Map 25 (25 West Mill Street) - This lot consists of approximately 0.6±acres of town-owned land and is situated on the east side of the Site between the ROW and West Mill Street. This lot contains one structure – the former Office Building only.

Lot 27, Tax Map 25 (ROW) - This lot consists of state-owned land and is a former railroad right-of-way (ROW) and is located between Lots 28 and 29. The ROW is managed by the Department of Transportation (NHDOT) through the Department of Economic and Recreation Development (DRED) Division of Rail Trails. The ROW varies between approximately 25 and 30 feet wide and extends approximately 930 feet in a north-south direction and bisects Lots 28 and 29. The ROW is located on the eastern terminus of a rail-trail system that extends from Jaffrey and Peterborough. The portion of the ROW within the boundary of the Site is estimated to consist of approximately 0.185±acres.

Collectively, the Site consists of three lots (Lot 28, Lot 29 and a portion of Lot 27, which is a ROW, and occupies approximately 2.8±acres of land. The entire Site measures approximately 930 feet long and 120 feet wide at its widest points. The location of the Site is shown on the Site Location Map in Figure 1. The northern portion of the Site is shown on the Site Plan in Figure 2 and the southern portion of the Site is shown on the Site Plan in Figure 3. *Note: This ABCA addresses Lot 28 only.*

2.2 Area and Physical Setting

The Site is located along the Contoocook River close to and upstream of the Bridge Street overpass and the Hillsborough Village Center. The western portion of the Site (Lot 28) is located with a Zone A an area of 100-year flooding. The ROW (elevation approximately 581 feet) marks the edge of the 100-year flood. The eastern portion of the Site (Lot 29) is located in a Zone B and is outside the 100-year flood plain. A small area of wetlands has been mapped on the southern terminus of the mill foundation (Lot 28). The wetlands were delineated in accordance with the Army Corp of Engineers (ACOE) wetlands delineation manual by Meridian Land Services, Inc. in 2002. The Site, although zoned for business use, is adjacent to a dense mixed use are of single-family residential properties.

Except for the driveway access road from West Mill Street and concrete pads/surfaces related to former structures, most of the Site is unpaved. A large concrete pad (≈200 feet long by 15 feet), presumably a former loading/unloading area, is located along the entire eastern side of the mill foundation. Several smaller concrete pads are located both outside and within the former foundation. The concrete pads, some of which may have been footings for the upper stories of the mill, range in size from approximately 50 to 350 square feet in size. On Lot 29, concrete pads are also located on the sloped area of the Site which may have acted as foundations for the fire suppression structures. Unpaved areas are covered with dense vegetation mostly of deciduous trees on Lot 29 and at the southern end of the Site at the trail head. The ROW is largely open and unpaved.

In the north-south direction, ground elevations are relatively uniform. In contrast in the east-west direction, ground elevations change significantly in a terrace-like fashion from West Mill Street own to the river. Along the ROW, ground elevations are relatively flat and measures approximately 590 feet above mean sea level (msl). The ground elevations slope downward from the ROW (on Lot 28), to the West towards the river to an elevation of approximately 570 feet. East of the ROW, ground elevations are approximately 610 feet on West Mill Street. The Site is steeply sloped and wooded between West Mill Street and the ROW (Lot 29) and is sloped between the ROW and the river (Lot 28).

2.3 Description of Existing Structures

Because this ABCA address Lot 28 only, only structures/buildings on Lot 28 are presented and discussed herein. Structures on Lot 28 include three buildings: Boiler House (which was a portion of the original mill building) a former warehouse building (#2) and a third building (Warehouse #3) collapsed an unknown number of years ago. The foundation of the original former mill building still remains as a large depressed area along the river. Site characteristics and the general layout of structures in relation to the boundaries of Lot 28 are depicted on Drawing 1, Site Plan and are described below.

Mill Foundation – The original four-story mill structure was harvested for its wood and ultimately demolished by the previous owner in circa 1999. Only the former foundation of the original mill building remains. This structure measures approximately 250 feet long by 50 feet wide and occupied an approximately 12,500 ft^2 area. This structure consisted of a basement floor and three manufacturing floors and was connected to a Boiler House. Each floor stood approximately 10 feet high. The foundation of the former mill is made of stone, portions of which still remain. The basement floors were finished with wood overlying soil/dirt. The former mill building's interior frame and floor was constructed entirely of wood and had an asphalt-tar roof. The mill building was heated by steam generated from coal and later oil-fired system in the Boiler House. The former mill building was equipped with a sprinkler system, an elevator and plumbing. An elevator was located on the northeast side (adjacent to the ROW) within the tower feature in the location of the concrete pad. Currently the foundation is littered with significant surface debris (building materials) and vegetated with small sapling deciduous trees.

Boiler Room/House - As stated above, this structure was part of the former original mill building and consists of a three-story brick structure, which housed the boiler tanks that were used to heat

the former mill building. Like the original mill building, this structure is dated to be more than 100 years old and dates back to the late 1800s. The Boiler Room/House, which still remains, is approximately 40 feet wide, 50 feet long, 30 feet high and occupies an area of approximately 2,000 ft^2. Unlike the basement floor of the mill foundation which is dirt, the basement floor of the Boiler House is concrete. The interior framing and exterior walls on the south and east sides are constructed of wood. The exterior wall on the north and west sides is of brick construction. The Boiler Room contains two coal-fired boilers (a center and a side), one "newer" oil-fired or package boiler and a large water storage tank, all of which are no longer in use. The tanks and/or portions of the tanks in the Boiler House are wrapped in asbestos. Asbestos is also contained inside one or some of the boilers. This structure is still standing but the condition of this building is gradually deteoriating.

Warehouse Building No. 2 - This structure is located on the northern end of the Site between the ROW and the river. This structure was formerly used as a storage warehouse for finished spools of textiles associated with historic textile manufacturing operations. The Warehouse Building is a one-story structure but has an unpaved dirt floor crawl space or basement. This building measures approximately 150 feet long and 38 feet (at its widest point) and covers an approximately 5,700 ft^2 area. The building's interior, framing and floors are constructed of wood and the roof is/was made of asphalt shingle. This structure was not equipped with a sprinkler system or insulation. Warehouse Building No. 2 is structurally unsound and the roofs and walls have collapsed.

Warehouse Building No. 3 *(Collapsed)* – This former structure which was located between the Boiler House and Warehouse Building #2 was the location of the Dye House and the Machine Shop. This structure, which collapsed several years ago, contains a large amount of debris of building materials within the foundation. Several dye pots were located on the basement level and are believed to still remain. The Warehouse #3 debris pile measures approximately 60 feet long by 40 feet wide and covers an approximately 2,400 ft^2 area between the ROW and the river.

2.4 Site Background and History

The property was the location of a former woolen mill from circa the late 1800s up until the mid 1980s. The former mill was known by several names including the Beck Mill (circa 1987 to 1999), Woods Woolen Mill (circa 1944 to 1987), the Gordon Woolen Mill (circa 1932 to 1944) and the Hillsborough Woolen Mill (circa 1880 to 1935). The original mill complex consisted of several structures along the southern bank of the Contoocook River and West Mill Street.

Textile manufacturing processes performed at the Mill including pickering (in the first floor at the southern end of the main mill building) and various finishing processes, including carding, spinning, weaving and twisting (in the second floor of the main mill building). Finished textiles, which included wool, acrylic and polypropylene, were spun onto cones and stored on the third floor of the main mill building. The basement of the main mill building, which had a wooden floor, was used for storage and also was the location of a "make-shift" machine shop. The mill also had an elevator which was located in a tower on the mill's east side. Finished textiles were shipped off-site by railroad.

