

DRAFT

Analysis of Brownfields
Cleanup Alternatives (ABCA)
Preliminary Evaluation

Ball Square Station Site
Boston Avenue and Broadway
Somerville and Medford,
Massachusetts

Massachusetts DEP
Release Tracking Numbers:

Prepared by
Massachusetts Bay Transportation
Authority
10 Park Plaza
Boston, Massachusetts

December 6, 2016

Table of Contents

<i>List of Tables</i>	Error! Bookmark not defined.
<i>List of Figures</i>	<i>i</i>
<i>List of Appendices</i>	<i>ii</i>
Section 1: Introduction and Background	1
1.1 Site Location	1
1.1.1 Forecasted Climate Conditions	1
1.2 Previous Site Use(s) and Any Previous Cleanup/ Remediation	2
1.2.1 20 Third Avenue, Somerville, Massachusetts	2
1.2.2 44-48 Third Avenue, Somerville, Massachusetts	2
1.3 Site Assessment Findings	4
1.3.1 20 Third Avenue, Somerville, Massachusetts	Error! Bookmark not defined.
1.3.2 44-48 Third Avenue, Somerville, Massachusetts	Error! Bookmark not defin
1.4 Project Goal (Site Reuse Plan).....	5
Section 2: Applicable Regulations and Cleanup Standards	6
2.1 Cleanup Oversight Responsibility	6
2.2 Cleanup Standards for Major Contaminants.....	6
2.3 Laws and Regulations Applicable to the Cleanup.....	6
Section 3: Cleanup Alternatives	7
3.1 Cleanup Alternatives Considered	7
3.2 Evaluation of Cleanup Alternatives.....	7
3.2.1 Effectiveness – Including Climate Change Considerations.....	7
3.2.2 Implementability	7
3.2.3 Cost	8
3.3 Recommended Cleanup Alternative	9
3.4 Green and Sustainable Remediation Measures for Selected Alternative	9
<i>References</i>	10

List of Figures

- 1 Site Location Plan

Table of Contents (cont'd)

List of Appendices

- A US Global Change Research Program (USGCRP) Climate Trends for the Northeast Region
- B FEMA Flood Zone Map

Section 1: Introduction and Background

1.1 Site Location

The Massachusetts Bay Transportation Authority (MBTA) has acquired five parcels in Somerville and Medford for the development of a new train station as part of the planned Greenline Extension light rail project (GLX). The properties are located at the following addresses:

- 0 Boston Ave, Somerville/Off Broadway, Medford
- 675 Broadway, Somerville/0 Broadway, Medford
- 662 Boston Avenue, Medford/664 Boston Avenue, Somerville
- 646 Boston Avenue, Medford
- 642 Boston Avenue, Medford

These parcels are referred to collectively as “the Site”. A Site Location Plan is presented as Figure 1.

1.1.1 Forecasted Climate Conditions

According to the US Global Change Research Program (USGCRP), climate trends for the northeast region of the United States include increased temperatures, increased precipitation with greater variability, increased extreme precipitation events, and rises in sea level (see attached summary included in Attachment A). Some of these factors, most specifically increased precipitation that may affect flood waters and stormwater runoff, are most applicable to the cleanup of the site.

According to FEMA Flood Zone Map 25017C0438E, the Site is located within a Zone X of the Mystic River (see Attachment B), where minimal flooding is expected. However, greater storm frequency and intensity in a changing climate may result in more frequent and more powerful flood waters within the Mystic River, which may result in changes to the flood zone and increased risk of flooding of the Site.

The Site does not currently receive stormwater discharge from the adjacent properties. Under current Site conditions, increased precipitation and extreme weather could result in additional stormwater runoff and potential erosion to the Site from the roof stormwater collection systems associated with the onsite structures, as well as the mostly impermeable parking lot area surrounding the structures.

Based on the nature of the Site and its proposed reuse, changing temperature, rising sea levels, wildfires, changing dates of ground thaw/freezing, changing ecological zone, saltwater intrusion and changing groundwater table are not likely to significantly affect the Site.

