SOUTH STATION
EXPANSION

South Station Expansion Project

Appendix 7 – Water Quality and Stormwater Technical Report

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massDOT
Massachusetts Department of Transportation

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1. Introduction

The Massachusetts Department of Transportation (MassDOT), the Massachusetts Bay Transportation Authority (MBTA), and the National Railroad Passenger Corporation (Amtrak) have for decades identified the expansion of rail capacity at Boston South Station as a crucial transportation need, one that has been articulated in multiple local, regional, state, and Northeast Corridor (NEC)-wide planning documents.[1] In cooperation with the Federal Railroad Administration (FRA), Amtrak, and the MBTA, MassDOT is now pursuing the expansion of South Station to support existing NEC and commuter rail services and to provide for future Amtrak and MBTA service expansions. The current track capacity, layout, and operations of South Station limit the ability to accommodate projected future expanded services. In addition to expanding South Station terminal facilities, the South Station Expansion (SSX) project will also identify a solution to address existing and future intercity and commuter rail service layover needs. The SSX project includes planning, environmental reviews, and preliminary engineering for the five primary elements of the project:

1. **Expand the South Station terminal facilities**, including the addition of up to seven tracks and four platforms and construction of a new passenger concourse and other amenities.
2. **Acquire and demolish the U.S. Postal Service (USPS) General Mail Facility** located on Dorchester Avenue adjacent to South Station, which will provide an approximately 14-acre site on which to expand South Station. (Note that the relocation of the USPS facility will be the subject of a separate environmental review process by others.) Dorchester Avenue will be restored for public and station access.
3. **Create an extension of the Harborwalk along reopened Dorchester Avenue.**
4. **Provide for the possibility of future joint public/private development** adjacent to and over an expanded South Station.
5. **Provide adequate rail vehicle layover space** to address existing and future intercity and commuter rail service needs.

This Water Quality and Stormwater Technical Report has been prepared in support of the Draft Environmental Impact Report (Draft EIR) and Environmental Assessment (EA) for the SSX project, in accordance with the Certificate of the Secretary of the Office of Energy and Environmental Affairs (EEA) on the Environmental Notification Form (ENF) for the SSX project (April 19, 2013), the Massachusetts Environmental Policy Act (MEPA) regulations, 301 Code of Massachusetts Regulation (CMR) 11.00 (revised, May 10, 2013), and FRA's Procedures for Considering Environmental Impacts, 64 Federal Register (FR) 101 (26 May 1999), pp. 28545-28556.

2. Summary of Findings

This report evaluates the impacts of the SSX project on water resources adjacent to the project sites.

Build Alternatives at the South Station site and the layover facility sites generally would result in minimal impacts on water resources. No drinking water supplies exist within the project study areas. The South

[1] Documents citing the need for an expanded South Station include: *Critical Infrastructure Needs on the Northeast Corridor* (2013), *The Northeast Corridor Infrastructure Master Plan* (2010); *The Amtrak Vision for High-Speed Rail in the Northeast Corridor* (2010), *A Vision for the Northeast Corridor* (2012), the Massachusetts Department of Transportation *Rail Plan* (2010), the Massachusetts Department of Transportation *Freight Plan* (2010), and the two most recent long range transportation plans of the Boston Region Metropolitan Planning Organization (2007, 2011).

Station site would have decreased impervious cover in the Build Alternatives in comparison to the No Build Alternative. The impervious cover on the site would decrease from 99% in the No Build Alternative to 94% in the Build Alternatives. As a result, there would be a reduction in peak stormwater rates and volumes in comparison to the No Build Alternative. Because the peak flow rates and runoff volume in the Build Alternatives would be lower than the No Build Alternative rates and volume, it is anticipated that the existing drainage infrastructure would be sufficient to handle stormwater associated with the Build Alternatives. Stormwater management best management practices (BMPs) would be installed where feasible at the South Station site to improve water quality and to comply with the MassDOT Complete Streets guidelines, the City of Boston Complete Streets guidelines, and MassDEP stormwater management regulations. No new discharges and no impacts to the surface water quality of Fort Point Channel would result from the project. Stormwater mitigation is discussed in Section 7.1 of this technical report.

Stormwater runoff from the additional platform area, the expanded concourse, the joint development, and Dorchester Avenue would ultimately discharge to Fort Point Channel. As discussed in Section 5.1.1, Fort Point Channel is within the Boston Inner Harbor which is classified as a Class SB, Category 5 impaired water body. Some of the outfalls to be utilized could include combined sewer overflows (CSOs). Due to the little change in land use percentages and stormwater flows associated with the SSX project, as well as the anticipated tie-in location for the Dorchester Avenue stormwater downstream of the existing CSOs, it is anticipated that there would be no impact to the frequency or volume of overflows to Fort Point Channel or to the Boston Water and Sewer Commission (BWSC) system as a result of the SSX project.

Land use under existing conditions at each layover facility site is industrial or commercial and proposed conditions would not result in an increase in potential pollutant loading to nearby water bodies. Changes in land cover at Beacon Park Yard and Widett Circle in the Build Alternatives would include removing impervious cover and installing tracks and ballast, which would reduce the peak flow rates for stormwater runoff during most storm events. Stormwater BMPs at all layover sites would be installed, as necessary, to mitigate for the changes in stormwater runoff volume and to limit the impact from construction and layover facility operations on nearby water bodies.

All project sites would be constructed to conform with applicable federal, state, and local regulations. For all project sites, it is anticipated that construction activities will disturb greater than one acre of surface area and therefore require a National Pollutant Discharge Elimination System (NPDES) Construction General Permit during construction. Section 7.2 includes a discussion of construction time BMPs which would be implemented in compliance with the NPDES Construction General Permit. The South Station site and all three layover facility sites would be located on previously developed sites and would meet the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Standards. The South Station, Beacon Park Yard, and Widett Circle sites are considered redevelopment projects under the MassDEP Stormwater Standards. Readville – Yard 2 site would be considered new development under the MassDEP Stormwater Standards as the existing layover facility would be expanded to currently pervious area. The proposed development at each site was evaluated for compliance with state and federal regulations and with the requirements of the Secretary's Certificate on the ENF.

3. Regulatory Context

Water resource regulations pertaining to the SSX project include federal, state, and local regulations concerning surface waters, public drinking water sources, groundwater, and stormwater. This section describes the specific regulations considered in this analysis.

Section 404 of the federal Clean Water Act (CWA) [33 United States Code (USC) 1251-1376] regulates discharges of dredged or fill material into waters of the United States. The National Wild and Scenic

Rivers Act of 1968 (16 USC 1271 et seq.) preserves certain designated rivers with outstanding natural, cultural, and recreational values.

Section 401 of the federal CWA (33 USC 1251-1376), and the regulations that implement the Act, require the enhancement and protection of surface waters from pollution to ensure they are capable of supporting their designated uses. In accordance with the CWA, Massachusetts has adopted surface water quality standards that designate the most sensitive uses for which waters of the Commonwealth are to be enhanced, maintained, and protected. The Massachusetts Surface Water Quality Standards (314 CMR 4.00 et seq.) establishes classifications for inland and coastal waters and anti-degradation provisions to protect the waters of the Commonwealth. As required by the federal CWA, MassDEP has developed a listing of waterbodies in the state that do not meet the surface water quality standards set forth in the Act (CWA Sections 303d and 305b) and either have or will require the development of a total maximum daily load (TMDL) of known pollutants deemed threatening to the receiving water. The MassDEP 2012 Integrated List of Waters[2] (303d and 305b list) lists the status of water bodies reviewed against their designed use, and was approved by the U.S. Environmental Protection Agency (U.S. EPA) on November 16, 2011. The water bodies are assigned one of the following five categories:

1. Unimpaired and not threatened for all designated uses;

2. Unimpaired for some uses and not assessed for others;

3. Insufficient information to make assessments for any uses;

4. Impaired or threatened for one or more uses, but not requiring the calculation of a TMDL; or

5. Impaired or threatened for one or more uses and requiring a TMDL.

The Massachusetts Surface Water Quality Standards also protect certain existing surface waters such as those designated as Outstanding Resource Waters (ORWs) (314 CMR 4.04(3) and 314 CMR 4.05(3)) and Areas of Critical Environmental Concern (ACECs) (301 CMR 12.00). As defined in Designated Outstanding Resource Waters of Massachusetts 1995,[3] ORWs categorically include but are not limited to all Class A designated public water supplies, their tributaries and bordering vegetated wetlands, and certified vernal pools. Other waters designated as ORWs may include selected waters found in National Parks, State Forest and Parks, ACECs, or other waters based on their outstanding socio-economic, recreational, ecological, and/or aesthetic values.

MassDEP has developed a Stormwater Management Policy that includes Stormwater Management Standards (administered under the Massachusetts Wetlands Protection Act [310 CMR 10.05]). The Standards address both water quality (pollutants) and water quantity (flood control) by establishing the level of required controls that can be achieved through site planning, non-structural measures, and BMPs. The Massachusetts Water Management Act [Massachusetts General Law (M.G.L.) c.21G] regulates and registers water withdrawals across the state.

Under the CWA, the U.S. EPA in partnership with MassDEP administers the NPDES permit program, which regulates point source discharges to waters of the United States to control water pollution. The City

[2] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

[3] Massachusetts Department of Environmental Protection. Division of Watershed Management. *Designated Outstanding Resource Waters of Massachusetts,* 1995.

of Boston is authorized to discharge stormwater in accordance with the NPDES Municipal Separate Storm Sewer System (MS4) General Permit. The MS4 General Permit includes numerous requirements to improve stormwater management through public education, upgraded infrastructure, and municipal bylaws. The permit also requires cities to locate and correct any unauthorized sewage discharges into the stormwater system.

In compliance with the federal CWA, industrial activities where the U.S. EPA is the permitting authority are permitted to discharge stormwater to the waters of the United States if authorized under the NPDES Multi-Sector General Permit (MSGP). The NPDES MSGP regulates discharges from 29 industrial sectors where activities such as material handling and storage, vehicle repairs and fueling, and vehicle and equipment storage are exposed to stormwater. MSGPs generally require the development of a stormwater pollution prevention plan (SWPPP) and implementation of control measures to minimize the discharge of pollutants in runoff.

The Boston Redevelopment Authority (BRA) has developed a policy to protect groundwater resources in the City of Boston including mitigation (BRA Article 32).[4] The Groundwater Conservation Overlay District (GCOD) established under this policy requires that new projects within the regulated district ensure no reduction in groundwater levels and install measures to increase recharge of rainwater into the ground.

4. Methodology

Four sites are under consideration in the SSX project: the South Station site and three layover facility sites consisting of Widett Circle, Beacon Park Yard, and Readville – Yard 2. Figure 1 shows the location of the four SSX project sites. For the water resources and stormwater evaluation, the study area was defined as a one-half-mile radius around the four SSX project site boundaries. The boundaries for each site are shown in Figure 2, Figure 3, and Figure 4. The study areas for the South Station, Widett Circle layover facility and Beacon Park Yard layover facility sites are shown in Figure 5. The study area for the Readville – Yard 2 layover facility site is shown in Figure 6.

Existing water resources in the study areas for the South Station site and the three layover facility sites were identified through a desktop review. Various resource datalayers obtained from MassGIS[5] were used for this review. Section 5 of this report discusses the existing water resources at each site.

Each site was reviewed to estimate peak stormwater discharge rates and runoff volumes from the site to the respective receiving water under No Build and Build conditions. The Natural Resource Conservation Service (NRCS) runoff curve number (CN) and unit hydrograph methods were used to calculate rainfall runoff response for storm events with recurrence intervals of 2, 10, 50, and 100 years. Rainfall depths for the 24-hour storm were used for this evaluation based on the Northeast Regional Climate Center data for the City of Boston.[6] Area-weighted average curve numbers for No Build and Build conditions were determined using curve numbers presented in U.S. Department of Agriculture (USDA) NRCS Technical Release 55 (TR-55).[7] Table 1 shows runoff curve numbers for urban areas as presented in TR-55. This

[4] Boston Redevelopment Authority. *Article 32 Groundwater Conservation Overlay District.* 2006. http://www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article32.pdf.
[5] Massachusetts Office of Geographic Information. Available at: http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/
[6] Northeast Regional Climate Center. *Extreme Precipitation in New York & New England: An Interactive Web Tool for Extreme Precipitation Analysis.* http://precip.eas.cornell.edu/.
[7] U.S. Department of Agriculture. Natural Resources Conservation Service, and Conservation Engineering Division. *Technical Release 55: Urban Hydrology for Small Watersheds (TR-55).* June 1986.

table was used to select curve numbers for the peak stormwater discharge rates and runoff volumes calculations in this review.

Table 1—Runoff Curve Numbers for Urban Land Covers and Hydrologic Soil Groups (HSG)

Cover type and hydrologic condition	HSG A	HSG B	HSG C	HSG D
Open space (lawns, parks, golf courses, cemeteries, etc.)				
Poor condition (grass cover < 50%)	68	79	86	89
Fair condition (grass cover 50% to 75%)	49	69	79	84
Good condition (grass cover > 75%)	39	61	74	80
Impervious areas:				
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	98	98	98	98
Streets and roads:	98	98	98	98
Paved; curbs and storm sewers (excluding right-of-way)	83	89	92	93
Paved; open ditches (including right-of-way)	76	85	89	91
Gravel (including right-of-way)	76	85	89	91
Dirt (including right-of-way)	72	82	87	89

Source: Technical Release 55: Urban Hydrology for Small Watersheds (TR-55). Page 2-5.

The condition of the underlying soils is not known at this time. For this evaluation, it was assumed the underlying soils are included in hydrologic soil group (HSG) C. For this evaluation, track ballast was assumed to be impervious – gravel land cover. Results of the analysis are included in Section 6 of this report.

Stormwater BMP feasibility was evaluated at each site to mitigate for impacts associated with future conditions. Soil infiltration capacity, likely presence of soil contamination, surface and subsurface space availability, stormwater drainage tie-in potential, topography, and maintenance and operations requirements were considered under the BMP feasibility review. A list of potential stormwater BMPs and their potential use on each site is provided in Section 7 of this report.

5. Existing Conditions

This section provides a description of existing conditions of the study areas, applicable to water quality and stormwater. These sections describe the water resources within each study area, existing land covers and land uses of the sites as they pertain to water quality and stormwater, and a description of the drainage patterns and existing stormwater infrastructure at each site.

5.1. South Station Site

The South Station site occupies approximately 49 acres located near Chinatown, Fort Point Channel, and the South Boston Waterfront/Innovation District. The site includes the following: South Station Rail/Transit Terminal and South Station Bus Terminal, the USPS General Mail Facility/South Postal Annex site, including that portion of Dorchester Avenue fronting the site and running parallel to Fort Point Channel. The USPS owns in fee the portion of Dorchester Avenue that extends from the southern line of Summer Street to a line on the southern shore of Fort Point Channel adjacent to the Gillette property.

Approximately 14 acres consist primarily of track and three acres consist of a small park, Harborwalk area, and a portion of Fort Point Channel located at the southern end of the site. The South Station site extends to include the headhouse to the north, located at the intersection of Atlantic Avenue and Summer

Street. The site extends along a portion of the NEC Main Line to the west, extending past Cove Interlocking. The site extends along a portion of the MBTA's Fairmount Line/Old Colony Railroad to the south, extending just past Broad Interlocking.

The 49 acres of the site consist of the following land covers:

- Open space (Rolling Bridge Park), comprising approximately 1.0 acre.
- Impervious paved parking, comprising approximately 21,000 sf or 0.5 acres.
- Impervious paved roadway (Dorchester Avenue), comprising approximately 217,800 sf or 5.0 acres.
- Building footprint, including the headhouse, Bus Terminal and USPS facility, comprising approximately 945,000 sf or 21.7 acres.
- Other altered area, including railroad tracks, comprising approximately 919,116 sf or 21.1 acres.

According to USDA NRCS soil survey maps,[8] the underlying soils at the South Station site are classified as urban land. Urban land is defined as excavated and filled land over natural soils where specific soil characterization is not available through the NRCS soil survey. Soil and groundwater contamination may be present at the South Station site. See Appendix 14 - *Site Contamination and Hazardous Materials Technical Report* for more information. Further review of the potential level of contamination would be conducted during preliminary design.

5.1.1. Water Resources

The only surface water body within the study area for the South Station site is Fort Point Channel, which is part of Boston Inner Harbor, in the Boston Harbor watershed. As shown in Figure 5, Boston Inner Harbor includes portions of the Mystic and Chelsea Rivers, and extends to the mouth of the Charles River and to the line between Governors Island and Fort Independence. Boston Inner Harbor also includes Fort Point Channel, Reserved Channel, and Little Mystic Channel. Fort Point Channel is located between Dorchester Avenue and South Boston and extends from West Fourth Street north of the Northern Avenue pedestrian bridge. The USPS facility abuts Fort Point Channel to the west, separated by Dorchester Avenue.

As shown in Figure 5, the Fort Point Channel drainage subbasin includes a large area of Boston. This subbasin, according to the Boston Water and Sewer Commission (BWSC), represents its combined sewer and stormwater infrastructure drainage catchment area draining to Fort Point Channel and includes the entire area draining to Fort Point Channel. The 2,600-acre subbasin is 83% impervious. Subbasin land uses are largely residential with commercial and industrial land uses in the vicinity of the study area and Fort Point Channel. No other open water features exist within the subbasin and all stormwater is assumed to be conveyed in closed drainage systems.

Boston Inner Harbor is included on the 2012 Final Integrated List of Waters[9] as Category 5. Category 5 waters are defined as waters identified as impaired (i.e., not supporting one or more intended uses) where the impairment is related to the presence of one or more "pollutants", and the source of those pollutants is not considered to be natural therefore requiring one or more Total Maximum Daily Load (TMDL). The 2012 Final Integrated List of Waters lists Boston Inner Harbor as being impaired for polychlorinated

[8] U.S. Department of Agriculture. Natural Resources Conservation Service. *Web Soil Survey.* http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
[9] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

biphenyls (PCBs) in fish tissue, fecal coliform, *Enterococcus*, dissolved oxygen, and other.[10] A Draft Pathogen TMDL has been developed for Boston Harbor in its entirety, which includes Boston Inner Harbor.

Boston Inner Harbor is identified as a Class SB water. According to 314 CMR 4.05 (4) (b) Class SB waters are defined as: "a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). These waters shall have consistently good aesthetic value."

According to the Boston Harbor Water Quality Assessment, the U.S. EPA has authorized 36 combined sewer overflows (CSOs) and six NPDES permitted discharges in the Boston Harbor. The BWSC operates seven CSOs that discharge to Fort Point Channel as shown in Figure 7 (Outfall IDs: BOS 062, BOS 064, BOS 065, BOS 068, BOS 070, BOS 072 and BOS 073).

Through an ongoing program to improve water quality of the Boston Inner Harbor, the Massachusetts Water Resources Authority (MWRA) has constructed a 2.2-million gallon CSO detention and treatment facility at Union Park in the South End neighborhood of Boston. The Union Park CSO facility captures combined sewer and stormwater flow before it reaches Fort Point Channel (Outfall ID BOS 070). In 2007, the MWRA completed the Fort Point Channel Sewer Separation Project. The goal of this project was to separate the storm drain and sanitary sewer systems and eliminate CSOs, thus removing pollutant sources to Fort Point Channel. The project included installing 4,550 feet of storm drains and raising the overflow weirs, installing new tide gates, and installing underflow baffles to outfalls BOS 072 and BOS 073. The BWSC is also constructing the South Boston Sewer Separation Project, scheduled to be complete in 2015. The project includes 5,700 feet of new sanitary sewers and storm drains, 3,600 feet of water mains, and 7,500 feet of sanitary sewer lining. The project will reduce CSOs and infiltration and inflow and improve water quality in Fort Point Channel.