Historically, the main mill building was connected to the Warehouse Building No. 2. In between these two structures were the Boiler Room/House and Warehouse Building #3, which included the dye house and a machine shop. The original picker room (which was on the second floor of the Boiler House), the machine shop and dye house were reportedly not used during post-1950 manufacturing. The mill was serviced by a subsurface water supply line from adjacent West Mill Street. The water lines ran parallel with the railroad tracks (one behind the office building) and a second which ran from the north side of the office building to the Boiler Room/House.

2.5 Previous Environmental Response Actions and Studies

In 1999, at the time just prior to and following Site abandonment by the former property owner, several previous environmental response actions and studies were conducted at the Site. A list of these actions and studies is presented below:

Previous Environmental Response Actions and Studies (1999 to 2007)

Response Action/Study	Conducted By	Date
Lead & Asbestos Survey and Sampling	Scott Lawson Group	September-October 1999
Drum Inventory and Removal	EPA and NHDES	September 1999-December 2000
ACM Sampling and Removal	NHDES and Town	October 2000-2001
UST Removal	NHDES	December 2000
Phase I ASTM ESA	Loureiro Engineering Associates	September 2006 – October 2007
Limited Subsurface Investigation	Loureiro Engineering Associates	December 2006 - March 2007

Lead and Asbestos Survey - The results of a 1999 lead/asbestos survey by Scott Lawson included analytical testing of 40 bulk samples for asbestos-containing material (ACM) and testing of red wood clapboard for lead-based paint (LBP) from the various buildings.

Asbestos-containing building materials (ACBM) were identified in the form of thermal system insulation, roofing materials, electrical insulation paper, cement board panels (Transite®) and window glazing in various locations of the former mill building and Warehouse Building No. 2. ACM, identified as friable chrysotile, was found on piping and tanks in the Boiler House.

LBP was identified on most of the exterior surfaces and in the interior of the main mill building. Lead concentrations in red, brown/black and dark green paint chip samples were tested and found to contain lead between 500 and 61,406 milligrams per kilogram (mg/kg) or 1% and 6.1%. Three of the samples exceeded the State of New Hampshire HUD guideline for lead of 0.5%. Results of testing of red paint chips (in exterior locations) by the Toxicity Characteristic Leaching Procedure (TCLP) indicated a TCLP-lead result of 115 micro grams per liter (mg/l). The TCLP result is above the hazardous waste threshold of 5 mg/l as regulated under the Resource Conservation and Recovery Act (RCRA). Based on the high cost estimate to abate the mill complex, the property owner discontinued all further work at the property and eventually defaulted on property taxes.

Drum Inventory and Removal - In 1999, the DES Waste Management Compliance Bureau conducted a site visit to assess various waste management issues within interior portions of the mill building and the adjacent Warehouse Building No.2. The DES inventory identified large quantities of demolition debris, ACM and ACBM, containers and drums containing unknown

chemicals and an out-of-use No.6 oil UST. Several five-gallon empty pails of roofing cement were identified on the east wall of the first floor of the mill and several containers and drums ranging in size from 5-gallon pails to 55-gallons were identified in the mill building. In total, twelve drums were identified in the basement and twenty-five drums were identified on the first floor (total of 37 drums). The DES inventoried and labeled all the containers/drums and their contents as either unknown, petroleum or a hazardous substance.

In December 2000, the DES in conjunction with the EPA conducted a final inventory of drums at the property. Drums identified included: 15 with hazardous substances, 27 with oil and water and 11 empty (total of 53 drums). Hazardous substances identified included 1,1,1-Trichloroethane (TCA) and sulfuric acid. The 27 oil and water drums (total of 1,430 gallons) were removed by the DES as state-regulated waste in conjunction with UST removal activities (see below). The remaining 15 drums containing hazardous wastes were removed by EPA in conjunction with asbestos removal activities in the Boiler House (see below).

ACM Sampling and Removal - In October 2000, the Scott Lawson performed additional asbestos sampling inside the Boiler Room for the DES. Ten samples were collected from various locations around the package boiler, the center boiler and the side boiler. Two sampled (one of insulation behind the steel face of center boiler and a second of insulation behind the steel face of the side boiler) contained 50% chrysotile asbestos. The EPA in coordination with DES removed two roll-off containers of friable ACM from inside the Boiler House and disposed of the asbestos waste at the Hillsborough town landfill in accordance with an approved asbestos disposal plan.

UST Removal - In December 2000, an unregistered 12,000-gallon single wall steel UST containing No. 6 fuel oil was removed from the ground from the area between the Boiler House and Warehouse Building #3 on the west side of the abandoned railroad ROW under the oversight of the DES Hazardous Waste Remediation Bureau. Removal activities included: sampling of the oil/sludge from inside the tank for disposal characterization, evacuation of 529 gallons of No.6 fuel oil and sludge/sediment from inside the tank, excavation and disposal of the UST and associated metal piping, and backfilling of the excavation with clean imported sand. DES's closure report indicated that the tank appear to be in fair condition, surface pitting and a ¼-inch diameter hole were observed in the bottom center of the tank, no petroleum odors were noted in soil above or below the tank, no positive readings in soil headspace using a photoionization detector (PID) were measured and no free product or groundwater encountered. Confirmatory soil sampling results identified TPH in one soil sample at 3,300 mg/kg below the Method 1 S-1 standard of 10,000 mg/kg. The UST removal was assigned Site# 199909015 by the NDHES. In summary, the DES concluded that a discharge of petroleum had not occurred to either groundwater or surface water and that no additional investigation or remedial measures were warranted and no further action (NFA) was needed.

Phase I ASTM ESA - In 2006, the town contracted Loureiro Engineering Associates (LEA) to conduct a Phase I Environmental Site Assessment (ESA). The Phase I ESA was conducted in accordance with the new AAI Rules. The results of the Phase I ESA concluded that potential sources for the release of oil and/or hazardous substances are present at the Site, including the red clapboard siding containing LBP, ACM inside structures (Warehouse Building and in Boiler Room/House), petroleum staining observed on and along concrete within the foundation of the

Mill and other spills/releases which may be associated litter and debris disposed at the property due to the unrestricted access and lack of site control. Other potential sources for the release of oil and/or hazardous substances to soil and groundwater exists include former use of the property for textile manufacturing and railroad-related activities along the former railroad ROW. Due to the site's location on the river, the potential for a release of oil and/or hazardous substances to surface water, pore water and sediment also exists. LEA concluded that recognized Environmental Conditions (RECs) were identified to exist at the site and past activities and/or former textile operations at the Site potentially have had an adverse impact on soil and/or groundwater quality in several Areas of Concern (AOCs).

Limited Subsurface Assessment - In March 2007, LEA conducted a limited subsurface assessment to evaluate subsurface conditions in locations where RECs/AOCs were identified during the Phase I. The limited subsurface assessment identified that petroleum and hazardous substances were present in surficial, near surface and shallow subsurface soils at the Site. The potential for risk to human health and/or the environment was identified to exist based on the exceedance of the S-1 and S-2 Method 1 standards (for PAHs, TPH, lead, antimony, arsenic, beryllium) and UCLs (TPH and lead only). PAHs and metals were attributed to the presence of fill material containing coal and wood ash, which were identified in the subsurface in some locations. Additional analytical testing to speciate chromium concentrations for comparison to applicable Method 1 standards was also warranted. TCLP-lead in one surficial soil sample, which contained visible red paint chips, was detected at 380 mg/L, which was above the RCRA hazardous waste characteristic threshold of 5 mg/L. Future comprehensive assessment of environmental conditions (both surficial and subsurface) in areas of the Site that could not be completely accessed and abatement/removal of surface debris, collapsed structures, and asbestos and lead-based paint (LBP) contaminated building materials was also recommended prior to completion of additional assessment activities.