1.2 Previous Site Use(s) and Any Previous Cleanup/ Remediation

The Site includes five parcels of land in Somerville and Medford, Massachusetts:

- 0 Boston Ave, Somerville/Off Broadway, Medford
- 675 Broadway, Somerville/0 Broadway, Medford
- 662 Boston Avenue, Medford/664 Boston Avenue, Somerville
- 646 Boston Avenue, Medford
- 642 Boston Avenue, Medford

This area is industrial zoned and has over 100 years of commercial and industrial use including such uses as a railroad station, coal storage facility, automobile and motorcycle repair shops, and even a bowling alley.

1.2.1 0 Boston Ave, Somerville/Off Broadway, Medford

The 3,250 square foot parcel is currently vacant. North Somerville Railroad Station was located at the site from at least 1910 to 1971. Automotive service facilities and gasoline stations with petroleum storage have historically been located to the southeast and northwest of the parcel.

This is a relatively small parcel. There was no record of soil or groundwater assessments performed at this property, however, the MBTA worked with an environmental consultant to perform investigations at the abutting properties. These investigations are discussed in the following sections.

1.2.2 675 Broadway, Somerville/0 Broadway, Medford

A one-story office building is located on the northwest corner of the 11,546 square foot parcel. The office was formerly used as a veterinary practice and is currently used for storage of automobile parts and miscellaneous items (Sako Auto Body). The parcel has been developed with an office structure since at least 1910, and may have also been developed with a restaurant circa 1950. North Somerville Railroad Station was located on the parcel from at least 1910 to 1971. Automotive service facilities and gasoline stations with petroleum storage have historically been located southeast and northwest.

In March 2011, the MBTA worked with an environmental consultant to advance four soil borings) within the paved portion of the Site. Soil samples were collected and submitted for laboratory analysis of metals, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), volatile petroleum hydrocarbons (VPH) and/or extractable petroleum hydrocarbons (EPH). Polycyclic aromatic hydrocarbons (PAHs) were detected above Massachusetts Contingency Plan (MCP) RCS-1 Reportable Concentrations (RCs) in soil samples collected from two boring locations. Nickel was detected above RCS-1 in one soil sample. In addition, fill

material containing coal and brick was observed during drilling activities at the Site. The MBTA acquired the property on March 22, 2014. As the property owner, the MBTA notified the Massachusetts Department of Environmental Protection (MassDEP) of the reportable conditions on July 17, 2015. MassDEP assigned Release Tracking Number 3-32975 to the Site. The notification linked this release to a Special Project Designation (SPD) RTN (3-30620) that covers multiple MCP release sites along the GLX project.

1.2.3 662-664 Boston Avenue, Medford

This 12,449 square foot parcel is occupied by two commercial operations located in two adjacent buildings. Ball Square Auto Repair is located on the parcel with an address of 664 Boston Avenue. A bowling alley is located on the parcel at 662 Boston Avenue. The parcel has been developed since 1910, although records of historical uses were not complete. An underground storage tank (UST) was reportedly located at the 664 Boston Avenue property as early as 1934; however, no closure documentation regarding this UST was identified.

In 2011, the MBTA worked with an environmental consultant to collect soil and groundwater samples on the 646 Boston Avenue property as part of the GLX project assessment. Concentrations of lead and PAHs were detected above RCs in two samples of fill material collected from 0 – 2 feet below ground surface (bgs). Dissolved lead and C5-C8 aliphatics were detected in groundwater in two monitoring wells at concentrations exceeding RCs. The MassDEP was notified of these concentrations on July 17, 2015. MassDEP assigned RTN 3-30612 to the Site. The notification linked this release to the SPD (RTN 3-30610) that covers multiple MCP release sites along the GLX project.

1.2.4 646 Boston Avenue, Medford

The 8,991 square foot parcel is currently used for automotive body repair and painting services. The property has operated as an automotive repair shop and/or sales business since at least 1930 and may have operated as a garage for a coal company in approximately 1911.

This is a relatively small parcel. There was no record of soil or groundwater assessments performed at this property, however, the MBTA worked with an environmental consultant to perform investigations at the abutting properties, including 662 Boston Avenue. These investigations are discussed in the previous sections.