Under NPDES permit number MA0003832, the Gillette Company, southeast of the South Station site, is permitted to discharge 53.1 million gallons of non-contact cooling water to Fort Point Channel daily. Under NPDES permit number MA0033928, MassDOT (formerly the Massachusetts Turnpike Authority) is authorized to discharge stormwater from the Central Artery Tunnel to various receiving waters, including Fort Point Channel. Additional permitted discharges contribute to Fort Point Channel via the BWSC system. There are no permitted water withdrawals from the Boston Inner Harbor.

The MWRA closely monitors water quality within Boston Harbor. Five CSO monitoring stations are in Fort Point Channel in the vicinity of the CSO outfalls shown in Figure 7. At the northern end of Fort Point Channel, MWRA operates a nutrient monitoring station. Data on bacteria (Enterococcus, fecal coliform, and E.coli), nutrient levels (ammonium, nitrate, nitrogen, phosphate, phosphorus, carbon, chlorophyll a, and phaeopytin), physical properties (temperature, pH, salinity, dissolved oxygen, turbidity, and specific conductance), and total suspended solids are collected and monitored monthly (at a minimum).

According to the MassGIS Outstanding Resource Water (ORW) data layer, ORWs, protected under the Massachusetts Surface Water Quality Standards (314 CMR 4.00 et seq.), are not present in the study

[10] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

areas. ORWs can include Areas of Critical Environmental Concern (ACECs), protected shoreline, protected and scenic rivers, wildlife refuges, protected water supply (Zone I, Zone II, and Interim Wellhead Protection Areas), and certified vernal pools.

Fort Point Channel is a tidal water. The National Oceanic and Atmospheric Agency (NOAA) operates a National Ocean Service (NOS) station in Boston, just north of the study area. The station has collected data related to tidal reach and sea level trends. Table 2 shows the tidal information collected at the Boston station, indicating the likely tidal elevations for Fort Point Channel.

Table 2—Boston Tidal Information

Datum	Elevation NGVD29 feet	Elevation NAVD88 feet
Highest Observed Water Level (date: 2/7/1978)	10.4	9.6
Mean Higher-High Water	5.6	4.8
Mean High Water	5.1	4.3
North American Vertical Datum of 1988	0.8	0.0
National Geodetic Vertical Datum of 1929	0.0	-0.8
Mean Sea Level	0.5	-0.3
Mean Diurnal Tide Level	0.4	-0.4
Mean Tide Level	0.4	-0.4
Mean Low Water	-4.4	-5.2
Mean Lower-Low Water	-4.7	-5.5

Source: National Oceanic and Atmospheric Agency, Boston National Ocean Service Station
Conversion Source: CORPSCON Available at: http://www.agc.army.mil/corpscon/

The BRA updated the Groundwater Conservation Overlay District as of April 25, 2007 to include the area of South Boston just east of Fort Point Channel. The Groundwater Conservation Overlay District is shown in Figure 5. Portions of the South Station study area are within the Groundwater Overlay District; however the South Station site is outside the Groundwater Conservation Overlay District. The Boston Groundwater Trust installed groundwater monitoring wells around South Station in August 2010. Three wells were installed, two along Summer Street and one along Atlantic Avenue. Groundwater levels are measured by the Boston Groundwater Trust on a monthly basis to ensure protection of the groundwater resources in this area.[11]

5.1.2. Existing Stormwater Management

The existing South Station site consists mostly of impervious surfaces including roadways, sidewalks, and rooftops (including rooftop parking). The track area, although ballasted, is underlain by compact soils and has a subsurface drainage system and is therefore assumed to be impervious. Other than Rolling Bridge Park, only minor, incidental pervious areas exist within the South Station site. Stormwater from the South Station site is collected in closed drainage systems. Based on the existing conditions survey,[12] no existing stormwater detention, infiltration, or treatment measures are in place in the South Station site.

[11] *Boston Groundwater Trust*. Accessed October 10, 2012. http://www.bostongroundwater.org.
[12] Bhatti Group. *VHB Project 10295.00: BRA/EDIC Track 61 on Ground Survey*, May 23, 2009.; Harry R. Feldman, Inc. *Existing Conditions Plan North Jetty*, April 21, 2007.; Harry R. Feldman, Inc. *VHB Project 09957.03: South Station Tower Project,* September, 2007.; HNTB. *Central Artery Base map.* March 7, 2008.; Vanasse Hangen Brustlin, Inc. *Existing Conditions Plan of Land: United States Postal Service. Boston, Massachusetts,* September 26, 2008.; Vanasse Hangen Brustlin, Inc. *VHB Project 07882.00: Modern Continental Construction/Central Artery Contract C17A6 Traffic Management Base mapping Supplemented with updated street and traffic signal work with completion of the Central Artery Project*, September 10, 2008.

Existing pollutants and pollutant sources at the South Station site include cars, trucks, trains, aerial (atmospheric) deposition, hydrocarbons, metals, pathogens, total suspended solids (TSS), herbicides, trash, chloride, and nutrients.

Along the western side of the South Station site, catch basins collect stormwater runoff along Atlantic Avenue and the runoff flows in a drainage main along Atlantic Avenue and off-site. As shown in Figure 7, catch basins within the train track area collect drainage from the tracks and direct it to an existing six-foot, nine-inch brick BWSC CSO located under the tracks, which discharges at CSO 065 into Fort Point Channel.[13] Available survey shows drainage lines flowing to the east which discharge to Fort Point Channel. A drainage collection system originating off-site from the west crosses Atlantic Avenue at East Street, and then heads north to Atlantic Avenue. From there, the 12-inch main connects to a manhole (labeled "Combined Sewer") at the northwest corner of the headhouse. From there, the main continues eastward along the south side of Summer Street, passing the headhouse, 245 Summer Street, and the USPS facility at the intersection of Summer Street and Dorchester Avenue. This combined sewer system is not located within the same drainage system as the Fort Point Channel Sewer Separation System Project, the South Boston Sewer Separation Project, or the Union Park CSO facility. Per BWSC no treatment occurs downstream of the combined sewer at CSO 065 at South Station.

Stormwater from the USPS parcel collects in a system of catch basins and drainage pipes. The pipes are shown in area survey plans as flowing from the USPS building, indicating that roof runoff is collected in the closed system as well. Stormwater from the USPS parcel discharges to Fort Point Channel separately from the South Station parcel discharges.

A peak flow rate and runoff volume analysis was completed for the existing South Station site and is provided in Table 3. Approximately 99% of the site is comprised of building, roofs, roadways, paved parking and other impervious surfaces including railroad track and yard, which is an unpaved impervious surface of ballast and gravel. The site has an estimated weighted CN of 94 (based on TR-55).

Table 3—South Station Site Existing Flow Rates and Runoff Volumes

24-Hour Storm Event	24-Hour Rainfall Depth (in)	Peak Flow (cu. ft/sec)	Runoff Volume (cu. ft)
2-year	3.3	165	463,000
10-year	4.9	233	749,000
50-year	7.4	327	1,189,000
100-year	8.8	377	1,444,000

Ten outfalls directly discharging stormwater runoff from the South Station site to Fort Point Channel are shown in the area survey. According to the survey plans, study area stormwater outfalls invert elevations range from 4.4 to 7.1 feet (NAVD88) (5.2 to 7.9 feet [NGVD29]). Each invert elevation is shown in Table 4. Locations of outfalls are shown in Figure 7.

[13] Boston Water and Sewer Commission. *Sewerage Works Improvements for Cleaning and Rehabilitation of Combined Sewer Overflow 065 in City Proper*. October, 2012.

Table 4—South Station Study Area Stormwater Outfall Inverts

Outfall ID	Elevation NGVD29 feet	Elevation NAVD88 feet
1	5.2	4.4
2	7.1	6.3
3	6.3	5.5
4	6.2	5.4
5	5.7	4.9
6	5.8	5.0
7	6.0	5.2
8	5.9	5.1
9	6.0	5.2
10	7.9	7.1

Source: Survey compiled for South Station Site (See complete reference in Section 10)
Conversion Source: CORPSCON Available at: http://www.agc.army8.mil/corpscon/

The mean higher-high water level of Fort Point Channel is 4.8 feet (NAVD88) (5.6 feet [NGVD29]). Therefore, at 4.4 feet (NAVD88), the Outfall 1 invert is below the mean higher-high water level. Each outfall is below the highest observed water level of 9.6 feet (NAVD88) (10.4 feet [NVGD29]), observed on February 7, 1978.[14] No tide gates are indicated on the SSX project preliminary survey plan at any of the 10 outfalls. Visual inspection of these outfalls showed there were likely no tide gates at the outlets. As the outfalls discharge to tidal water, potential flooding would be influenced more by the tidal conditions as opposed to the volumes and rates of runoff from the site.

There are three BWSC CSOs that convey combined sewer to Fort Point Channel in the immediate vicinity of the South Station site: CSO 064, CSO 065 and CSO 068. Historical plans obtained from BWSC show the existence of a tide gate at CSO 065 the origin of the overflow discharge pipe located along Atlantic Avenue.

5.2. Layover Facility Sites

This section describes the existing conditions as they pertain to water quality and stormwater for each of the layover sites. Each site has unique water resources, land cover and existing drainage characteristics.

5.2.1. Widett Circle

The Widett Circle site, totaling approximately 29.4 acres, is located in South Boston along the MBTA's Fairmount Line, approximately one track-mile from South Station. It is comprised of two parcels, primarily in private ownership: Cold Storage and Widett Circle. Cold Storage, approximately 6.6 acres, located primarily at 100 Widett Circle, currently houses a temperature controlled food storage and distribution facility, owned by Art Mortgage Borrower Propco 2006 2 LP, and used by Americold/Crocker & Winsor Seafoods. The building has an active rail siding served by CSX Transportation, Inc. (CSXT) with space for six freight cars. A change in ownership of the Cold Storage parcel within the Widett Circle site is anticipated. In October 2013, Celtic Recycling, LLC received approval from the Massachusetts Environmental Policy Act (MEPA) Office (EEA No. 15070) to renovate and convert existing facilities at the Cold Storage parcel, located at 100 Widett Circle, into a material recycling facility. Widett Circle, located primarily at 1 and 2 Foodmart Road, is owned by The New

[14] National Oceanic & Atmospheric Administration. *Boston NOS Station Home Page.* Accessed October 10, 2012. http://tidesandcurrents.noaa.gov/geo.shtml?location=8443970.

Boston Food Market Development Corporation and is made up of approximately 30 units leased to multiple businesses in the food processing, food storage, and food logistics industry.

The 29.4-acre site is completely impervious and consists of the following land covers:

- Impervious paved parking/storage areas (approximately 853,000 sf, 19.6 acres).
- Building footprint (approximately 366,000 sf, 8.4 acres).
- Other altered area including railroad tracks (approximately 60,000 sf, 1.4 acres).

According to USDA NRCS soil survey maps, the underlying soils at the Widett Circle site are classified as urban land. Urban land is defined as excavated and filled land over natural soils where specific soil characterization is not available through the NRCS soil survey. Soil and groundwater contamination may be present at the Widett Circle site. See Appendix 14 - *Site Contamination and Hazardous Materials Technical Report* for more information. Further review of the potential level of contamination would be conducted during preliminary design.

Water Resources

The only surface water body within the study area for the Widett Circle is Fort Point Channel, which is part of Boston Inner Harbor, in the Boston Harbor watershed. A description of Fort Point Channel is included in Section 5.1.1 of this report.

Existing Stormwater Management

Stormwater from the Widett Circle site is currently collected in a series of catch basins within existing parking areas and along existing roadways, Widett Circle and Foodmart Road. Runoff from the catch basins is collected in a 36-inch storm drain which ties into the overflow portion of a large combined sewer that runs north to south adjacent to the Americold facility.[15] The ultimate discharge point for overflows from the combined sewer is Fort Point Channel at CSO 070, as shown in Figure 7.

Based on existing aerial survey, no existing stormwater detention, infiltration, or treatment measures are in place in the Widett Circle site. Existing pollutant sources at the Widett Circle site include cars, trucks, aerial depositions, trash, and food byproducts from the existing food processing industries.

A peak flow rate and runoff volume analysis was completed for the existing Widett Circle site and is provided in Table 5. The existing land cover is completely impervious and with an estimated CN of 97 (based on TR-55).

Table 5—Widett Circle Site Existing Flow Rates and Runoff Volumes

24-Hour Storm Event	24-Hour Rainfall Depth (in)	Peak Flow (cfs)	Runoff Volume (cu. ft)
2-yr	3.3	71	307,000
10-yr	4.9	101	478,700
50-yr	7.4	142	741,200
100-yr	8.8	165	892,600

[15] Boston Water and Sewer Commission. *Utility Mapping*. April 2010.

Many of the existing industrial facilities located within the Widett Circle layover facility site are required to have a U.S. EPA NPDES MSGP under Sector U: Food and Kindred Products Facilities. The MSGP requires the facilities to implement source control measures to limit the potential of pollutants from the sites from entering the storm drain system and ultimately surrounding water resources.

5.2.2. Beacon Park Yard

MassDOT intends to utilize Beacon Park Yard as a preferred location to the west, to provide a more-balanced mix of layover sites west and south of South Station. MassDOT is continuing to evaluate the Widett and Readville Alternatives to provide a layover facility south of South Station. MassDOT is simultaneously performing environmental review of the I-90 Allston Interchange project, which is located in an area that includes the Beacon Park Yard rail site and I-90 (the Massachusetts Turnpike). The Interchange project is examining how to best realign the transportation assets in this area while also addressing significant structural needs; highway operational changes (the introduction of All-Electronic Tolling); the construction of a commuter rail station; and the introduction of significant off-road multimodal connections throughout the area. MassDOT has determined that it is appropriate to consider these potential transportation changes under a single environmental review process. Therefore, MassDOT plans to continue environmental review of the Beacon Park Yard site as a layover facility as part of the I-90 Allston Interchange project's environmental review. An ENF for that project is anticipated to be filed with the Secretary of EEA in late 2014 concurrent with this DEIR.

The site is 30.0 acres and consists of the following land covers:

- Impervious paved parking/storage areas (approximately 280,000 sf, 6.4 acres).
- Building footprint (approximately 6,700 sf, 0.15 acres).
- Other altered area including railroad tracks (approximately 1,020,500 sf, 23.4 acres).

According to USDA NRCS soil survey maps, the underlying soils at the Beacon Park Yard site are classified as urban land. Urban land is defined as excavated and filled land over natural soils where specific soil characterization is not available through the NRCS soil survey. Soil and groundwater contamination may be present at the Beacon Park Yard site. See Appendix 14 - *Site Contamination and Hazardous Materials Technical Report* for more information. Further review of the potential level of contamination would be conducted during the design stage.

Water Resources

The only surface water body within the Beacon Park Yard layover facility study area is the Charles River, within the Charles River watershed. Drainage from Beacon Park Yard discharges to the Charles River in the lower Charles River Watershed. The Charles River is 80 miles long and is broken into various segments. Beacon Park Yard discharges to Segment MA72-36 of the Charles River. This segment of the Charles River extends 6.1 miles from the Watertown Dam in Watertown to the Boston University Bridge in Boston/Cambridge. The watershed of the Lower Charles includes portions of Boston, Cambridge, Watertown, Newton, and Brookline and is located within an urbanized area that is densely developed with single- and multi-family residences, commercial, industrial, and institutional properties.

According to the National Wild and Scenic Rivers program[16] and the Massachusetts Riverways Program,[17] the Charles River is not designated as Wild and Scenic.

[16] Massachusetts Executive Office of Environmental Affairs. *National Wild and Scenic Rivers System.* Accessed October 4, 2012. http://www.mass.gov/eea/agencies/dfg/der/technical-assistance/wild-and-scenic-rivers.html.

The Charles River (Segment MA72-36) is included on the 2012 Final Integrated List of Waters[18] as Category 5. Category 5 waters are defined as waters identified as impaired (i.e., not supporting one or more intended uses) where the impairment is related to the presence of one or more "pollutants", and the source of those pollutants is not considered to be natural therefore requiring one or more TMDL.

The 2012 Final Integrated List of Waters lists the Charles River (Segment MA72-36) as being impaired for chlorophyll-a, DDT, *Escherichia coli*, fish-passage barrier, fishes bioassessments, non-native aquatic plants, oil and grease, other flow regime alterations, dissolved oxygen, secchi disk transparency, nutrient/eutrophication biological indicators, total phosphorus, PCB in fish tissue, sediment bioassays, acute toxicity freshwater, other, and high pH.[19] MassDEP has issued a Pathogen TMDL for the Charles River Watershed (CN 156.0).[20] MassDEP has also issued a Phosphorus TMDL for the Lower Charles River Watershed (CN 301.0).[21]

In 2001, the MWRA conducted a study to identify stressed basins across the Commonwealth.[22] The study evaluated the flow levels in three locations along the Charles River: Dover, Waltham, and Wellesley and characterized stress conditions for the associated subbasins. Each of these locations is upstream of the Charles River segment within the Beacon Park Yard layover facility study area. The Charles River Watershed downstream of Waltham within the Beacon Park Yard layover facility study area was not classified due to lack of available data. As a result of the study, the Charles River Watershed closest to the study area (upstream of Waltham) was classified as a medium stressed basin.

The Charles River is identified as a Class B water. According to 314 CMR 4.05 (3)(b) Class B waters are defined as: "habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth, and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value."

According to the MassGIS ORW data layer, ORWs, protected under the Massachusetts Surface Water Quality Standards (314 CMR 4.00 et seq.), are not present in the Beacon Park Yard layover facility study area.[23]

Existing Stormwater Management

According to Massachusetts Turnpike Authority record plans, an underground waterway known as Salt Creek is conveyed in a seven-foot by seven-foot concrete culvert under the site and discharges directly to

[17] Massachusetts Executive Office of Energy and Environmental Affairs. *Massachusetts Riverways Program.* Accessed October 4, 2012. http://www.mass.gov/eea/agencies/dfg/der/technical-assistance/wild-and-scenic-rivers.html

[18] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

[19] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

[20] Massachusetts Department of Environmental Protection. *Final Pathogen TMDL for the Charles River Watershed (CN 0156.0).* 2007. http://www.mass.gov/dep/water/resources/charles1.pdf.

[21] Massachusetts Department of Environmental Protection. *Final Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts (CN 310.0).* 2007. http://www.mass.gov/dep/water/resources/charlesp.pdf.

[22] Massachusetts Water Resources Commission. *Stressed Basins in Massachusetts.* 2001. http://www.mass.gov/eea/docs/eea/wrc/stressed-basins.pdf.

[23] Massachusetts Department of Environmental Protection. Division of Watershed Management. *Designated Outstanding Resource Waters of Massachusetts.* 1995.

the Charles River.[24] The outfall to the Charles River includes a containment boom in the river to control the spread of oil and floatables. Stormwater from the parking areas at the Beacon Park Yard site is currently collected in a series of catch basins and likely discharges to the culverted stream. The existing ballasted tracks at the Beacon Park Yard site likely include underdrains to collect stormwater and outfall to the stream culvert to the east of the site. Based on existing aerial survey, no existing surface stormwater detention, infiltration, or treatment measures are in place in the Beacon Park Yard site. Additional information on the existing stormwater management infrastructure at Beacon Park Yard will be obtained during preliminary design.

Additionally, BWSC sewers and combined sewers are located within the surrounding streets, including Cambridge Street. Additionally, a 32-inch by 42-inch MWRA sewer crosses the site in a south-north direction. The large sewer crossing the site collects wastewater from sewer systems to the south of the site and discharges it to the Cottage Farm CSO facility in Cambridge. Beneath the tracks on the site, the sewer has a directional change where likely due to the structure noted above. The age and condition of these pipes and structures are unknown. The location of existing sewer services, if any, from the site is unknown. As design advances, MassDOT will confirm existing conditions with BWSC.

A peak flow rate and runoff volume analysis was completed for the existing Beacon Park Yard site. The existing land cover consists of impervious cover, tracks and ballast, and some incidental pervious cover with an estimated CN of 92 (based on TR-55). Peak flow rates and runoff volume for existing conditions are provided in Table 6.

