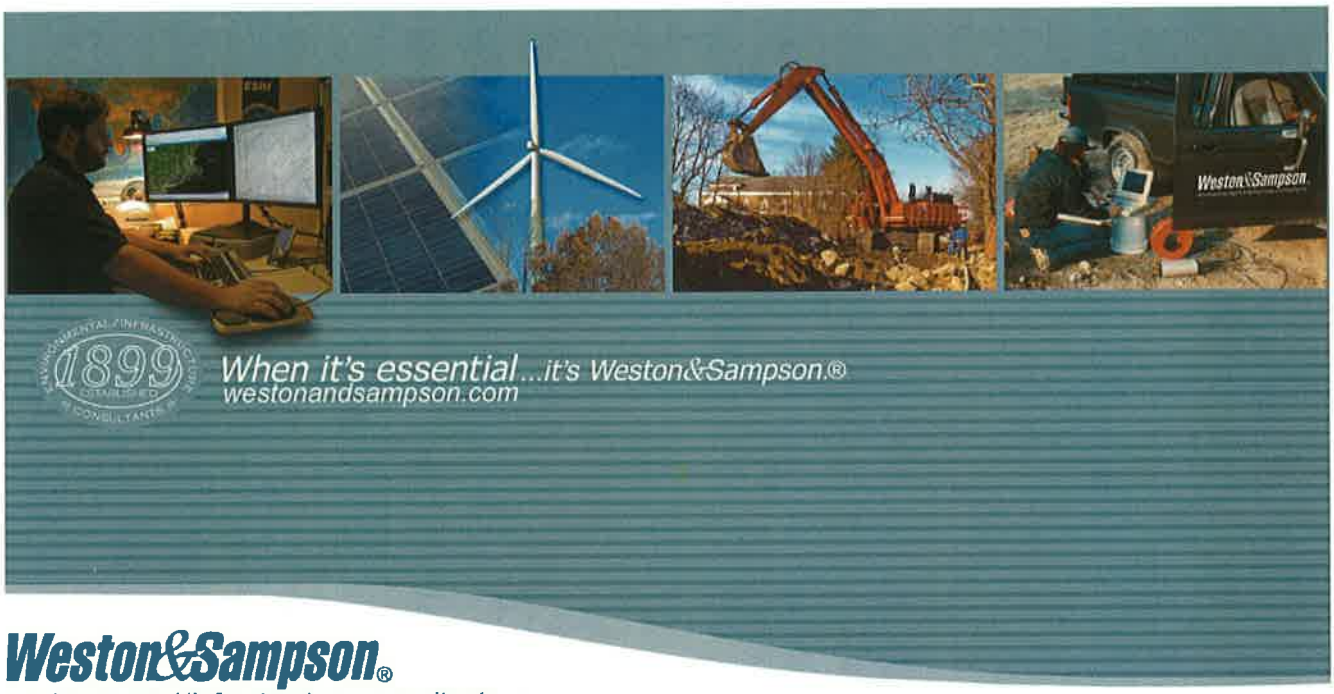

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report

DRAFT - Analysis of Brownfields Cleanup Alternatives

Former Hart Wool Combing Site
aka Farr Alpaca Site
216 Appleton Street
Holyoke, MA

March 2014

Funded through
United States Environmental Protection Agency
Brownfields Revolving Loan Fund # BF 97119201-3
On behalf of Pioneer Valley Planning Commission and
City of Holyoke

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This Analysis of Brownfields Cleanup Alternatives (ABCA) for the Former Hart Wool Combing property (the "Site") in Holyoke, Massachusetts was prepared by Weston & Sampson Engineers, Inc. (Weston & Sampson) on behalf of the City of Holyoke, Massachusetts and Pioneer Valley Planning Commission (PVPC). The Site was also known as the Farr Alpaca site. The City is receiving United States Environmental Protection Agency (EPA) Brownfields Revolving Loan Fund (RLF) grant funds from PVPC to cleanup hazardous building materials identified in the Site buildings. This ABCA evaluates three cleanup alternatives for the Site and is required in support of the RLF funds. The Site is located at 216 Appleton Street, see Figure 1.

As part of its ongoing redevelopment efforts, the City of Holyoke intends to either renovate or demolish the building, or do a combination of both based on the condition of the building and the amount of contamination in the building. This project will assist with the City's redevelopment plans to reuse this unused and abandoned property, and contribute to the economic revitalization of the surrounding area. Several Mixed-use redevelopment scenarios have been created for the Site. All the scenarios involve demolition of some of the buildings to make room for parking to support the project and/or the development of greenspace, the redevelopment of portions of buildings, and the development of a public pedestrian walkway along the adjacent canal. The cleanup of this Site will reduce the threat posed by the hazardous building materials and allow the City of Holyoke to execute its redevelopment vision.