2.6 Identified Site Risks

Based on the results of assessments conducted at the Site to-date, environmental conditions at the Site in soil and in various building materials pose numerous potential risks to human health, public safety, welfare and the environment. The various risk drivers are identified and described below:

Risks to Human Health

- TPH and lead in surficial soils within the northern end of the mill foundation exceed the RCMP Method S-1 soil standard and Method 3 UCLs.

- Lead in surficial soil is above the RCMP Method S-1 soil standard and Method 3 UCLs. The red-painted wood siding on several of the existing structures is suspected to be a contributing source of lead to surficial soils.

- Various PAHs in shallow subsurface soils exceed various Method 1 S-1 and S-2 soil standards. The source of PAHs is suspected to be the presence

of coal, ash and cinders associated with the former coal bin and boiler house during historic mill operations. The latter source (coal ash) is exempt and not-regulated however the PAH concentrations in near surface soil would be unacceptable for future property use as a park.

Risks to Public Safety and Welfare

- Asbestos-containing materials (ACM) and asbestos-containing building materials (ACCM) associated with the Boiler House, Warehouse #2 and #3 structures and on the ground surface within the mill foundation and the Warehouse Building#3 debris pile

- Building debris associated with former collapsed and/or demolished structures (mill and Warehouse #3) and Warehouse Building #2, currently in a state of collapse, is at risk of falling into the adjacent Contoocook River. The river is a supplemental water supply source for the City of Concord. The latter debris also poses a threat of release (TOR) and is a potential physical hazard to the Bridge Street dam located just downstream of the Site.

Risks to the Environment

- Lead and petroleum contaminants in surficial soil as well as ACBM and LBP-contaminated materials on the ground surface pose a continued threat to environmental receptors and surface water of the adjacent Contoocook River.

The goals of interim cleanup will be to mitigate the risks associated with public safety and welfare which are associated with the collapsing buildings and ACM and LBP-contaminated surface debris materials. Mitigation of these risks is needed as son as possible and to prevent other potential hazards such as fire and vandalism to on-site structure and potential injury to trespassers. Risks to human health and the environment as associated with contaminants in upland surface and shallow subsurface soils will be addressed as part of final cleanup efforts in the future. Supplemental site assessment activities are needed to fully characterize the extent of TPH, PAH and metals contamination in soil and possibly groundwater at the site.

2.7 Future Planned Use of Site

The Town acquired Lots 28 and 29 (combined 2.6± acres) in 2004 from the previous owner as a result of a tax lien on the properties. The town recognized the site posed several environmental and public safety hazards to residents and acquired the property for the purpose of cleaning up the site and restoring the property for future public use. In 2007, the town applied for federal brownfields funding for the mill site and was awarded a $200,000 cleanup grant from EPA.

The town proposes to use the mill site as a recreational public park. The former ROW (Lot 27) especially the section west of the site towards Keene-Peterborough, is used for recreation such as

hiking, biking and snowmobiling. Redevelopment of portions of Lot 27 (between Lots 28 and 29) would add an additional 0.2± acre to the park and would create a link to the existing Keene-Peterborough rail trail system to the west. A trailhead would be constructed at the southern terminus of the Site. At the northern terminus of the site/ROW, the town is interested in rebuilding the former wooden covered bridge, which was destroyed by an arson fire in 1985 as a way to re-establish a walking trail connection to the Hillsborough town center. The final park will also serve as a tribute and commemorate the many former town residents and their families who worked at the mill.

3. ANALYSIS OF CLEANUP ALTERNATIVES

3.1 Interim Cleanup Goals

The goals of interim cleanup activities at the Site are to:

- Eliminate the physical hazards and risk to public safety posed by the open mill foundation, collapsing buildings and demolished structures.

- Eliminate the environmental hazards and risk to public safety and welfare and the environment posed by the presence of ACM and ACBM on the ground and inside collapsed structures.

- Remove LBP-contaminated wood materials and structures which continue to act as a source of lead contamination to surficial soils.

- Increase the accessibility of portions of the property and allow supplemental comprehensive site investigation activities to be conducted.

Interim cleanup activities to remove the vast amount of ACBM-and LBP-contaminated solid waste and other debris on the ground surface and decaying building structures at the Site is necessary in order to conduct supplemental comprehensive site investigation activities and final cleanup to facilitate redevelopment of the Site into a passive use recreational riverfront park.

3.2 Areas of Evaluation

Interim cleanup activities are needed on Lot 28 and will include: Warehouse Building #2 (collapsing), Warehouse Building #3 (collapsed) and the Mill Foundation. The approximate boundaries of these areas are shown on the Site Plans in Figures 2 and 3. A separate ABCA for final clean-up will be conducted in the future to address remedial options for future use and development of the entire Site as park land.

3.3 Site Contaminants and Hazards

3.3.1 Type of Materials

Contaminants and hazards on Lot 28 consist of large amounts of solid waste debris and building materials. Solid waste materials associated with the old mill buildings, and include materials such as wood (both siding and framing varieties), asphalt, glass, concrete, brick and granite blocks. The basement level of the Warehouse Building #2 and the Mill Foundation also contain large amounts of rubble including: wood debris and various trash items, small appliances, metal drums, rubber tires, buckets, plastic and metal containers. Also, much of the interior of the Mill Foundation is vegetated with small deciduous trees and shrubs. It is suspected that the brick mortar (particularly in the Boiler House) may also contain asbestos.

LBP was identified on most exterior surfaces (red-painted wood surfaces) and in the interior of the former mill building. Structures which were painted red include: Warehouse Building #2

(and possibly #3), the east side of the Boiler House and the former mill structure. A red-paint chip sample was tested and found to have a TCLP-lead concentration of 115 mg/L during past investigations (Scott Lawson, 1999).

Asbestos and Asbestos-Containing Building Materials (ACBM) have also been identified in the form of and found in roofing materials, flashing tar, electrical insulation paper, cement board panels (Transite®) and in the thermal insulation system of several structures. In the Boiler House, the boilers and breaching and tank insulation are wrapped in ACM. Previous reports also indicate that ACM was placed inside one of the boiler(s). Asbestos was identified to be on the window glazing in the Warehouse Buildings and in roof material and flashing tar in the Boiler House and was suspected to be in the exterior coating on the concrete pad on the east side of the Mill foundation (Scott Lawson, 1999).

Some universal waste may also be present but in de minimis quantities. Fluorescent light bulbs and ballasts were observed still hanging from the ceiling inside the Boiler House. It is suspected that similar lighting fixtures and bulbs may also be present inside Warehouse Building #2.