Table 6—Beacon Park Yard Site Existing Flow Rates and Runoff Volumes

Storm Event	24-Hour Rainfall (in)	Peak Flow (cu. ft/sec)	Runoff Volume (cu. ft)
2-yr	3.3	65.0	262,200
10-yr	4.9	97.5	434,700
50-yr	7.4	142.0	702,400
100-yr	8.8	166.5	857,700

Existing pollutant sources at the Beacon Park Yard site include cars, trucks, trains, aerial depositions, and trash.

CSXT operations were covered under the NPDES MSGP (Permit No. MA0025704). The permit includes effluent limitations and monitoring requirements for various pollutants and flow characteristics for stormwater discharging from the Beacon Park Yard site to the Charles River.

5.2.3. Readville – Yard 2

The MBTA's Readville – Yard 2 is located in the Readville section of Hyde Park in Boston in the northeast quadrant of the intersection of the NEC and the MBTA Fairmount Line, approximately 8.8 track-miles south of South Station (shown in Figure 4). Readville – Yard 2 is a maintenance repair facility and the largest layover yard used by the MBTA for its South Side service. The layover yard has a total of 12 tracks. The MBTA currently uses Readville – Yard 2 for midday layover storage of 10 trainsets[25] of variable lengths.

[24] Massachusetts Turnpike Authority. *Boston Extension Section No. C-2 Grading and Drainage Plan.* Sheet HC2-33.
[25] A trainset describes the physical makeup of a combination of locomotives and coaches coupled together and operating as one unit.

The site is 17.4 acres and consists of the following land covers:

- Impervious paved parking/storage areas (approximately 141,000 sf, 3.2 acres).
- Building footprint (approximately 35,000 sf, 0.8 acres).
- Other altered areas including railroad tracks (approximately 582,000 sf, 13.4 acres).

The eastern portion of the site is currently not used for railroad operations. This portion of the site is used for material storage and is pervious; however, pockets of standing water indicate poorly draining soils.

According to USDA NRCS soil survey maps, the underlying soils at the Widett Circle site are classified as urban land. Urban land is defined as excavated and filled land over natural soils where specific soil characterization is not available through the NRCS soil survey Soil and groundwater contamination may be present at the Readville – Yard 2 site. See Appendix 14 - *Site Contamination and Hazardous Materials Technical Report* for more information. Further review of the potential level of contamination would be conducted during preliminary design.

Water Resources

The only surface water body within the Readville – Yard 2 layover facility site study area is the Neponset River, within the Neponset River watershed as shown in Figure 6. The study area extends to the banks of Mother Brook, which is also within the Neponset River watershed.

The Neponset River is approximately 25 miles long and extends from Foxborough to Dorchester Bay. In the MassDEP Integrated List of Waters, the Neponset River is broken into four segments (MA73-01, MA73-02, MA73-03, and MA73-04). Drainage from Readville – Yard 2 discharges to Segment ID MA73-02 of the Neponset River, which runs south to north just east of the site. This segment of the Neponset River extends 7.7 miles from the confluence of the East Branch of the Neponset River in Canton to the confluence of Mother Brook in Boston. The watershed includes portions of Norwood, Canton, Westwood, Dedham, Milton, and Boston. Generally, the watershed to the Neponset River is developed with single- and multi-family residences, commercial, recreational, and large transportation facilities (including Interstates 93 and 95, commuter rail lines, and the Norwood Memorial Airport).

According to the National Wild and Scenic Rivers program[26] and the Massachusetts Riverways Program,[27] the Neponset River is not designated as Wild and Scenic.

The Neponset River (Segment MA73-02) is included on the 2012 Final Integrated List of Waters[28] as Category 5. Category 5 waters are defined as waters identified as impaired (i.e., not supporting one or more intended uses) where the impairment is related to the presence of one or more "pollutants", and the source of those pollutants is not considered to be natural therefore requiring one or more (TMDL).

The 2012 Final Integrated List of Waters lists the Neponset River (Segment MA73-02) as being impaired for dissolved oxygen, fecal coliform, turbidity, foam/flocs/scum/oil slicks, PCB in fish tissue,

[26] Massachusetts Executive Office of Energy and Environmental Affairs. *National Wild and Scenic Rivers System.* Accessed October 4, 2012. http://www.mass.gov/eea/agencies/dfg/der/technical-assistance/wild-and-scenic-rivers.html.
[27] Massachusetts Executive Office of Energy and Environmental Affairs. *Massachusetts Riverways Program.* Accessed October 4, 2012. http://www.mass.gov/eea/agencies/dfg/der/technical-assistance/wild-and-scenic-rivers.html
[28] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.

debris/floatables/trash, DDT, Escherichia coli, and other.[29] In 2002, MassDEP issued a Bacterial TMDL for the Neponset River Watershed (CN 121.0) that includes all segments of the Neponset River.[30]

In 2001, the Massachusetts Water Resources Commission conducted a study to identify stressed basins across the Commonwealth.[31] The study evaluated the flow levels at one location along the Neponset River Segment MA73-01 in Norwood. This location is upstream of the Neponset River segment within the Readville – Yard 2 layover facility study area. The Neponset River Watershed downstream of the Norwood flow gauge within the Readville – Yard 2 layover facility study area was not classified due to lack of available data. As a result of the study, the Neponset River Watershed closest to the study area (upstream of Norwood) was classified as a medium stressed basin.

The Neponset River is identified as a Class B water. According to 314 CMR 4.05 (3)(b) Class B waters are defined as: "habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth, and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value."

According to the MassGIS ACEC data layer, an area surrounding the Neponset River south and upstream of the Readville – Yard 2 layover facility site is designated as an ACEC.[32] The Fowl Meadow and Ponkapoag Bog ACEC was designated in 1992 and includes an eight-mile stretch of the Neponset River and its tributaries, adjacent wetlands, and floodplains.[33] According to the MassGIS ORW data layer, ORWs, protected under the Massachusetts Surface Water Quality Standards (314 CMR 4.00 et seq.), are not present in the Readville – Yard 2 layover facility study area.[34]

Existing Stormwater Management

The existing ballasted tracks include underdrains that discharge via an existing 12-inch storm drain to the Neponset River in the northern portion of the site. A second 54-inch existing storm drain crosses through the southern portion of the site. This storm drain collects stormwater from the neighborhood to the south of the site.[35] Stormwater contributions from the site to this storm drain are not known. The tracks where the locomotives are stored include drip pans which are drained to oil/water separators for treatment before being discharged to the sanitary sewer system. Based on existing aerial survey, no existing stormwater detention, infiltration, or treatment measures are in place at the Readville – Yard 2 site, excluding the oil/water separators.

[29] Massachusetts Department of Environmental Protection. *Massachusetts Year 2012 Integrated List of Waters - Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act.* 2013. http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf.
[30] Massachusetts Department of Environmental Protection. *Total Maximum Daily Loads of Bacteria for Neponset River Basin.* 2002. http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/neponset.pdf.
[31] Massachusetts Water Resources Commission. *Stressed Basins in Massachusetts.* 2001. http://www.mass.gov/eea/docs/eea/wrc/stressed-basins.pdf.
[32] Massachusetts Office of Geographic Information. *Areas of Critical Environmental Concern.* Massachusetts Geographic Information Systems, April 2009. Accessed October 2012. http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/acecs.html.
[33] Massachusetts Department of Conservation and Recreation. *Designation of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern.* August 20, 1992. Accessed February 2013. http://www.mass.gov/eea/docs/dcr/stewardship/acec/acecs/fm-des.pdf.
[34] Massachusetts Office of Geographic Information. *Outstanding Resource Water.* March 2010. Accessed October 2012. http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/orw.html.
[35] Boston Water and Sewer Commission. *Utility Mapping.* April 2010.

Stormwater management for the pervious areas at the existing Readville – Yard 2 site is unknown. Additional information on the existing stormwater management infrastructure at Readville – Yard 2 will be obtained during preliminary design.

A peak flow rate and runoff volume analysis was completed for the existing Readville – Yard 2 site. The existing land cover consists of impervious cover, tracks and ballast, and some incidental, poorly draining pervious cover with an estimated CN of 90 (based on TR-55). Peak flow rates and runoff volume for existing conditions are provided in Table 7.

Table 7—Readville – Yard 2 Existing Flow Rates and Runoff Volumes

Storm Event	24-Hour Rainfall (in)	Peak Flow (cu. ft/sec)	Runoff Volume (cu. ft)
2-yr	3.3	35.3	140,500
10-yr	4.9	54.4	238,750
50-yr	7.4	80.6	392,600
100-yr	8.8	95.0	482,150

Existing pollutant sources at the Readville – Yard 2 site include cars, trucks, trains, aerial (atmospheric) depositions, trash, and material storage from the eastern portion of the site.

6. Potential Impacts

The No Build Alternative represents a future baseline condition against which the Build Alternatives will be compared. The Build Alternatives would include the expansion of South Station and the construction of additional layover facilities at a minimum of two sites. Impacts of the No Build Alternative and Build Alternatives are discussed in this section.

6.1. No Build Alternative

6.1.1. Summary

The No Build Alternative represents a future baseline condition against which the Build Alternatives are compared. With the No Build Alternative, South Station, including the headhouse and track operations, and the USPS General Mail Facility, would remain as they currently exist. The majority of Dorchester Avenue at the site would remain in private use by the USPS in support of USPS operations. Extending from the southern line of Summer Street, the MBTA would continue to maintain a permanent easement along Dorchester Avenue for pedestrians and vehicles of over approximately 200 feet. Generally unrestricted public access would continue to be provided along Dorchester Avenue of over approximately 400 feet for customer use of USPS facilities.

With the No Build Alternative, there would be no private development associated with South Station beyond the development previously approved by the Massachusetts EEA: the South Station Air Rights (SSAR) project. The SSAR project was approved by the Secretary of EEA in 2006 (EEA No. 3205/9131) as an approximately 1.8 million square foot mixed-use development to be located directly above the railroad tracks at the South Station headhouse. The SSAR project also includes a horizontally expanded bus terminal of approximately 70,000 square feet, pedestrian connections from the train station concourse and platforms to the expanded bus terminal, and a 3-level parking garage with 775 spaces located above the bus terminal.

With the No Build Alternative, the Widett Circle site would remain in private development. The Beacon Park Yard site would remain largely the same as today, with the exception of highway reconfiguration of the Massachusetts Turnpike to the north of the site and MBTA Framingham/Worcester Line track improvements to the south of the site. The MBTA would continue to use Readville – Yard 2 to provide layover space for 10 trainsets.

6.1.2. Impacts Analysis

In the No Build Alternative, the pollutant sources would remain the same as existing conditions and no change to water quality to the water resources associated with the South Station, Widett Circle, Beacon Park Yard, and Readville – Yard 2 sites would be expected. No change to the drainage system or outfalls to water resources would be expected in the No Build Alternative. Land uses would remain unchanged and peak flow rates and runoff volume from the Beacon Park Yard and Readville – Yard 2 sites would remain the same in the No Build Alternative. Existing conditions in Section 5 of this report includes the existing peak flow rates and runoff volumes for each project site.

At the South Station site, the pollutant loading sources and land use associated with the existing transportation elements are not be expected to change. The SSAR project could alter pollutant loads based upon the extent of development.

In the No Build Alternative, changes in ownership at the Cold Storage site within the Widett Circle site are expected. In October 2013, Celtic Recycling, LLC completed the MEPA process through the Massachusetts EEA to renovate and convert existing facilities at the Cold Storage site, located at 100 Widett Circle, into a material recycling facility. According to the Celtic Recycling ENF (EEA No. 15070), the existing building would be updated to be a LEED certified building. These updates would include adding vegetation around the existing building and practicing rainwater harvesting. These improvements would likely result in reductions in peak flow rates and runoff volume and pollutant loads from the Cold Storage portion of the Widett Circle site from No Build conditions.

6.2. South Station Build Alternatives

Alternative 1- Transportation Improvements Only

Alternative 1 would include the previously-approved private development included in the No Build Alternative. In addition, South Station would be expanded onto the adjacent 14-acre USPS property. MassDOT would acquire and demolish the USPS General Mail Facility/South Postal Annex. The existing South Station Terminal would be expanded by approximately 400,000 square feet, consisting of an expanded passenger concourse and passenger support services. Capacity improvements would include construction of up to seven new tracks and four platforms for a total of up to 20 tracks and 11 platforms. Tower 1 Interlockings and approach interlockings at the terminal approach would be reconstructed. With Alternative 1, no provision would be made for future private development as part of the SSX project.

Dorchester Avenue would be restored for public and station access. Restoration of Dorchester Avenue would reconnect Dorchester Avenue to Summer Street as a public way. It would include landscaping and improved pedestrian and cycling connections and facilities (adjacent sidewalks, crosswalks, and cycle track). Restoration also would include construction of a long-awaited extension of the Harborwalk along reopened Dorchester Avenue.

Alternative 2 – Joint/Private Development Minimum Build

Alternative 2 would include all of the improvements included in Alternative 1, including provisions for future private development by incorporating appropriate structural foundations into the overall station and track design. Future private development with Alternative 2 could include approximately 660,000 sf of mixed-use development consisting of residential, office, and commercial uses, including retail and hotel uses, with building heights ranging up a maximum of 130 feet within jurisdictional filled tidelands. Development could include approximately 234 parking spaces, not including public/private shared parking opportunities.

Alternative 3 – Joint/Private Development Maximum Build

Alternative 3 would include all of the improvements included in Alternative 1, including provisions for future private development by incorporating appropriate structural foundations into the overall station and track design. Future private development with Alternative 3 potentially could include approximately 2 million square feet of mixed-use development consisting of residential, office, and commercial uses, including retail and hotel uses, with building heights ranging up to approximately 21 stories. Development could include approximately 506 parking spaces, not including public/private shared parking opportunities.

In Alternative 3, the maximum potential for future private development at the South Station complex would be limited by the FAA's maximum building height limits, pursuant to the Terminal Instrument Procedures (TERPS) regulations applicable to Boston Logan International Airport. Accordingly, MassDOT determined that building heights would be limited to approximately 290 feet to the top of the mechanical space. Alternative 3 would require an amendment to the MHP, modifying applicable Chapter 91 regulations

6.2.1. Proposed Stormwater Management

Improvements to the existing stormwater management system, located along Atlantic Avenue, Summer Street, and Dorchester Avenue, would be designed based on the BWSC's "Regulations Governing The Use of Sanitary And Combined Sewers and Storm Drains of The Boston Water And Sewer Commission," adopted February 27, 1998. Stormwater management for the tracks and platforms would be designed based on the MBTA Commuter Rail Design Standards Manual.

The existing closed drainage system along the USPS Facility would be retained and primarily utilized to convey roof drainage from the proposed South Station expansion to Fort Point Channel. The existing 81-by 81-inch CSO 065 pipe that crosses Dorchester Avenue and the 64-inch CSO 064 pipe within Summer Street would be retained and used for proposed drainage connections. Measures to treat stormwater runoff would be employed to remove TSS and other pollutants from stormwater runoff. Due to site limitations and the vertical separation between Fort Point Channel and the topography of the site, many BMPs are not practical to employ. Measures could include deep sump catch basins and proprietary separators. Table 17 provides a summary of potential stormwater BMPs which may be implemented on the site.

Stormwater management for the tracks would be designed based on the MBTA Commuter Rail Design Standards Manual. Track drainage would consist of track ballast underlain with a relatively impervious subgrade crowned at each track centerline. A ditch or subdrain on either side of the tracks would collect stormwater and convey it to a catch basin or manhole and closed drainage system. Drip pans would be installed to collect any incidental drips from trains. The pipes collecting the mixture of water and drippings would be connected to an oil/water separator. From there, the pipes would connect to the

existing sanitary sewer system. The oil/water separator would require periodic cleaning to remove waste matter.

Stormwater management along the redeveloped Dorchester Avenue would be designed based on the MassDOT Project Development Design Guide. The proposed stormwater patterns would closely match the existing conditions. The proposed surface conditions may include pervious pavers with underdrains for the sidewalks and the Harborwalk, grassed medians, vegetated open spaces, and trees. Most of these features are aesthetic benefits to cyclists, pedestrians and motorists throughout Dorchester Avenue and can provide stormwater water quality benefits.

The proposed development along Dorchester Avenue would include low impact development (LID) practices including bioretention/rain gardens, permeable pavement and/or tree box filters. These features would be implemented, as applicable, to promote water quality treatment before discharging into the proposed closed drainage system and ultimately into Fort Point Channel. Section 7 of this report discusses proposed mitigation measures.

The proposed closed drainage system would consist of deep sump catch basins with hoods, along both sides of Dorchester Avenue, to collect stormwater and then reinforced concrete pipes and manholes to convey runoff to existing outfalls along Fort Point Channel. No new outfalls are proposed.

Along sidewalks abutting existing roads, including Atlantic Avenue and Summer Street, the proposed stormwater management system would closely match the existing conditions. The proposed surface conditions for the sidewalk could include pervious pavers with underdrains, grassed areas, vegetated open spaces and trees. Most of these features would be aesthetic benefits to pedestrians and commuters who pass through South Station and could provide stormwater water quality benefits.

6.2.2. Impacts Analysis

This section includes the impacts that relate to stormwater management for the South Station site. Potential pollutant sources and impacts related to the proposed drainage system, infrastructure, and construction are discussed in this section. Impacts were assessed for Alternative 3. Alternative 2 was not specifically analyzed because its development footprint would be essentially the same as Alternative 3. Therefore, the results of Alternative 3 also would be applicable to Alternative 2. This analysis includes water quality (Potential Pollutants Analysis) and stormwater quantity (Drainage Analysis).

Potential Pollutants Analysis

Potential pollutant sources were evaluated to determine the treatment measures required to protect surface and groundwater resources. Most potential contaminants at the South Station site would be related to train traffic on the rails and roadway traffic, including trucks and passenger vehicles. Rail lines themselves are not considered significant sources of pollutants, as the rail and ballast are made of stable, non-hazardous materials. Some pollutants generated by the train operations would be filtered by the stone ballast supporting the rail ties. The proposed stormwater system would collect runoff and improve water quality with BMPs where feasible. See Table 17 for a list of potential BMPs.

Dorchester Avenue is closed to the public under No Build conditions. Opening the roadway would result in heavier vehicle and pedestrian traffic; however, the pollutant loads would likely be lower or similar to those from existing USPS operations. The following section summarizes the major pollutant sources that have been considered for the South Station site, and compares potential pollutant sources in both the No Build and Build conditions.

Hydrocarbons: Hydrocarbons represent the most common contaminant found on rail ballast and roadways from drips of fuel and other fluids from trains and vehicles. Currently, fueling does not occur at South Station, nor would it in the Build condition.

An increase in train capacity could result in increased hydrocarbons at the South Station site. An increase in vehicle traffic along Dorchester Avenue is expected, however, the elimination of existing USPS truck traffic would likely result in no change or a reduction in hydrocarbon pollutant sources. No significant change in hydrocarbon pollutant sources between the No Build Alternative and the Build condition is expected for the South Station site as containment BMPs would be in place.

Metals: Vehicle and train operations may generate trace amounts of iron from wheels, brake pads, and rails. Metal roofs and atmospheric depositions also are sources of metals. Metals, however, currently are not a significant source of pollution to Fort Point Channel.

An increase in train capacity could result in increased metals at the South Station site; however, no significant change in sources of metal pollutants between the No Build Alternative and the Build condition is expected for the South Station site.

Pathogens: On-board sanitary facilities on commuter trains may be a source of pathogen pollution if storage tanks were to leak or spill. Leaks and spills of sanitary sewage are prohibited by the MassDEP Stormwater Standards and the CWA. Wildlife, such as dogs and waterfowl, is also a source of potential pathogen pollution.

An increase in train capacity and the increase in pedestrian traffic along Dorchester Avenue could result in a minor increase of pathogens at the South Station Site; however, no significant change in sources of pathogens between the No Build Alternative and the Build condition is expected for the South Station site.