1.2 Site Description

The Site is located at 216 Appleton Street (formerly erroneously described as 130 Appleton Street), which is in the center of downtown Holyoke. The Site is located on the west side of the First Level Canal between Appleton and Cabot Streets. The Site consists of approximately 1.15 acres with two parcels of land (020-02-007 and 020-02-008) which are almost entirely occupied by six (6) interconnected brick mill buildings (+/-168,000 square feet). The buildings are currently vacant and abandoned. A locked chain-link fence along Appleton Street restricts access to the Site. A Locus Map showing the location and general surroundings of the Site is included as Figure 1 and a Site Plan showing the property boundary and other significant Site features is included as Figure 2.
This Analysis of Brownfields

1.3 Previous Site Use

The City of Holyoke is the current owner of the Site. According to available on-line records, the previous owner of the Site is listed as Up With Downtown, Inc. The City acquired the Site through non-payment of taxes in 2011.

According to previous reports reviewed for the Site, the Site was used as a wool combing operation to support the local textile industry and for the manufacturing and storage of wool products until Hart Wool Combing ceased operations in early the 1990's. The mill buildings are currently vacant, but have been used as a warehouse and most recently used by an artist as storage and work space.

1.4 Site Assessment Findings

1.4.1 Phase I Environmental Site Assessment (ESA)

Nobis Engineering, Inc. (Nobis) conducted a Phase I Environmental Site Assessment (ESA) as part of a United States Environmental Protection Agency (EPA)-approved Targeted Brownfields Assessment (TBA) work. The work was conducted in 2012 and identified several Recognized Environmental Conditions (RECs) in connection with the Site including:

- The historical industrial use of the Site including the use and storage of oil, coal, metals, and industrial process chemicals,
- The historical industrial use of adjacent parcels in the vicinity of the Site, and
- The presence of oils and unknown chemical currently stored in tanks and containers located throughout the interior of the Site buildings.

1.4.2 Hazardous Building Materials Survey

On November 19, 2012, SAK Environmental, under contract to Nobis Engineering, Inc. (Nobis), conducted a Hazardous Building Materials (HBM) Survey to determine the presence and estimate the quantity of hazardous and/or regulated materials within the site buildings. The HBM Survey was performed as part of a TBA conducted by Nobis. A Phase I ESA was also conducted by Nobis in 2013 as part of the TBA. Based on the findings of the Nobis Phase I ESA RECs still exist at the Site.

The HBM Survey indicated the presence of asbestos containing materials (ACM), lead-based paint (LBP), hazardous building components (e.g., fluorescent light tubes/ballasts, and thermostats), bulk hazardous material, and chemical storage containers in the buildings. Fungal growth was noted on wood members within the buildings such that Nobis indicated that a "more extensive" study of microbial populations throughout the building was warranted. Polychlorinated biphenyls (PCBs) above regulatory thresholds were not identified within the building materials sampled. The PCB sampling work was limited in extent and did not include any paint samples. Additional sampling of PCBs in building materials will be conducted to support the cleanup design.

1.4.3 Asbestos

According to the HBM Survey results, the materials in the buildings that tested positive for asbestos and their approximate quantities are summarized below:

Material	Quantity
Floor tiles & mastic	2,000 square feet (s.f.)
Ceiling tiles	3,000 s.f.
Thermal insulation	2,000 linear feet (l.f.)
Boilers	2
Sheetrock walls	Not determined
Window Caulking	Not determined

Nobis estimated a total cost of $172,000 to completely abate the ACM from all the buildings. Nobis did not document the condition of asbestos. As part of design services, Weston & Sampson will hire a licensed asbestos design professional to confirm quantities and collect a limited number of additional samples, and to document the condition of the ACM at the Site.

1.4.4 Lead-based Paint

Nobis indicated that most exterior and interior painted surfaces within the buildings contained lead in concentrations equal to or greater than 1.0 milligrams per square centimeter (mg/cm^2). The surfaces that contain lead include:

- Metal fire doors
- Metal and wood columns
- Brick walls
- I-beams and ceiling beams
- Floors
- Hand rails
- Wall tiles
- Exterior doors and associated trim

Nobis estimated an abatement cost of $1.2 million to properly remove the LBP in the buildings. Nobis' LBP work was completed in the field with an xray fluorescence meter (XRF) and no confirmatory sampling and analysis was performed. Weston & Sampson will collect a limited number of samples for the analysis of lead. It is important to note that removal of LBP would not necessarily be required as part of building demolition.

1.4.5 Universal and Hazardous Wastes

The following universal and hazardous wastes and quantities (where known) have been documented in the Site buildings by Nobis:

- 580 fluorescent light blubs
- 299 fluorescent light ballasts
- 3 storage tanks
- 14 55-gallons drums
- 2 35-gallon drums
- 6 oil containers
- 2 paint containers
- 1 fire extinguisher
- 1 thermostat
- 8 pressure stats
- 18 electrical panels
- 1 washing machine
- wool combing equipment
- Trench residual waste

Nobis estimated an abatement cost of $25,000 to properly remove and dispose of the universal and hazardous wastes from the building.