3.3.2 Quantities

The quantities of building debris and ACBM that require removal are difficult to estimate due to the mixed un-containerized nature of the materials and the condition of Warehouse Building #2, #3 and the Mill foundation. Consequently, reliable volume estimates of the various materials (in square feet or lineal feet, cubic feet or bags) to be removed from these structures cannot be well estimated. However, based on the building dimensions, Warehouse Building #2 (partially collapsed) is estimated to consist of approximately 200 cubic yards of building material. Warehouse Building #3 which collapsed several years ago is estimated to contain an additional 100 cubic yards of similar building materials Preliminary quantities of some materials in the Warehouse Building #2 were also estimated by Scott-Lawson in 1999 (See Section 2.5) as follows:

Warehouse ("Storage") Building #2

Location	ACM Type	Approx. Qty	General Condition
Walls and Ceilings	Cement Board	2,185 ft^2	Fair
Main Roof and debris burned in section	Roofing Material	3,500 ft^2	Fair-Poor
Along River Side of building	Window Glazing	10 windows 3 ft by 5 ft	Fair

In addition to the materials associated with Buildings #2 and #3, building materials and miscellaneous debris is visible in the mill foundation. Based on a visual assessment the volume of this material is estimated to be 1,000 cubic yards (approximately 25% of this volume is actual building materials). This volume includes not only building materials (such as roofing and wood) but also trees, appliances, trash and other discarded items.

The volume of ACM in the Boiler House has not yet been quantified. At the present time, the Boiler House is in fair condition and can be entered. Obtainment of a work plan and cost estimate for ACM abatement, disposal of interior tanks and structures and demolition and removal of the Boiler House by a licensed contractor is planned and will be conducted as an

auxiliary task prior to or during implementation of this ABCA. A work plan and clean-up cost estimate for the Boiler House will be pursued to assist with and leverage additional funding for clean-up of the site.

3.3.3 Characterization of Materials

Based on existing limited data various both RCRA hazardous non-hazardous materials may be present at the Site. Red paint present on buildings has been previously tested for lead following TCLP extraction with a result of 115 mg/L, which is above the RCRA hazardous waste threshold criteria for lead of 5 mg/L. During demolition activities, representative samples of building materials will be collected and analyzed to determine proper characterization of materials and to determine their ultimate disposition. The exact quantities of the various types of materials is not known, however for cost estimation purposes, it is assumed that 25% of the total volume of the debris materials will requiring handling as a RCRA hazardous waste.

3.4 **Presumptive Remedy for Boiler House**

Remedial alternatives for clean-up of the Boiler House have not been evaluated in this ABCA because ACM abatement, removal of the tanks and demolition of the Boiler House is considered to be the only viable remedial alternative that would allow for future redevelopment of the Site into a recreational park. LEA considers "abatement, removal and demolition" as "presumptive" as defined under Env-Or 606.11 (c) and which would satisfy the RAP requirements as outlined in Env-Or 606.13 (a) through (j).

3.5 **Evaluation Criteria**

The alternatives for interim cleanup were compared to each other using the following five (5) criteria as described below:

Criteria 1: Effectiveness and Reliability – This criterion considers the ability of the alternative to meet the cleanup standards and the long term reliability of the alternative.

Criteria 2 Feasibility and Ease of Implementation – This criterion evaluates the technical feasibility and the availability of services, materials and equipment needed to implement the alternative.

Criteria 3 Risk Reduction versus Benefit – This "threshold" criterion considers whether the alternative provides adequate protection and describes how risks to human health, public safety, welfare and the environment posed by Site hazards are either eliminated, reduced or controlled.

Criteria 4: Cost Effectiveness – This criterion includes an evaluation of the estimated capital, operation and maintenance costs for each alternative. Both direct and indirect capital costs (i.e. engineering, contingencies, licenses, permits) are considered.

Criteria 5: Clean-Up Time – This criterion considers the time it will take to implement the alternative. For final cleanup, this criterion evaluates the time it will take to achieve Site closure.

For Criterion No. 5, evaluation of the alternative relative to achieving site closure (or "No Further Action") is not relevant as Criterion No. 5 relates to final clean-up activities only. In the future, once supplemental assessment activities are conducted and risks associated for future use of the Site are identified and confirmed, an ABCA for final clean-up will be completed. Consequently, Criterion No. 5 (Clean-Up Time) was evaluated with respect to the amount of time it would take to implement the alternative(s) described herein and was not evaluated with respect to achieving regulatory closure.

3.6 Description of Cleanup Alternatives

Three options for interim cleanup were evaluated against the five criteria described above. The three options included:

Alternative No. 1 - No Action
Alternative No. 2 - Building Demolition and Off-Site Disposal
Alternative No. 3 - Building Demolition, On-Site Disposal and Activity and Use Restriction (AUR)

A description of each of these options is presented below.

3.6.1 Alternative No. 1 – No Action

The "No Action" alternative is a do-nothing or leave as is approach. Under this approach, the existing surficial solid waste and building demolition debris and existing structures would remain as is.

3.6.2 Alternative No. 2 – Building Demolition and Off-Site Disposal

This alternative would involve demolition, removal and off-site disposal of Warehouse Building #2 and removal and off-site disposal of remaining building debris from within the mill foundation and the Warehouse Building #3 debris pile. Demolition and removal activities would be completed following representative sampling and analysis of the various materials, to confirm their disposal characterization. The activities would result in the disturbance of asbestos containing materials as well as those with lead based paint, therefore, prior to the implementation of these tasks a work plan would be developed including mechanisms to reduce airborne particles (such as wetting), methods to prevent loose debris from entering the river, and site monitoring and controls. It is anticipated that the following amount of material would require removal:

- Warehouse Building #2 (200 cy)
- Mill Foundation Debris (25% of 1,000 cy or 250 cy)

- Warehouse Building #3 Debris Pile (100 cy)

Note: Assuming just Warehouse Building #2 and the Warehouse Building #3 debris pile are disposed off-site, an estimated total of 300 cy will be generated, anticipated to be characterized as both RCRA hazardous (25%) and non-hazardous waste (75%). If the 250 cy of material from within the mill foundation were also removed and disposed off-site, it is presumed that this material would be characterized as non-hazardous waste.

Potential off-site disposal facilities identified include: an in-state lined landfill (i.e. Waste Management's Turnkey Landfill in Rochester, New Hampshire), an out-of-state commercial hazardous waste landfill (i.e. EQ Wayne Landfill in Belleville, Michigan) or a permitted out of-country waste disposal facility such as Stablex in Blainevielle, Quebec, Canada. Final disposition of the waste will depend on characterization and cost.

3.6.3 Alternative No. 3 – Building Demolition, On-Site Disposal and AUR

This alternative assumes the debris (other than vegetation and salvageable/scrap materials) and ACBM materials in the mill foundation would remain on-site and all non-hazardous demolition materials from the Warehouse Buildings #2 and #3 would be re-located to within the footprint of the former mill foundation and solidified in-place using flowable fill or "liquid soil" technologies. The containment cell would be located in the northern end of the foundation adjacent to the boiler house. In general, the demolition procedures would be the same as those under Alternative #2.

Flowable fill is a technology that has been used for over 20 years in various engineering applications and is commonly used as bedding and backfill (in lieu of compacted earth) for utility trenches, paving subbase, bridge abutments and as retaining wall backfill. The EPA also supports the use of flowable fill to close various types of under-ground storage structures, including abandoned tanks (USTs), basements, tunnels and mines and sewers. Flowable fill is cementitious slurry and generally consists of a mixture of fine aggregate or filler, water, and cementitious material(s) which can be customized to specific compresseive strength as needed for a specific project. Flowable fill is self-leveling and eliminates the need for obtaining off-site of materials and compaction equipment and is less labor intensive than traditional soil backfilling.

The general design and construction specifications for the on-site disposal option are illustrated in Figures 3 and 4. Prior to placement of the debris, deciduous trees and significant vegetation would be removed from the foundation. If possible, materials from the bottom along the foundation's east side would be relocated and moved to regrade the bottom surface. Debris and/or ACBM in the mill foundation would remain and not be removed. If practicable, some debris that might have salvage value (such as granite blocks and/or scrap metal) would be removed. The existing mill foundation wall will remain in-place but some of the concrete pads inside the foundation would be broken and relocated in the foundation in order to construct two cast-in-place concrete gravity retaining walls ("retaining walls").