Total Suspended Solids (TSS): Sources of TSS include any exposed soils, roadways treated with sand, impervious surfaces, and atmospheric deposition.

Increased traffic along Dorchester Avenue could increase the amount of TSS coming from atmospheric deposition in the area. An increase in exposed soils during construction could result in temporary higher potential TSS sources at the South Station site. With the reopening of Dorchester Avenue to the public, a greater amount of sand may be placed on the roadway during snow events. However, with regularly-scheduled street sweeping, an increase of TSS would not be realized, and no significant change in sources of TSS between the No Build Alternative and the Build condition is expected for the South Station site.

Herbicides: Herbicides are used on rail lines to keep the rail corridors free of intrusive or obstructive vegetation. Herbicides may also be used to control unwanted vegetation in planted areas of the Harborwalk. Overuse of herbicides near Fort Point Channel could impact the health and biodiversity of waterbodies.

No significant change in sources of herbicides between the No Build Alternative and the Build Alternatives are expected for the South Station site. Changes in land cover along Dorchester Avenue include grass medians and other vegetated cover. This slight increase in vegetated cover between the No Build Alternative and the Build condition could result in a minor, but not significant, increase of herbicides at the South Station site.

Trash: Trash and debris could be introduced to the stormwater system and be conveyed to downstream waterbodies.

An increase in concession capacity and the increase in pedestrian traffic along Dorchester Avenue could result in an increase of trash at the South Station site; however, no significant change in sources of trash between the No Build Alternative and the Build condition is expected for the South Station site.

Chloride: During winter months, roadways and parking areas are salted to prevent ice buildup. Salt can be dissolved in stormwater runoff and carried to downstream water resources, although it poses less of a water quality threat to salt waters.

It is estimated that roadway salt use would change based on winter severity and not as a result of proposed conditions at the South Station site. Consequently, no significant change in sources of chloride between the No Build Alternative and the Build condition is expected for the South Station site.

Nutrients: Organic materials, soil, sediment, atmospheric deposition, vehicle exhaust, and fertilizer are all sources of nutrients that may be present at the South Station Site. Excess of nutrients can be harmful to water resources as it may stimulate algal growth and lead to dissolved oxygen depletion in the waterbody.

The increase in train emissions of NOx and the introduction of more vegetated features along Dorchester Avenue could result in minor increases of nutrient sources at the South Station site; however, no significant change in sources of nutrients between the No Build Alternative and the Build condition is expected for the South Station site.

Drainage Analysis

Preliminary peak flow rate and runoff volume analyses were completed for the South Station site. The analyses were conducted to identify order of magnitude impacts to expected stormwater peak runoff rates and volumes with the implementation of the various Build Alternatives. The existing site land uses, features and topography were assessed as described in Section 5.1.2 of this report. Similarly, utilizing the site concept plans for each Build Alternative, the future site features were defined and quantified. No Build stormwater peak runoff rates and volumes were computed using the existing site information as shown in Table 2. Using the same calculation procedures, flow rates and volumes for the proposed Build Alternative conditions were computed and compared with the results of the No Build analyses. Peak runoff flow rates and volumes were computed for Alternative 1 and Alternative 3. The peak runoff flow rates and volumes for Alternative 2 are anticipated to be the same as those for Alternative 3.

Peak stormwater runoff rates and volumes were calculated using methods defined in the USDA NRCS's TR-55, Urban Hydrology for Small Watersheds. These calculation methodologies were applied to both No Build and Build conditions to allow equitable comparisons among No Build and proposed conditions under the Build Alternatives. The peak runoff rate and volumes computed do not reflect final design detail, including discharge paths, roof runoff discharge points, and numerous other factors. The flow rates and volume presented should not be used for final design, but are intended for comparative purposes only.

As shown in Table 8, the South Station site would have similar land cover/use conditions in the Build Alternatives' conditions in comparison to the No Build conditions. In the Build alternatives, the major change in land use would be the removal of the existing USPS facility and its replacement with an expanded railroad yard, both of which are considered impervious surfaces, and the addition of landscaped areas (such as bioretention/rain gardens), permeable pavement, and/or box tree filters on Dorchester

Avenue which are considered pervious surfaces. This results in an increase in the percentage of pervious surface on the South Station site for all alternatives[36].

Table 8—Proposed South Station Land Cover

Types of Cover	No Build (%)	No Build (acres)	Alt 1 (%)	Alt 1 (acres)	Alt 2/3 (%)	Alt 2/3 (acres)
Pervious Cover	1 %	1.0	5 %	2.4	6 %	2.9
Impervious Cover	99 %	48.0	95 %	46.6	94 %	46.1

As shown in Table 9, there would be a reduction in peak stormwater rates and volumes in all Alternatives from No Build conditions. The proposed reduction in peak rates and volumes is attributed to the pervious areas on Dorchester Avenue and railroad yard having a lower TR-55 CN than buildings, which contributes to determining stormwater flow rates and runoff volumes.

Table 9—Proposed South Station Flow Rates and Runoff vs. No Build Conditions

Storm Event	24-Hour Rainfall (in)	Peak Flow (cfs)		Runoff Volume (cu. ft)	
		Proposed Conditions	Change from No Build conditions	Proposed Conditions	Change from No Build conditions
Alternative 1					
2-year	3.3	156	(9)	428,000	(35,000)
10-year	4.9	227	(7)	710,000	(39,000)
50-year	7.4	322	(5)	1,147,000	(42,000)
100-year	8.8	373	(4)	1,401,000	(43,000)
Alternative 2/3					
2-year	3.3	161	(4)	445,000	(18,000)
10-year	4.9	230	(3)	729,000	(20,000)
50-year	7.4	325	(2)	1,168,000	(21,000)
100-year	8.8	375	(2)	1,422,000	(22,000)

The additional platform area, the expanded concourse and the joint development would ultimately discharge directly to Fort Point Channel; some of the outfalls to be utilized could include CSOs. Due to the minor change in land cover percentages and decrease in stormwater flows, however, it is anticipated that there would be no impact to the frequency or volume of overflows to the BWSC system as a result of the SSX project.

Dorchester Avenue stormwater would also outfall directly to Fort Point Channel. Some outfalls utilized may include CSOs; however the tie-in location for the Dorchester Avenue stormwater would be downstream of the overflows. This would result in no impact to the frequency or volume of overflows from the system.

The peak flow rates and runoff volume in the Build conditions would be lower than the rates and volume in No Build conditions, therefore it is anticipated that existing drainage infrastructure capacity would be sufficient for proposed conditions. The condition of the outfalls to Fort Point Channel would be evaluated during final design and addressed if necessary.

[36] Land cover analysis for the un-programmed area of Alternative 1 assumed the area to the north of the new concourse considered totally impervious (platform area and walkway). The area to the south of the new concourse was considered the same permeability as the yard areas, which is only slightly more pervious than paved areas in a saturated condition.

Construction Impacts

Activities associated with construction could require removing existing pavement, concrete, structural steel, and building materials, material stockpiling, and grading in some areas. Exposing previously developed soils and material stockpiling could potentially lead to erosion and runoff into Fort Point Channel if not properly controlled.

During construction, dewatering could be required if groundwater is encountered during excavation or if surface water is ponding in temporary BMPs or other areas. Construction dewatering water could contain sediment or other contaminants. Any construction dewatering water would be treated on-site before being discharged to the drainage system and ultimately Fort Point Channel and be consistent with the NPDES Dewatering General Permit, as necessary. An Erosion and Sediment Pollution Control Plan would be developed as part of the NPDES Construction General Permit as discussed in Section 7.2 of this report.

Coastal Storm Events

Coastal storm events could affect the functionality of the storm drain outfalls to Fort Point Channel along Dorchester Avenue. All site stormwater runoff would ultimately discharge to these outfalls. Similar effects could be caused by sea level rise, which is addressed in DEIR Chapter 5.

The South Station site is located immediately adjacent to Fort Point Channel which is a component of Boston Harbor and at an elevation that is not substantially higher than the mean sea level (MSL). Current MSL at Fort Point Channel according to NOAA is approximately -0.3 feet (NAVD 88), and mean high water (MHW) is approximately 4.3 feet (NAVD 88). The existing ground elevation at South Station varies from approximately nine to 16 feet (NAVD 88), meaning that existing "freeboard" ranges from five to 12 feet above the normal daily tidal water levels (MHW). Existing outfall elevations in relation to the water levels of Fort Point Channel are discussed in Section 5.1.2 of this report.

With projected 100-year flood elevations in Fort Point Channel ranging from 10 to 13 feet (from Dorchester Avenue bridge to old Northern Avenue bridge, respectively), much of the South Station site would be subjected to higher coastal storm tailwater discharge elevations than experienced in the past. Portions of the stormwater drainage system at the South Station site would be inundated during 100-year flood events where ground elevations are below 13 feet. Once flood levels return to normal, the system would drain normally by gravity discharge.

Portions of the existing drainage system that could be retained in the Build condition would require analysis to confirm acceptability for use, conceivably under a different set of design conditions than their original design. It could be determined that certain sections of the existing system would be inadequate under a new set of design input, such as elevated tailwater or storms with greater precipitation intensities.

6.3. Widett Circle Build Alternative

6.3.1. Description of Build Alternative

The Widett Circle facility will be designed to store up to 30 trainsets (each set consisting of eight coach cars and one locomotive), as shown in Figure 8. The program includes:

- Power substation building (6,400 sf);
- Support shed building (7,500 sf); and
- Crew building (30,000 sf).

6.3.2. Proposed Stormwater Management

Stormwater management at the Widett Circle layover facility site would be designed based on the MBTA Commuter Rail Design Standards Manual. Track drainage would consist of track ballast underlain with a relatively impervious subgrade crowned at each track centerline. A ditch or subdrain on either side of the tracks would collect stormwater and convey it to a catch basin or manhole and closed drainage system. Each locomotive storage area, at the end of each track, would be equipped with a drip pan to collect potential contaminants. The drip pans would connect to an oil/water separator to be treated before being connected to the closed drainage system or sewer system.

Stormwater from the Widett Circle site would be directed off-site via an existing connection to the existing 17-foot by 13.5-foot BWSC CSO that runs under the Widett Circle roadway and discharges into Fort Point Channel. MassDOT would coordinate with BWSC during the design of connections to the existing CSO or drainage system.

Pervious areas on the eastern and western sections of the site, around the proposed buildings, and to the west of the existing Cold Storage building may be suitable for surface stormwater management BMPs. Subsurface treatment BMPs may be implemented due to space constraints or maintenance considerations. Existing soils at the Widett Circle site are classified as urban land. Further site specific soil investigation during the design stage would be required to determine the infiltration capabilities of the existing soils. Gravel wetlands, retention/detention basins, swales, or underground detention/infiltration systems could be suitable for detention and treatment of stormwater before discharging to Fort Point Channel.

6.3.3. Impacts Analysis

This section includes the impacts that relate to stormwater management for the Widett Circle layover facility site. Additionally this section discusses potential pollutant sources and impacts related to the proposed drainage system, infrastructure, and construction.

Potential Pollutants Analysis

Potential pollutant sources were evaluated to determine the treatment measures required to protect surface and groundwater resources. Most potential contaminants at layover facility sites are related to train activity. Other sources include vehicles and parking, aerial deposition, and wildlife. Rail lines themselves are not significant sources of pollutants, as the rail and ballast are made of stable, non-hazardous materials. Some pollutants generated by the train operations are filtered by the stone ballast supporting the rail ties. This section summarizes the major rail pollutant sources that have been considered for the Widett Circle layover facility site and the potential impacts to water quality.

Hydrocarbons: Hydrocarbons are the most common contaminant found on rail ballast from drips of fuel and other fluids from trains. Spills from fueling trains and power substations are also a potential source of hydrocarbon pollution.

The number of vehicles and trucks on site, a source of hydrocarbons, would decrease from the No Build Alternative. Drips from trains under the Build Alternative would be collected in track ballast and oil/water separators before discharging to the storm drain system. Therefore, a decrease in sources of hydrocarbons from the No Build Alternative is expected at the Widett Circle site.

Metals: Vehicle and train operations may generate trace amounts of iron from wheels, brake pads, and rails. Metal roofs and atmospheric deposition would also be a source of metals. It is not anticipated that metals would be a significant source of pollution to nearby water resources.

Metals from trains and tracks under the Build Alternative would be collected in track ballast and oil/water separators before discharging to the storm drain system. Additionally the number of metal roofs, vehicles, and trucks on site would decrease from the No Build Alternative. A decrease in sources of metals from the No Build Alternative is expected at the Widett Circle site.

Pathogens: On-board sanitary facilities on commuter trains may be a source of pathogen pollution if storage tanks were to leak or spill. Leaks and spills of sanitary sewage are prohibited by the MassDEP Stormwater Standards and the CWA. Wildlife such as dogs and waterfowl are also a source of potential pathogen pollution.

Pathogen sources from trains would replace the existing food product waste and numerous sanitary sewer connections. Crew facilities would introduce sanitary sewer service connection to the site which could be a potential source of pathogen pollution. However, no significant increase in sources of pathogens between the No Build Alternative and the Build Alternative is expected for the Widett Circle site.

Total Suspended Solids (TSS): TSS sources include any exposed soils, roadways treated with sand, impervious surfaces, and aerial deposition.

Impervious cover along with the area of roadway requiring winter sanding would decrease at Widett Circle. Therefore, a decrease in sources of TSS from the No Build Alternative is expected at the Widett Circle site.

Herbicides: Herbicides are used on the rail lines to keep the rail corridors free of intrusive or obstructive vegetation. Overuse of herbicides near surface waters could impact the health and biodiversity of waterbodies.

Changes in land use at the Widett Circle site to include decreased impervious cover could result in minor increases of herbicides. However, no significant change in sources of herbicides between the No Build Alternative and the Build Alternative is expected for the Widett Circle site.

Trash: Trash and debris could be introduced to the stormwater system and be conveyed to downstream waterbodies.

It is estimated that the Widett Circle site would have fewer daily visitors and therefore less trash pollution potential. No significant change in sources of trash between the No Build Alternative and the Build Alternative is expected for the Widett Circle site.

Chloride: During winter months, roadways and parking areas are salted to prevent ice buildup. Salt can be dissolved in stormwater runoff and carried to downstream water resources.

It is estimated that roadway salt use would change annually based on winter severity and generally decrease as a result of the reduction in paved surfaces under the Build Alternative at the Widett Circle site. No significant change in sources of chloride between the No Build Alternative and the Build Alternative is expected for the Widett Circle site.

Nutrients: Organic materials, soil, sediment, aerial deposition, vehicle exhaust, and fertilizer are all sources of nutrients that could be present at the layover facility site. Excess of nutrients can be harmful to water resources as it may stimulate algal growth and lead to dissolved oxygen depletion in the waterbody.

A decrease in impervious cover may result in minor increases of nutrient sources at the Widett Circle site. However, no significant change in sources of nutrients between the No Build Alternative and the Build Alternative is expected for the Widett Circle site.

The proposed conditions at Widett Circle would result in overall improved conditions for surface water quality. The proposed conditions would result in increased permeable area on the site which would allow for stormwater to infiltrate into the ground, providing some treatment and reducing the overall volume of stormwater discharged to Fort Point Channel. No negative impacts to the water quality of Fort Point Channel are anticipated. BMPs included in the standard track design including drip pans, oil/water separators and deep sump catch basins would be proposed as part of the Widett Circle Build condition.

Drainage Analysis

A peak flow rate and runoff volume analysis was completed for the Widett Circle site. The Build condition at the site would result in a decrease in impervious cover and therefore a decrease in peak flow rates. Table 10 shows the change in impervious cover between No Build and Build conditions. Curve numbers used for the No Build and Build peak flow rate and runoff volume analysis are 97 and 92, respectively. Peak flow rates and runoff volume comparisons between No Build and Build conditions are provided in Table 11.

Table 10—Proposed Widett Circle Land Cover

Pervious/ Impervious Cover	No Build (%)	No Build (acres)	Proposed (%)	Proposed (acres)
Pervious Cover	0%	0.0	10%	2.2
Impervious Cover	100%	29.4	90%	27.2

Table 11—Proposed Widett Circle Flow Rates and Runoff vs. No Build Conditions

Storm Event	24-Hour Rainfall (in)	Peak Flow (cfs)		Runoff Volume (cu. ft)	
		Proposed Conditions	Change from No Build conditions	Proposed Conditions	Change from No Build Conditions
2-yr	3.3	62.9	(8.2)	253,450	(53,500)
10-yr	4.9	94.2	(6.4)	420,200	(58,500)
50-yr	7.4	137.1	(4.7)	679,000	(62,300)
100-yr	8.8	160.8	(4.0)	829,000	(63,500)

The Widett Circle site would discharge directly to Fort Point Channel. The site storm drain would connect to a CSO, however the tie-in location would be beyond the overflow. This would result in no impact to the frequency or volume of overflows from the system.

The peak flow rates and runoff volume in the Build Alternative would be lower than the rates and volume in No Build conditions. Therefore, the existing stormwater system capacity would likely be sufficient for the proposed stormwater expected. The condition of the existing drain connection would be evaluated during final design and addressed if necessary.

Construction Impacts

Activities associated with construction could require removing existing pavement, material stockpiling, and grading in some areas. Exposing previously developed soils and material stockpiling could

potentially lead to erosion and runoff into adjacent drainage systems and Fort Point Channel bodies if not properly controlled.

During construction, dewatering could be required if groundwater is encountered during excavation or if surface water is ponding in temporary BMPs or other areas. Construction dewatering water could contain sediment or other contaminants. Any construction dewatering water would be treated on-site before being discharged to the drainage system and ultimately Fort Point Channel and be consistent with the NPDES Dewatering General Permit, as necessary. An Erosion and Sediment Pollution Control Plan would be developed as part of the NPDES Construction General Permit as discussed in Section 7.2. of this report.

Coastal Storm Events

At the Widett Circle layover facility site, coastal storm events could affect the functionality of the storm drain discharges to offsite. All site stormwater runoff would ultimately discharge to Fort Point Channel where there is a preliminarily established base flood elevation of 10 feet. The layover facility site is located approximately 2,000 feet south of Fort Point Channel and is predominantly at an elevation of 10 feet and lower. The current preliminary FEMA flood mapping does not indicate that the base flood elevation reaches the Widett Circle site vicinity by overland connection. The site is shown by FEMA to be subject to potential flooding during a 500-year storm. Due to the Widett Circle downstream drain piping being below base flood elevations in the vicinity of Fort Point Channel, this system could be influenced by coastal storm events. For example, Widett Circle drain system design tailwater elevations could be influenced by offsite downstream base flood elevations. Further information on drainage system elevations will be collected in the design stage to determine the effects of a 100-year coastal flood on the drainage system.

6.4. Beacon Park Yard Build Alternative

6.4.1. Description of Build Alternative

The proposed Beacon Park Yard layover facility site will be designed to store up to 20 trainsets (eight coach cars and one locomotive), as shown in Figure 9. The proposed layover facility would be equipped with several support buildings to allow midday layover of 20 commuter rail trainsets:

- Power substation building (5,400 sf).
- Support shed building (5,000 sf).
- Crew building (21,000 sf).

6.4.2. Proposed Stormwater Management

Stormwater management at the Beacon Park Yard site would be designed based on the *MBTA Commuter Rail Design Standards Manual*. Track drainage would follow the existing stormwater management in place for the existing tracks. This would consist of a centerline crown on each track and a ditch or subdrain on either side of the tracks to collect stormwater and convey it to a catch basin and closed drainage system. Each locomotive storage area, located at the end of each track, would be equipped with a drip pan to collect any potential contaminants. The locomotive storage areas would connect to an oil/water separator to be pre-treated before being connected to the closed drainage system.

Stormwater from the Beacon Park Yard site would be directed off-site via an existing BWSC storm drain that runs under the existing tracks and discharges into the Charles River. MassDOT would coordinate with BWSC to connect to the existing drainage system.