1.4.6 Mold/Fungi

Fungal growth was detected on wood building members within the interior of the building. Mold is not carried through this ABCA as a contaminant of concern (COC). However, any future redevelopment will have to consider the mold issue. Nobis estimated that supplement mold verification work will cost $2,500.

1.5 Project Goals

The goal of the project is to remediate the COC's including ACM, LBP, universal and hazardous wastes, and floor drain residuals. The goal of the City is to prepare the Site such that it can be redeveloped to create vibrant living/work space opportunities for local residents of Holyoke.

A number of redevelopment options have been discussed ranging from full building demolition to renovation of all buildings. Once the Site has been remediated, the proposed plan for redevelopment consists of a mixed-use site with a combination of market rate residential space and commercial retail space. Portions of the buildings are in relatively poor condition and will be demolished to build parking lots to support the redevelopment. Depending on which redevelopment concept is pursued by the City, a portion of the redeveloped Site may be dedicated to a variety of open space uses including a greenspace pocket park and/or hardscape walking paths. The City anticipates that the Site will be redeveloped in a number of phases.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 Cleanup Oversight Responsibility

The cleanup will be overseen by a State of Massachusetts Licensed Site Professional (LSP). Abatement activities will be overseen by a Massachusetts Licensed Asbestos Designer/Monitor. The Site is not currently listed under the Massachusetts Contingency Plan (MCP), therefore work will be coordinated with the Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Prevention, only.

2.2 Cleanup Standards for major contaminants

Cleanup standards include the requirements for asbestos abatement. Specifically all ACM will be removed and air clearance samples must be below 0.01 fibers per cubic centimeter (f/cc). The MCP does not apply to this site.

2.3 Laws and Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, and the Federal Davis-Bacon Act. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. As described herein, all cleanup will be in accordance with a variety of Commonwealth of Massachusetts regulations. All applicable permits and documentation (e.g., Inspectional Services/Building Permit, Dig Safe, soil transport/disposal manifests) will be obtained prior to the work commencing, and all work will be conducted in accordance with the conditions for approval. Pertinent laws and regulations applicable to the COC's for this ABCA (asbestos, LBP, and universal and hazardous wastes) are detailed in the following subsections:

2.3.1 Asbestos

Asbestos is regulated by the Asbestos Hazard Emergency Response Act Program (AHERA), the Toxic Substances Control Act (TSCA), the Clean Air Act (CAA), and Massachusetts regulations. In Massachusetts, all residential, commercial and institutional buildings are subject to MassDEP asbestos regulations at 310 CMR 7.15. Therefore, building owners and/or operators (e.g. renovation and demolition contractors, plumbing and heating contractors, flooring contractors, etc.) need to understand the ACM's (both non-friable and friable) that are present at the site and whether or not those materials will be impacted by the proposed work prior to conducting any renovation or demolition activities. Notification to MassDEP is required by all contractors prior to any abatement/renovation activities.

To protect asbestos abatement workers, all asbestos abatement work must be performed in accordance with Occupational Safety and Health Administration (OSHA) asbestos regulations as promulgated in Title 29 of the Code of Federal Regulations (29CFR), Section 1926.1101. All asbestos-containing materials must be handled and disposed of in an approved manner (USEPA, 2006a; Asbestos/NESHAP Regulated Asbestos-Containing Materials Guidance). 2.1.1 text here

2.3.2 Lead-Based Paint

Lead-based paint in pre-1978 housing and children-occupied buildings is regulated under the authority of TSCA (15 U.S.C. 2601 et seq.) and amended by the Residential Lead-Based Paint Hazard Reduction Act of 1992, generally referred to as Title X (of The Housing and Community Act of 1992 - Public Law 102-550). Title X mandates the training, certification and licensing of

LBP abatement contractors, inspectors, risk assessors, and the training and certification of abatement workers and project designers. The Act also amended the TSCA sections 402 & 403. The provisions of Title X apply to residential buildings and child-occupied facilities.

The EPA issued a final rule regarding dangerous levels of lead in pre-1978 housing and children-occupied buildings on January 5, 2001 (40 CFR Part 745). Under the new standards, lead is considered a hazard if there are greater than: 1) 40 micrograms of lead in dust per square foot on floors; 2) 250 micrograms of lead in dust per square foot on interior window sills and 3) 400 parts per million (ppm) of lead in bare soil in children's play areas or 1,200 ppm average for bare soil in the rest of the yard.

The Massachusetts Lead Law requires the removal or covering of lead paint hazards in homes built before 1978 where children under the age of six live. Lead paint hazards include loose lead paint and lead paint on windows and other surfaces accessible to children. Owners are responsible with complying with the law.