1.2.5 642 Boston Avenue, Medford

The 3,193 square foot parcel is currently used as an extension of an automobile body repair shop (Sako). Prior to the automobile repair, the parcel was reportedly used as a motorcycle repair shop. The property has operated as an automotive and/or motorcycle repair shop since at least 1930 and may have operated as a coal company in approximately 1911.

This is a relatively small parcel. There was no record of soil or groundwater assessments performed at this property, however, the MBTA worked with an environmental consultant to perform investigations at the property located at 662 Boston Avenue (located approximate 110 feet to the southeast). These investigations are discussed in Section 1.2.3.

1.3 Site Assessment Findings

1.3.1 0 Boston Ave, Somerville/Off Broadway, Medford

Prior to taking ownership of the parcel, the MBTA hired Kleinfelder, Inc. (Kleinfelder) to prepare an ASTM Phase I Report for the property, dated February 28, 2014. The ASTM Phase I Report identified the following Recognized Environmental Concerns (RECs) for the Site: 1) the presence of soil and groundwater impacts on immediately adjacent properties (675 Broadway); 2) the historical use of the property as a railroad, 3) historical use and storage of oil and hazardous material (OHM) at the Site; 4) historical industrial property use; 5) historical releases and ongoing gasoline station operations at an property located approximately 310 feet to the southwest of the Site (620 Broadway); 6) an unlabeled 35-gallon drum observed at the Site; and 7) a CREC related to a historical release that was remediated at Ball Square Medical Center (former Knox Dodge) located at 643-645 Broadway.

1.3.2 675 Broadway, Somerville/0 Broadway, Medford

Prior to taking ownership of the parcel, the MBTA hired Kleinfelder to prepare an ASTM Phase I Report for the property, dated February 28, 2014. The ASTM Phase I Report identified the following RECs for the Site: 1) the presence of soil and groundwater impacts including PAH, nickel, and lead in soil and dissolved lead in groundwater; 2) the historical use of the property as a railroad; 3) historical use and storage of OHM at the abutting property (664 Boston Avenue); 4) historical releases and ongoing gasoline station operations at an property located approximately 350 feet to the southwest of the Site (620 Broadway); and 5) a CREC related to a historical release that was remediated at Ball Square Medical Center (former Knox Dodge) located at 643-645 Broadway.

1.3.3 662 Boston Avenue, Medford

Prior to taking ownership of the parcel, the MBTA hired Kleinfelder to prepare an ASTM Phase I Report for the property, dated March 28, 2014. The ASTM Phase I Report identified the following RECs for the Site: 1) Concentrations of lead and PAHs in soil and dissolved lead and C5-C8 aliphatics detected in groundwater; 2) historical use and storage of OHM at the abutting property (664 Boston Avenue); 3) the potential storage of OHM at the property (UST fill and vent pipes observed); 4) the presence of soil and groundwater impacts at an abutting property including PAH, nickel, and lead in soil and dissolved lead in groundwater (675 Broadway); and 5) historical use and storage of OHM at the abutting property (646 Boston Avenue); 6) historical releases and ongoing gasoline station operations at an property located approximately 620 feet to the southeast of the Site (620 Broadway)the historical use of the property as a railroad, and; 7) a CREC related to a historical release that was remediated at Ball Square Medical Center (former Knox Dodge) located at 643-645 Broadway.

1.3.4 646 Boston Avenue, Medford

Prior to taking ownership of the parcel, the MBTA hired Kleinfelder to prepare an ASTM Phase I Report for the property, dated February 28, 2014. The ASTM Phase I Report identified the following RECs for the Site: 1) historical use of the property for automobile repair and related storage and use of OHM; 2) concentrations of lead and PAHs in soil and dissolved lead and C5-C8 aliphatics detected in groundwater at an abutting property (664 Boston Avenue); 3) the historical use of the property as a railroad; 4) historical use and storage of OHM at the property located approximately 60 feet to the southeast (664 Boston Avenue); 5) historical releases and ongoing gasoline station operations at a property located approximately 600 feet to the southeast of the Site (620 Broadway) and; 6) a CREC related to a historical release that was remediated at Ball Square Medical Center (former Knox Dodge) located at 643-645 Broadway.