The demolition material from Warehouse Building #2 and debris pile from former Warehouse Building #3 would be placed into the mill foundation and solidified in-place using flowable-fill. The flowable fill migrates and fills the void spaces and over time hardens into a solid, providing structural integrity/strength. The first retaining wall (120 feet in length) would be constructed approximately 10 feet inside parallel to the existing west foundation wall. A second wall (40-feet in length) would be constructed perpendicular to the first wall and provide support on the south side. The retaining walls would be constructed to a height of approximately 5 feet to an elevation approximately 7 feet lower than the ROW elevation. Debris and flowable fill would be placed up to 4 feet. Ideally, the flowable fill would be overlain with approximately 18 inches of fill, topsoil and seeding until future plans for redevelopment of the site are implemented, however, the ability to complete this item will be determined based on available funding. Based on these design dimensions, the volume available for on-site disposal will be approximately 1,200 cubic yards (cy). The volume estimated for placement based on the current plan is 175 cy from Warehouse #2 and 75 cy from Warehouse #3. Note: these volumes assume that 25% of the debris from the areas will be shipped off-site for disposal based on characterization as a hazardous waste.

The on-site disposal alternative would require implementation of an Activity and Use Restriction (AUR) on Lot 28 to restrict future disturbance of the buried mass of LBP and ACBM-contaminated debris. The AUR would be recorded onto the property deed (Lot 28 only) and would require future monitoring and maintenance of the restricted area.

It should also be noted that as future remedial activities are planned and conducted (including those associated with the boiler house), additional non-hazardous materials may be generated and sought to managed on-site, in the footprint of the Mill Building and/or the adjacent building foundations of lower levels.

3.7 Evaluation and Comparison of Cleanup Alternatives

A general evaluation of each of the three alternatives to the five criteria is summarized in Table 1 and described in further detail below.

3.7.1 Alternative No. 1 – No Action

This alternative is neither effective nor reliable and would not meet the interim cleanup goals or pave the way for future redevelopment of the Site into a passive use recreational park (Criterion No. 1). Naturally, this alternative would be considered feasible and easy to implement (Criterion No. 2), cost nothing (Criterion No. 4) and involve no cleanup whatsoever (Criterion No. 5). This "do nothing" alternative would result in the continuance of potential hazards and risk to public safety and welfare and provides no protection from these hazards based on Criterion No. 3. The Site would continue to remain an "eyesore" and be a visual detriment on the abutting residential neighborhood and on the adjacent scenic Contoocook River. The existing Boiler House, Warehouse Building #2 (which is currently collapsing) and debris associated with former Warehouse Building#3 would continue to pose a threat to the adjacent waterway and the hydro-electric dam on Bridge Street which is located approximately 250 feet downstream of the Site.

3.7.2 Alternative No. 2 – Building Demolition and Off-Site Disposal

Effectiveness and Reliability: This alternative would meet the desired interim cleanup goals and remove the physical safety and environmental hazards present at the Site (Criterion No. 1).

Feasibility and Ease of Implementation: This alternative would be feasible and relatively easy to implement. However, implementation has some physical constraints due to the shape of the Site, building layout and entrance and egress into the Site (which is the same for Alternative No. 3). Monitoring and dust controls would have to be implemented during building demolition and material loading/unloading activities. The ease of implementation and finding a disposal facility for the material is complicated by the likely classification of portions of the waste stream as a RCRA hazardous waste and the lack of in-state facilities for this type of material (Criterion No.2).

Risk Reduction versus Benefit: This alternative would reduce the identified site risks and remove the physical hazards from the site. During implementation there would be a potential risk to surrounding receptors due to air-borne dust containing ACM and lead. However, this situation can be mitigated and/or controlled by wetting of materials or working during a seasonally wet period, dust monitoring and workers using respiratory protection. The overall risk reduction from implementation of this alternative would achieve the desired public health and safety protection benefits desired (Criterion No. 3).

Cost Effectiveness: The cost to implement Alternative No. 2 higher than Alternative No. 3 but requires less engineering (i.e. permitting costs) and does not have a future costs associated with monitoring an AUR. The total estimated cost to implement Alternative No. 2 is approximately $249,870 broken down as follows:

Cost Estimate – Alternative No. 2

Task Description/Item	**Estimated Cost ($)**
Building Demolition, including mobilization/demobilization, site preparation work	$104,800
Warehouse Building #2 and #3 Debris Pile: Off-Site Transportation and Disposal – Hazardous Waste (75 tons)	$15,000
Warehouse Building #2 and #3 Debris Pile: Off-Site Transportation and Disposal – Non-Hazardous Waste (225 tons)	$26,000
Subtotal (Warehouse Building #2 and #3 Debris Pile)	$145,800
Contingency (20%)	$29,160
Subtotal #2 (without addressing mill foundation)	**$174,960**
Mill Foundation: Foundation preparation, retaining wall construction, clean backfill T&D of 250 cy non-hazardous building debris	 $46,160 $28,750
Subtotal (for mill foundation)	**$74,910**
TOTAL #2	**$249,870**

Note: if all of the debris is characterized as non-hazardous waste that would result in a cost reduction of $6,400.

As noted above, the mill foundation results in an additional cost of approximately $46,160 for foundation preparation work, retaining wall construction and clean fill purchase and placement, as well as an additional $28,750 for off-site disposal of 250 cubic yards of non-hazardous building debris (volume estimated to be in the foundation).

Clean-Up Time: The time to implement this alternative is essentially the same as Alternative No. 3. It is estimated that building demolition would require approximately one week. Transportation and disposal of materials would be conducted over the same time period. An additional one to two weeks would be necessary to address the mill foundation and general site restoration. The total estimated time needed to implement Alternative No. 2 would be approximately three weeks.

3.7.3 Alternative No. 3 – Building Demolition, On-Site Disposal and AUR

Effectiveness and Reliability: This alternative would be as effective and reliable as Alternative No. 2 and would meet the desired goals for interim cleanup of the site.

Feasibility and Ease of Implementation: In general, building demolition and debris removal would be conducted in the same manner as Alternative No. 2 but rather than transferring debris into trucks for off-site disposal, materials would be transferred into a pre-engineered excavation ("containment cell") within the mill foundation. The technical feasibility and ease of implementation of Alternative No. 3 is slightly less compared to Alternative No. 2 because additional engineering is required (including solid waste permitting and approvals) and labor and materials are needed to prepare the foundation and construct the retaining walls.

Risk Reduction versus Benefit: The reduction in site risk and benefits returned by the on-site disposal alternative would generally be the same as by Alternative No. 2 (off-site disposal) however, the use of an activity and use restriction would be required to ensure risk to future receptors is monitored/minimized due to the on-site management of LBP debris and ACM-contaminated materials.

Cost Effectiveness: The cost to implement Alternative No. 3 is slightly less than Alternative No. 2. The total estimated cost to implement Alternative No. 3 is approximately $215,520.

Cost Estimate – Alternative No. 3

Task Description/Item	**Estimated Cost ($)**
Retaining Wall Construction *including purchase and placement of flowable fill*	$59,800
Warehouse Building #2: Building Demolition**,** including mobilization/demobilization, site preparation work	$104,800
Warehouse Buildings #2 and #3 Debris Pile: Off-Site Transportation and Disposal – Hazardous Waste (75 tons)	$15,000
Subtotal #3	$179,600
Contingency (20%)	$35,920
TOTAL #3	**$215,520**

Note: if all of the debris is characterized as non-hazardous waste, nothing would be shipped off-site, resulting in a cost reduction of $15,000.