The Occupational Safety and Health Administration has published regulations regarding worker safety during activities involving LBP abatement. The Construction Standards (29 CFR Part 1926) and the Occupational Safety and Health Standards (29 CFR Part 1910) promulgate a permissible exposure limit for lead construction workers, including workers performing demolition, salvage, or renovation of lead-containing materials at sections 1926.62 and 1910.1025 as follows: "The employer shall assure that no employee is exposed to lead at concentrations greater than 50 micrograms per cubic meter ($\mu g/m^3$) of air averaged over an 8-hour period." Additional regulations under these chapters address other worker safety precautions such as respiratory protection programs, work practices, and medical monitoring.

LBP debris (material containing or surfaced with LBP) from commercial buildings may be classified as hazardous waste if lead concentrations exceed the Toxicity Characteristic Rule (40 CFR 261.24, 40 CFR 262.11) concentration limit of 5.0 milligrams per liter (mg/L) in sample extract prepared according to the Toxicity Characteristic Leaching Procedure (TCLP), test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846.

2.3.3 Hazardous and Universal Waste

The State of Massachusetts requires that universal waste and hazardous waste be managed in accordance with 310 CMR 30.1000. Where present these regulation mirror similar federal statues including 40 CFR 260.

2.3.4 Oil and/or Hazardous Materials

The State of Massachusetts requires that releases of oil and/or hazardous materials in excess of a reportable threshold are regulated by the MCP; 310 CMR 40.0000. MCP response actions are required to be under the supervision of a Massachusetts LSP.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

3.1 Cleanup Alternatives Considered

As a part of this proposed cleanup work, there are two approaches required. Buildings that are to be demolished will require complete abatement of ACM and removal of universal and hazardous waste prior to demolition however, removed of LBP will not necessarily be required from building demolition. Buildings that are to be renovated will require abatement of ACM or encapsulation of ACM in those areas where the ACM is in good condition and will be utilized as part of the renovated building. For example, heating pipes that are insulated with ACM insulation may be utilized in the future, however the insulation must be properly encapsulated and maintained. Removal or encapsulation of LBP would also be required for building renovation.

In order to be considered effective, the remedial alternative selected for the Site needs to minimize the potential for human exposure to ACM, LBP, and universal and hazardous wastes. Multiple remedial alternatives are available to address the identified COC's. However, based on our past experience at sites with similar contaminants and conditions, we have prescreened general advantages and disadvantages of various treatment options and have selected the following five remedial alternatives for further evaluation and comparison:

- Alternative #1 - No Action Alternative

Demolition Alternative

- Alternative #2 – Building Demolition - Contaminant Removal and Disposal

Renovation Alternatives

- Alternative #3 – Building Renovation - Contaminant Encapsulation
- Alternative #4 – Building Renovation - Hybrid Approach – Removal and Encapsulation
- Alternative #5 – Building Renovation – Contaminant Removal and Disposal

These remedial alternatives were evaluated for implementation at the Site and are further discussed in the following sections.

3.1.1 *Alternative #1 – "No Action"*

A "No Action" alternative signifies that no remediation activities would be implemented at the Site. The "No Action" alternative does not include a means for mitigating or eliminating potential exposure to contaminated groundwater or building materials both during and following redevelopment. Therefore, the potential for exposure continues to exist for future residents, commercial and Site workers, and visitors. This alternative does not meet the objectives of the project and therefore is not considered further.

3.1.2 *Alternative #2 – Building Demolition - Contaminant Removal and Disposal*

This alternative would be required in support of building demolition. This alternative would include abatement by removal of all ACM and removal and proper disposal of universal and hazardous wastes/building components. Lead-based paint would be left in place as it will be addressed during demolition and included in the bulk demolition debris. LBP would not require removal prior to demolition.

3.1.3 *Alternative #3 – Building Renovation - Contaminant Encapsulation*

This alternative would include the continued use of ACM in the Site buildings by properly enclosing it; encapsulating LBP with a paint cover system; continued use of universal/hazardous wastes/building components; and development and implementation of a Hazardous Building Material Management Plan (HBMMP) to ensure that hazardous building materials are managed properly in the future.

3.1.4 *Alternative #4 – Building Renovation - Hybrid Approach – Removal and Encapsulation*

This alternative would include abatement by removal and disposal of all ACM; encapsulation of LBP with a paint cover system; removal and disposal of all universal/hazardous wastes/building components; and development and implementation of a HBMMP to ensure that the encapsulated LBP is managed properly in the future.

3.1.5 Alternative #5 – Building Renovation - Hybrid Approach – Removal and Encapsulation

This alternative would include abatement by removal and disposal of all ACM; abatement/removal of LBP; removal and disposal of all universal/hazardous wastes/building components. This alternative would support residential reuse

4.0 COMPARISON OF CLEANUP ALTERNATIVES

The effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative. A discussion of these parameters and the four alternatives is presented below and summarized in Table 1.