1.3.5 642 Boston Avenue, Medford

Prior to taking ownership of the parcel, the MBTA hired Kleinfelder to prepare an ASTM Phase I Report for the property, dated March 27, 2014. The ASTM Phase I Report identified the following RECs for the Site: 1) current use of the property for automobile repair and related storage and use of OHM; 2) concentrations of lead and PAHs in soil and dissolved lead and C5-C8 aliphatics detected in groundwater at an abutting property (664 Boston Avenue); 3) the historical use of the property as a railroad; 4) historical use and storage of OHM at the property located approximately 170 feet to the southeast (664 Boston Avenue); 5) historical releases and ongoing gasoline station operations at a property located approximately 720 feet to the southeast of the Site (620 Broadway) and; 6) a CREC related to a historical release that was remediated at Ball Square Medical Center (former Knox Dodge) located at 643-645 Broadway.

1.4 Project Goal (Site Reuse Plan)

The five parcels will be redeveloped as an MBTA Green Line Extension (GLX) light rail station—Ball Square Station. The GLX will provide fast, reliable, and affordable transportation for area residents to get to work and other places. The new light rail system will also lead to the revitalization of these areas of Somerville with new Transit Oriented Development (TOD) projects. These TOD projects provide the extended benefit of a sustainable work, live, and play community that is interconnected to other communities. Additional benefits of a TOD project typically include improved quality of life and increased economic vitality and jobs. New light rail service will also provide direct environmental benefits by reducing the number of buses and cars on the road. The GLX project has local, state and federal support.

Section 2: Applicable Regulations and Cleanup Standards

2.1 Cleanup Oversight Responsibility

The cleanup will be overseen by a Massachusetts Licensed Site Professional (LSP) under the MassDEP regulations. In addition, all documents prepared for this site will be submitted to the MassDEP under Release Tracking Numbers 3-32975 and 3-30612.

2.2 Cleanup Standards for Major Contaminants

The MBTA currently anticipates that the MassDEP MCP Method 1 standards applicable for non-residential use (children present at low frequency and low intensity) will be used as the cleanup standards for these parcels. However, the contaminated soil that is excavated as part of site redevelopment, including foundations, footings, utilities, etc. will need to be managed as “remediation waste”.

2.3 Laws and Regulations Applicable to the Cleanup

The laws and regulations that are applicable to this cleanup include the MassDEP Massachusetts Contingency Plan and City of Somerville local by-laws. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. In addition, all appropriate permits (e.g., DigSafe, soil transport/disposal manifests) will be obtained prior to the work commencing.

Section 3: Cleanup Alternatives

3.1 Cleanup Alternatives Considered

To address contamination at the Site, three different alternatives were considered, including Alternative #1: No Action, Alternative #2: Comprehensive Soil Excavation, and Alternative #3: Limited Soil Excavation with Engineered Barriers.

3.2 Evaluation of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative.

3.2.1 Effectiveness – Including Climate Change Considerations

- Alternative #1: No Action is not an effective alternative to control or prevent the exposure of Site contamination to receptors.
- Alternative #2: Comprehensive soil excavation is an effective way to prevent exposure to contaminated soils since contamination will be removed and the exposure pathways will no longer exist. This measure would eliminate direct contact risk for future employees, residents, trespassers, and/or utility workers at the Site.
- Alternative #3: Limited soil excavation with engineered barriers is an effective way to limit exposure to contaminated soils at the Site. In addition, an institutional control (land use restriction) would need to be recorded on the deed to maintain the engineered barriers and prevent the future residential use of the property (in order to meet the objective of eliminating the direct contact pathway for residents).

General Climate Consideration Notes:

As discussed in Section 1.1, the redevelopment of the GLX corridor involves system-wide stormwater drainage improvements. Therefore, the stormwater management at the Site will be able to accommodate increased stormwater runoff volume and rates related to predicted, increased storm intensity. Alternative #1 (No Action) will be difficult to implement at the Site along with drainage improvements because soil will need to be excavated to install stormwater management features. Alternatives #2 and #3 would support these drainage improvements at the Site.