The difference in cost between Alternatives No. 2 and No. 3 is $34,000. Also, as noted previously, the establishment of the on-site disposal area will likely facilitate future remediation and development of the site as other non-hazardous materials are generated and may be added to the area and/or adjacent areas/foundations.

Clean-Up Time: The time to implement this alternative is the same as Alternative No. 2. It is estimated that mobilization, foundation clearing, preparation work and retaining wall forming would require approximately one to two weeks for completion. Building demolition and relocation of the material, concrete retaining wall and flowable fill placement would require approximately one additional week. The total estimated time needed to implement Alternative No. 3 would be approximately three weeks.

4. SELECTED ALTERNATIVE FOR INTERIM CLEANUP

4.1 Recommended Alternative

The "No Action" Alternative No. 1 is not recommended as this alternative does not accomplish the two primary goals of interim cleanup goals – eliminate site risks and promote future park development. Based on a comparison of Alternatives No.2 and No. 3 against the five criteria, both alternatives are equal in comparison with respect to effectiveness and reliability (Criterion No.1), feasibility and ease of implementation (Criterion No. 2) and implementation time (Criterion No. 5). The risk reduction and benefits received (Criterion No.3) via implementation of Alternative No. 3 is greater than implementation of Alternative No. 2. The cost (Criterion No. 4) of Alternative No. 3 is less than Alternative No. 2 (assuming the mill foundation is addressed under Alternative No. 2.

Backfilling of the foundation is important for two reasons: 1) to mitigate public safety hazard associated with the open mill foundation, and, 2) to make progress toward and facilitate future park development. The immediate need to backfill the mill foundation for safety reasons (Reason No. 1) has recently been mitigated via the installation of a six-foot high chain-link permanent fencing around the property. The property is now gated both at the main driveway entrance on West Mill Street and at the ROW entrance on the property's southern boundary. Signage has been posted in gated areas to keep trespassers and the public off the property and out of the abandoned buildings. Progress toward future park development (Reason No. 2) as would be obtained via Alternative No. 3 is preferred. A summary of deciding factors for interim cleanup are presented below:

Alternatives Analysis
Summary of Deciding Factors

Cleanup Alternative	Criterion No. 3 Risk Reduction	Criterion No. 4 Cost Effectiveness	Other Criteria
Alternative #2 (w/o addressing mill foundation)	No (however, fencing in-place)	$174,960	Provides flexibility for future property development
Alternative #2 (including addressing mill foundation)	Yes	$249,870	Advance property development by filling foundation
Alternative #3	Yes	$215,520	

Based on the available funds remaining in the cleanup grant, none of the alternatives can be completed without additional funding. LEA recommends the town proceed with Alternative #3, which should be competitively bid. If a winning bid cannot allow for completion of the work using the available funds (approximately $150,000), additional funds will need to be sought. In conjunction with bidding, a cost estimate for future demolition and ACM abatement of the Boiler House should also be obtained in order to leverage additional public or private monies for this effort.

4.2 Implementation Schedule

Upon submittal of the ABCA to EPA, a 30-day public comment period will be held. During this same time, the ABCA will be submitted to the NHDES (a cooperative partner on the brownfields project) for comment. Availability of the ABCA for review will be made to the public in accordance with the Community Relations Plan (CRP). During the 30-day public comment period, a public meeting will also be held in the town of Hillsborough to present the results of the ABCA and the proposed alternative for interim cleanup.

Implementation of an alternative will depend on several factors, include: EPA's approval of the ABCA, DES comment and the public's comment. If the proposed alternative is accepted by the public, than additional funds should be secured as a contingency in the event that bids are higher than the available funds. If bids are obtained and the required funds and a NHDES-approved work plan are "in hand" by October 1st, interim cleanup could begin on or about mid October 2008 and complete by November 2008.

4.3 List of Required Federal, State and Local Permits

4.3.1 Federal

Because of the site's location along the Contoocook River, a major waterway, and the site's location within a Zone A11 as designated on Flood Insurance Rate Maps (FIRM) maps, the need for a permit from the United States Corps of Engineers (Corp) was reviewed.

Generally, any person, firm, or agency (including Federal, state, and local government agencies) planning to work in navigable waters of the United States, or discharge (dump, place, deposit) dredged or fill material in waters of the United States, including wetlands, must first obtain a permit from the Corps of Engineers. Permits, licenses, variances, or similar authorization may also be required by other Federal, state and local statutes. Permits are also typically required for all construction, building or development projects in a Federal Emergency Mapped Area (FEMA)-mapped floodplain. The FEMA maps were overlain on the site/project limits and this indicated that the site is located primarily in the floodway fringe and outside the floodway. Based on conversations with the Corp's New England Regional Office about the proposed activities and the fact that the activity would be outside the Contoocook River floodway, a permit from the Corp will not be required.

4.3.2 State

On February 6, 2008, LEA met with various NHDES department representatives from the Site Remediation, Air, Water and Solid Waste divisions to discuss the conceptual idea of on-site disposal of the demolition debris and the need for any potential permits. The overall concept of the on-site disposal alternative was accepted.

Air: The asbestos in the building(s) and the ACBM debris at this site is regulated by the NHDES Air Resources Division (ARD). Given the conditions of Warehouse Building #2, ARD indicated that a NESHAP survey would not be required (assume all material is ACM) and recommended

implementation of the work during the spring or fall and wetting of the building and debris materials during handling to reduce dust. Any activity that will expose workers to or disturb building asbestos or asbestos debris that has fallen onto the ground is subject to the ARD rules. All work conducted at the Site either under Alternative No. 2 or No.3 would involve potential exposure to LBP and ACBM and therefore must be performed by a New Hampshire Licensed Asbestos Disposal Site (ADS) Contactor and asbestos trained workers. No permit would be required for either Alternative No. 2 or No. 3, however, dust and exposure monitoring during interim cleanup would be required to protect worker health and safety, the procedures of which should be described in the final work plan.

Water: No specific water quality permit will be required for implementation of either Alternative No. 2 or 3. However, a contingency plan for containment of the building demolition and surface debris and prevention of release to the adjacent Contoocook River must be in-place. Contingencies include: use of a boom system in the river and water run-off control. Contingencies for water quality control shall be incorporated into the final work plan.

Solid Waste: The placement of LBP and ACBM into the mill foundation as proposed under Alternative No. 3 would trigger the need for a solid waste permit and designate the site as a "solid waste facility". A solid waste general permit would need to be completed and submitted to the NHDES Solid Waste Division prior to implementation of the on-site disposal option. The permit fees vary with facility function, size and life expectancy and ranges between $2,000 and $35,000. The solid waste permit would also require a financial assurance mechanism (FAM) and would also be dependent on the use of institution controls (See Section 4.4) via implementation of an AUR.