4.1 Alternative #1 – "No Action"

The "No Action" alternative involves no remedial activities at the Site. This alternative is not effective in controlling the release of contaminants or achieving the goals of the project. This alternative was not considered further.

4.2 Alternative #2 – Building Demolition - Contaminant Removal and Disposal

4.2.1 Effectiveness

Once the COCs are remediated and taken off-site for disposal, the toxicity, mobility, and threat of exposure would be eliminated as this approach wholly eliminates the presence of COCs. LBP is left as it will be handled as part of the bulk demolition material and is not abated prior to demolition. This approach would also be considered highly effective because it is a permanent solution that eliminates exposure to future receptors. Therefore, this alternative would be considered the most effective and reliable of all of the alternatives.

4.2.2 Feasibility and Ease of Implementation

This alternative utilizes standard and proven remedial abatement techniques to remove COCs. Numerous area contractors are experienced in the necessary ACM abatement techniques; therefore, this alternative is technically feasible and is generally easily implementable. Removing LBP is not required under this alternative. This alternative should be considered if demolition meets the goals and objectives of the project.

4.2.3 Risk Reduction and Associated Benefits

This alternative fulfills the requirement for protection of human health and the environmental by permanently eliminating the risk of exposure to COCs. This alternative achieves a high level of risk reduction compared to the other alternatives because ACM and Universal waste are removed under this alternative. LBP is left on site to be managed during demolition.

4.2.4 Cost Effectiveness

Based on prior project experience and current estimates provided by Nobis, the approximate cost to completely abate ACM and universal and hazardous wastes/building materials is estimated as follows:

Abatement ACM	$ 172,000
Universal/hazardous waste removal	$ 25,000
Total	**$ 197,000**

This alternative leaves LBP as it will be handled during demolition. If the building is to be demolished then complete abatement of LBP is not required.

4.3 Alternative #3 – Building Renovation - Contaminant Encapsulation

4.3.1 Effectiveness

Encapsulation of the ACM and LBP would be effective and reliable at preventing exposure to current and future receptors at the Site; however, this alternative does not reduce the volume or toxicity of the COCs at the Site. In addition, a mechanical means of encapsulating or enclosing certain universal and/or hazardous wastes may not be effective because the associated exposure risks may remain (e.g. volatile organic compound releases from drums). In addition, enclosing tanks, boilers, and other bulky equipment in place would limit the amount of room available for redevelopment in these areas. As such, this alternative is not wholly compatible with Site redevelopment plans and this alternative is only partially effective and reliable.

4.3.2 Feasibility and Ease of Implementation

This alternative would use standard and proven encapsulation and enclosure techniques to manage COCs in-place. For management of ACM and LBP in place, numerous area contractors are experienced in encapsulation techniques; therefore, this alternative is technically feasible and is easily implementable. However, encapsulating certain universal and hazardous wastes may not be technically feasible or allowed from a regulatory perspective.

Additionally, encapsulation of ACM would require a HBMMP. Encapsulation of PCBs requires a notice to be placed on the deeds. Both of these measures therefore require additional work after the initial encapsulation phase is complete.

4.3.3 Risk Reduction and Associated Benefits

For ACM and LBP encapsulation, this alternative is protective of human health and the environmental requirement by reducing, but not permanently eliminating, the risks posed by human exposure to the identified contaminants. In some instances, such as encapsulation of PCBs, a deed restriction is required for the property. Therefore, this alternative does not reduce risk as effectively as other alternatives under consideration.

4.3.4 Cost Effectiveness

Based on prior project experience and current estimates provided by Nobis, the approximate cost to completely encapsulate/enclose the ACM, LBP and universal and hazardous wastes/building materials are estimated as follows:

Encapsulation of ACM	$100,000
Encapsulation of Universal/hazardous Waste	$ 50,000
Encapsulation of LBP	$150,000
HBMMP development	$ 5,000
Total	**$305,000**

This alternative is the most cost effective of all the alternatives. This cost does not include the cost of a deed notice if PCBs are encapsulated and left in place, or future HBMMP costs to inspect and maintain the encapsulation.

4.4 Alternative #4 – Building Renovation - Hybrid Approach – Removal and Encapsulation

4.4.1 Effectiveness and Reliability

Under this alternative, ACM and universal/hazardous waste would be removed and disposed of at a licensed facility. LBP would be encapsulated in those areas slated for renovation and removed (as part of the bulk demolition materials) where full demolition is proposed. This method would eliminate the toxicity, mobility, and volume of ACM and universal and hazardous wastes. This alternative also permanently prevents exposure to ACM and universal and hazardous wastes by future receptors. For LBP in areas slated for renovation, this alternative will not reduce volume or toxicity but will reduce its mobility by containing the LBP in place under the encapsulating barrier. This alternative assumes that encapsulated LBP is appropriately managed under a HBMMP. Therefore, this alternative is considered highly effective and reliable.