Due to the Build condition site layout and land cover, on-site surface locations for stormwater management BMPs are limited at Beacon Park Yard. Existing soils at Beacon Park Yard are classified as urban land. Further site specific soil investigation during the design stage would be required to determine the infiltration capabilities. Soils at the Beacon Park Yard site are likely contaminated, additionally constraining infiltration capabilities. Additional soil and groundwater contamination information would be collected during the design stage. Surface and subsurface detention, retention and filtration systems could be suitable for treatment of stormwater before discharging to the Charles River and would be evaluated in preliminary design.

6.4.3. Impacts Analysis

This section includes the impacts that relate to stormwater management for the Beacon Park Yard layover facility site. Potential pollutant sources and impacts related to the Build condition drainage system, infrastructure, and construction are discussed in this section.

Potential Pollutants Analysis

Various potential pollutant sources were evaluated to determine the treatment measures required to protect surface and groundwater resources. Most potential contaminants at layover facility sites are related to train activity on the rails. Other sources include vehicles and parking, aerial deposition, and wildlife. Rail lines themselves are not significant sources of pollutants, as the rail and ballast are made of stable, non-hazardous materials. Some pollutants generated by the train operations would be filtered by the stone ballast supporting the rail ties. This section summarizes the major rail pollutant sources that have been considered for the Beacon Park Yard layover facility site.

Hydrocarbons: Hydrocarbons are the most common contaminant found on rail ballast from drips of fuel and other fluids from trains. Spills from fueling trains and power substations are also a potential source of hydrocarbon pollution.

No change significant change in hydrocarbon sources is expected under the Build Alternative as drips from trains under the Build Alternative would be collected in track ballast and oil/water separators would collect any drips before discharging to the storm drain system. Therefore, no significant change in sources of hydrocarbons from the No Build Alternative is expected at the Beacon Park Yard site.

Metals: Vehicle and train operations may generate trace amounts of iron from wheels, brake pads, and rails. Metal roofs and aerial deposition would also be a source of metals. It is not anticipated that metals would be a significant source of pollution to nearby water resources.

Metals from trains and tracks under the Build Alternative would be collected in track ballast and oil/water separators before discharging to the storm drain system. Therefore, no significant change in sources of metals from the No Build Alternative is expected at the Beacon Park Yard site.

Pathogens: On-board sanitary facilities on commuter trains may be a source of pathogen pollution if storage tanks were to leak or spill. Leaks and spills of sanitary sewage are prohibited by the MassDEP Stormwater Standards and the CWA. Wildlife such as dogs and waterfowl are also a source of potential pathogen pollution.

An increase in sources of pathogens between the No Build Alternative and the Build Alternative may occur for the Beacon Park Yard site. Pathogen sources from trains would increase over No Build conditions as trains would be stationary in the layover facility, increasing the potential of leaks or spills.

Crew facilities would introduce sanitary sewer service connections to the site which could be a potential source of pathogen pollution.

Total Suspended Solids (TSS): TSS sources include any exposed soils, roadways treated with sand, impervious surfaces, and aerial deposition.

No significant change in sources of TSS between the No Build Alternative and the Build Alternative is expected for the Beacon Park Yard site.

Herbicides: Herbicides are used on the rail lines to keep the rail corridors free of intrusive or obstructive vegetation. Overuse of herbicides near surface waters could impact the health and biodiversity of waterbodies.

No significant change in sources of herbicides between the No Build Alternative and the Build Alternative is expected for the Beacon Park Yard site. No significant changes in land use at the Beacon Park Yard site are proposed over No Build conditions.

Trash: Trash and debris could be introduced to the stormwater system and be conveyed to downstream waterbodies.

It is estimated that the Beacon Park Yard site would have an increase in daily visitors and therefore a potential increase in trash pollution. However, no significant change in sources of trash between the No Build Alternative and the Build Alternative is expected for the Beacon Park Yard site.

Chloride: During winter months, roadways and parking areas are salted to prevent ice buildup. Salt can be dissolved in stormwater runoff and carried to downstream water resources.

It is estimated that roadway salt use would change primarily based on winter severity. The proposed driveways and parking areas may increase the need for salt use. However, no significant change in sources of chloride between the No Build Alternative and the Build Alternative is expected for the Beacon Park Yard site.

Nutrients: Organic materials, soil, sediment, aerial deposition, vehicle exhaust, and fertilizer are all sources of nutrients that may be present at the layover facility site. Excess of nutrients can be harmful to water resources as it may stimulate algal growth and lead to dissolved oxygen depletion in the waterbody.

No significant change in land use, traffic, or fertilizer use is expected under the Build Alternative at the Beacon Park Yard site. Therefore, no significant change in sources of nutrients between the No Build Alternative and the Build Alternative is expected for the Beacon Park Yard site.

The Build Alternative at Beacon Park Yard would result in overall neutral change in conditions for surface water quality. The Build Alternative would result in a slight decrease in pervious cover and a slight increase in track and ballast coverage of the site, which would allow for stormwater to be slowed and provide some filtration. This negligible change in land use would not result in any significant change to the estimated peak flow rate of stormwater and runoff volume discharged to the Charles River. Stormwater BMPs would be included to the maximum extent practicable to provide treatment and remove pollutants before discharging to the Charles River. No negative impacts to the water quality of the Charles River are anticipated. The Build condition would ensure compliance with the Charles River pathogen and phosphorus TMDLs. Section 7.2.1 of this report provides more information on compliance with the Charles River TMDLs.

Drainage Analysis

A peak flow rate and runoff volume analysis was completed for the Beacon Park Yard site. The Build condition at the site would result in a slight increase in impervious cover and an increase in track and ballast cover. Because track and ballast provide some storage and detention of stormwater, there would be no change in estimated peak flow rates or runoff volumes for all storm events. Table 12 shows the change in impervious cover between No Build and Build conditions. To be conservative, it was assumed that the areas to the north of the proposed tracks would be impervious, associated with projects proposed by others. Curve numbers used for the No Build and Build peak flow rate and runoff volume analysis are 92 and 92, respectively. Peak flow rates and runoff volume comparisons between No Build and Build conditions are provided in Table 13.

Table 12—Proposed Beacon Park Yard Land Cover

Pervious/ Impervious Cover	No Build (%)	No Build (acres)	Proposed (%)	Proposed (acres)
Pervious Cover	2%	0.4	1%	0.3
Impervious Cover	98%	29.6	99%	29.7

Table 13—Proposed Beacon Park Yard Flow Rates and Runoff vs. No Build Conditions

Storm Event	24-Hour Rainfall (in)	Peak Flow (cfs)		Runoff Volume (cu. ft)	
		Proposed Conditions	Change from No Build conditions	Proposed Conditions	Change from No Build conditions
2-yr	3.3	65.0	0.0	262,200	0.0
10-yr	4.9	97.4	0.0	434,700	0.0
50-yr	7.4	142.0	0.0	702,400	0.0
100-yr	8.8	166.4	0.0	857,700	0.0

Note: Drainage analysis does not include potential stormwater BMPs.

Stormwater from Beacon Park Yard would outfall directly to the Charles River. The site storm drain is an underground stream and separate from the sanitary sewer system. Therefore, no impacts to CSOs would result from this connection.

The estimated peak flow rates and runoff volumes in the Build Alternative would remain the same as they are in No Build conditions. Therefore, it is anticipated that the existing stormwater system capacity would be the same under Build conditions. The condition of the outfalls and drainage infrastructure to the Charles River would be evaluated during final design and addressed if necessary.

Construction Impacts

Activities associated with construction could require removing existing pavement, material stockpiling, and grading in some areas. Exposing previously developed soils and material stockpiling could potentially lead to erosion and runoff into the Charles River if not properly controlled.

During construction, dewatering could be required if groundwater is encountered during excavation or if surface water is ponding in temporary BMPs or other areas. Construction dewatering water could contain sediment or other contaminants. Any construction dewatering water would be treated on-site before being discharged to the drainage system and ultimately the Charles River and be consistent with the NPDES Dewatering General Permit, as necessary. An Erosion and Sediment Pollution Control Plan would be developed as part of the NPDES Construction General Permit as discussed in Section 7.2.

Coastal Storm Events

The Beacon Park Yard layover facility site is inland from Boston Harbor and is not located within a coastal flood hazard area. Based on its location, the Beacon Park Yard facility site is not expected to be affected by coastal storm events.

6.5. Readville – Yard 2 Build Alternative

6.5.1. Description of Build Alternative

The Readville – Yard 2 layover facility would be an expansion of the existing facility by eight additional trainsets (eight coach cars and one locomotive), as shown in Figure 10. The existing layover facility support buildings would be expanded to accommodate eight additional trainsets:

- Power substation building (1,700 sf onto existing facility).
- Support shed building (2,000 sf onto existing facility).
- Crew building (8,000 sf onto existing facility).

6.5.2. Proposed Stormwater Management

Stormwater management at the Readville – Yard 2 layover facility site would be designed based on the *MBTA Commuter Rail Design Standards Manual*. Track drainage would be similar to the existing stormwater management in place for the existing tracks. This would consist of a centerline crown on each track and a ditch or subdrain on either side of the tracks to collect stormwater and convey it to a catch basin and closed drainage system. Each locomotive storage area, located at the end of each track, would be equipped with a drip pan to collect any potential contaminants. The locomotive storage areas would connect to an oil/water separator to be pre-treated before being connected to the closed drainage system.

Currently, stormwater from the Readville – Yard 2 site is directed off-site via an existing 54-inch BWSC storm drain which discharges into the Neponset River. A second 12-inch storm drain exists in the northern portion of the site and drains the runoff from tracks and ballast nearby. In the Build Alternative, the 54-inch existing storm drain could need to be relocated based on the condition of the structure. An inspection of the existing storm drain to assess its condition would be performed to determine if the pipe should be replaced or if a structural liner could be installed. MassDOT would coordinate with BWSC during the design phase to inspect and upgrade to the existing drainage system, as necessary.

Permeable areas located on the eastern and western boundaries of the site could be suitable for stormwater management BMPs. Existing soils at the Readville – Yard 2 site are classified as urban land. Further site specific soil investigation during the design stage would be required to determine the infiltration capabilities. The proximity of the site to the Neponset River, in addition to visible pockets of standing water on portions of the site, indicate poorly draining soils and/or high groundwater levels which would further restrict infiltration potential. Surface and subsurface detention, retention and filtration systems could be suitable for treatment of stormwater before discharging to the Neponset River and would be evaluated in preliminary design.

6.5.3. Impacts Analysis

This section includes the impacts that relate to stormwater management for the Readville – Yard 2 layover facility site. Potential pollutant sources and impacts related to the proposed drainage system, infrastructure, and construction are discussed in this section.

Potential Pollutants Analysis

Various potential pollutant sources were evaluated to determine the treatment measures required to protect surface and groundwater resources. Most potential contaminants at layover facility sites are related to train activity on the rails. Other sources include vehicles and parking, aerial deposition, and wildlife. Rail lines themselves are not significant sources of pollutants, as the rail and ballast are made of stable, non-hazardous materials. Some pollutants generated by the train operations would be filtered by the stone ballast supporting the rail ties. This section summarizes the major rail pollutant sources that have been considered for the Readville – Yard 2 layover facility site.

Hydrocarbons: Hydrocarbons are the most common contaminant found on rail ballast from drips of fuel and other fluids from trains. Spills from fueling trains and power substations are also a source of potential hydrocarbon pollution.

Similar to No Build conditions, drips from trains under the Build Alternative would be collected in track ballast and oil/water separators before discharging to the storm drain system. More trainsets would be stored at the site under the Build Alternative, resulting in a slight increase in potential pollution. However, no significant change in sources of hydrocarbons from the No Build Alternative is expected at the Readville – Yard 2 site.

Metals: Vehicle and train operations may generate trace amounts of iron from wheels, brake pads, and rails. Metal roofs and aerial deposition also would be a source of metals. It is not anticipated that metals would be a significant source of pollution to nearby water resources.

Similar to No Build conditions, metals from trains and tracks under the Build Alternative would be collected in track ballast and oil/water separators before discharging to the storm drain system. More trainsets would be stored at the site under the Build Alternative, resulting in a slight increase in potential pollution. However, no significant change in sources of metals from the No Build Alternative is expected at the Readville – Yard 2 site.

Pathogens: On-board sanitary facilities on commuter trains may be a source of pathogen pollution if storage tanks were to leak or spill. Leaks and spills of sanitary sewage are prohibited by the MassDEP Stormwater Standards and the CWA. Wildlife such as dogs and waterfowl are also a source of potential pathogen pollution.

No significant change in sources of pathogens between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site. Pathogen sources from trains and crew facilities would be similar to the No Build conditions.

Total Suspended Solids (TSS): TSS sources include any exposed soils, roadways treated with sand, impervious surfaces, and aerial deposition.

No significant change in sources of TSS between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site.

Herbicides: Herbicides are used on the rail lines to keep the rail corridors free of intrusive or obstructive vegetation. Overuse of herbicides near surface waters could impact the health and biodiversity of waterbodies.

A decrease in pervious cover at the Readville – Yard 2 site is proposed over No Build conditions, which could result in fewer herbicides being used. Therefore, no significant change in sources of herbicides between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site.

Trash: Trash and debris could be introduced to the stormwater system and be conveyed to downstream waterbodies.

No significant change in sources of trash between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site.

Chloride: During winter months, roadways and parking areas are salted to prevent ice buildup. Salt can be dissolved in stormwater runoff and carried to downstream water resources.

It is estimated that roadway salt use would change based on annual winter severity and would slightly increase due to the increase of roadways in the Build Alternative at the Readville – Yard 2 site. However, no significant change in sources of chloride between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site.

Nutrients: Organic materials, soil, sediment, aerial deposition, vehicle exhaust, and fertilizer are all sources of nutrients that may be present at the layover facility site. Excess of nutrients can be harmful to water resources as it may stimulate algal growth and lead to dissolved oxygen depletion in the waterbody.

An increase in impervious cover, exposed soils, and vegetation is expected under the Build Alternative at the Readville – Yard 2 site which could reduce the potential nutrient sources on site. However, no significant change in sources of nutrients between the No Build Alternative and the Build Alternative is expected for the Readville – Yard 2 site.

The Build Alternative at Readville – Yard 2 would result in overall neutral change in conditions for surface water quality. The proposed conditions would result in a decrease in pervious cover and an increase in track and ballast coverage of the site, which would allow for stormwater to be slowed and provide some filtration. This change in land use would increase the peak flow rate of stormwater and result in an increase in runoff volume discharged to the Neponset River. Stormwater BMPs would be included to provide detention, treatment and remove pollutants before discharging to the Neponset River and address the requirements of the Massachusetts Stormwater Management Standards as new development and conditions of the Neponset River TMDL. No new operations, only an expansion of existing operations, would occur at the site. Therefore, potential pollutant loads and surface water quality of the Neponset River are not expected to change significantly. Potential pollutant sources from the existing material storage area on the eastern portion of the site would be investigated during the next phases of project development. No negative impacts to the water quality of the Neponset River are anticipated. The Build condition would ensure compliance with the Neponset River pathogen TMDL. Section 7.2.1 provides more information on compliance with the TMDL.

Drainage Analysis

A peak flow rate and runoff volume analysis was completed for the Readville – Yard 2 site. The Build condition at the site would result in an increase in impervious cover, which would result in an increase in peak flow rates in the Build Alternative for most storm events. Table 14 shows the change in impervious cover between No Build and Build conditions. Estimated curve numbers used for the No Build and Build peak flow rate and runoff volume analysis are 90 and 91, respectively. Peak flow rates and runoff volume comparisons between No Build and Build conditions are provided in Table 15.

Table 14—Proposed Readville – Yard 2 Land Cover

Pervious/ Impervious Cover	No Build (%)	No Build (acres)	Proposed (%)	Proposed (acres)
Pervious Cover	38%	6.6	16%	2.8
Impervious Cover	62%	10.9	84%	14.7

Table 15—Proposed Readville – Yard 2 Flow Rates and Runoff vs. No Build Conditions

Storm Event	24-Hour Rainfall (in)	Peak Flow (cfs)		Runoff Volume (cu. ft)	
		Proposed Conditions	Change from No Build conditions	Proposed Conditions	Change from No Build conditions
2-yr	3.3	36.5	1.2	146,200	5,700
10- yr	4.9	55.5	1.1	245,400	6,650
50- yr	7.4	81.5	0.9	400,000	7,400
100- yr	8.8	95.8	0.8	489,800	7,650

Note: Drainage analysis does not include potential stormwater BMPs.

Stormwater from Readville – Yard 2 would outfall directly to the Neponset River. The site storm drain is an independent system, separate from the sewer system. Therefore, no impacts to CSO would result from this connection.

The peak flow rates in the Build Alternative would be slightly higher than those in No Build conditions under most storm events, and runoff volume in the Build Alternative would increase by less than 5% over No Build conditions. Therefore, it is anticipated that the existing stormwater system capacity would be sufficient for the proposed stormwater expected in the Build Alternative. The condition of the outfalls to the Neponset River would be evaluated during final design and addressed if necessary. Stormwater BMPs would be included to mitigate for the increased impervious cover and peak flow rates and runoff volumes. Table 17 at the end of this section includes a summary of BMPs under review for the Readville – Yard 2 site.

Construction Impacts

Activities associated with construction could require removal of existing pavement, material stockpiling, and grading in some areas. Construction would result in reworking and/or removing existing unimproved areas in the eastern portion of the Readville – Yard 2 site. Exposing previously developed soils and material stockpiling could potentially lead to erosion and runoff into adjacent streams or other water bodies if not properly controlled.

During construction, dewatering could be required if groundwater is encountered during excavation or if surface water is ponding in temporary BMPs or other areas. Construction dewatering water could contain sediment or other contaminants. Any construction dewatering water would be treated on-site before being discharged to the drainage system and ultimately nearby water resources and be consistent with the NPDES Dewatering General Permit, as necessary. An Erosion and Sediment Pollution Control Plan would be developed as part of the NPDES Construction General Permit as discussed in Section 7.2 of this report.

Coastal Storm Events

The Readville – Yard 2 layover facility site is approximately six miles inland from Boston Harbor and not within a coastal flood hazard area. Based on its location, the Readville – Yard 2 layover facility site is not expected to be affected by coastal storm events.

6.6. Summary of Impacts

This section provides a summary of the impacts related to water quality associated with the SSX project. Impacts would be mitigated through use of various mitigation measures discussed in Section 7 of this report.

Table 16 shows each site evaluated and the potential impacts associated with the Build Alternative for each. As shown in Table 16 and summarized in Section 6, impacts to water resources would be site specific. Mitigation for these impacts would be determined on a site-by-site basis depending on the impacts and regulatory requirements. Mitigation is discussed in Section 7 of this report. Table 17 includes a summary of stormwater BMPs that may be implemented at each project site.

6.6.1. South Station Site

As shown in Table 9, the impervious cover and runoff rates and volumes for all the build alternatives at the South Station site are anticipated to decrease compared to No Build conditions. Changes in land cover and use of the site may affect pollutant loadings from the site. Efforts would be made to minimize waste material from entering the stormwater conveyance system. Stormwater BMPs would be implemented to the extent practicable to mitigate for the potential increase in pollutants and to comply with the MassDOT Complete Streets guidelines, the City of Boston Complete Streets requirements, and MassDEP stormwater management regulations. No new discharges and no impacts to the surface water quality of Fort Point Channel would result from the project. The water quality of discharges to Fort Point Channel would likely improve due to the addition of treatment BMPs.

6.6.2. Layover Facility Sites

The Build condition at Widett Circle would result in a slight decrease in impervious cover and a decrease in peak flow rate and runoff volume from the site. Decreases in potential pollutant sources would also result from the changed land use at the site under the Build Alternative. No negative impacts from stormwater discharges to Fort Point Channel would result. The land use changes at Widett Circle would likely result in fewer potential pollutants on the site. Due to the improved conditions associated with the Build Alternative at Widett Circle, no stormwater mitigation BMPs beyond those included in the standard track design would be proposed.