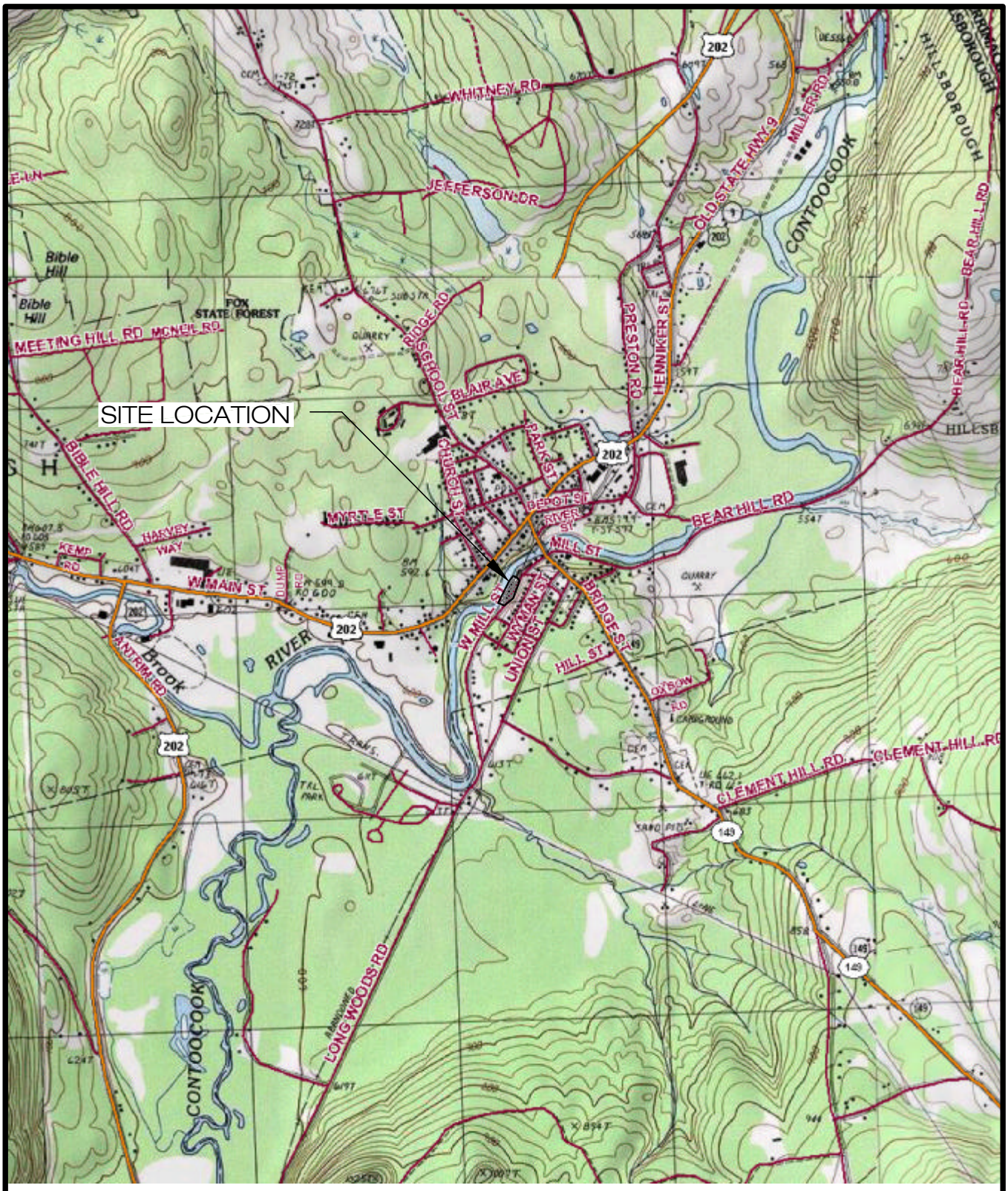
4.3.3 Local

Based on communications with the town, a building permit for demolition (as included under both Alternatives No. 2 and No. 3) will not be required. A wetlands permit will not be needed as all work to be done during interim cleanup will not impact the on-site wetlands area. A small wetland area exists at the south end of the mill foundation/property boundary. This wetland area was mapped by Meridian Land Services, Inc. in October 2002 as part of the Haley & Aldrich Slopes Alternatives Study. The wetlands were mapped in accordance with Army Corp of Engineers wetlands delineation methods. Work conducted as part of future park construction and development (activities of which will be conducted site-wide) may require a wetlands permit.

4.4 **Institutional Controls**

For Alternative No. 3, implementation of institutional controls (in the form of an Activity and Use Restriction or AUR recorded on the property deed) would be needed to identify the existence and location of the buried LBP and ACBM-contaminated debris and to prohibit future disturbance of materials within the AUR area. Institutional controls are widely used to reduce direct exposure to contaminants buried in the subsurface and are especially useful on properties which are planned to have a specific long-term use and will not change over time, such as a park which is planned at the site. Future obligations and conditions associated with AURs include

regular inspection of the area for structural integrity and settlement and will require maintenance of the area.



MAP REFERENCE:

SECTION OF THE USGS 7.5 MINUTE TOPOGRAPHIC MAP OF HILLSBOROUGH UPPER VILLAGE, NH, DATED 1987, REVISED 1998 BY NATIONAL GEOGRAPHIC HOLDINGS INC. TOPO! © 2005 TELE ATLAS, NORTH AMERICA, INC.

1000 0 1000 2000 3000

SCALE IN FEET

N

Analysis of Brownfields Cleanup Alternatives

FORMER WOODS WOOLEN MILL SITE, TOWN OF HILLSBOROUGH, NEW HAMPSHIRE

SITE LOCATION MAP

Comm.No. 40HM802.006

FIGURE 1

LEA

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CONTOOCOOK RIVER

BUILDING TO BE DEMOLISHED.

BUILDING #4

BUILDING #2

BUILDING #3 (DEMOLISHED)

BUILDING #5

CONCRETE PAD

DEBRIS PILE

MATCH LINE

WEST MILL STREET

I.PIN FND.

SCALE IN FEET

10 0 10 20 30

NORTH

Analysis of Brownfields Cleanup Alternatives

FORMER WOODS WOOLEN MILL SITE, TOWN OF HILLSBOROUGH, NEW HAMPSHIRE

SITE PLAN
WAREHOUSE BUILDINGS #2 AND #3

Comm.No. 40HM802.006

FIGURE 2

LEA

G:\AUTOCAD\PROJECTS\40HM802\REPORT DWGS\40HM802-006-FIGURES.DWGTab: FIG 2 Saved: 8/29/2008 2:16 PM Plotted: 8/29/2008 2:18 PM

CONTOOCOOK RIVER

REMOVE CONCRETE PADS AS REQ'D TO CONSTRUCT NEW RETAINING WALL.

1 FIG 4

2 FIG 4

125'±

40'±

NEW CAST–IN–PLACE CONCRETE GRAVETY RETAINING WALL.

NEW TOPSOIL & SEEDING ON CONSTRUCTION DEBRIS & FLOWABLE FILL.