4.4.2 Feasibility and Ease of Implementation

This alternative would use standard and proven techniques for both ACM/hazardous waste removal and LBP encapsulation. Numerous area contractors are experienced in the necessary abatement techniques; therefore, this alternative is technically feasible and easily implementable.

4.4.3 Risk Reduction and Associated Benefits

This alternative is protective of human health and the environmental by permanently eliminating the risk of exposure to ACM and universal and hazardous wastes, and reducing the risk of exposure to LBP.

4.4.4 Cost Effectiveness

Based on prior project and contractor experience and current estimates received from contractors, the approximate cost to implement this alternative is as follows:

Abatement by removal of ACM	$172,000
Universal/hazardous waste removal	$ 25,000
Encapsulation of LBP	$150,000
HBMMP development	$ 5,000
Total	**$352,000**

This cost does not include the cost of a deed notice if PCBs are encapsulated and left in place, or future HBMMP costs to inspect and maintain the encapsulation.

4.5 Alternative #5 – Building Renovation - Contaminant Removal and Disposal

4.5.1 Effectiveness

Once the COCs are remediated and taken off-site for disposal, the toxicity, mobility, and threat of exposure would be eliminated as this approach wholly eliminates the presence of COCs. LBP is abated prior to renovation. This approach would also be considered highly effective because it is a permanent solution that eliminates exposure to future receptors. Therefore, this alternative would be considered the most effective and reliable of all of the alternatives.

4.5.2 Feasibility and Ease of Implementation

This alternative utilizes standard and proven remedial abatement techniques to remove COCs. Numerous area contractors are experienced in the necessary ACM abatement techniques; therefore, this alternative is technically feasible and is generally easily implementable. Removing LBP is also feasible, however it is a costly and time intensive operation. For this reason, this alternative should be considered the least feasible of all the alternatives except "No Action".

4.5.3 Risk Reduction and Associated Benefits

This alternative fulfills the requirement for protection of human health and the environmental by permanently eliminating the risk of exposure to COCs. This alternative achieves the highest level of risk reduction compared to the other alternatives because all COCs are removed under this alternative.

4.5.4 Cost Effectiveness

Based on prior project experience and current estimates provided by Nobis, the approximate cost to completely abate ACM, LBP and universal and hazardous wastes/building materials is estimated as follows:

Abatement ACM	$ 172,000
Abatement of LBP	$1,200,000
Universal/hazardous waste removal	$ 25,000
Total	**$1,397,000**

This alternative is the most costly of all the alternatives because the abatement of LBP from building structures is extremely costly.

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5.0 RECOMMENDED CLEANUP ALTERNATIVE

The recommended cleanup alternative is either Alternative #2 – Contaminant Removal and Disposal (if the buildings are to be demolished), or if renovation is proposed, Alternative #4 - the Hybrid Approach. Alternatives #2 and #4 effectively meet the goals and objectives of the cleanup, are compatible with the future redevelopment of the Site and allow the most flexibility to support future redevelopment alternatives.

If the City decides to demolish the buildings then Alternative #2 is most advantageous. For building renovation and reuse, alternative #4 allows for either demolition or flexibility between renovation and demolition and includes both encapsulation/enclosure and removal and disposal alternatives. While cost is not the primary driver in the selection, this alternative is also advantageous from a cost perspective as it is relatively low cost, when compared to the alternative for contaminant removal and disposal.