The Build condition at Beacon Park Yard would result in a minor increase in impervious cover and no change in peak flow rate or runoff volume from the site. No new outfalls or changes in surface water quality are anticipated for discharges to the Charles River. The Charles River is covered by two TMDLs and therefore would require a reduction in pollutant loads over existing conditions. Stormwater mitigation BMPs would be implemented on the site to the maximum extent practicable to improve water quality and address the TMDLs.

The Build condition at Readville – Yard 2 would increase impervious cover, as the existing area in the eastern portion of the site, currently used for material storage, would be converted to track. As a result, there would be an increase in peak flow rate and an increase in runoff volume. Operations at the existing layover site would continue and be expanded to the eastern portion of the site in the Build condition. No

new operations, only expansion of existing operations, would occur at the site; therefore, potential pollutant loads and surface water quality of the Neponset River are not expected to change significantly. The existing pollutant sources from the material storage area in the eastern portion of the site would be investigated during further phases of project development. Stormwater mitigation BMPs would be included at Readville – Yard 2 to address the conditions of Massachusetts Stormwater Management Standards as new development and conditions of the Neponset River TMDL.

Table 16—Summary of Impacts

Site	Change in Impervious Cover	Impact to ORW	Discharge to an impaired water	Discharge to a water covered by a final TMDL	Change in peak flow rate (cfs) (10-year storm)	Change in runoff volume (cu. ft) (10-year storm)	New outfall to a water resource	Change in surface water quality impacts
South Station Alts. 2/3	(5)%	No	Yes	No	(3)	(20,000)	No	No
Widett Circle	(10)%	No	Yes	No	(6.4)	(58,500)	No	No
Beacon Park Yard	1%	No	Yes	Yes	0.0	0.0	No	No
Readville – Yard 2	22%	No	Yes	Yes	1.1	6,650	No	No

Note: Impact analysis for peak flow rate and runoff volume does not take into consideration the mitigation provided by potential stormwater treatment BMPs.

7. Proposed Mitigation/Consistency with Regulatory Requirements

This section addresses proposed mitigation measures and summarizes the consistency of the Build Alternatives with respect to state, regional and/or local guidelines, regulations, policies.

Generally, the South Station site and the three layover facility sites would be designed with the following considerations to minimize potential impacts:

- Reduce impervious cover wherever possible.
- Minimize disturbance of existing vegetation on site.
- Use existing stormwater infrastructure to eliminate the need for additional outfalls to surface waters.
- Implement pollutant source control measures through good housekeeping measures.
- Minimize unexposed soils and the creation of steep slopes to minimize potential erosion.
- Avoid infiltration where soils are known or likely to be contaminated.
- Meet the 10 Massachusetts Stormwater Standards in accordance with 310 CMR 10.05 to the maximum extent practicable.

7.1. Mitigation Measures

7.1.1. Non-Structural Best Management Practices

This section provides a brief description of the non-structural water quality control BMPs to be implemented at the South Station site and layover facility sites. Source control would be implemented at each site.

Snow Management

The City of Boston would manage the snow on Dorchester Avenue and MBTA would be responsible for snow management for the remaining portion of the South Station and layover sites. Snow removal and management procedures would direct that snow be placed on paved surfaces where debris and sand may be deposited and swept up for disposal once melted. Snow melt would enter the stormwater management system at the site. No snow would be placed on ballast stone or adjacent to the tracks. Salt would be used to treat snow and ice on the roadway and parking areas. Sand use for snow and ice removal would be limited.

Spill Prevention

Spill prevention would be achieved with proper storage and handling of hazardous materials. During construction, this would be addressed in the SWPPP for Construction Activities that would be prepared prior to the start of construction activities. As required under the CWA (40 CFR Part 112), an operational phase Spill Prevention, Control and Countermeasures (SPCC) Plan would be prepared prior to the commencement of operations at each layover facility site. An SPCC Plan is required to prevent oil pollution from reaching water resources and requires identification of all oil products stored or handled on the site and the development of a spill prevention plan. As required by future NPDES MSGPs for the project layover facilities, a SWPPP and monitoring program would be developed.

Source Control

A comprehensive source control program would be implemented at each site, which would include regular pavement sweeping, catch basin cleaning, material and waste handling, and enclosure and maintenance of all dumpsters, compactors, and loading areas.

The MBTA would develop a detailed Operation and Maintenance (O&M) Plan for each site during the final design phase of the project. This plan would address specific maintenance measures to be performed at the required frequency in order to properly maintain the stormwater management features at each site.

7.1.2. Structural Best Management Practices

This section provides a brief description of structural stormwater quality and quantity control BMPs that could be implemented at one or more of the SSX project sites. Structural BMPs would be designed to treat urban pollutants, including phosphorus, nitrogen, TSS, metals, and pathogens, and to provide detention for sites with increased peak flow rates.

Structural stormwater BMPs would be incorporated at the South Station site, including Dorchester Avenue, and the layover facility sites as required. Stormwater BMPs would be implemented to mitigate impacts due to an increase in total impervious cover, to treat potential pollutants from operations on the site, and to comply with regulations. Impacts of each site are summarized in Section 6 of this report. Table 17 at the end of this section shows the potential applicability of BMPs at each site in the Build Alternative, as well as existing site constraints. Within Table 17, white cells indicate proposed BMPs or potential BMPs which could be appropriate for the site; gray cells indicate BMPs that would not be appropriate for the site due to the listed site constraints; and dark grey cells indicate that BMPs would not be required to treat stormwater on the site.

For the Widett Circle site, impervious cover would be reduced under the Build Alternative and the runoff rate and volume would be decreased. Because of the proposed improved conditions at the Widett Circle

site, additional stormwater BMPs beyond those included in the standard track design would not be required. For Beacon Park Yard, stormwater BMPs would be included to the extent practical to improve water quality and address TMDLs. For the Readville – Yard 2 site, compliance with all Massachusetts Stormwater Management Standards would be mandatory, as a portion of the site would not be considered a redevelopment project. Specific requirements are included in Table 17.

As shown in Table 17, not all BMPs would be suitable or feasible for each site. Existing site conditions could limit the potential for implementing stormwater BMPs at each site. For example, use of infiltration as a BMP to treat stormwater could be limited at some sites due to soil properties, groundwater levels and soil contamination. Additional soil investigations at each site would be conducted in the final design stage to determine infiltration suitability. Other BMPs could be limited due to the nature of the layover facility sites. BMPs with intensive operation and maintenance needs would not be proposed for the layover facilities.

Catch Basin with Sump and Hood

All catch basins at the South Station site and the layover facility sites would be constructed with sumps (minimum of four feet) and hoods on outlet pipes to mitigate the discharge of sediments and floating contaminants. Regular cleaning to remove accumulated debris and maintain functionality would be outlined in the O&M Plan.

Drip Pan (Collection Tray)

All storage tracks would have drip pans or collection trays in areas where locomotives would be parked to catch any incidental drips, leaks or spills of hazardous materials from the locomotive. Runoff and contaminants collected in drip pans would be connected to an oil/water separator prior to discharge (and other treatment as necessary) to the drainage or sewer system. Drip pans would be inspected and cleaned according to the maintenance schedule developed in the site-specific O&M Plan.

Oil/Water Separator

MassDEP requires the use of a pretreatment BMP, such as an oil/water separator, for sites that constitute land uses with higher potential pollutant loads (LUHPPLs). All layover facility sites and the South Station site would include oil/water separators to treat runoff from tracks (specifically locomotive standing areas), roadways, and parking lots. Separators are underground structures designed to remove heavy particulates, floating debris, and hydrocarbons from stormwater. Oil/water separators would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Leaching Basin

A leaching basin is a similar device to a catch basin with a deep sump; however, the leaching basin is perforated to allow water entering the basin to enter the surrounding substrate and infiltrate into the ground. Leaching basins should only be used in locations where infiltration is feasible and permitted. Leaching basins would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Gravel Wetland

A gravel wetland is designed as an excavation or depression with a gravel substrate that allows for a microbe rich environment. Stormwater would flow through the gravel wetland system and receive treatment through physical, biological, and chemical reactions. An outlet control system would be

included to allow for overflow of larger storms. Gravel wetlands would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Vegetated (Grass) Swale

Vegetated swales are designed to carry and capture stormwater to promote infiltration. Each swale would include an earthen check dam to slow the flow within the swale and promote infiltration and settling of stormwater. Vegetated swales are appropriate for areas where stormwater must travel in a long and linear fashion. Vegetated swales would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Infiltration Basin

An infiltration basin is an impoundment or excavation designed to capture stormwater. An infiltration basin would include an outlet control structure for larger storms, but generally stormwater would infiltrate into the underlying soils. Infiltration basins are designed to drain fully over time through infiltration. Infiltration basins would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Bioretention Area/Rain Garden

A bioretention area or rain garden is an excavated surface depression with specifically selected native vegetation to capture and treat stormwater runoff. The bioretention area/rain garden would include a gravel infiltration bed with a perforated underdrain pipe and overflow structure to ensure adequate drainage. Bioretention areas/rain gardens are designed to be aesthetically pleasing and therefore would be appropriate for highly visible areas. They could also be installed in locations with poor infiltration rates as the underdrains could prevent flooding and vegetation and gravel could allow for incidental infiltration. Bioretention areas/rain gardens would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Permeable Pavement

Permeable pavement could replace some conventional impermeable surfaces and allow stormwater to flow through the pavement and into a stone reservoir below. Stormwater in the reservoir would then infiltrate into the underlying soils or discharge through an underdrain to the storm drain. Permeable pavement is available in concrete, asphalt or interlocking pavers and is recommended for pedestrian and bicycle facilities or roadways with low traffic volumes. Permeable pavement would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Tree Box Filter

A tree box filter is designed to replace conventional tree boxes along roadways or other uses. The tree box filter would include a filtering material that also supports plant life and is designed to capture stormwater and filter it. Stormwater would then infiltrate into underlying soils or overflow to the storm drain system. Tree box filters would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Detention Basin/Wet Pond

Detention basins and wet ponds are impoundments or excavations generally exposed to the elements and designed to detain stormwater. A detention basin would include an outlet control structure to slow the

rate of stormwater discharge and mimic natural conditions. Detention basins are designed to drain fully over time and would not include a permanent pool. Wet ponds are designed to include a permanent pool which would not drain and could include wetland vegetation. Detention basins and wet ponds would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

Underground Filtration System/Proprietary Separator

Underground filtration systems and separators are typically proprietary devices aimed at collecting sediments and reducing their associated pollutant loads. The devices are often aimed at removing specific pollutants from stormwater based on their design and components. In some cases, these could be used in lieu of drip pans. Maintenance and operation of these devices would be based on manufacturer's recommendations and would be included in the site-specific O&M Plan.

Underground Infiltration/Detention System

Underground infiltration/detention systems are designed to receive stormwater from impervious areas on the surface. The stormwater would receive some pre-treatment for sediment removal before entering the underground system. Based on the design of the system, water could be infiltrated into the underlying soils, released at a specified rate, or detained and reused for irrigation or other graywater uses. Underground infiltration/detention and proprietary separator systems would be inspected and cleaned based on the schedule developed in the site-specific O&M Plan.

7.1. Consistency with Regulatory Requirements

7.1.1. Clean Water Act

Section 401 of the federal CWA (33 USC 1251-1376), and the regulations that implement the Act, require the enhancement and protection of surface waters from pollution to ensure they are capable of supporting their designated uses. Under the CWA, the U.S. EPA in partnership with MassDEP administers the NPDES permit program, which regulates point source discharges to waters of the United States to control water pollution. The City of Boston is authorized to discharge stormwater in accordance with the NPDES Municipal Separate Storm Sewer System (MS4) General Permit. The MS4 General Permit includes numerous requirements to improve stormwater management through public education, upgraded infrastructure, and municipal bylaws. The permit also requires cities to locate and correct any unauthorized sewage discharges into the stormwater system. The project will comply with the City's MS4 General Permit and will not result in any new wastewater discharges or other discharges specifically regulated under the Clean Water Act.

Table 17—Build Alternative Potential Mitigation Practices and Constraints[a]

Site	Catch Basins with Sumps and Hoods	Drip Pans	Oil/Water Separators	Leaching Basins[b]	Gravel Wetlands	Vegetated (Grass) Swales	Infiltration Basins[b]	Bioretention Area/Rain Garden	Permeable Pavement	Tree Box Filter	Detention Basin/Wet Pond	Underground Filtration System/ Proprietary Separator	Underground Infiltration/ Detention System[b]
South Station Headhouse	Proposed	Proposed	Proposed	Utility conflicts	Limited area	Limited area	Limited area	Limited area	Limited area	Limited area	Limited area	Potential	Limited area
Dorchester Avenue	Proposed	N/A; no train operations	Proposed	Utility conflicts	Potential	Potential	Limited area	Potential within grass median	Potential along cycle track and sidewalk	Potential	Limited area	Potential	Utility conflicts
Widett Circle	Proposed	Proposed	Proposed	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required
Beacon Park Yard	Proposed	Proposed	Proposed	Potential	Potential	Potential	Limited area	Intensive O&M	Potential	Intensive O&M	Limited area	Potential	Potential
Readville – Yard 2	Proposed	Proposed	Proposed	Likely high ground-water	Potential	Potential	Limited area	Intensive O&M	Potential	Intensive O&M	Limited area	Intensive O&M	Potential

Notes:
a White cells indicate either proposed BMPs or potential BMPs which could be appropriate for the site; light gray cells indicate BMPs which may not be appropriate for the site due to the listed site constraints; and dark grey cells indicate that BMPs would not be required to treat stormwater on the site.
b Infiltration practices could be limited at specific sites due to soil properties, groundwater levels and contamination.

Charles River TMDLs

Under Section 303(d) of the CWA, the Charles River has been determined to be impaired as it does not meet the set water quality standards. A TMDL for pathogen impairments[37][38] and a TMDL for phosphorus impairments[39] have been developed for the Charles River. The pathogen TMDL identifies major contributors to the pathogen impairment and specifies both general and specific discharge limits that must be met in order to reduce the pathogen loading and improve the health of the Charles River. According to the TMDL, major sources of bacteria in the Charles River watershed include: failing septic systems; CSOs; sanitary sewer overflows (SSO); sewer pipes connected to storm drains; certain recreational activities; wildlife, including birds, along with domestic pets and animals; and direct overland storm water runoff. Bacteria sources from the Beacon Park Yard site are expected to be negligible. Wastewater from the Beacon Park Yard site would be discharged to a combined sewer system. Wastewater impacts are discussed in the Water Supply and Wastewater Technical Report. On-board sanitary facilities and on-site sanitary sewer systems would be designed to eliminate the potential of pathogen sources reaching the Charles River. Stormwater BMPs designed to treat urban pollutants would treat ambient sources of pathogens on the site such as from birds and other wildlife

The phosphorus TMDL lists natural sources such as vegetation, soil, and fecal matter and commercial sources such as fertilizers and detergents as the causes for phosphorus impairments in the Charles River. Phosphorus enters the Charles River through stormwater, illicit discharges, and CSOs. The phosphorus TMDL has set a 65% phosphorus load reduction for commercial and industrial land uses, under which the Beacon Park Yard site falls. MassDOT would incorporate stormwater BMPs to treat urban pollutants including phosphorus from the Beacon Park Yard site to address the TMDL. Table 17 provides a summary of potential stormwater BMPs which may be implemented on the site.

Neponset River TMDL

Under Section 303(d) of the CWA, the Neponset River has been determined to be impaired as it does not meet the established water quality standards. A TMDL for bacteria impairments to the Neponset River has been developed. The TMDL identifies major contributors to the bacteria impairment and specifies both general and specific discharge limits that must be met in order to reduce the bacteria loading and improve the health of the Neponset River. According to the TMDL, major sources of bacteria in the Neponset River watershed include illicit discharges to storm drains, leaking sanitary sewers, failing septic systems, and stormwater runoff. Bacteria sources from the Readville – Yard 2 site are expected to be negligible. Wastewater from the site would be discharged to a separate sanitary sewer system. Wastewater impacts are discussed in the Water Supply and Wastewater Technical Report. On-board sanitary facilities and on-site sanitary sewer systems would be designed to eliminate the potential of pathogen sources reaching the Neponset River. Stormwater BMPs designed to treat urban pollutants would treat ambient sources of bacteria on the site, such as from birds and other wildlife.

[37] Massachusetts Department of Environmental Protection. *Final Pathogen TMDL for the Charles River Watershed (CN 0156.0)*. 2007. http://www.mass.gov/dep/water/resources/charles1.pdf.
[38] Massachusetts Department of Environmental Protection. *Final Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts (CN 310.0)*. 2007. http://www.mass.gov/dep/water/resources/charlesp.pdf.
[38] Massachusetts Department of Environmental Protection. *Total Maximum Daily Loads of Bacteria for Neponset River Basin*. 2002. http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/neponset.pdf.

National Pollutant Discharge Elimination System

Industrial activities such as material handling and storage, equipment maintenance and cleaning, and storage of vehicles can be exposed to stormwater and therefore regulated under the NPDES MSGP. Layover facilities are included in the Industrial Sector P: Land Transportation and Warehousing and therefore regulated under the NPDES MSGP. Layover facilities fall under the standard industrial classification (SIC) 4011 and 4013 which includes rail transportation facilities. A permit would be required for the layover facility sites and could include stormwater effluent limits, monitoring requirements, and other conditions related to post-construction operations at the facility.

Construction at all SSX project sites would require a NPDES Construction General Permit, required to regulate erosion control, pollution prevention, and stormwater management (including construction dewatering) at construction sites larger than one acre. A SWPPP is required by the NPDES Construction General Permit and must identify potential pollutant source areas and describe measures to be employed for erosion and sedimentation control, temporary stormwater management, dust control, and winter stabilization. The SWPPP would be completed during the final design phase and would be implemented by the project contractor.

7.1.2. MassDEP Stormwater Standards

The Massachusetts Stormwater Management Standards were included as part of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) in 2008. MassDEP ensures compliance with the Massachusetts Stormwater Management Standards as part of its review of projects subject to the Wetlands Protection Act. The SSX project would be subject to the Wetlands Protection Act due to its proximity to wetland resource areas, including the Neponset River and Fort Point Channel.

Under the Massachusetts Stormwater Management Standards, most elements of the SSX project would qualify as redevelopment projects. Redevelopment projects are defined under the Massachusetts Stormwater Management Standards as: "development, rehabilitation, expansion and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area." SSX project activities at the South Station, Widett Circle, and Beacon Park Yard sites would be considered redevelopment projects as they would occur on previously developed sites and would result in no net increase in impervious cover. SSX project activities at the Readville – Yard 2 site would not constitute as redevelopment as track expansion would convert previously permeable land to impervious tracks and ballasts.

Below is a summary of how the SSX project would comply with the Massachusetts Stormwater Standards.

- Standard 1: Avoid new untreated discharges or erosion to wetlands.
  Compliance: Full compliance would be achieved. All project elements would drain to existing municipal storm sewers.

- Standard 2: Reduce peak rate attenuation to pre-development rates.
  Compliance: Compliance would be achieved to the maximum extent practicable for redevelopment sites. Stormwater BMPs would be installed at the Readville – Yard 2 site to ensure peak flow rates are reduced to pre-development rates. The peak flow rates for each site are presented in Section 6 – Potential Impacts. This standard does not apply to discharges to tidal waters including Fort Point Channel.

- Standard 3: Minimize loss of stormwater recharge from pre-development conditions.
  Compliance: Compliance would be achieved to the maximum extent practicable for redevelopment sites. Stormwater BMPs would be installed at the Readville – Yard 2 site to promote recharge to match pre-development rates. Stormwater treatment BMPs would be included at each site as outlined in Table 16.

- Standard 4: Remove 80% of average annual post-construction load of TSS.
  Compliance: Compliance would be achieved to the maximum extent practicable for redevelopment sites. Stormwater BMPs would be installed at the Readville – Yard 2 site to ensure TSS removal. Stormwater treatment BMPs would be included at each site as outlined in Table 16.