BUILDING #4

BUILDING #5

PETERBOROUGH & HILLSBOROUGH RAILROAD (BOSTON & MAINE CORPORATION)

WEST MILL STREET

MATCH LINE

ROCKS

CONCRETE PAD

CONC. PAD

10 0 10 20 30

SCALE IN FEET

NORTH

Analysis of Brownfields Cleanup Alternatives

FORMER WOODS WOOLEN MILL SITE, TOWN OF HILLSBOROUGH, NEW HAMPSHIRE

SITE PLAN MILL FOUNDATION

Comm.No. 40HM802.006

FIGURE 3

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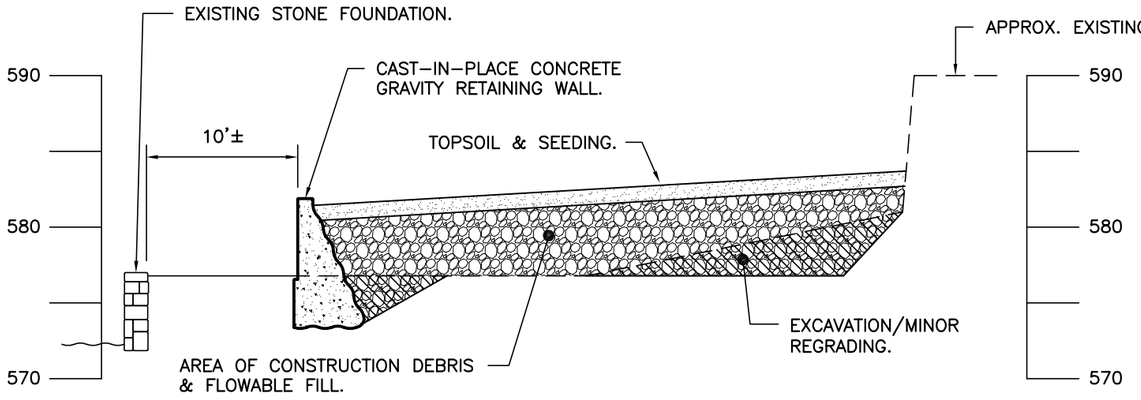
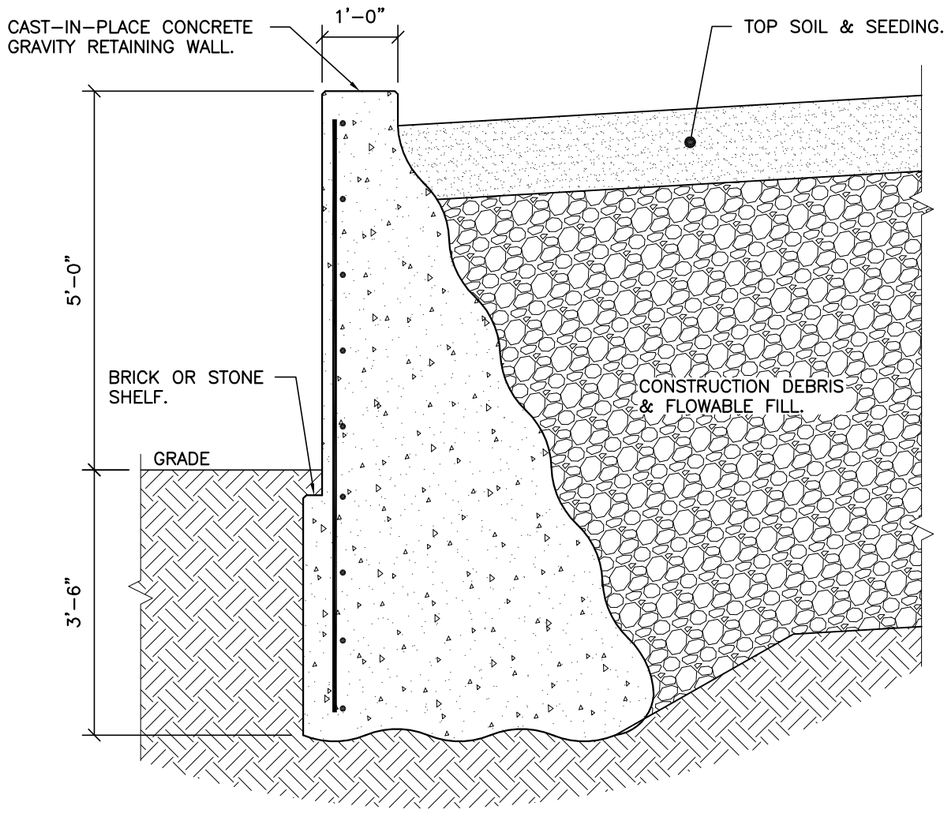


1 TYPICAL SECTION
1" = 10'



2 TYPICAL WALL SECTION
1/2" = 1'–0"

Analysis of Brownfields Cleanup Alternatives
FORMER WOODS WOOLEN MILL SITE, TOWN OF HILLSBOROUGH, NEW HAMPSHIRE

REMEDIAL ALTERNATIVE No. 3
CONTAINMENT WALL CROSS SECTION AND DESIGN

Comm.No. 40HM802.006

FIGURE 4

LEA

G:\AUTOCAD\PROJECTS\40HM802\REPORT DWGS\40HM802-006-FIGURES.DWGTab: FIG 4 Saved: 8/29/2008 2:16 PM Plotted: 8/29/2008 2:18 PM

TABLE 1
Summary of Interim Cleanup Alternatives
Mill Foundation and Warehouse Buildings No. 2 and No. 3 (LOT 28)
Former Woods Woolen Mill Site, Hillsborough, NH

Criterion	Alternative No. 1 No Action	Alternative No. 2A Building Demolition and Off-Site Disposal (without addressing Mill Foundation)	Alternative No. 2B Building Demolition and Off-Site Disposal (Including Mill Foundation)	Alternative No. 3 Building Demolition and On-Site Management
Effectiveness and Reliability	• Does not eliminate or reduce risks to human health, public safety, welfare or the environment. • Does not eliminate or reduce TOR of building materials to river and hydro-electric dam. • Does not eliminate or reduce TOR to river and City of Concord PWS. • Does not facilitate supplemental environmental assessment. • Does not facilitate future park development.	• Building demolition and off-site disposal of debris would be effective and reliable. • Institutional controls would not be required.	• Building demolition and off-site disposal of debris would be effective and reliable. • Institutional controls would not be required.	• Building demolition and on-site burial would be effective and reliable. • Institutional controls would be required via preparation and recording of an Activity and Use Restriction (AUR). • The use of an institutional control would need to be accepted by the town.
Feasibility and Ease of Implementation	• Easy to implement.	• Building demolition and off-site disposal of materials is technically feasible. • Relatively easier to implement than Alternatives No. 2B & 3.	• Building demolition and off-site disposal of materials is technically feasible. • Additional engineering required to implement similar to Alternative No. 3 to support placement of soil fill.	• Technical feasibility is the same as for Alternatives No. 2A & 2B. • Additional engineering required to implement Alternative No. 3 than 2A. • Relatively more difficult to implement than Alternative No. 2A.
Risk Reduction and Benefit	• No Risk Reduction or Benefits Achieved.	• Risks to human health from LBP and ABCM in structures would be removed. • Risks associated with debris in mill foundation would still remain, but are limited by current fencing.	• Risks to human health from LBP and ABCM in structures would be removed. • Risks increased by trespassing and potential fires would be eliminated.	• Risk reduction and benefits are the same as Alternative No.2B.
Cost Effectiveness	• No immediate cost to implement.	• Total Estimated Cost is $174,960. • Alternative cost is estimated to exceed remaining available cleanup funds.	• Total Estimated Cost is $249,870. • Alternative cost is estimated to exceed remaining available cleanup funds.	• Total Estimated Cost is $215,520. • Alternative cost is estimated to exceed remaining available cleanup funds.
Clean-Up Time/Time to Achieve “No Further Action”	• Not Applicable.	• Not Applicable. Alternative is for interim cleanup only.	• Not Applicable. Alternative is for interim cleanup only.	• Not Applicable. Alternative is for interim cleanup only.
Other – Consistent with Future Park Development	• No. Alternative is not supportive of future park development plan.	• Partially, removal assists with future development of park but does not address mill foundation which is critical area for redevelopment.	• Yes. Supportive of future park development plan.	• Yes. Supportive of future park development plan.

Note: Site has temporary chain-link fencing to prevent public dumping, trespassing, building vandalism and/or potential fires.