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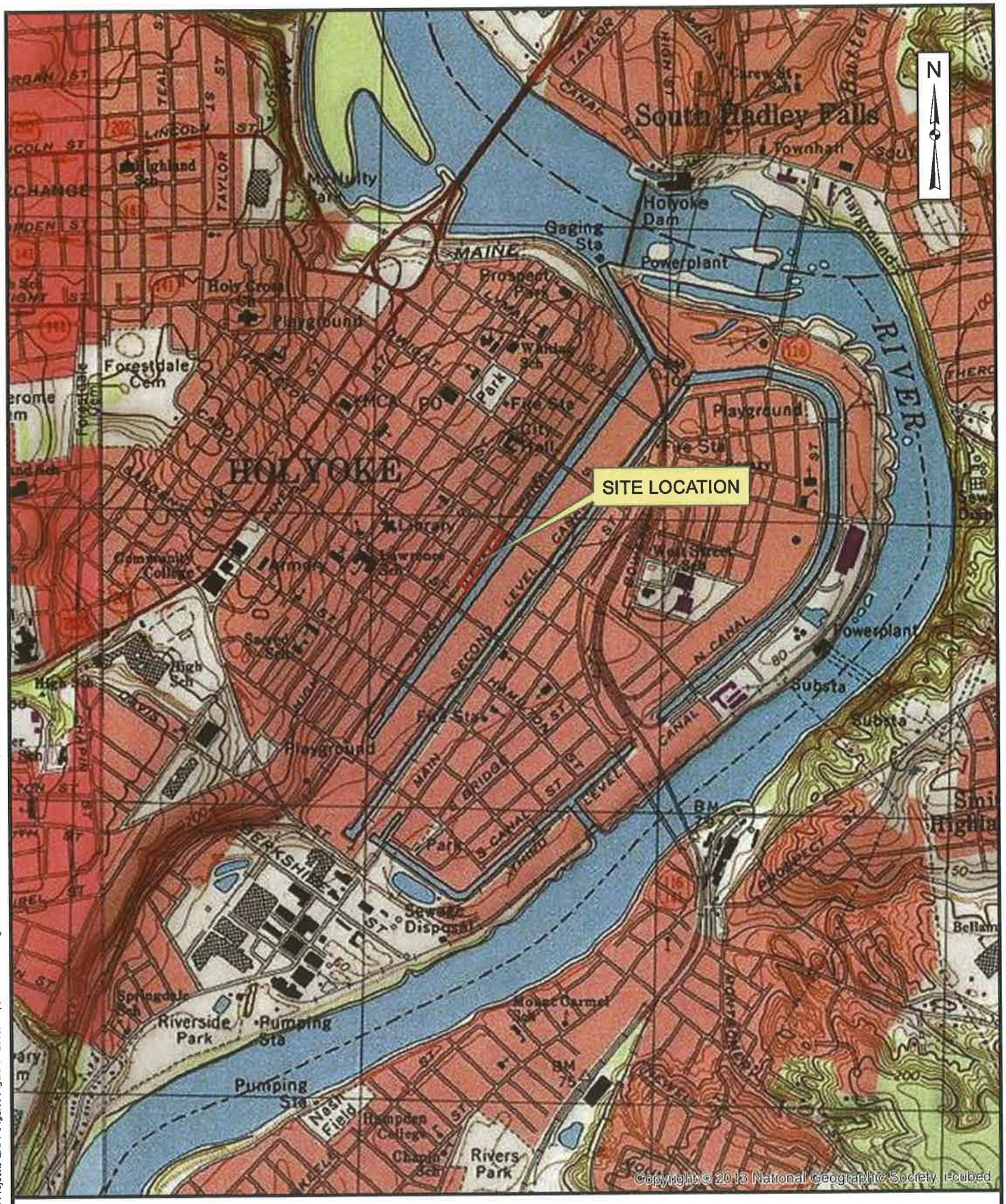

FIGURE 1
FORMER HART WOOL COMBING SITE
216 APPLETON STREET (FORMERLY 130 APPLETON STREET)
HOLYOKE, MASSACHUSETTS

LOCUS MAP

0 2,000 4,000 Feet

Weston&Sampson

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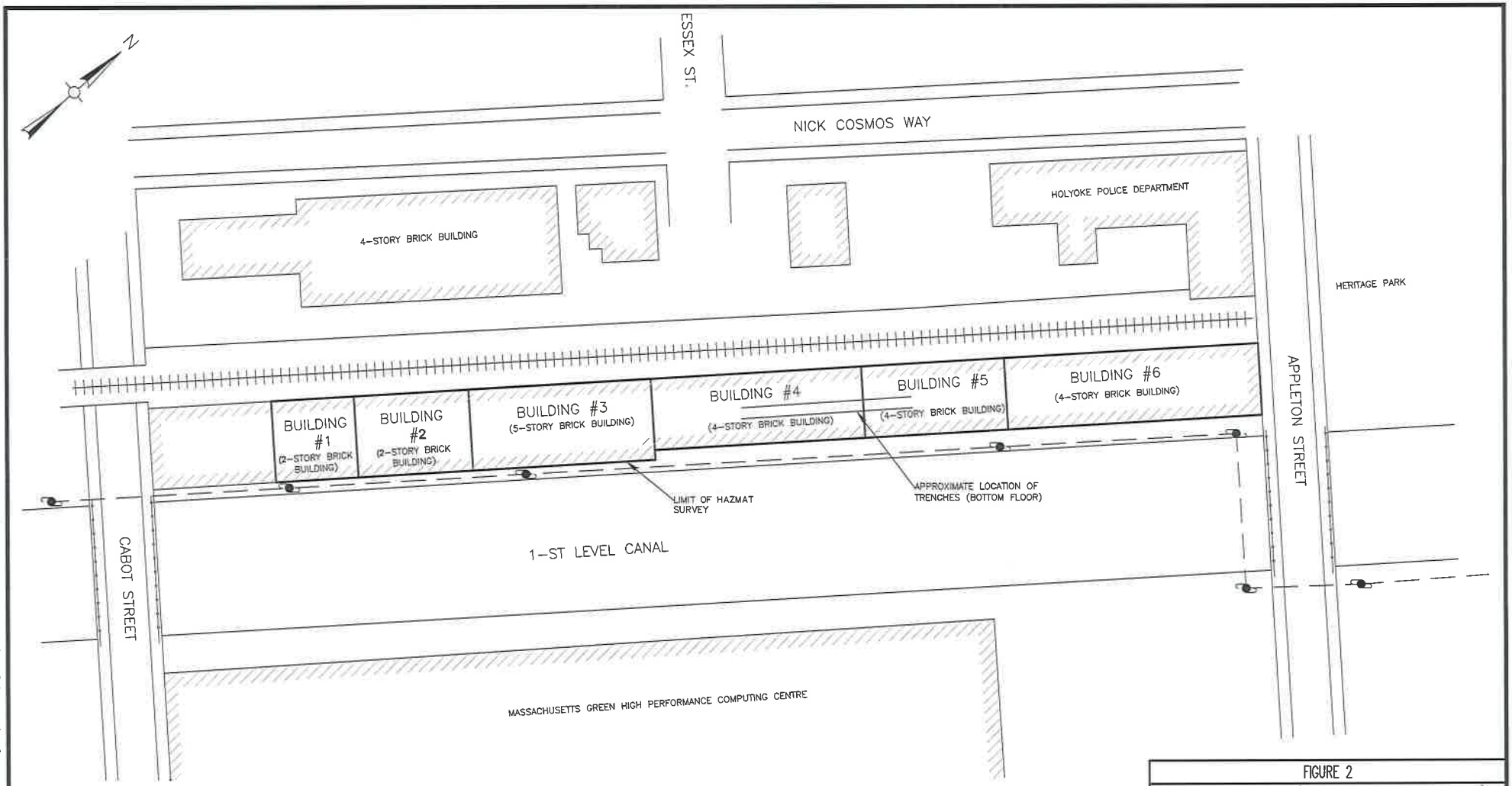