- Standard 5: Implement source control and pollution prevention measures for land uses with higher potential pollutant loads.
  Compliance: Compliance would be achieved to the maximum extent practicable for redevelopment sites. The layover facility sites qualify as LUHPPLs as they are regulated under the NPDES MSGP. Containment and treatment measures would be used to prevent the release of oil and hazardous materials from the site.

- Standard 6: Implement source control and pollution prevention measures around critical areas.
  Compliance: Full compliance would be achieved. No project elements would discharge near or to a critical area.

- Standard 7: Comply to the maximum extent possible with redevelopment projects.
  Compliance: All project elements except for Readville – Yard 2 would constitute redevelopment. Compliance with the Massachusetts Stormwater Standards would be achieved to the maximum extent practicable.

- Standard 8: Implement construction period pollution prevention and erosion and sedimentation controls.
  Compliance: Full compliance would be achieved. The project would obtain coverage under the NPDES Construction General Permit prior to the start of construction and meet the requirements of this standard for each site.

- Standard 9: Develop and implement long term operation and maintenance plan.
  Compliance: Full compliance would be achieved. MassDOT would develop a detailed O&M plan during final design.

- Standard 10: Avoid/remove illicit discharges.
  Compliance: Full compliance would be achieved. The proposed project elements would be designed to be in full compliance with current standards. Any identified illicit connections would be removed.

7.1.3. Groundwater Overlay District

The BRA updated the Groundwater Conservation Overlay District as of April 25, 2007 to include the area of South Boston just east of Fort Point Channel. The Groundwater Conservation Overlay District is shown in Figure 5. The South Station site is outside the Groundwater Conservation Overlay District, therefore this project does not need to comply with these requirements.

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8. Figures

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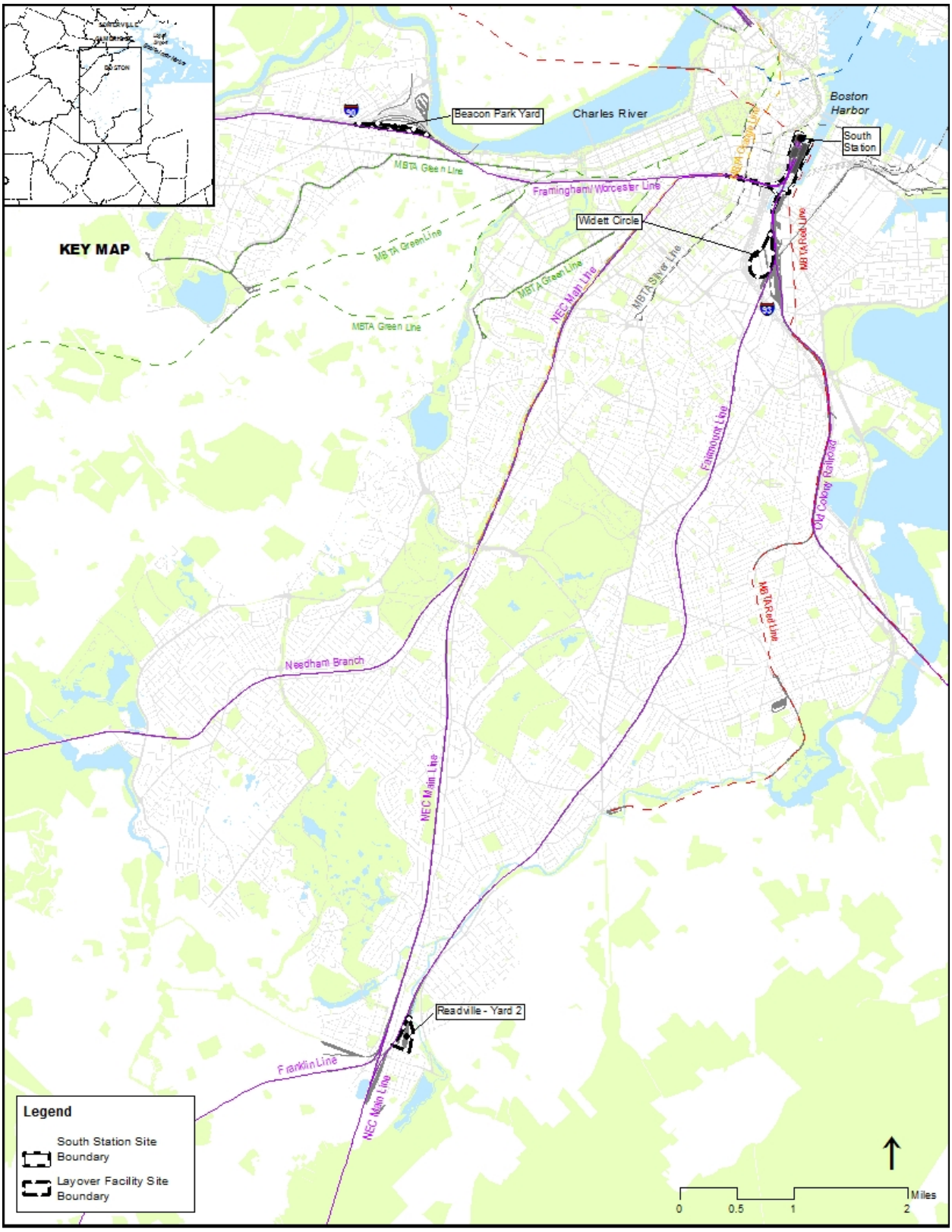

Figure 1—South Station Expansion Site Boundaries

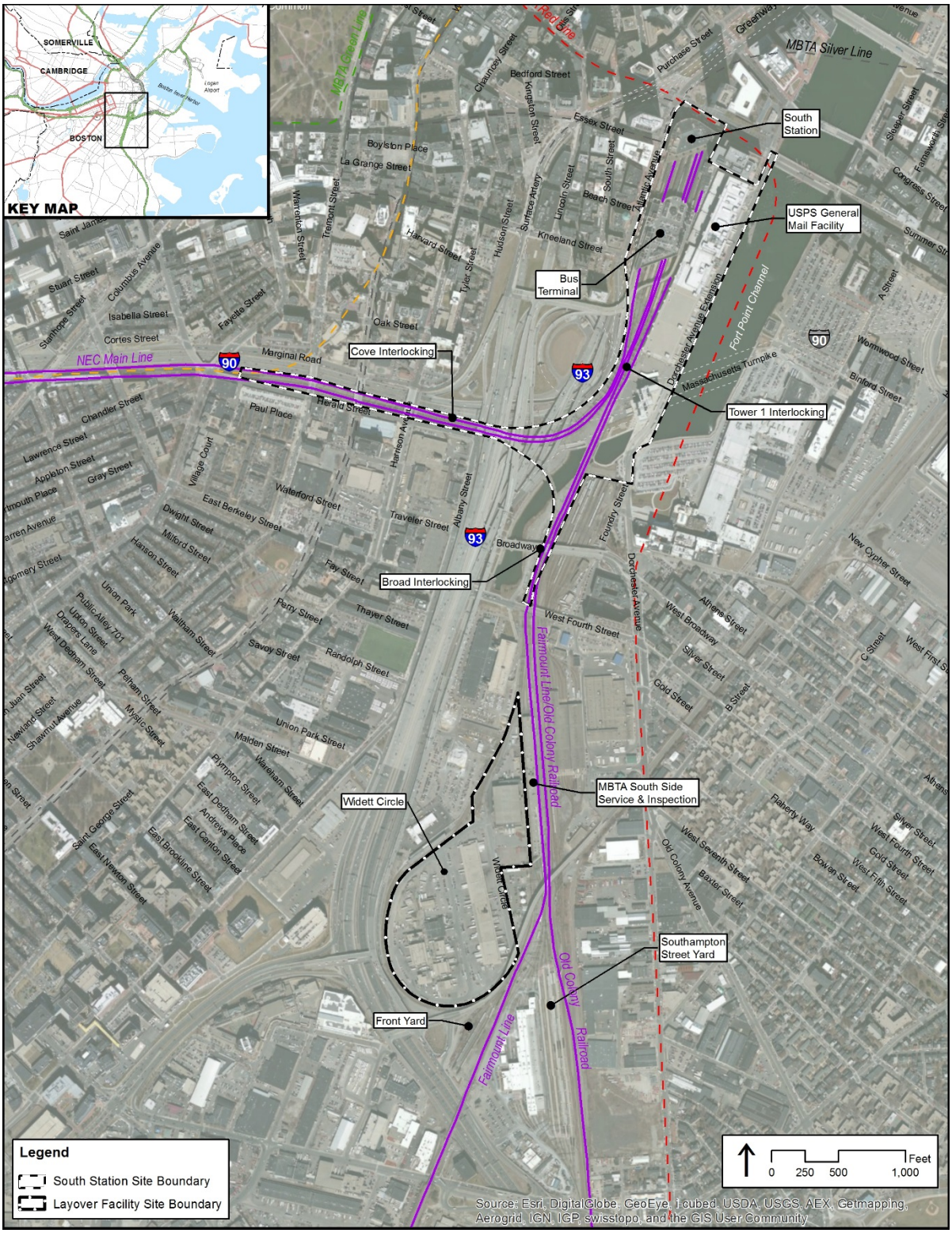

Figure 2—South Station and Widett Circle Layover Facility Site Boundaries

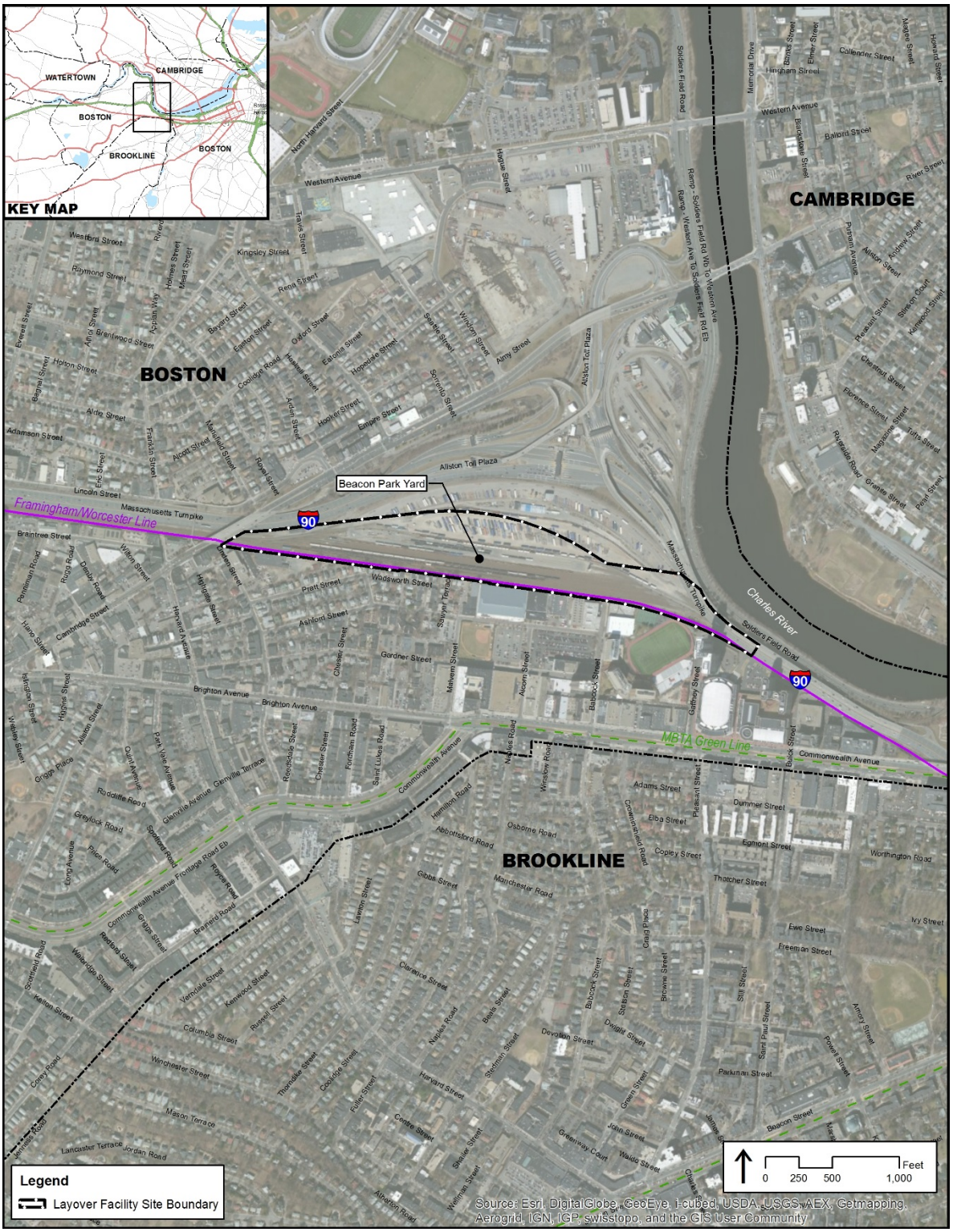

Figure 3—Beacon Park Yard Layover Facility Site Boundary

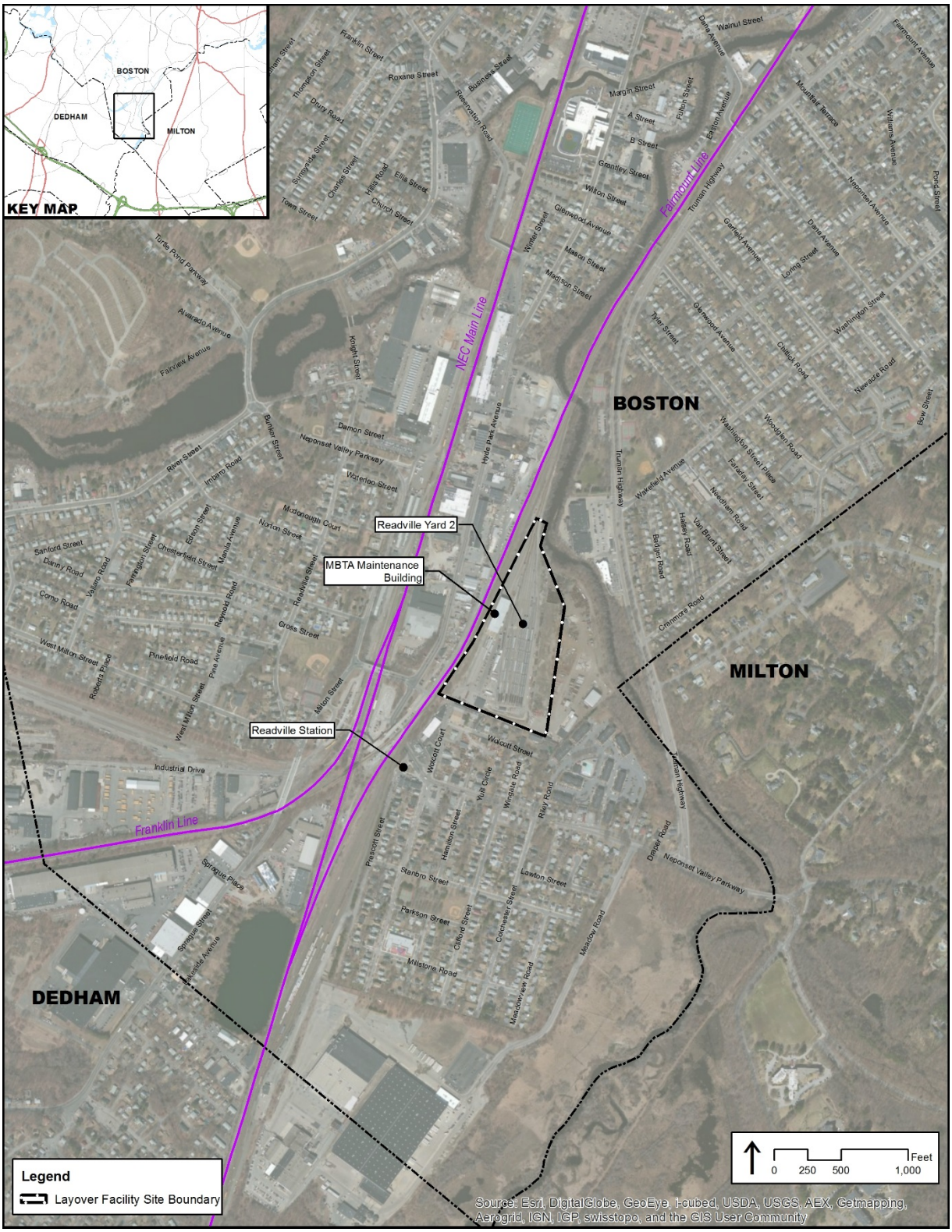

Figure 4—Readville – Yard 2 Layover Facility Site Boundary

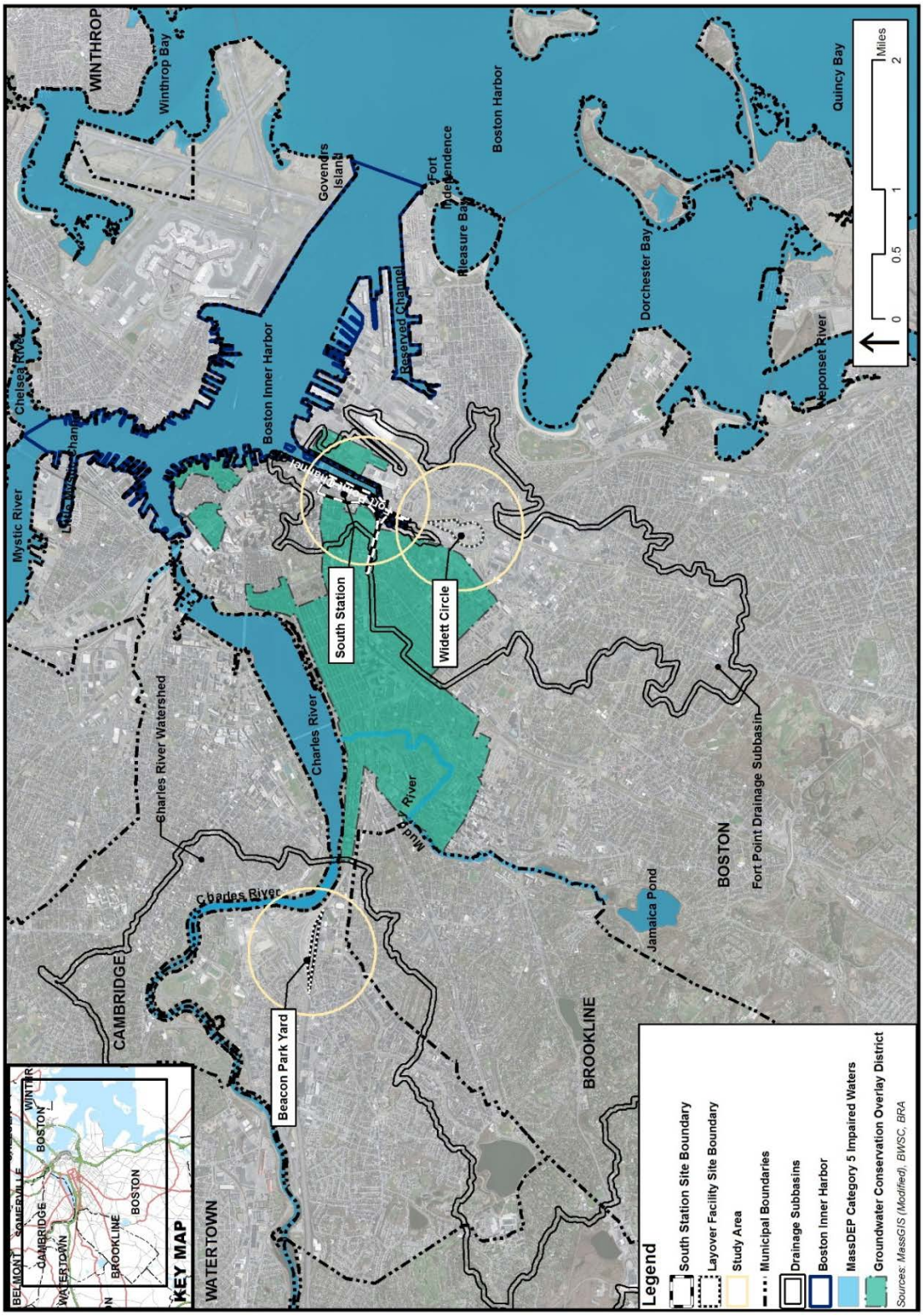

Figure 5—Water Resources Existing Conditions: South Station, Widett Circle, and Beacon Park Yard Study Areas