3.2.2 Implementability

- Alternative #1: No Action would be easy to implement since no actions would be performed.

- Alternative #2: Comprehensive excavation and off-site disposal of soil would be relatively easy to implement. During cleanup activities and short-term disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated. However, given the industrial/commercial nature of the surrounding properties, this disturbance to the community will be limited. Additionally, the soil contamination appears to be limited to historical fill material deposited in the top 2 to 8 feet which could be excavated across the Site, leaving native material at the Site for redevelopment. The shallow nature of these soils will limit the amount of dewatering necessary. By removing all of the fill material at the Site, the remediation activities can be completed independent of the redevelopment activities.
- Alternative #3: Limited excavation and off-site disposal of soil will be moderately difficult to implement. During cleanup activities and short-term disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated. However, given the industrial/commercial nature of the surrounding properties, this disturbance to the community will be limited. The shallow nature of these soils will limit the amount of dewatering necessary. Additionally, the volumes of soil will be limited to areas where soil will need to be excavated to support future construction activities. This alternative takes planning and coordination with redevelopment activities to limit exposure of the impacted-soils left in-place with the placement of buildings and/or paved drives and parking.

3.2.3 Cost

- There would be no costs associated with Alternative #1: No Action.
- Alternative #2: The cost of comprehensive soil excavation with engineered barriers would be high. The area of the five parcels is 39,500 square feet. Excavating the top 8-feet of fill material would generate approximately 12,000 cubic yards of material for offsite disposal. At an average cost of \$50 per cubic yard, the cost to excavate, transport, and dispose of this volume of soil would be approximately \$600,000. Preliminary planning, assessment, and characterization are estimated at \$90,000. The costs for coordinating engineered barriers, preparing a land use deed restriction, and filing the remediation submittals would be an additional \$75,000 for a total estimated cost of \$765,000.
- Alternative #3: Limited soil excavation with engineered barriers and a land use deed restriction is estimated to a more cost-effective option. Approximately 20% of the property will need to be excavated to support the construction of drainage, subsurface utilities, footings, foundations, etc. Therefore the cost of disposing 2,400 cubic yards of material for offsite disposal is estimated to be approximately \$120,000. Preliminary planning, assessment, and characterization are estimated at \$90,000. The costs for coordinating engineered barriers, preparing a land use deed restriction, and filing the remediation submittals would be an additional \$75,000 for a total estimated cost of \$385,000.

3.3 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #3: Limited soil excavation with engineered barriers and a land use deed restriction. Alternative #1: No Action is not a recommended alternative because it does not address the risk of exposure to Site contamination. Alternative #2: Comprehensive excavation and offsite disposal would address exposure risks but is cost-prohibitive (more than twice the cost of Alternative #3). Alternative #3 will also be able to be implemented for a shorter duration and with less disruption to the community.

Alternative #3: Limited soil excavation with engineered barriers and a land use deed restriction.

3.4 Green and Sustainable Remediation Measures for Selected Alternative

To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort.

By leaving a majority of the impacted-soils on-Site there will be less of a carbon footprint involved with transportation of soils. There will also be less material taking up space in a landfill or other disposal facility. The MBTA will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The excavation work will be performed during the dry-weather months, if possible, to minimize groundwater infiltration into the excavation area, in turn reducing dewatering needs and the amount of dewatering liquids requiring disposal/treatment. The number of mobilizations to the Site would be minimized and erosion control measures would be used to minimize runoff into environmentally sensitive areas. In addition, the MBTA plans to ask bidding cleanup contractors to propose additional green remediation techniques in their response to the Request for Proposals for the cleanup contract.

References

1. 662 and 664 Boston Ave Phase 1 Environmental Site Assessment, Kleinfelder, 28 March 2014
2. 646 Boston Ave Phase 1 Environmental Site Assessment, Kleinfelder, 28 February 2014
3. 0 Boston Ave Phase 1 Environmental Site Assessment, Kleinfelder, 28 February 2014
4. 675 Broadway Ave Phase 1 Environmental Site Assessment, Kleinfelder, 18 March 2014
5. 642 Boston Ave Phase 1 Environmental Site Assessment, Kleinfelder, 27 March 2014