LEGEND

OVERHEAD WIRE

RAILROAD TRACKS

NOTES

THIS SITE PLAN WAS BASED ON INFORMATION TAKEN FROM PREVUIOUS SURVEYS MADE BY NOBIS AND TIGHE&BOND.

FIGURE 2

216 APPLETON STREET (FORMERLY 130 APPLETON STREET)
HOLYOKE, MASSACHUSETTS

SITE PLAN
HART WOOL COMBING

DESIGNED BY:	SQ	CHECKED BY:	LEM	DATE:	FEBRUARY 2014

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TABLE 1
COMPARISON OF REMEDIAL ALTERNATIVES

EVALUATION CRITERIA	Alternative #1 NO ACTION	Alternative #2 DEMOLITION - REMOVAL & DISPOSAL	Alternative #3 RENOVATION – ENCAPSULATION/ ENCLOSURE	Alternative #4 RENOVATION - HYBRID – REMOVAL & ENCAPSULATION	Alternative #5 RENOVATION – REMOVAL & DISPOSAL
Effectiveness & Reliability	Not Effective or reliable.	Effective and reliable as a long-term permanent solution.	Effective and reliable for ACM & LBP, but potentially not for universal and hazardous wastes (UW/HW). Long-term maintenance is required.	Effective and reliable as a long-term permanent solution. Long-term maintenance is required.	Effective and reliable as a long-term permanent solution.
Feasibility & Ease of Implementation	Not feasible but easily implementable.	Utilizes standard construction, remedial, and abatement control techniques.	ACM & LBP encapsulation utilizes standard construction and remedial techniques. However, addressing UW/HW may require specialty	Utilizes standard construction and remedial techniques.	Utilizes standard construction, remedial, and abatement control techniques. Very time intensive work making it less desirable.
Risk Reduction	No reduction in risks to human health and the environment. No reduction in contaminant mobility or toxicity.	Risk to human health by exposure to COCs is eliminated by removing the contaminant source. LBP left in place to be handled during building demolition.	Risk to human health by exposure is reduced for ACM and LPB, but not permanently eliminated. Reductions in contaminant mobility but not toxicity. May also not reduce human health risk to some UW/HW.	Risk to human health by exposure to ACM and UW/HW is eliminated by removing source. Risk to human health by exposure to LBP is reduced. Encapsulating LBP reduces contaminant mobility but not toxicity.	Risk to human health by exposure to COCs is eliminated by removing the contaminant source.
Year 2014 Costs	No Cost	$197,000	$305,000	$352,000	$1,397,000
Time to Reach "No Further Action"	Will not be achieved	2 to 3 Months	3 to 6 Months	3 to 6 Months	12 to 18 Months
Comments	Does not address risk to human health or the environment.	**Recommended Alternative for Disposal**	Not feasible because it may not reduce exposure risk to UW/HW.	**Recommended Alternative for Renovation**	**Not Recommended**