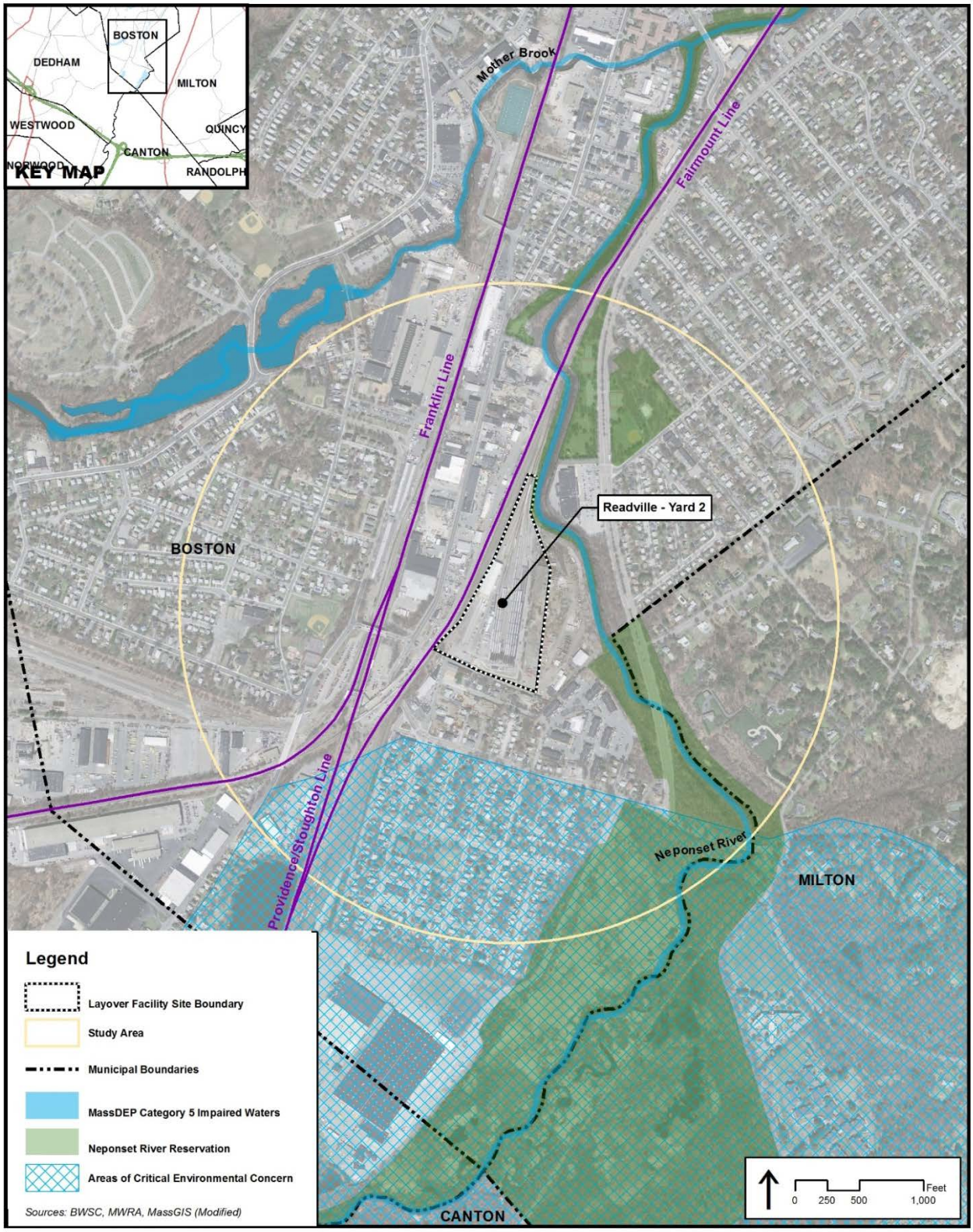

Figure 6—Water Resources Existing Conditions: Readville – Yard 2 Study Area

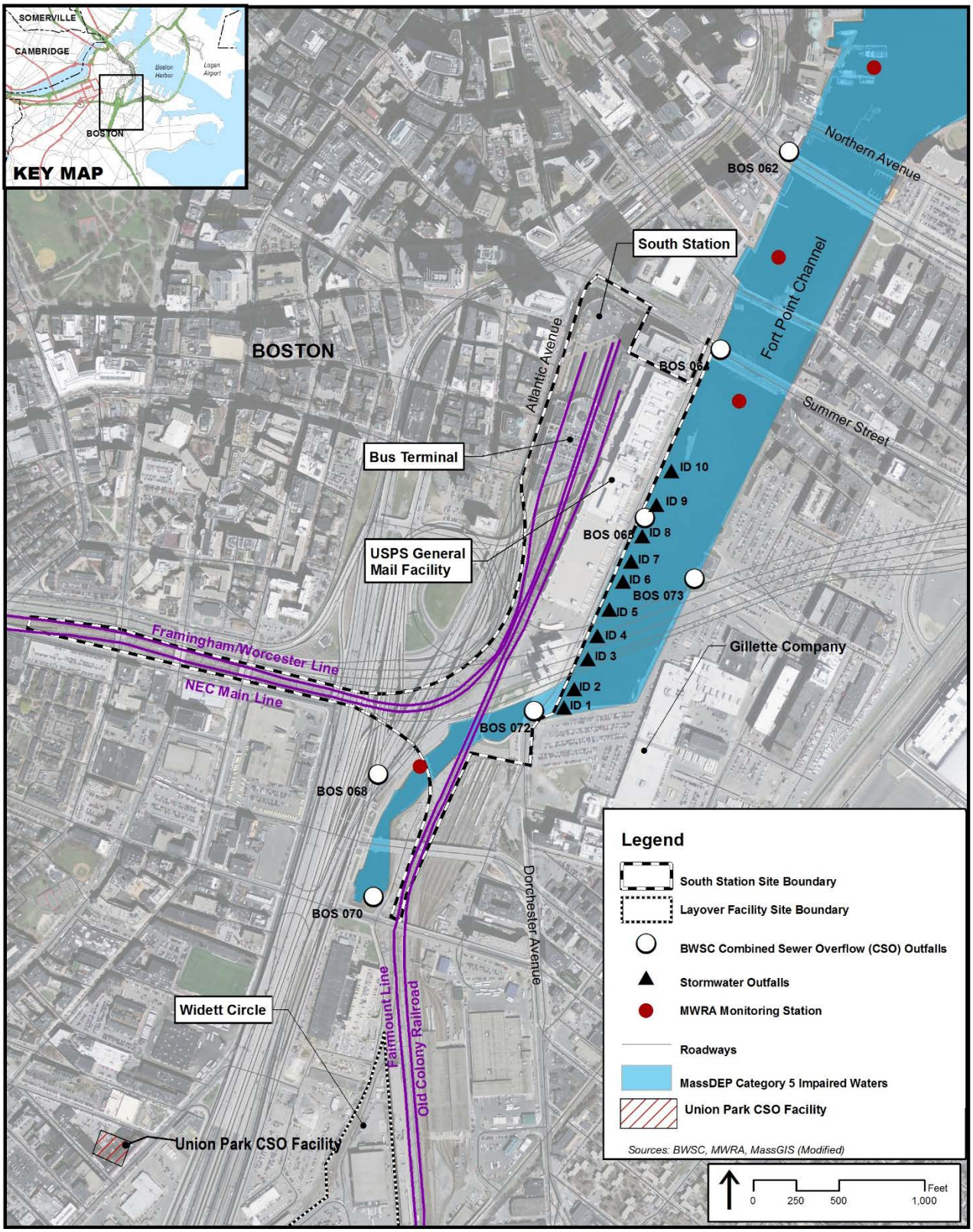

Figure 7—Stormwater Management Existing Conditions: South Station and Widett Circle Vicinity

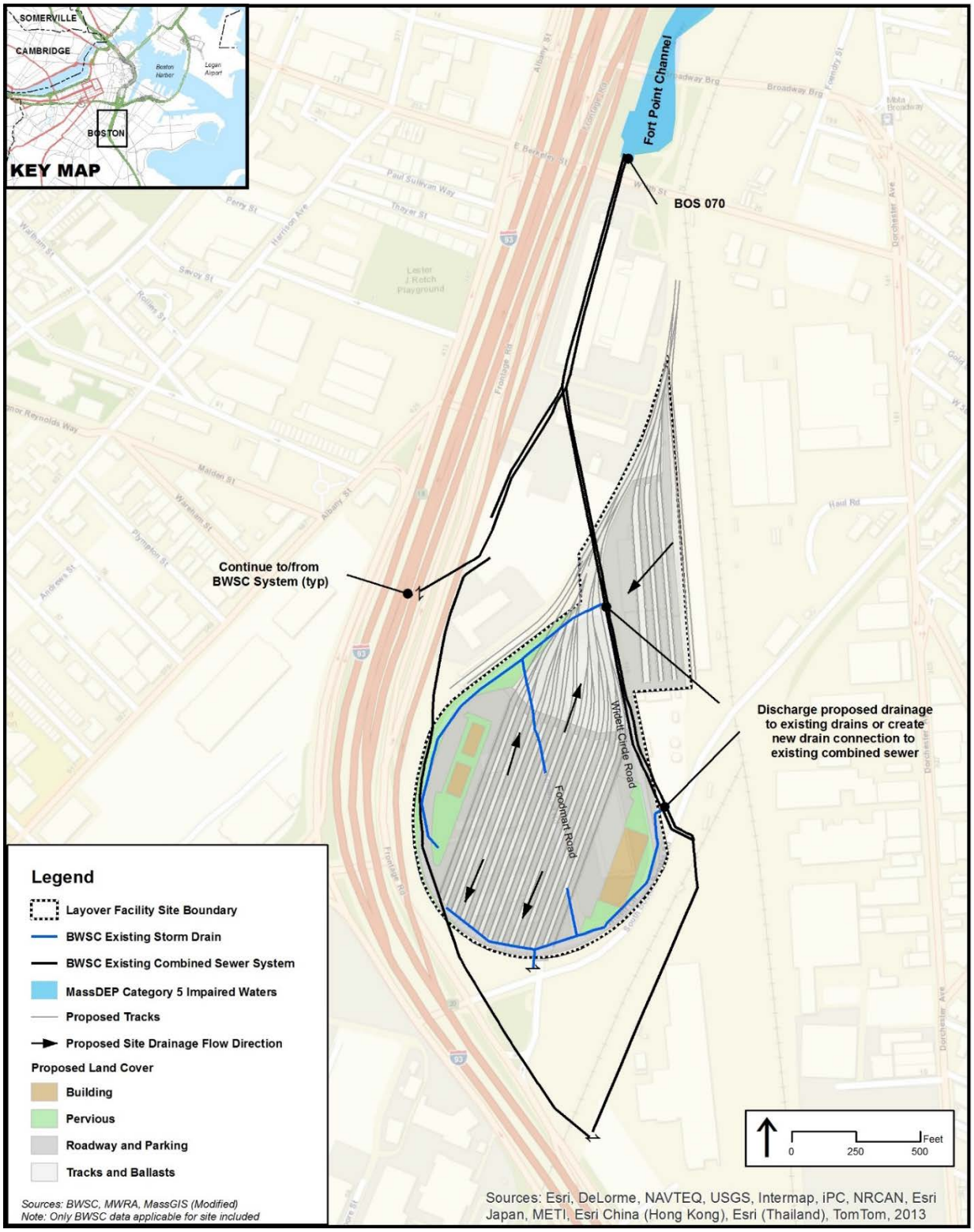

Figure 8—Water Resources Proposed Conditions: Widett Circle Layover Facility Site

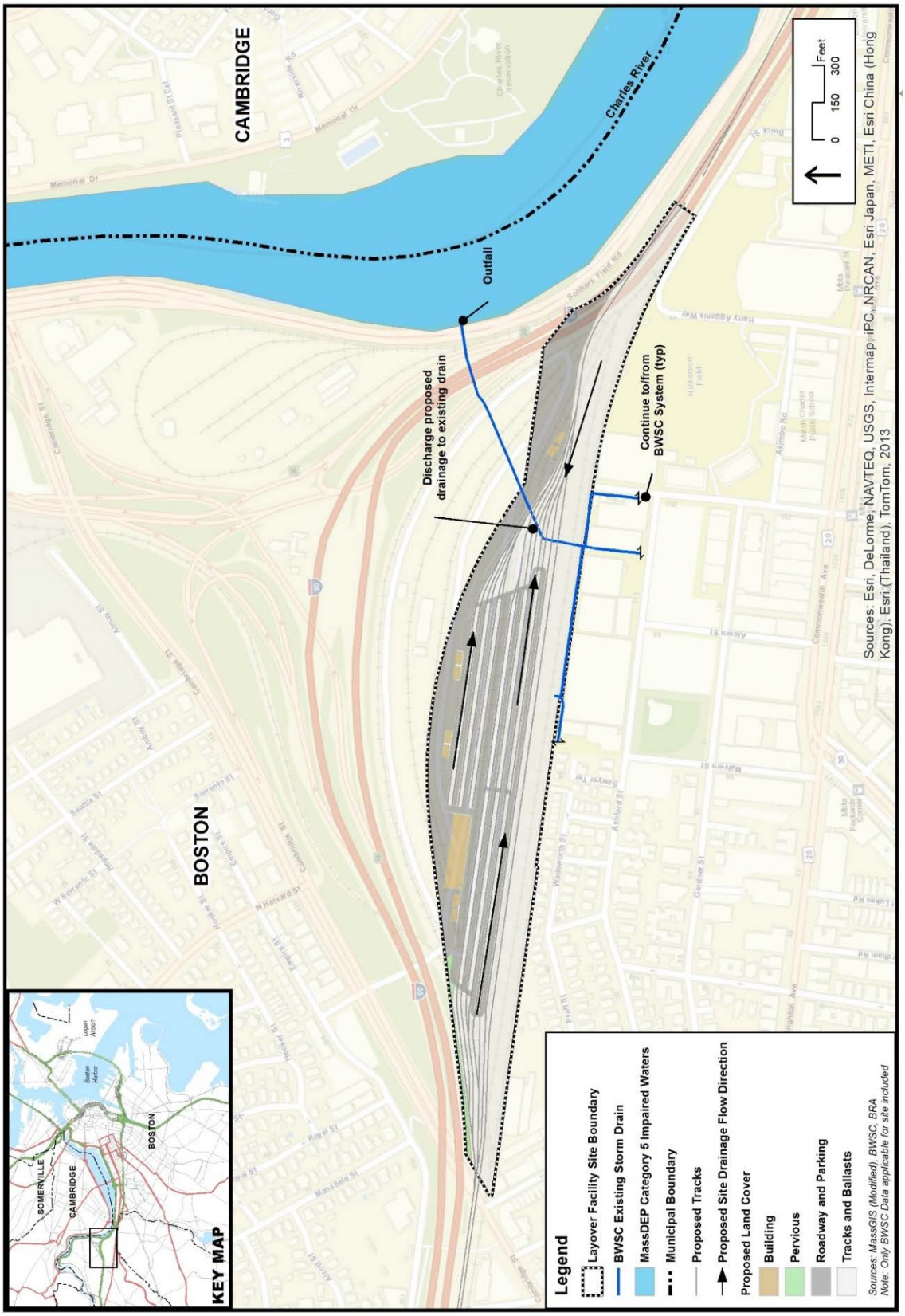

Figure 9—Water Resources Proposed Conditions: Beacon Park Yard Layover Facility Site

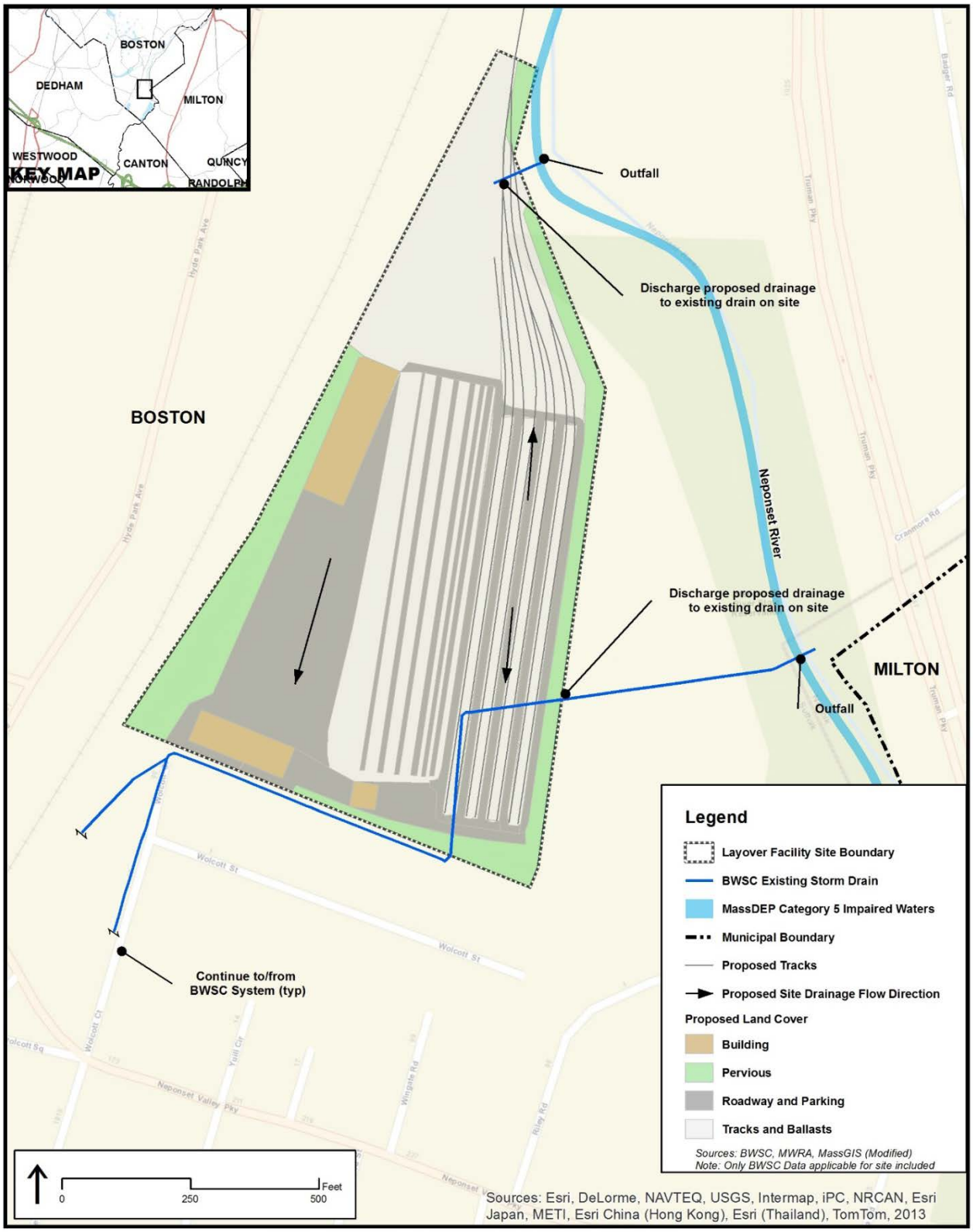

Figure 10—Water Resources Proposed Conditions: Readville – Yard 2 Layover Facility Site